Instruction Manual

AUTOMATIC PROGRAMMABLE COMPACTOR

Product Code

S199

Do not attempt to operate this equipment before reading and comprehending the manual in all its parts

Users

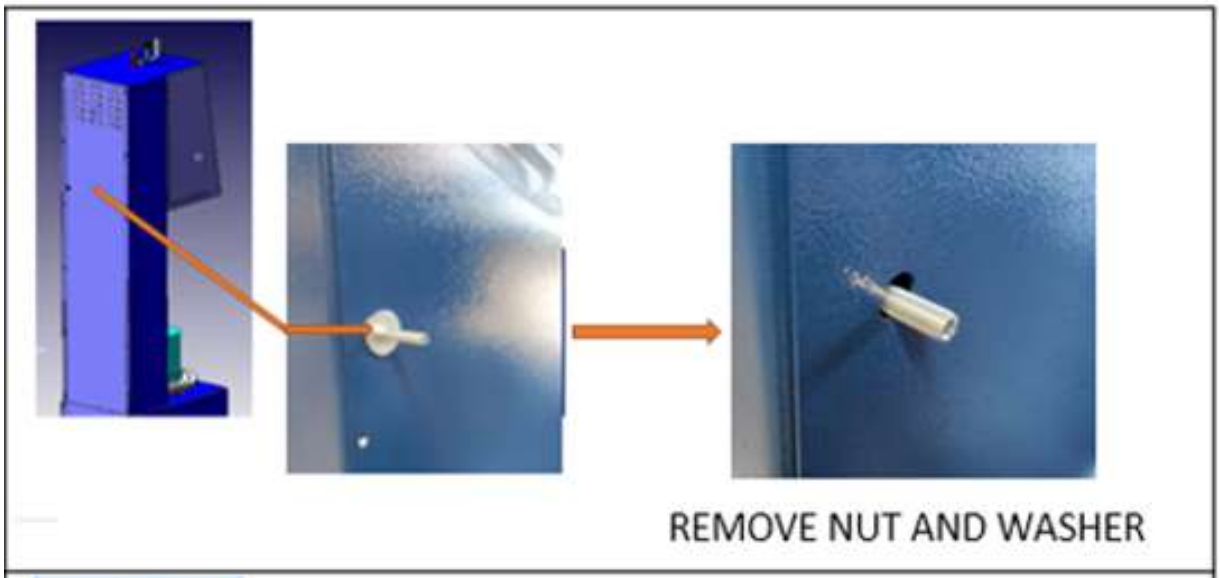
MACHINE MANUFACTURERS | DRAUGHTSMEN | OPERATORS | MAINTENANCE WORKERS | ANY OTHERS

REV.	DESCRIPTION	MANAGED	APPROVED	PRODUCT CODE	PAGES	ISSUE DATE
08	Instruction Manual	EK	UTEC	**S199.M01.EN**	33	09/2023

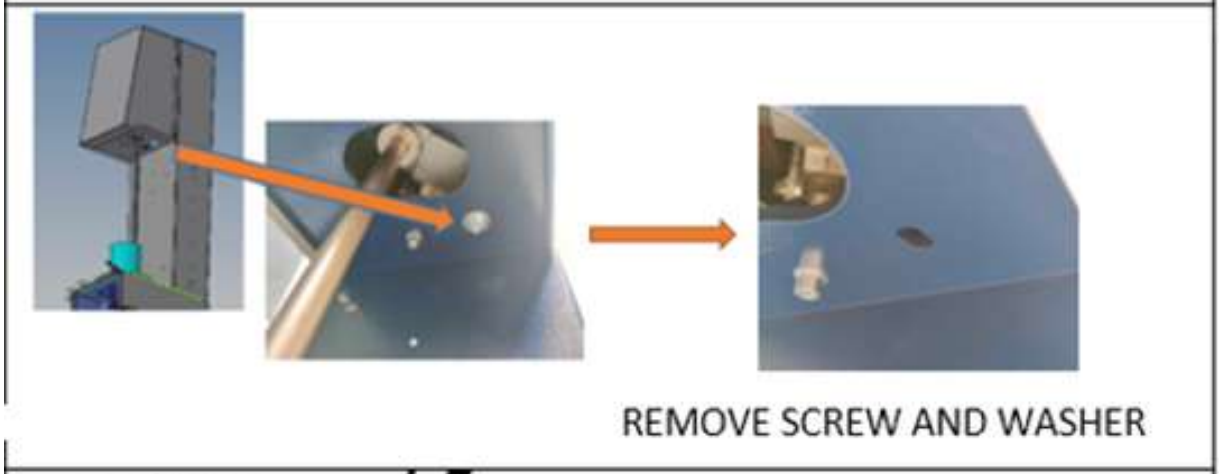
Matest S.p.a. Via delle Industrie 25, 24048 Treviolo (BG) Italy TEL. +39 035 2055011
info@matest.com | **www.matest.com**

Contents

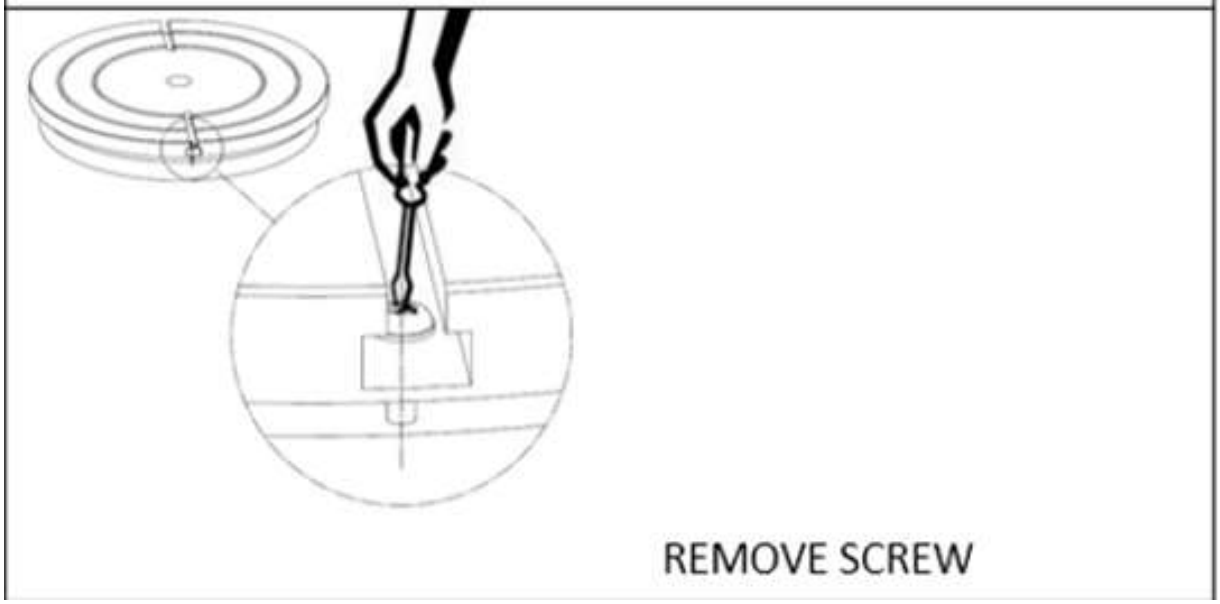
WARNING DANGER	**BEFORE TURNING ON THE MACHINE, TAKE NOTE OF THE FOLLOWING NOTES**



REMOVE NUT AND WASHER



REMOVE SCREW AND WASHER



REMOVE SCREW

1. GENERAL INFORMATION

1.1 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 (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.

1.2 WARNING AND DANGER INDICATIONS - SIGNS

The machine has been designed and constructed according to the current norms and consequently with mechanical 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**	It indicates that machine damage could be caused should indications be ignored.
	**DANGER**	It 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 on the appliance in which a person is exposed to the risk of injury of damage to health.

1.3 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.

1.4 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.

1.5 COMPOSITION OF THE INSTRUCTIONS MANUAL

Document Description	Document Code
Instructions manual	S199.M01.EN.08

1.6 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.

1.7 CONSTRUCTOR IDENTIFICATION

See first page.

1.8 MACHINE IDENTIFICATION DATA

See machine identification data on EC Declaration or behind the machine.

1.9 EC STAMP

See EC Declaration

1.10 USAGE

The compactor has been projected to compact the CBR, standard and modified Proctor specimens in a completely automatic way.

WARNING DANGER	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.

1.11 OPERATORS

WARNING DANGER	The use, transportation, installation, maintenance, demolition and disposal of the appliance are only permitted to "QUALIFIED PERSONNEL". This manual is exclusively aimed at "QUALIFIED PERSONNEL" and contains the necessary information for machine use.

'' 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 authorized 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 recognize 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 1C°, and a maximum of +40C° and a maximum humidity of 100%.

1.13 TRASPORTATION 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.
The appliance is generally delivered in a wooden case movable by a forklift

PACKAGING weight ***(Kg):~ 240***

Dimensions (mm):~ **1900x750x900**

WARNING DANGER	**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.

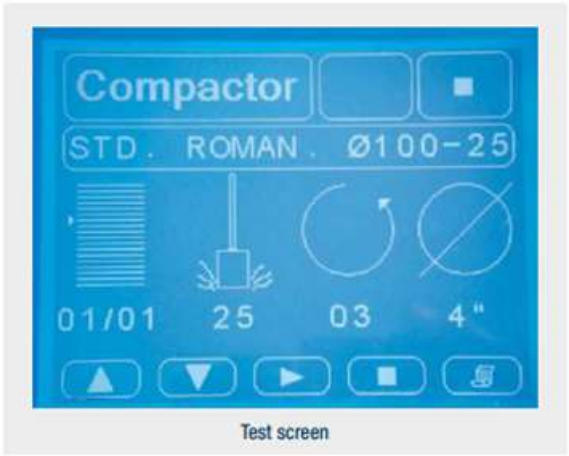
WARNING	In order to avoid bumps and overturn adopt the normal and logical precautions. Before disposing of the packaging check all machine components such as accessories, utensils, instructions, documents etc have been removed.

2. TECHNICAL CHARACTERISTICS

2.1 GENERAL MACHINE DESCRIPTION

A	FRAME
B	CONTROL PANEL
C	OPTIONAL SAFETY GUARDS

Technical characteristics:
Fall height: 12”/18” or 300/450 mm
Rammer drop speed: 1 blow each 2 seconds.
Compatible moulds: dia 4”/6”/100 mm/150 mm
Power supply: 230 V 1 ph 50 Hz 500 W



Test screen

ACCESSORIES

S199-11 SAFETY GUARDS to CE Directive.
If the door is opened when the Compactor is working, it stops automatically.

As alternative:

S199-12 SOUNDPROOF SECURITY CABINET, steel made with microswitch, complying to CE Safety Directive, lined with sound-proofing material for noise reduction. If the door is opened while the Compactor is working, it automatically stops.
Dimensions: 740x730x1900 mm
Weight: 80 kg approx.

NEEDED ACCESSORIES

S199-06 STANDARD RAMMER Ø 50 ± 0.2 mm and 2500 ± 10 g weight
S199-07 MODIFIED RAMMER Ø 50 ± 0.2 mm and 4535 ± 5 g weight
Modified rammer are hardened for wear resistance.
Conforming to: EN 13286-47 | BS 1377:4 | DIN 18127 UNE 7255, 7365, 103-501-94 Standards.

OR:

S199-08 STANDARD RAMMER Ø 50.8 ± 0.13 mm and 2491,25 ± 1.25 g weight
S199-09 MODIFIED RAMMER Ø 50.8 ± 0.13 mm and 4537 ± 3 g weight
Modified rammer are hardened for wear resistance.
Conforming to: ASTM D558, D559, D698, D1557, D1883 NF P94-066/93 | CNR UNI 10009 CNR N. 69 | ASHTO T99, T180, T193

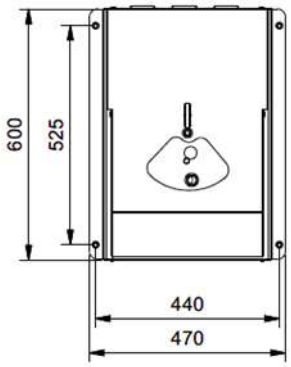
OR:

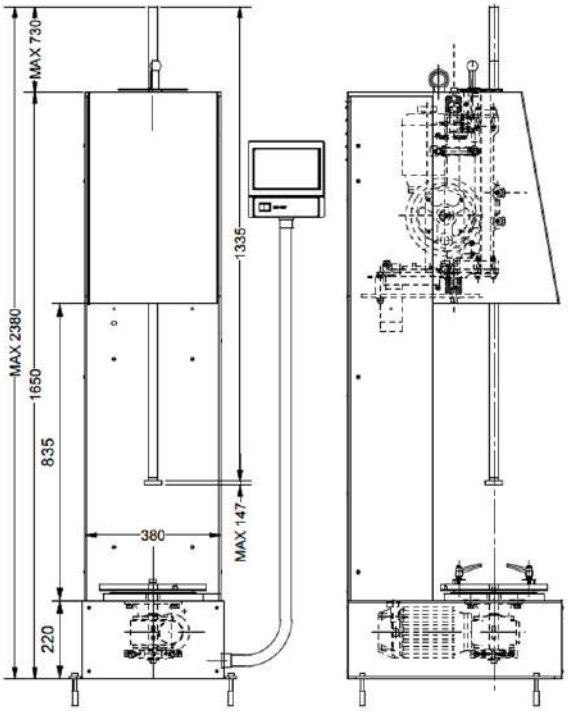
S199-13 STANDARD RAMMER, Ø 50 ± 0.4 mm and 2700 ± 10 g weight
S199-14 MODIFIED RAMMER, Ø 50 ± 0.4 mm and 4900 ± 10 g weight
Modified rammer are hardened for wear resistance.
Conforming to: AS 1289 (Australian) Standard.

2.2 DIMENSIONS AND WEIGHT

Width (mm)	*470*
Length (mm)	*600*
Height (mm)	*1710*

Weight *(Kg) ~ 200Kg*





2.3 POWER SUPPLY

The identification plate is located on the rear side of the instrument, near the power cable outlet.

2.4 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 greater than 85 dB (A), it is advisable to use Personal Protective Equipment (Protective cap, Protective caps, etc.). If the daily personal exposure is equal to or greater than 90 dB (A), it is mandatory to use Personal Protective Equipment (Protective cap, Protective caps, etc.). For more information, consult the regulations in force in the country of installation.

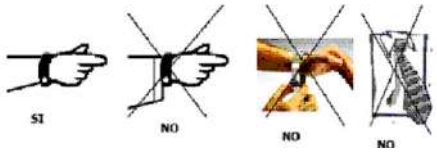
DANGER
Continuous use of the appliance and machines predictably present in the installation environment could cause a heightened daily personal exposure to noise.

3. GENERAL SAFETY STANDARDS

3.1 GENERAL STANDARDS

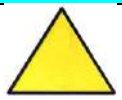
To ensure the safety of machine operators:

- 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 Carry 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 authorized 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.

RISK OR DANGER		PROTECTION DEVICES	
FINGER SQUEEZE CUTS OR ABRASIONS		REINFORCED GLOVES	
MATERIAL FALL		ACCIDENT-PREVENTION SHOES	

3.2 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.

3.3 FIXED AND MOBILE DEVICES

The testing machine in the STANDARD version does not have any type of guard or protection.

By adding the S199-11 safety guards (OPTIONAL) the machine becomes compliant with the European CE directives, thus having a safety micro switch to prevent the operator from accessing the moving parts of the equipment during the execution of the tests.

3.4 ACTIVE SAFETY DEVICES

Active safety devices are those devices or measures which eliminate or reduce the risks for the operators and which require active and conscious interventions by the operator to carry out their preventive action.
The control panel of the appliance is equipped with a main switch (C1) acting also as emergency switch

3.5 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 compactor is equipped with a system of alarms, these alarms intervene in the event of malfunctioning of the equipment, immediately stopping the movement of the rammer, thus reducing potential risks for the user and for the equipment itself.

With the activation of an alarm, the danger symbol "⚠" is displayed in the center of the control panel, flanked by a descriptive icon that denotes the type of alarm activated, for further information consult the chapter "DESCRIPTION OF THE ALARMS".

4. INSTALLATION INSTRUCTIONS

4.1 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	ALLOWED RELATIVE HUMIDITY
From +5°C to +40°C	from 30% to 70%

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.
Unauthorized 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 control panel must be fixed to the wall and placed at a height such as to allow the operator good control of all the functions in progress and rapid intervention in the event of an emergency and should it be necessary to suspend all the operations.
The machine must be installed on a flat and rigid floor in a stable manner; fix the machine to the floor using the special tie rods and carefully check that the axis of the compacting rammer (B5) is perfectly level.
The floor must have a capacity of at least 500 kg/m2 to support the weight of the machine and the loads transmitted during the operating phase.

4.2 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.
The compactor is equipped with an eyebolt (B17) placed on the top, to facilitate handling.

4.3 ASSEMBLING PROCEDURE

After removing the packaging, make sure the machine is intact, checking that there are no visibly damaged parts. In case of doubt DO NOT USE THE MACHINE and contact the retailer.

4.4 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
- The voltage pulses must not last more than 1,5 ms with an up/down time between 500 ms and

- 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.

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.

5. MAN-COMMAND INTERFACE

5.1 CONTROLS AND MESSAGE

DESCRIPTION OF ENCLOSURE B – DETAIL VIEW OF THE RAMMER GROUP
DESCRIPTION OF ENCLOSURE B1 – DETAIL VIEW OF THE RAMMER HOLDING UNIT
DESCRIPTION OF ENCLOSURE B2 –DETAIL VIEW OF THE MOULD TABLE ROTATION UNIT
DESCRIPTION OF ENCLOSURE B3 – DETAIL VIEW OF THE RAMMER POSITION CONTROL SENSORS

	CONTROL	DESCRIPTION
B1	FALL HEIGHT SELECTOR LEVER	Two heights of drop of the rammer can be selected: - 18” (457.2 mm) by pulling upwards the lever; - 12” (304.8 mm) by pulling downwards the lever.
B2	FALL HEIGHT ADJUSTMENT SCREW “18”	It allows the correction or modification of the compaction rammer drop height.
B3	FALL HEIGHT ADJUSTMENT SCREW “12”	It allows the correction or modification of the compaction rammer drop height.
B4	UPPER PROTECTIVE CARTER	It allows the protection of the moving parts of the compacting rammer
B5	COMPACTION RAMMER	It allows the compaction of the material under test. It is possible to attach the weights as per the different test standards.
B6	MOLD HOLDER ROTATING TABLE	It allows the placement of the appropriate mold containing the specimen to be compacted. The mold must be centered on the table using the appropriate centering pin, and locked using the appropriate clamps.
B7	BLOCKING CLAMPS	They allow the blocking of the mold on the rotating table. Check and verify that the positions of the clamps do not interfere with the lower protective casing (model S198-01 only) during rotation. To unlock the movement of the clamp, lift the clamp itself; to lock it, push it down again.
B8	RAMMER MOVEMENT CONTROL SENSOR	
B9	RAMMER MOVEMENT CONTROL SENSOR COMMAND	
B10	TABLE ROTATION CONTROL SENSOR	
B11	TABLE ROTATION CONTROL SENSOR COMMAND	
B12	RAMMER CENTRAL POSITION CONTROL SENSOR	
B13	RAMMER POSITION CONTROL SENSOR FOR 4" MOLD	
B15	RAMMER POSITION CONTROL SENSOR FOR 6" MOLD	

B16	RAMMER CENTRAL POSITION CONTROL SENSOR COMMAND	
B17	EYEBOLT	It allows the equipment to be lifted during installation operations.
B18	GEAR MOTOR	It allows the cam working.
B19	CAM	By turning, it allows the compaction rammer to move upwards and downwards
B20	ENGINE ARM ROTATION PIN	
B21	GEAR MOTOR	It allows the operation of the mold holder rotating table.

DESCRIPTION OF THE ENCLOSURE C – CONTROL PANEL

		DESCRIPTION
C1	MAIN SWITCH	It allows the switching on and off of the appliance.
C2	PUSHBUTTONS	They assume the function of the symbol placed above them in section C3
C3	ICONS	The keys  allow you to scroll forward and backward the pre-set regulations which are shown in the upper part of the display (C5)
		The "PLAY" key  allows you to start the selected functions. **ATTENTION: Before pressing the key, check that the suitable mold for the test is mounted on the table**. At the end of the cycle, to restart a new cycle, it is necessary to press the STOP button and then the PLAY button
		Press the "STOP" key  twice to stop all the functions in progress, without cutting off power to the panel; pressed once it activates the "PAUSE" function, which allows you to open the lower protective casing (if supplied) without contraindications.
		The key  allows access to the function customization masks
C4	CHARACTERISTICS	From right on the left: current phase of constipation out of the total amount, n° of blows, n° of turns, diameter of constipation.
C5	STANDARD	Identifier of the selected standard (See table below)

The compactor carries out the compaction test according to the following Standards in a fully automatic way:

STANDARD	**BLOW**			
	RAMMER	**MOLD**	**drop H**	**Sequence**
EN 13286-2	RAMMER "A" : ø50 +/-0.5mm – WEIGHT 2500g +/- 20g	MOLD "A" : ø100 +/- 1	305 +/- 3mm	FOR EACH LAYER, 24 SHOTS IN 3 FULL TURNS AND 1 CENTER SHOT (TOTAL 25 SHOTS)
	RAMMER "A" : ø50 +/-0.5mm – WEIGHT 2500g +/- 20g	MOLD "B" : ø150 +/- 1	305 +/- 3mm	FOR EACH LAYER, 8-TIME REPETITION OF A CYCLE OF 6 STROKES IN A COMPLETE TURN AT THE MOLD 150mm +1 CENTRAL SHOT (TOTAL 56 STROKES)

	RAMMER "B" : ø50 +/-0.5mm – WEIGHT 4500g +/- 40g	MOLD "A" : ø100 +/- 1	457 +/- 3mm	FOR EACH LAYER, 8-TIME REPETITION OF A CYCLE OF 6 STROKES IN A COMPLETE TURN AT THE MOLD 150mm +1 CENTRAL SHOT (TOTAL 56 STROKES)
	RAMMER "B" : ø50 +/-0.5mm – WEIGHT 4500g +/- 40g	MOLD "B" : ø150 +/- 1	457 +/- 3mm	FOR EACH LAYER, 8-TIME REPETITION OF A CYCLE OF 6 STROKES IN A COMPLETE TURN AT THE MOLD 150mm +1 CENTRAL SHOT (TOTAL 56 STROKES)
ASTM D1883	RAMMER PER MOLD ø4" : ø50.8 +/-0.13mm – WEIGHT 2500g +/-10g –	MOLD ø6" (152.4 +/- 0.7mm)	304.8 +/- 1.3mm	THE RAMMER MUST BE AT A DISTANCE OF 2.5mm FROM THE EDGE OF THE MOLD FREQUENCY : 25 STROKES MIN. FOR EACH LAYER A SEQUENCE OF 56 STROKES + 25 STROKES + 10 UNIFORMLY DISTRIBUTED ON THE SURFACE **FIRST SEQUENCE OF 56 SHOTS** • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center. **SECOND SEQUENCE OF 25 SHOTS** • 18 rounds in 1 complete turn of the MOLD at the dia. 6"; • 6shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; **THIRD SEQUENCE OF 10 STROKES** • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center. THE SEQUENCES ARE CONSECUTIVE, WITH NO INTERRUPTIONS OR CONSENSUS BETWEEN THEM.

STANDARD	**BLOW**			
	RAMMER	**MOLD**	**drop H**	**Sequence**
ASTM D1557	RAMMER PER MOLD ø4" : ø50.8 +/-0.13mm – WEIGHT 4540g +/- 10g –	MOLD dia. 4" (101.6 mm)	457.2 +/- 1.6mm	THE RAMMER MUST BE AT A DISTANCE OF 2.5mm FROM THE EDGE OF THE MOLD. FREQUENCY :25 MIN STROKES • 25 rounds in 3 complete turns of the MOLD at the dia. 4"
	RAMMER PER MOLD ø6" : CIRCULAR SECTOR OF RADIUS 73.7mm +/- 0.5mm WITH THE SAME AREA OF A DIAMETER OF 50.8mm WEIGHT 4540g +/- 10g –	MOLD dia. 6" (152.4 mm)	457.2 +/- 1.6mm	THE TIP OF THE SECTOR MUST COINCIDE WITH THE CENTER OF THE MOLD. THE RAMMER MUST BE AT A DISTANCE OF 2.5mm FROM THE EDGE OF THE MOLD. FREQUENCY :25 MIN STROKES 56 rounds divided into: • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center.

ASTM D698	RAMMER PER MOLD ø4" : ø50.8 +/- 0.13mm – WEIGHT 2500g +/-10g –	MOLD dia. 4" (101.6 mm)	304.8 +/- 1.3mm	THE RAMMER MUST BE AT A DISTANCE OF 2.5mm FROM THE EDGE OF THE MOLD. FREQUENCY :25 MIN STROKES • 25 rounds in 3 complete turns of the MOLD at the dia. 4"
	RAMMER PER MOLD ø6" : CIRCULAR SECTOR OF RADIUS 73.7mm +/- 0.5mm WITH THE SAME AREA OF A DIAMETER OF 50.8mm WEIGHT 4540g +/-10g –	MOLD dia. 6" (152.4 mm)	304.8 +/- 1.3mm	THE TIP OF THE SECTOR MUST COINCIDE WITH THE CENTER OF THE MOLD. THE RAMMER MUST BE AT A DISTANCE OF 2.5mm FROM THE EDGE OF THE MOLD FREQUENCY :25 MIN STROKES 56 rounds divided into: • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center.
AFNOR NF P 94-066	RAMMER STANDARD : ø 51+/-1 – WEIGHT 2490 +/-2.5g	MOLD CBR : ø 152 +/- 0.5	305 +/- 2mm	CONSTIPATION SEQUENCE: 100 STROKES WITHOUT SPECIFYING THE MODE * 6 shots in a complete turn of the MOLD at the edge; * 1 shot at the center of the MOLD; * this sequence is repeated 14 times and the last two shots are given at the edge of the MOLD;
AFNOR NF P094-093	RAMMER STANDARD : ø 51+/-1 – WEIGHT 2490 +/-2.5g	MOLD PROCTOR : ø101.5 +/-0.5	305 +/- 2mm	MOLD dia. 4" (102 mm) 25 rounds: * 24 rounds in 6 complete turns of the MOLD at the dia. 100 mm (4"); * 1 final shot at the MOLD center.
	RAMMER MODIFIED : ø 51+/-1 – WEIGHT 4535 +/-5g	MOLD CBR : ø 152 +/- 0.5	457 +/- 2mm	MOLD dia. 6" (152) - 56 rounds: * 6 shots in a full turn of the MOLD at the dia. 150 mm (6"); * 1 final shot at the MOLD center; This sequence is repeated 8 times

STANDARD	BLOW			
	RAMMER	MOLD	H drop	Sequence
AASHTO T99-10 **METHOD "A" – " C"**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 2495g +/-9g	MOLD : ø101.6mm +/-0.41mm	305 +/-2mm	25 UNIFORMING ROUNDS DISTRIBUTED IN 3 COMPLETE TURNS OF MOLD
AASHTO T99-10 **METHOD "B" – "D"**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 2495g +/-9g	MOLD : ø152.4mm +/-0.66mm	305 +/-2mm	56 ROUNDS DIVIDED INTO: • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center.
AASHTO T180-10 **METHOD "A" – " C"**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 4536g +/-9g	MOLD : ø101.6mm +/-0.41mm	457 +/- 2mm	25 UNIFORMING ROUNDS DISTRIBUTED IN 3 COMPLETE TURNS OF MOLD
AASHTO T180-10 **METHOD "B" – "D"**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 4536g +/-9g	MOLD : ø152.4mm +/-0.66mm	457 +/- 2mm	56 ROUNDS DIVIDED INTO: • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center.
AASHTO T193-10 **58 STROKES**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 2495g +/-9g RAMMER : ø 50.8 +/-0.25mm WEIGHT 4536g +/-9g	MOLD : ø152.4mm +/-0.66mm	305 +/-2mm 457 +/- 2mm	58 ROUNDS DIVIDED INTO: • 1 shot in the center; • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center.

STANDARD	BLOW			
	RAMMER	MOLD	RAMMER	Sequence
AASHTO T193-10 **96 STROKES**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 2495g +/-9g RAMMER : ø 50.8 +/-0.25mm WEIGHT 4536g +/-9g	MOLD : ø152.4mm +/- 0.66mm	305 +/- 2mm 457 +/- 2mm	96 ROUNDS DIVIDED INTO: FIRST SEQUENCE - 10 STROKES • 9 shots in a complete turn of the MOLD at the dia. 4" • 1 shot in the center. SECOND SEQUENCE - 30 STROKES • 20 shots in a full turn of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4" • 1 shot in the center. THIRD SEQUENCE - 56 STROKES; • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center; • 9 shots in a complete turn of the MOLD at the dia. 4"; 1 shot in the center;
AASHTO T193-10 **105STROKES**	RAMMER : ø 50.8 +/-0.25mm WEIGHT 2495g +/-9g RAMMER : ø 50.8 +/-0.25mm WEIGHT 4536g +/-9g	MOLD : ø152.4mm +/- 0.66mm	305 +/- 2mm 457 +/- 2mm	105 ROUNDS DIVIDED INTO: FIRST SEQUENCE - 10 STROKES • 9 shots in a complete turn of the MOLD at the dia. 4" • 1 shot in the center. SECOND SEQUENCE - 30 STROKES • 20 shots in a full turn of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4" • 1 shot in the center. THIRD SEQUENCE - 65 STROKES; • 36 rounds in 2 complete turns of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 10 shots in 1 complete turn of the MOLD at the dia. 6"; • 9 shots in a complete turn of the MOLD at the dia. 4"; • 1 shot in the center;
DIN 18127	RAMMER "A": ø50 +/-0.2 – WEIGHT 2500 +/-10g	MOLD "A" : ø100 +/- 0.4	300 +/- 1.2mm	25 STROKES IN 3 COMPLETE LAPS THE MOLD MUST ROTATE COUNTERCLOCKWISE
	RAMMER "B": ø50 +/-0.2 – WEIGHT 4500 +/-18g	MOLD "B" : ø 150 +/- 0.6	450 +/- 1.8mm	25 STROKES IN 5 COMPLETE LAPS THE MOLD MUST ROTATE COUNTERCLOCKWISE

STANDARD	BLOW			
	RAMMER	**MOLD**	**RAMMER**	**Sequence**
BS1377:4	RAMMER "A" :ø50 +/-0.5mm – WEIGHT 2500 +/-25g	MOLD "A" : ø105 +/-0.5	300 +/-3mm	SEQUENCE "1" : • 27 STROKES in 3 complete turns of the MOLD at ø105
	RAMMER "B" :ø50 +/-0.5mm – WEIGHT 4500 +/-50g	MOLD "B" : ø152 +/-0.5	450 +/-4mm	SEQUENCE "2" : 62 STROKES DIVIDED INTO: • 20 STROKES in 1 complete turn of the MOLD at the dia. 152 mm; • 10 STROKES in 1 complete turn of the MOLD at the dia. 105 mm; • 1 shot in the center; • 20 STROKES in 1 complete turn of the MOLD at the dia. 152 mm; • 10 STROKES in 1 complete turn of the MOLD at the dia. 105 mm; • 1 shot in the center. SEQUENCE "3" : 30 STROKES DIVIDED INTO: • 20 STROKES in 1 complete turn of the MOLD at the dia. 152 mm; • 10 STROKES in 1 complete turn of the MOLD at the dia. 105 mm;
PROG. SPEC. CNR 29		MOLD : ø6" (152.4mm)		The compactor automatically performs 85 STROKES divided into: • 18 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; • 9 STROKES in 1 complete turn of the MOLD at dia.101.6 mm; • 1 central shot; • 18 STROKES in 1 complete turn of the MOLD at dia.152.4 mm; • 9 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm; 2 central STROKES.
CNR 69	RAMMER : ø 51mm – WEIGHT 4539 +/-5g	MOLD dia. 6" (152.4 mm)		56 STROKES divided into: * 18 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; * 9 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm; * 1 central shot. * 18 STROKES in 1 complete turn of the MOLD at dia.152.4 mm; * 9 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm; * 1 central shot.

STANDARD	BLOW			
	RAMMER	MOLD	RAMMER	Sequence
CNR UNI 10009	RAMMER : ø51mm – WEIGHT 2495 +/-5g	MOLD : ø152.4 +/-0.2mm		PROG. UNI 10009/56 MOLD dia. 6" (152.4 mm) 56 STROKES divided into: * 18 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; * 9 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm; * 1 central shot; * 18 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; * 9 STROKES in 1 complete turn of the MOLD in corresponding dia. 101.6 mm; * 1 central shot. PROG. UNI 10009/26 MOLD dia 6" (152.4 mm) 26 STROKES divided into: * 18 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; * 8 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm. PROG. UNI 10009/12MOLD dia. 6" (152.4 mm) 12 STROKES divided into: * 9 STROKES in 1 complete turn of the MOLD at the dia. 152.4 mm; * 3 STROKES in 1 complete turn of the MOLD at the dia. 101.6 mm
DUTCH RAW		MOLD dia. 4" (101.6 mm)		25 STROKES in 4 complete turns of the MOLD at the ø4".
		MOLD dia. 6" (152.4 mm)		56 STROKES divided into: * * 18 STROKES in 2 complete turns of the MOLD at the dia. 6"; * * 10 STROKES in 2 complete turns of the MOLD at the dia. 4"; * * 18 STROKES in 2 complete turns of the MOLD at the dia. 6"; * * 10 STROKES in 2 complete turns of the MOLD at the dia. 4".
DUTCH EPP 16/4		MOLD dia. 6" (152.4 mm)		40 STROKES divided into: * * 14 STROKES in a complete turn of the MOLD at the dia. 6"; * * 6 STROKES in a complete turn of the MOLD at the dia. 4"; * * 14 STROKES in a complete turn of the MOLD at the dia. 6"; * * 6 STROKES in a complete turn of the MOLD at the dia. 4"; *
DUTCH EPP 20		MOLD dia. 6" (152.4 mm)		20 STROKES in 4 complete laps of the MOLD 6".

STANDARD	BLOW			
	RAMMER	MOLD	RAMMER	Sequence
STANDARD ROMANIAN Ø 100 – 25	RAMMER diameter 50 mm WEIGHT RAMMER 2.5 kg	MOLD Ø 100 mm	300 mm	25 STROKES in tangent to the internal diameter 100mm, divided into 3 laps
STANDARD ROMANIAN Ø 150 – 70	RAMMER diameter 50 mm WEIGHT RAMMER 4.5 kg	MOLD Ø 150 mm	450 mm	Drop sequence 70 STROKES divided into: * 12 STROKES tangent to the 150 mm diameter, in 1 turn of the MOLD; * 7 STROKES tangent to the 100 mm diameter, in 1 turn of the MOLD; * 12 STROKES tangent to the diameter 150 mm in 1 turn of the MOLD; * 7 STROKES tangent to the 100 mm diameter, in 1 turn of the MOLD; * 12 STROKES tangent to the diameter 150 mm in 1 turn of the MOLD; * 7 STROKES tangent to the 100 mm diameter, in 1 turn of the MOLD; * 13 STROKES tangent to the diameter 150 mm in 1 turn of the MOLD;
UNE 7-255-79	RAMMER : ø 50 +/-0.2 – WEIGHT 2500 +/-10g	MOLD : ø 102 +/-0.4	305 +/-2mm	PROG.SPEC.UNE 26 MOLD dia. 4” (101.6 mm) 26 STROKES in 3 full turns of the MOLD near the inside diameter of the MOLD PROG.SPEC.UNE 60 MOLD dia.4” (101.6 mm) 60 STROKES in 8 full turns near the inside diameter of the MOLD
UNE 7-365-79	RAMMER : ø 50 +/-0.2 – WEIGHT 4540 +/-10g	MOLD : ø 152.5 +/-0.7	457 +/-2mm	MOLD dia. 6” (152.4 mm) 55 STROKES divided into: * 36 STROKES in 2 full turns of the MOLD at the dia. 6”; * 9 STROKES in one full turn of the MOLD at the dia. 4”; * 1 central shot; * 9 STROKES in 1 full turn of the MOLD at the dia. 4".
UNE 103-501	RAMMER : ø 50 +/-0.2 – WEIGHT 4535 +/-10g	MOLD : ø 152.5 +/-0.7	457 +/-2mm	60 STROKES divided into: * 20 STROKES in 1 full turn of the MOLD at the dia. 6”; * 3 central STROKES; * 18 STROKES in 1 full turn of the MOLD at the dia. 6”; * 2 central STROKES; * 15 STROKES in 1 full turn of the MOLD at the dia. 6”; * 2 central STROKES;

STANDARD	BLOW			
	RAMMER	MOLD	RAMMER	Sequence
UNE 103-502	RAMMER : ø 50 +/-0.2 – WEIGHT 4535 +/-10g	MOLD : ø 152.5 +/-0.3	457 +/-2mm	DROPS SEQUENCE N°1 : * 15 STROKES divided into: * * 6 STROKES in 1 round of the MOLD at the dia. 6"; * * 2 central STROKES; * * 6 STROKES in 1 round of the MOLD at the dia. 6"; * * 1 center shot. * DROPS SEQUENCE N°2 : * 30 STROKES divided into: * * 6 STROKES in 1 round of the MOLD at the dia. 6";2 STROKES central; * * 6 STROKES in 1 round of the MOLD at the dia. 6"; * * 1 central shot * * 6 STROKES in 1 round of the MOLD at the dia. 6"; * * 2 central STROKES; * * 6 STROKES in 1 round of the MOLD at the dia. 6"; * * 1 central shot DROPS SEQUENCE N°3 : 60 STROKES divided into: * 20 STROKES in 1 full turn of the MOLD at the dia. 6"; * 3 central STROKES; * 18 STROKES in 1 full turn of the MOLD at the dia. 6"; * 2 central STROKES; * 15 STROKES in 1 full turn of the MOLD at the dia. 6"; * 2 central STROKES;

6. IN FUNCTION - USE

6.1 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.

6.2 SWITCHING ON

Position the main switch (C1) on “I”.

6.3 TOOLING UP

DANGER	The operator must take all the necessary precautions to operate safely. Make sure that the machine does not activate for any accidental reason or that other people can operate the control unit while the tooling operations are in progress.

Manually lift the rod of the compaction rammer (B5) about 25 cm from the rotating table (B6) and fix the head of the pre-selected weight to the rod of the ram according to the standard.
Place and center the mold on the rotating table using the appropriate centering pin and fix it to the table itself using the appropriate closing clamps (B7). Check that the clamps, during the rotation of the table, do not hit the frame or the lower protective casing.

6.4 PREPARATION AND SPECIMENS POSITIONING

Put the specimen to be tested into the mould. For a proper preparation of the materials kindly check the standards.

6.5 DESCRIPTION OF THE ALARMS

This compactor is equipped with an alarm safety system, these alarms intervene in case of malfunctioning of the equipment by immediately stopping the movement of the rammer. In this way potential risks for the operator as well as for the equipment are reduced.

With the activation of an alarm, the danger symbol "⚠" is displayed large in the center of the control panel, flanked by a descriptive icon that denotes the type of alarm activated:

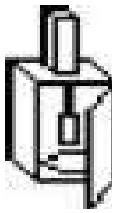
POSITION ALARM

This icon displayed next to the danger symbol "⚠" indicates that the position alarm has been activated: in this case one of the 4 position control sensors (B12, B13, B14, B15), has detected an anomaly in the positioning of the rammer.
To restore the normal functions of the equipment, consult the "DIAGNOSTICS" chapter of this manual.

STOP MOTOR ALARM

This icon displayed next to the danger symbol "⚠" indicates that the engine block alarm has been activated:
In this case, the B8 rammer movement control sensor has detected a stop of the gearmotor responsible for lifting the compacting rammer.
The compactor is equipped with a safety system to safeguard the motor responsible for lifting the compacting ram (B5); this safety system intervenes when, due to some unexpected event during the starting phase, the engine is subjected to an excessive load that could damage it, in this case the engine stops and the alarm is activated.
To restore the normal functions of the equipment, consult the "DIAGNOSTICS" chapter of this manual.

DOOR OPEN ALARM



This icon indicates that the door open alarm has been activated.
On the compactor, equipped with a safety casing, there is a safety microswitch which stops the operation of the equipment if the casing itself is not closed, or if it is opened during operation.
To restore the normal functions of the equipment, consult the "DIAGNOSTICS" chapter of this manual.

6.6 PROCEDURE TO OPEN THE LOWER SAFETY CAGE (IF SUPPLIED)

The compactor can only work if the lower protective casing is closed, with the two leaves fixed together by the special closing handle.
If it is necessary to intervene on the mold during operation of the compactor, press the "STOP" key. In these conditions, the compactor stops without losing data and temporarily suspends the count of compaction ram falls.
At this point, the lower protective casing can be opened without any contraindications.

WARNING	**To activate the "PAUSE" function, the "STOP" key must be pressed when the pestle is falling; otherwise errors in the stroke count could occur.**

To continue the test, close the protective casing and restart the compactor by pressing the 4" or 6" key according to the mold placed on the rotating table (B6); the electronic card will resume the count from the point where it was suspended.
Opening the protective casing without carrying out the specific procedure can cause the immediate stop of all the compactor functions. If the casing is closed before ten seconds, the equipment restarts without missing a drop; otherwise the symbol "⚠" appears on the display with the consequent loss of the test data. To reactivate the compactor, close the protective casing and press the "STOP" key. The selected standard appears on the display. Press the 4" or 6" key, according to the mold placed on the table.

6.7 SAFETY DEVICE TO PROTECT THE MOTOR

The compactor is provided with a safety device to protect the motor from the lifting of the compaction rammer (B5); the device operates when the motor could be subjected to an overload that could damage it during the starting phase: the display will show the message "⚠". For the restore of the normal functions of the appliance consult the chapter "DIAGNOSIS".

6.8 STARTING THE APPLIANCE

Press to start the test 

6.9 STOPPING THE APPLIANCE

Press to end the test 

6.10 EMERGENCY STOP

The test can be stopped in every moment by switching off the machine position the main switch (C1) on "0".

	**WARNING DANGER**	Deactivating the voltage inside the panel without first pressing the STOP button causes blocking of the compactor or unwanted settling movements upon restarting.

6.11 START UP AFTER EMERGENCY

	**WARNING DANGER**	It is recommended to find the causes that stop the test and set the initial conditions

To restart the appliance, position the main switch (C1) on "I", this will reset the appliance normal functions

6.12 SWITCHING OFF

To switch off the appliance, push twice the pushbutton "STOP" and position the main switch (C1) on "0".

6.13 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.

6.14 EXAMPLE OF OPERATING

	**WARNING DANGER**	Before starting the procedure described hereunder, carefully read and learn the instructions given in this manual.

This machine can be used in different ways depending on the kind of test you wish to perform.
Here follows a "standard procedure" allowing even to an operator without a wide experience to carry out a test.
The time will increase the operator's skill in the machine use according to one's need.

1. By means of the proper lever, open the lower safety cage (only for S198-01 model).
2. Tool up correctly the appliance as described in the chapter "TOOLING UP" of this manual.
3. Prepare and position the specimen as described in the chapter "PREPARATION AND SPECIMENS POSITIONING" of this manual.
4. Close the lower safety cage (only for S198-01 model), by means of the proper lever.
5. Position the main switch (C1) on "I".
6. Push the buttons  till the desired standard appears on the display.

7. Select the height of drop requested by the standard through the lever (B1), and check that the mould on the rotating table (B6) is the right one corresponding to the selected standard.
8. To start the test, push the button 4" or 6" according to the dimensions of the mould placed on the rotating table.
9. At the end of one cycle, to restart with a new Cycle, first press the STOP button and then PLAY
10. When the test is finished, position the main switch (C1) on "0".

7. MAINTENANCE

7.1 PERIODIC CHECKS

 **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.

Carry out punctually and correctly all the periodic checks shown below in order to prevent possible failures and malfunctions.

OPERATION	CHECK THE PROPER WORKING OF THE SAFETY DEVICE PLACED ON THE LOWER SAFETY CAGE (only for S199-11 model)
PROCEDURE	Let the machine work for some minutes. Open the lower safety cage following the right procedure (see the chapter "PROCEDURE TO OPEN THE LOWER SAFETY CAGE"). Push the button 4" or 6" depending on the mould. If no functions start, the safety system is efficient, otherwise stop immediately the machine and follow the instructions of the chapter "DIAGNOSTIC" of this manual.
PRECAUTIONS	**During this inspection, no one, including the operator, should be within the range of the rammer.**
FREQUENCY	EVERY 50 OPERATING HOURS

OPERATION	CLEANING AND GREASING OF THE ROTATING TABLE (B6)
PROCEDURE	Remove the rotating table by pulling it upwards. Clean the surface and the base of the compactor. Grease the rotating table and the base of compactor. Place again the rotating table in the right position.
FREQUENCY	EVERY 100 OPERATING HOURS

OPERATION	CLEANING OF THE COMPACTION RAMMER ROD (B5) AND THE CAM (B19)
PROCEDURE	Remove the upper safety device (B4). Clean the cam and the compaction rammer rod by some nitro solvent spreads on a wiping cloth. Lubricate the rotation pivot (B20) without strewing it on surrounding parts. Replace the upper safety device (B4).
FREQUENCY	EVERY 100 OPERATING HOURS

7.2 ORDINARY MAINTENANCE

 **WARNING DANGER**	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.

7.3 EXTRAORDINARY MAINTENANCE

For extraordinary maintenance operations refer directly to the Manufacturer.

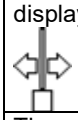
7.4 AUTHORIZED MAINTENANCE CENTRES

For information on the nearest authorized help center it is essential to contact the Manufacturer.

8. DIAGNOSIS

This chapter presents and discusses simple problems that may arise during operation of the equipment.

WARNING DANGER	All maintenance, checking, control and repairing operations of each part of the machine or of the electric system, must be carried out by skilled operators instructed about the functions and working procedures of the appliance.

PROBLEM	POSSIBLE CAUSE	REMEDY ACTION
After operating the main switch (C1) the compactor does not start.	Lack of power supply	Check that the supply is plugged in.
	Engine failure	Contact Customer Service
	Electrical system failure	Contact Customer Service
	Fuse breakage	Replace broken fuses with fuses of equal capacity. Fuses are located on the electronic board inside the control panel
The position alarm symbol appears on the display of the general panel  next to 	The motor for lateral movement of the rammer is faulty	See procedure “B”
	Failure of one or more sensors for position control	Contact Support
The engine lock alarm symbol appears on the display of the main panel  next to 	The compaction rammer lifting motor (B5) has overloaded or failed	See procedure “A”
	Failure of one or more sensors for position control	Contact Customer Service
The display of the general panel shows the alarm symbol of the open door  next to 	The lower guard cover was opened without the appropriate procedure being followed.	Close the door. Press the F4 button from the control panel to reset the alarm.
	Failure of one or more sensors for position control	Contact Customer Service
The compaction rammer does not respect the predetermined positions during operation	Failure of one or more sensors for position control	Contact Customer Service
	Failure of the electronic management and control board	Contact the Technical Assistance Service for the replacement of the electronic board
The compactor maintains all its functions even after opening the lower protective casing (only for model S198-01)	Failure of the safety device combined with the lower guard	Contact Technical Assistance Service for replacement of the safety microswitch

PROCEDURE “A” (see enclosure E)

WARNING	This check must be carried out every time the machine does not start at the beginning of the test.

1. Position the main switch C1 on “0”.
2. Disconnect the feeding cable.
3. Remove the upper safety cage (B4); the cam (B19) will be in the position shown in picture “A”.
4. Turn the knob located on the B18 gearmotor until the cam is in the position shown in figure "B".
5. Replace the upper safety cage (B4).
6. Connect the machine and switch it on again; now the compactor executes a procedure of auto positioning of the compaction rammer (B5).

If the compactor doesn't make the auto-positioning, it means that there are still some disfunctions:

1. Check the fuses inside the control panel; replace the fuses damaged with the new fuses having the same capacity

DANGER	The check of fuses must be carried out after having first disconnected the feeding cable.

2. If the equipment still does not work, check that the engine is not faulty. To perform the check, we recommend removing the rammer rod and feeding the engine autonomously by checking its operation. Check that the cam is in the position shown in Figure "B" when start-up.
3. If after checking the motor, the malfunctioning still exists, contact our After Sale Service for the replacement of the electronic board.

PROCEDURE “B”

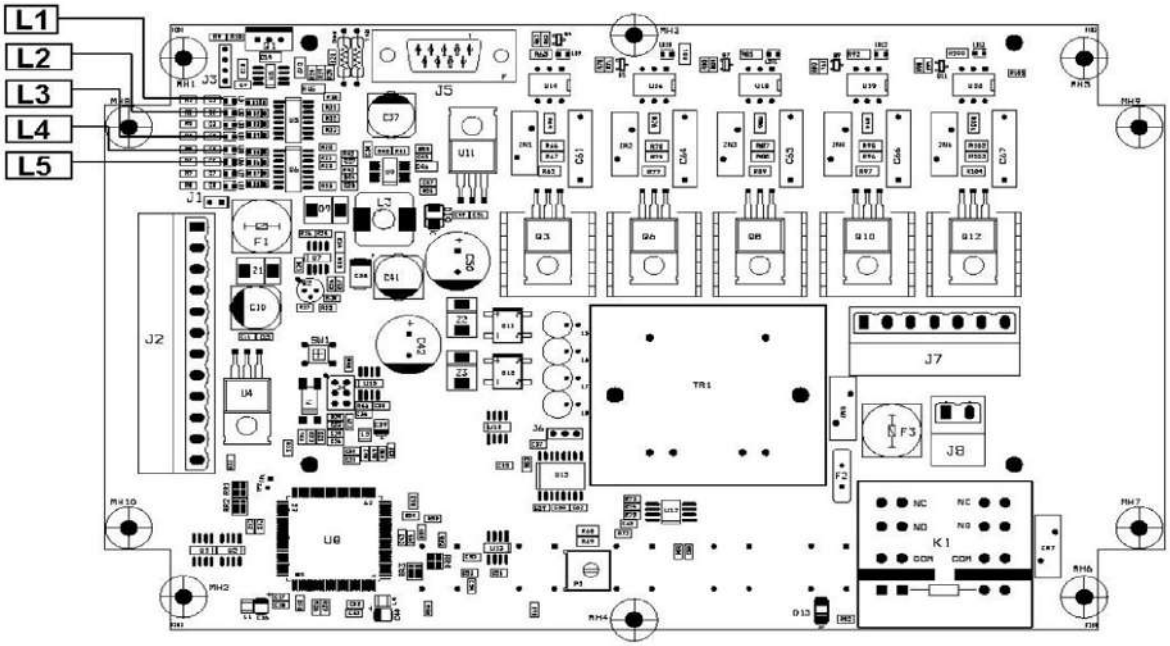
1. Turn off the appliance by means of the cut-off switch C1
2. Remove the cable from the knife switch
3. Remove the rear safety case
4. Check that the connections of the electric motors are not disconnected
5. If the cables are correctly connected and the problem persists, contact the technical assistance service.

PROCEDURE “C”

DANGER	This procedure requires special attention as it must be carried out with the presence inside the general panel and the compactor of the supply voltage. Even if all live parts have been carefully insulated, possible dangers can arise from possible failures and sudden movements; Make sure that no one except the maintainer can access the control panel keyboard and then activate the operation.

1. Remove the upper and rear safety cages. Open the lower safety cage
2. Open the control panel unscrewing the 4 screws that fix the cover.
3. Position the main switch on “I”.
4. When the compaction rammer is in the central position the led L1 L3 L4 L5 must be switched on.
5. Rotate the rammer group unit using the knob located on the B18 gearmotor so that the position sensors command is not present in any sensor; the following LEDs will thus be on: L1 L2 L3 L4 L5
6. Insert a piece of cardboard into the slot of the B8 sensor and check the L1 LED shutdown
7. Insert a piece of cardboard into the slot of the B12 sensor and check the L2 LED shutdown
8. Insert a piece of cardboard into the slot of the B13 sensor and check the L3 LED shutdown
9. Insert a piece of cardboard into the slot of the B15 sensor and check the L4 LED shutdown
10. Insert a piece of cardboard into the slot of the B10 sensor and check the L5 LED shutdown

If each of the above operations does not correspond to the relative reaction, contact Customer Service to replace the relevant sensor.
Otherwise the fault could be given by the electronic management and control board.



9. 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.

10. 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.

11. DECOMMISSIONING THE MACHINE

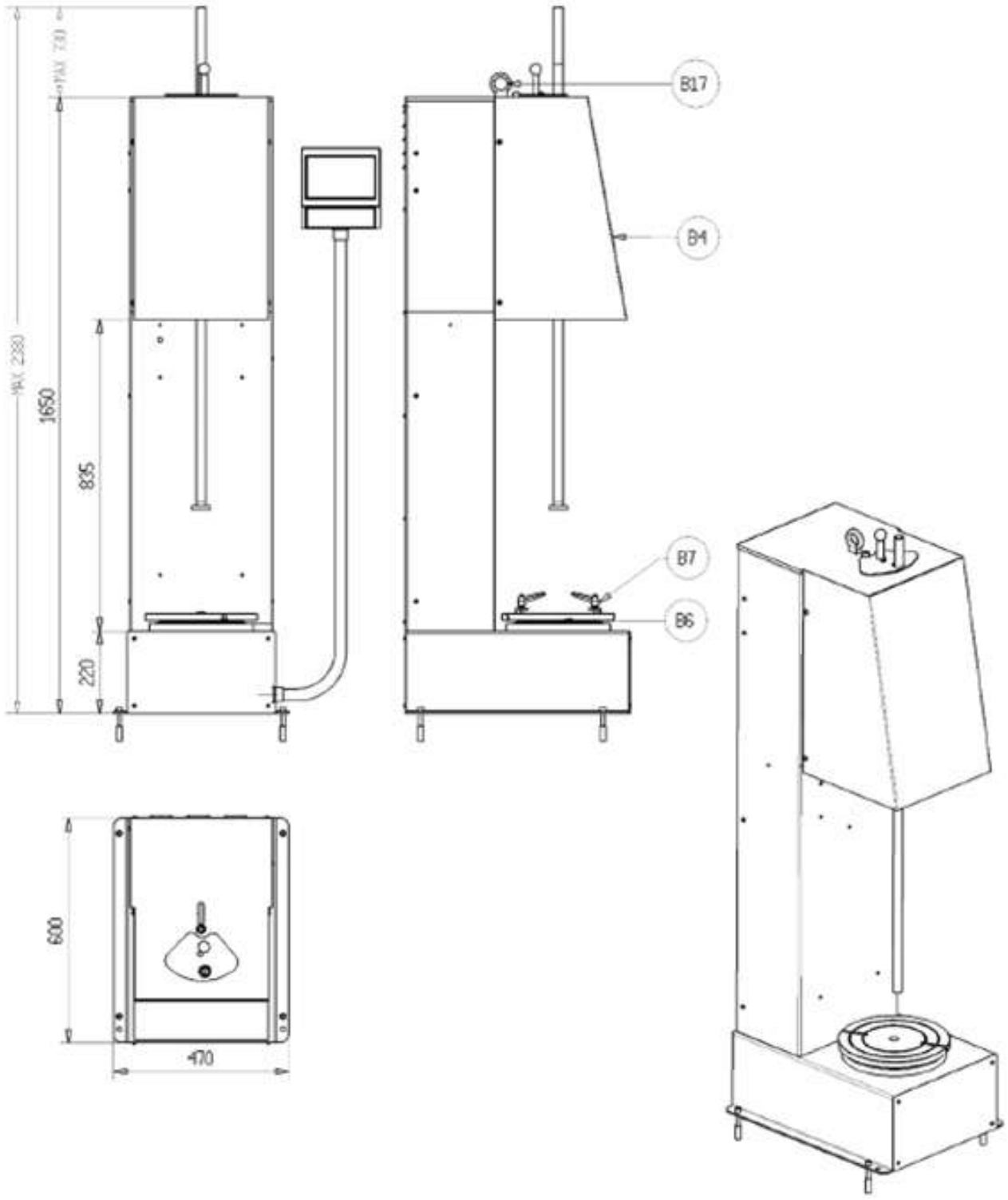
Should it be decided that the machine is to be no longer used, proceed as follows:

- 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

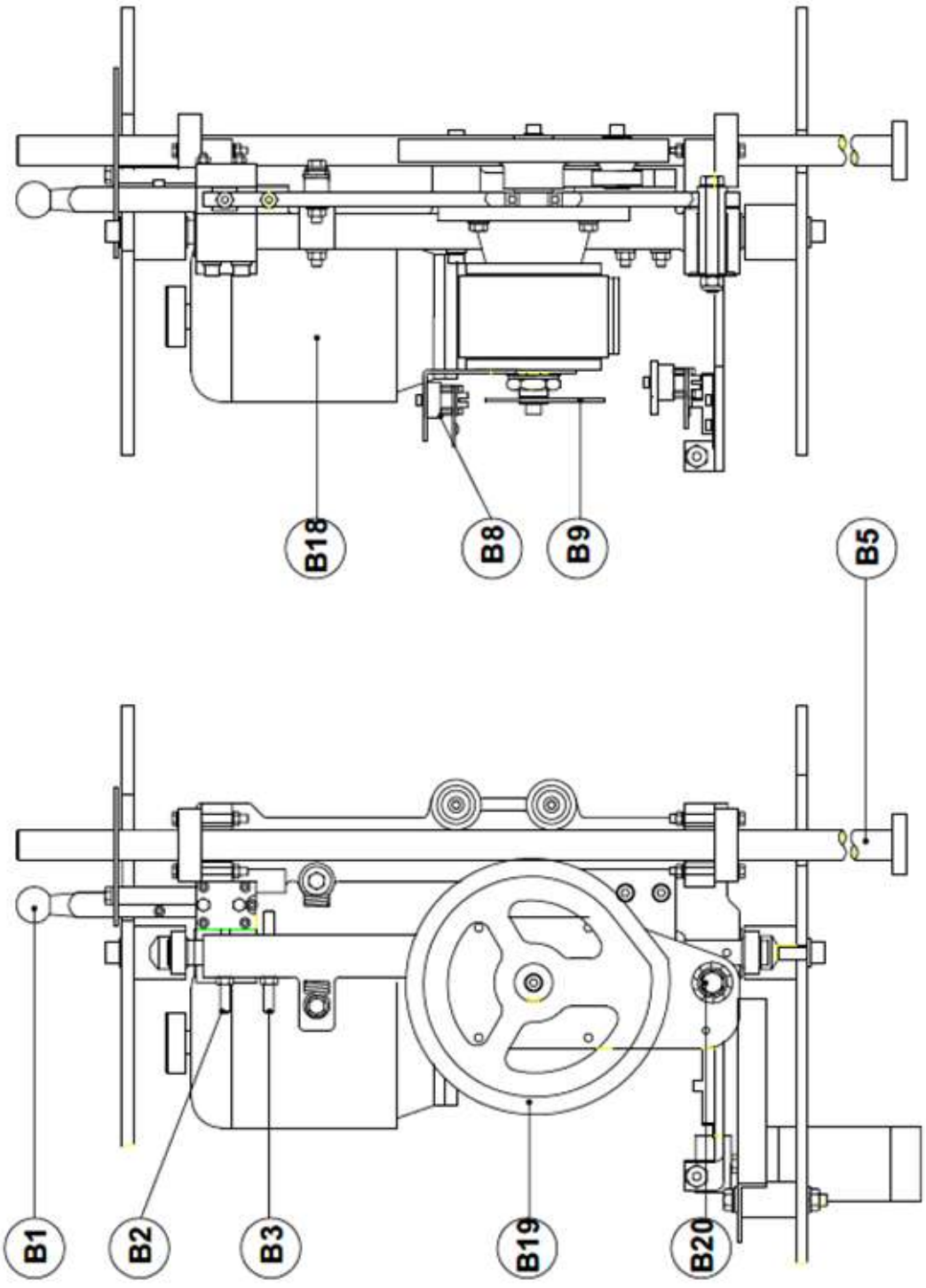
Recycling notice for the disposal of electrical and electronical devices

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.

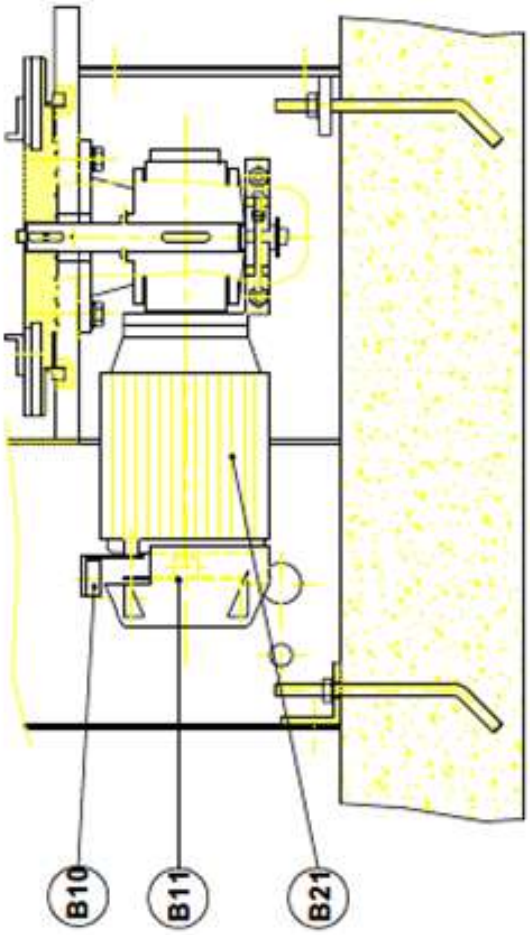
12. ENCOLSURE B – DETAIL VIEW OF THE RAMMER GROUP

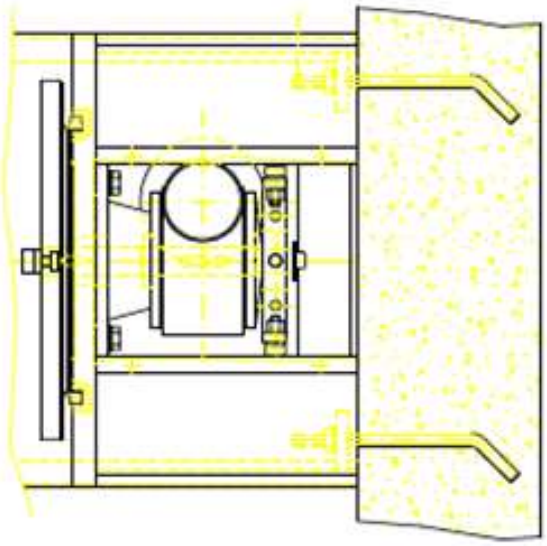


13. ENCOLSURE B1 – DETAIL VIEW OF THE RAMMER HOLDING UNIT

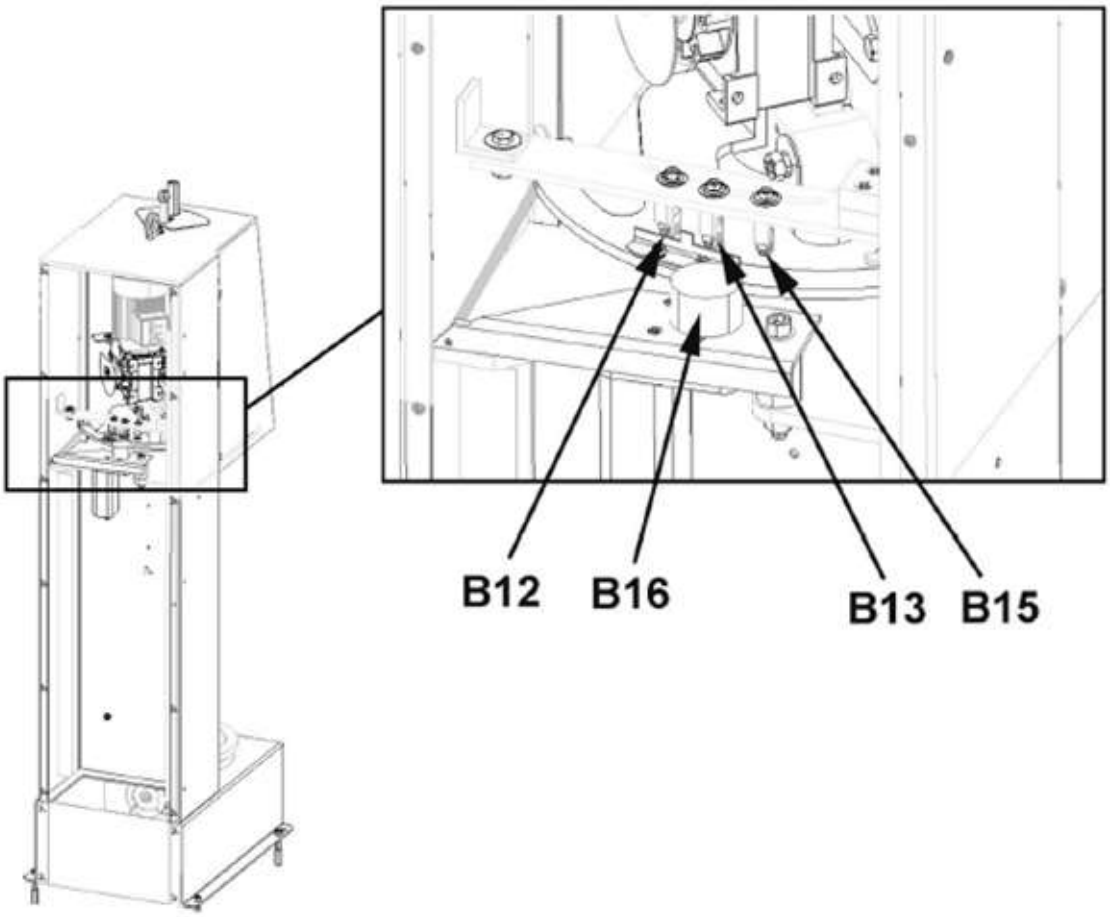


14. ENCOLSURE B2 – DETAIL VIEW OF THE MOULD TABLE ROTATING UNIT

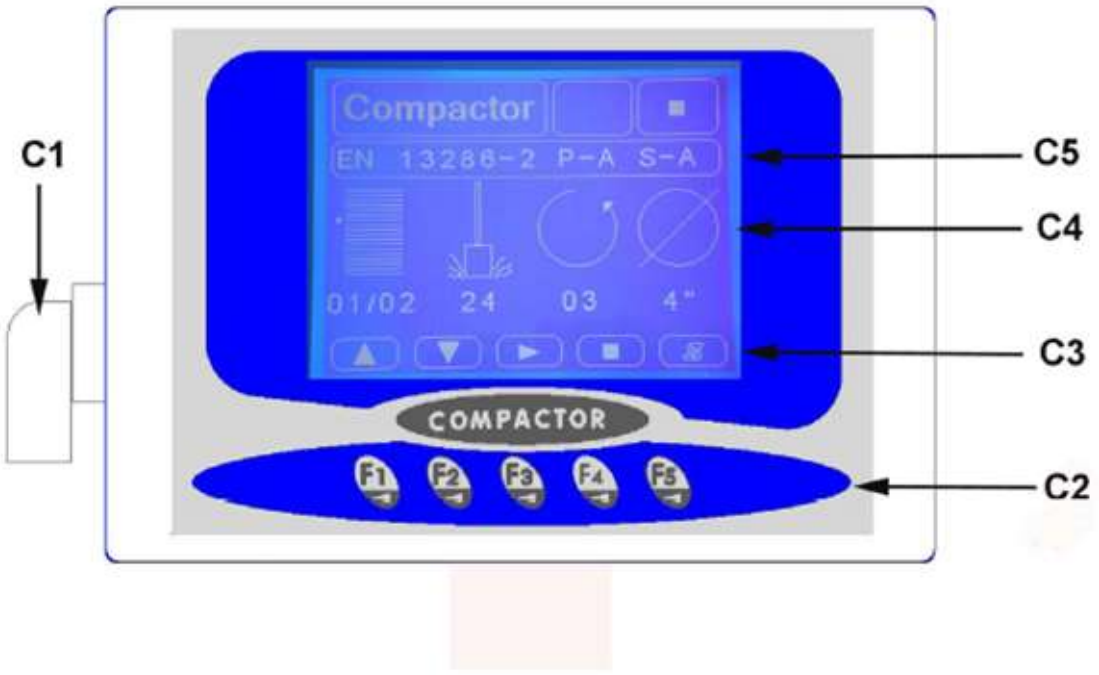




15. ENCOLSURE B3 – DETAIL VIEW OF THE RAMMER POSITION CONTROL SENSORS



16. ENCOLSURE C – VIEW OF THE CONTROL PANEL



17. ENCOLSURE E – CAM ADJUSTMENT VIEW

Figura B
Picture B

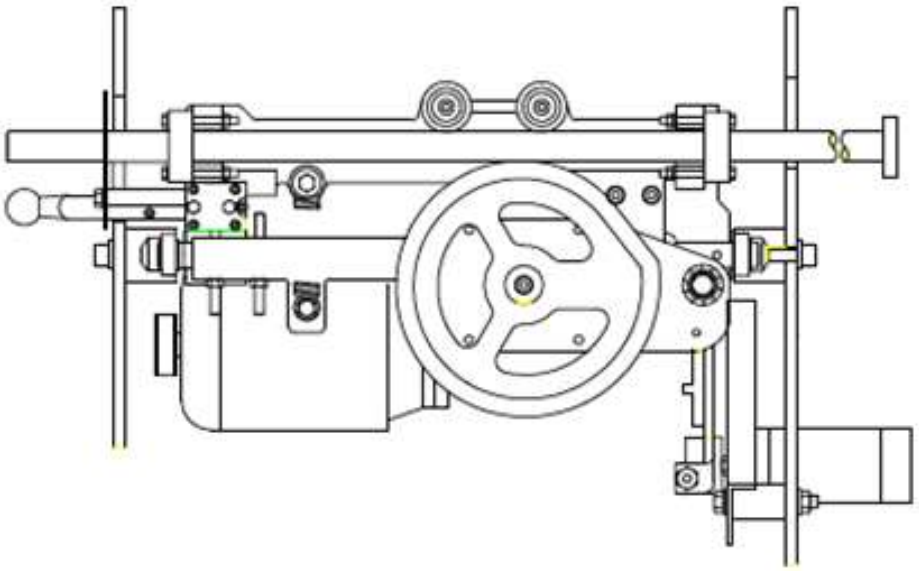
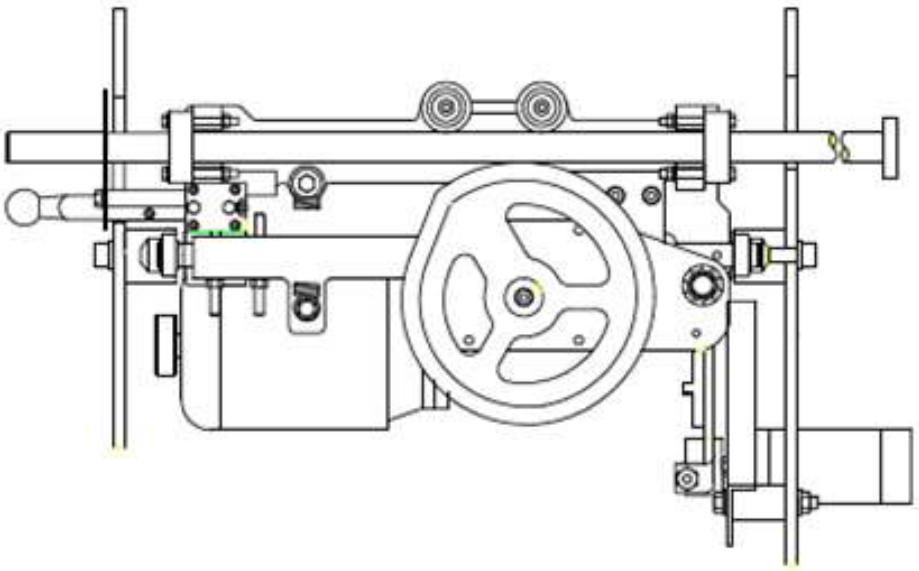


Figura A
Picture A



18. ENCOLSURE F – SETTING OF CUSTOMIZED COMPACTION PROCEDURES

TO CREATE A PERSONALIZED COMPACTION PROCEDURE, PLEASE FOLLOW THESE INSTRUCTIONS:

AFTER SWITCHING ON THE CONTROL PANEL, YOU WILL SEE THIS SCREEN

PRESS ‘’F5”

THEN YOU HAVE THE NEXT SCREEN IMAGE

PRESS ‘’F3”

DIGIT THE NAME OF THE TEST BY CHOOSING THE LETTERS WITH ‘’F1+F2”KEYS AND BY CONFIRMING THEM WITH ‘’F3”

SAVE THE NAME BY SELECTING ‘’F4”

THE FOLLOWING FEATURES ARE SHOWN FROM LEFT TO RIGHT:

- COMPACTION PHASES
- NUMBER OF BLOWS
- NUMBER OF ROTATIONS
- MOULD DIAMETER

IMPORTANT NOTE: IT IS NECESSARY TO SET “0” AS COMPACTION DIAMETER IN ORDER TO SET BLOWS AT THE CENTER OF THE MOULD.

AFTER DEFINING ALL THE FEATURES, SAVE THE SETTINGS WITH ‘’F4”

IN THIS WAY THE NEW PROCEDURE IS SAVED AND IT IS ADDED TO THE STANDARD ONES

USE‘’F1+F2” KEYS TO SELECT THE REQUESTED FEATURES AND ‘’F3” TO ENTER THE SETTING MODE.

USE THE SAME ‘’F1+F2” KEYS TO SET THE VALUES FOR EACH FEATURE AND CONFIRM THEM WITH ‘’F3”.

TO DELETE A PERSONALIZED COMPACTION PROCEDURE, PLEASE FOLLOW THESE INSTRUCTIONS:

- AFTER SWITCHING ON THE CONTROL PANEL PRESS “F5”
- PUSH THE BUTTONS  TILL THE STANDARD APPEARS ON THE DISPLAY
- PRESSING SIMULTANEOUSLY THE KEYS “F1” AND “F2”, WILL APPEAR THE BUTTON TO DELETE THE PROCEDURE  IN CORRESPONDENCE OF THE KEY “F3”
- PRESS THIS BUTTON  (KEY F3) TO DELETE THE SELECTED PROCEDURE

TO RESTORE THE DEFAULT PARAMETERS OF THE COMPACTOR FOLLOW THE BELOW INSTRUCTIONS:

- DURING THE ACTIVATION OF THE CONTROL PANEL, PRESS THE KEYS “F1” AND “F5” SIMULTANEOUSLY
- THE NOTICE “FACTORY DEFAULT” WILL APPEAR ON THE SCREEN
- THIS PROCEDURE WILL DELETE ALL THE CUSTOMIZATIONS ACTIVATED BY THE CUSTOMER AND WILL RESTORE THE DEFAULT PARAMETERS SET BY THE MANUFACTURER