

M.M. 818

Vacuum impregnation device

EN



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1. Safety Regulations

1.1 General

Name and address of the manufacturer: LAM PLAN S.A.
7 rue des Jardins - BP 15
74240 GAILLARD / FRANCE

These operating instructions apply to:

Order no.	Type Features	Edition
08 00818 00	M.M. 818	2022/04

1.2 Designation and type of the unit

Designation of the device	Type of device	Valid from Serial no.
Vacuum impregnation device for cold mounting resins	M.M. 818	GAA-5285 FR

1.3 General safety practices

To ensure safe and hassle-free operations, read the user manual carefully before installing or operating the machine.
When necessary, before attempting to service or performing any maintenance operations, stop the machine and disconnect the main power source.
Plan in advance, a dedicated space with a power supply to operate the machine.

1.4 Machine storage

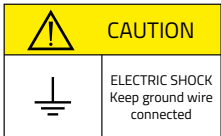
If the machine is not installed and used immediately upon delivery, it should be stored in a dry place that is adequately protected against atmospheric condition. We recommend that the machine is kept in its original packaging until the time of installation. The reasons to store the machine properly are to retain the cleanliness of the machine components and to ensure all the components are in one place at the time of installation.

1.5 Safety signs

All operations and parts of the equipment demanding caution are marked on the machine as safety signs at appropriate locations. Wherever necessary, the safety signs are presented with cautionary advice on the hazards associated and specific advice for safe operations.

DESCRIPTION OF SAFETY SIGNS AND INDICATIONS

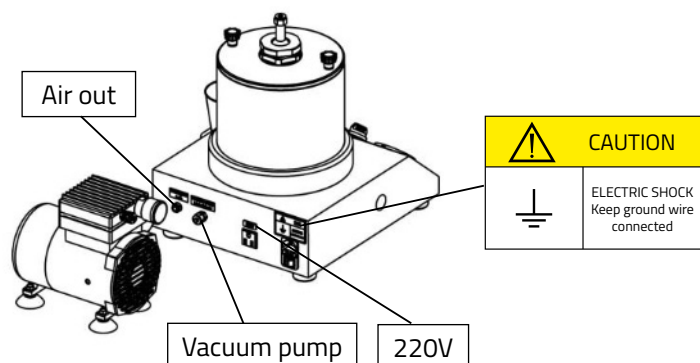
The safety signs on the machine are described below:

Voltage	Caution	Indication	Indication
220V		Air out	Vacuum pump

LOCATIONS OF SAFETY SIGNS AND INDICATIONS

ENSURING LEGIBILITY OF SAFETY SIGNS

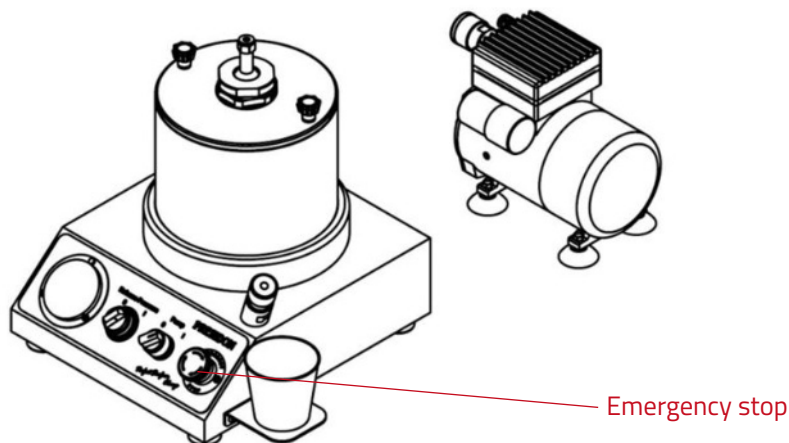
It is recommended to regularly ensure the cleanliness and legibility of the safety signs through proper reinforcement of rules and conditions in the working environment. When the safety signs get damaged or become illegible, replace them immediately.



1.6 Emergency stop

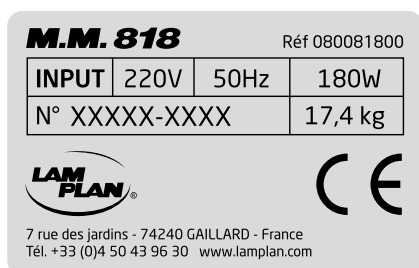
The Emergency Stop button stops all the machine operations when pressed. When there is an issue while the machine is operating, press the button to stop the machine immediately.

To continue operations with the machine, release the button by turning it clockwise.



1.7 Certification and other details

A sticker behind the machine attests that the machine is CE certified. Details on the voltage, weight of the machine, serial number and reference of the machine are also printed on this sticker.



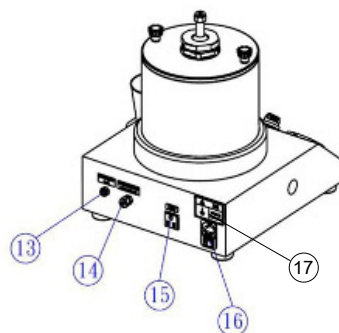
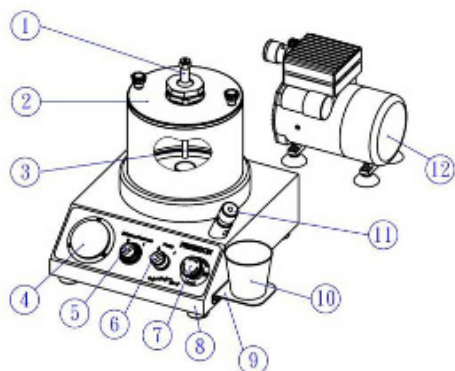
2. Specifications

2.1 Technical specifications

Model - Ref.	M.M.818 - GAA-5285 FR
Vacuum size	Ø 160 x H 160 mm
Vacuum pressure	650 mm - Hg
Machine size W x H x D	480 X 400 X 400 mm
Weight	10,10 kg Vaccum - 7,25 kg Pump
Motor power	180 W
Power supply	220 V - 1Ø

3. Machine layout

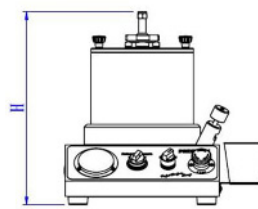
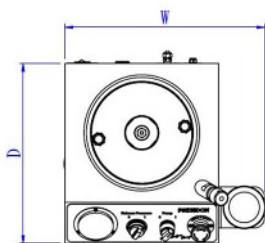
3.1 Legend



- | | | |
|----------------------------|-----------------------------|-----------------------------------|
| 1. Lever | 7. Emergency stop button | 13. Pressure release outlet |
| 2. Top cover | 8. Machine body | 14. Air outlet to vacuum pump |
| 3. Stainless steel pipe | 9. Resin cup holder | 15. Power socket for vacuum pump |
| 4. Vacuum pressure gauge | 10. Cup for resin | 16. Main power socket for machine |
| 5. Pressure release switch | 11. Resin flow control knob | 17. Main power switch |
| 6. Vacuum pump switch | 12. Vacuum pump | |

3.2 Dimensions

Machine size W x H x D
480 x 400 x 400 mm

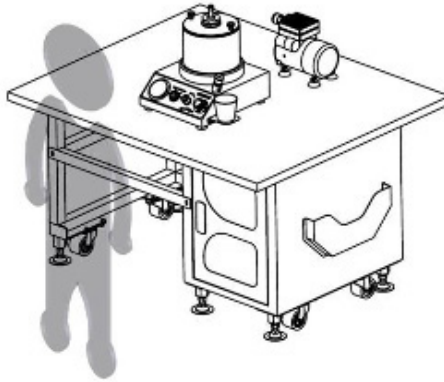


4. Machine installation

4.1 Pre-installation planning

Plan adequate space for the machine to be installed. Ensure that, the chosen space has ergonomic and safe conditions to power the machine. Make sure the platform is flat and stable.

For ergonomic operations, there should be enough space for the operator to use the machine without any hassle arising from the power cables or the vacuum pump.



The environmental conditions necessary for the machine to work optimally are shown below:

Ambient temperature	+ 5°C - + 40°C
Ambient Humidity	< 85 %

4.1.1 Power supply requirements

Insufficient voltage from factory power source may affect the power output of the motor and the function of the controller. It is critical to connect the machine to the right voltage powering the laboratory. It is a good practice to use an exclusive power socket for the machine.

In case of uncertainty, seek help from a professional electrician or a qualified personnel.

4.1.2 Organizing machine components

Place all the machine components on the platform where the machine is to be assembled. Care has to be taken to lift the machine safe out of the box. If necessary, two people can share the load of the machine while lifting.

4.1.3 Installing the machine

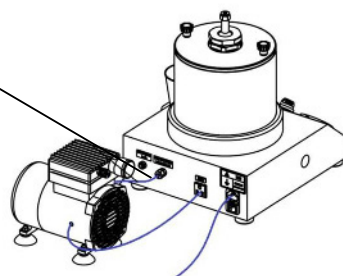
Place the machine body on the platform.

Place a rubber seal on the cylindrical base that will hold the mounting chamber. This seal avoids any leakage during mounting operations.

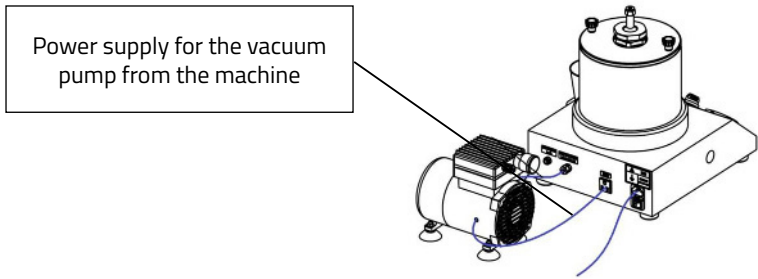
Screw in the knobs on the top cover(Labelled number 2 in Section 3) with the lever and steel pipe.

Connect one end of the transparent pneumatic tube provided with the machine to the vacuum pump and the other end to the port on the machine marked 'Vacuum Pump'.

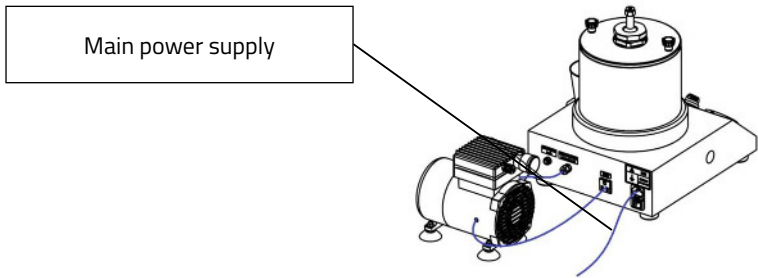
Pneumatic tube connecting the vacuum pump and the machine



Connect the power cable from the vacuum pump to the port (labelled number 15 in Section 3).



Plug the main power cable into the port labelled 16 in Section 3. Before plugging the cable into the power supply socket, ensure you have read and understood the conditions to ensure and risks involved described in the section below.



POWER CONNECTION



Before connecting the cables, ensure that the voltage necessary for the machine and the power supply at the lab are the same.

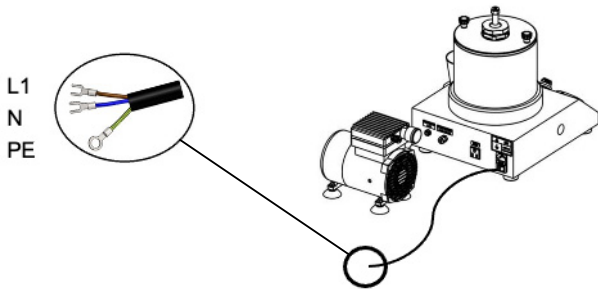
All electrical connections wherever necessary must be performed by a qualified electrical personnel.

Using a power stabilizer is strongly recommended, especially when the voltage is not consistently stable.



Machine must be used with proper earthing. In case of uncertainty, suspend the installation and contact the electrical personnel.

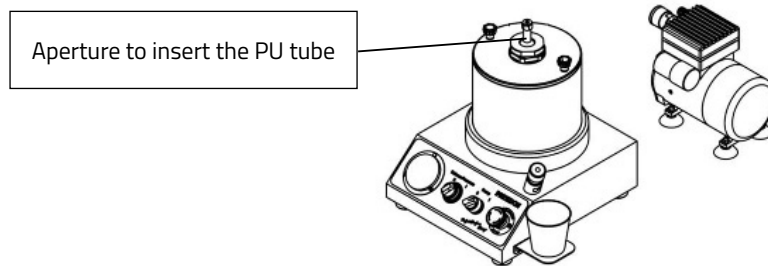
Some supplementary details on the components of power supply (line, neutral, and ground) are given below:



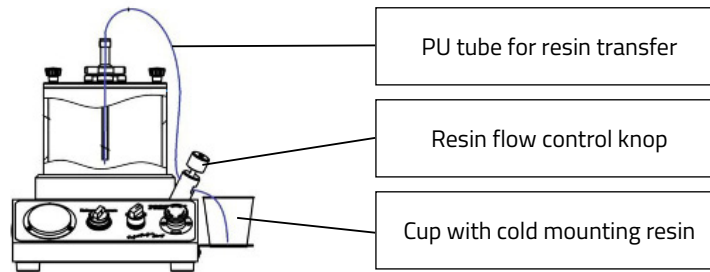
Kw	Voltage	Current	Breaker capacity	Wire
180 W (include vacuum pump)	220 V	1 A	6 A	Ø 1,25 mm ² one wire

5. Machine operation

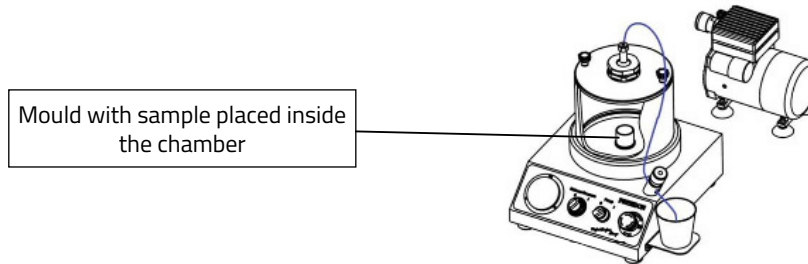
1. Insert a transparent PU tube provided with the machine into the steel pipe through the lever. Loosen the nut if necessary. The tube has to pass through the nut and a rubber seal found on the inner side of the nut and then into the steel pipe. Ensure that the length of PU tube inside the chamber is longer than the steel tube. This tube acts as a channel to transport resin from outside the chamber to inside under vacuum.



2. Pass the other end of the PU tube under the knob and tighten the knob to pinch the tube shut. The knob is used to control the resin flow into the vacuum chamber.



3. Open the top cover and place the cold mounting mould with the sample inside the chamber and place the top cover back on the chamber.



4. Adjust the position of the steel pipe so that its aperture is on top of the mould cavity. This ensures that the resin entering the chamber will drip directly into the mould.
5. Make sure the PU tube is sealed tight using the resin flow control knob. If the tube is not sealed tight, there will be a leakage of air into the chamber affecting the magnitude of vacuum attained.
6. Turn on the machine using the red switch behind the machine.
7. Prepare the resin by mixing the liquid and hardener and immerse the end of PU tube into the mix.
8. Ensure the mounting chamber is closed. (Close the chamber by turning the switch over *Chambre to Fermer*.)
9. Turn on the vacuum pump by turning the switch over *Pompe* to ON. The pressure gauge will indicate the magnitude of vacuum in the chamber. Once the pressure reaches about -650 mmHg, turn off the vacuum pump by turning the switch to OFF.
10. Loosen the resin flow control knob to allow the resin to be sucked into the chamber from difference of pressures inside and outside the chamber. Allow the resin to fill in the mould. If and when there are multiple moulds in the chamber, the lever is used to adjust the position of the tube inside the chamber. To avoid resin dripping on the chamber floor, it is recommended to close the resin flow tube using the knob before switching moulds inside the chamber.

11. Once all moulds are filled, stop the resin supply using the resin flow control knob.
12. Repeat the following cycle as long as necessary to remove entrapped air to the best extent possible:
 - a. Bring the vacuum level to 0 mmHg by turning the Chambre switch to Ouvrir (this opens the air supply channel to the chamber).
 - b. Close the chamber by switching to Fermer and turn on the vacuum pump until a vacuum level between -300 mmHg and -400 mmHg (approximately) is reached.
 - c. Stop the vacuum pump and hold the vacuum for about 20 seconds.
 - d. Open the chamber to bring the vacuum level to 0 mmHg.

Do not hold the vacuum for long time to avoid the vacuum chamber cover damaged.

13. Once the vacuum cycles are done, open the chamber and take the samples out. Before taking the top cover off, ensure the vacuum level is zero and the Chambre switch is set to Ouvrir.
14. After every mounting cycle, it is recommended to allow the resin inside the PU tube to harden before removing it from the steel tube. This avoids the steel tube to be clogged by the resin.

6. Maintenance

To keep the machine clean at all times, it is recommended to clean the machine after every mounting cycle. It is easier to clean unhardened epoxy inside the chamber than after it has hardened.
Avoid using corrosive liquids to clean the machine.

7. Consumable

Set of 25 PU supply tubes	CODE 080081810
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8. Troubleshooting

Problem: Vacuum build-up in the chamber is too slow

Solution: Make sure the Chambre switch is turned to Fermer whenever the vacuum pump is on.

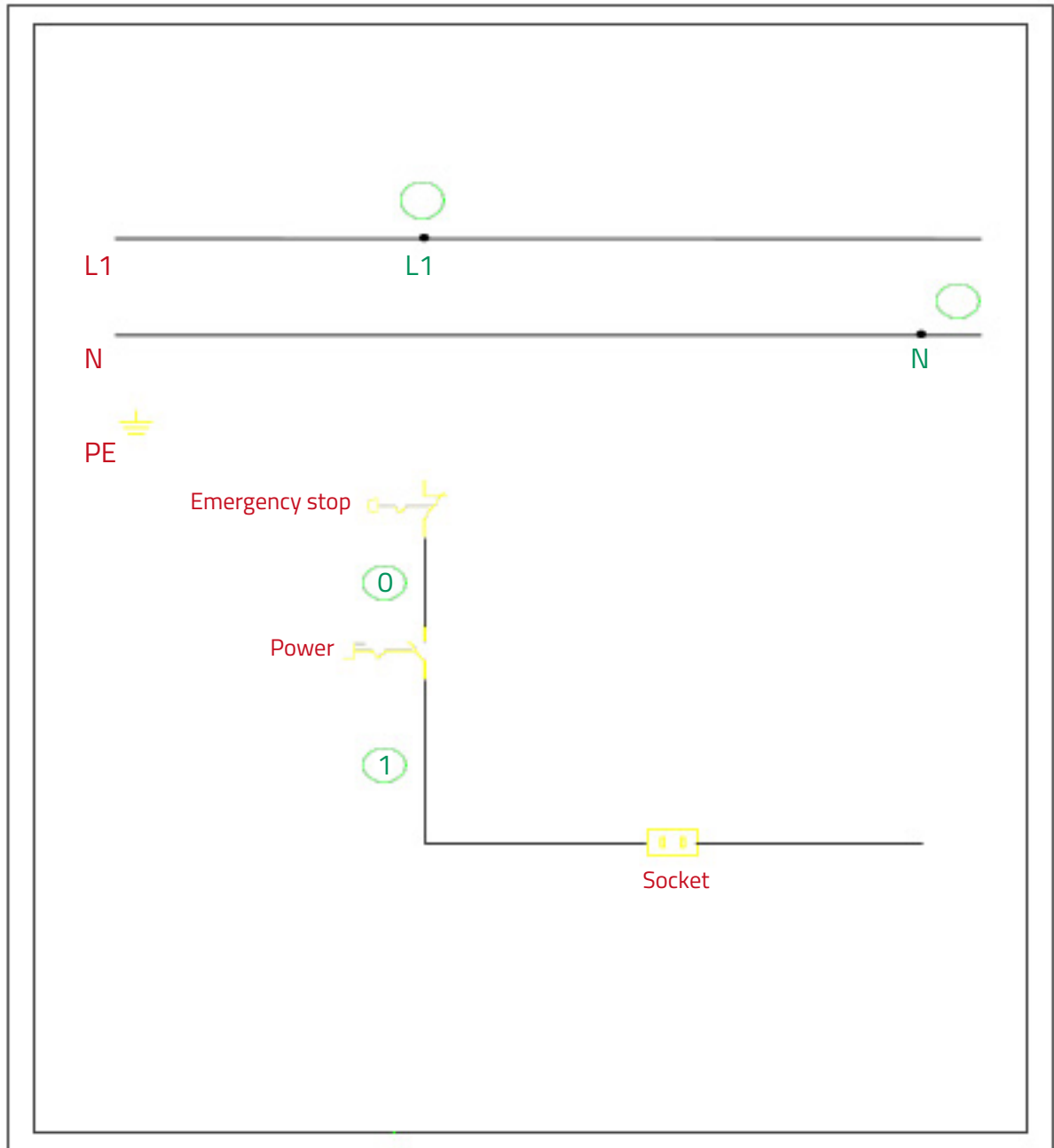
Problem: Top cover on the vacuum chamber is stuck after a mounting cycle

Solution: Make sure the Chambre switch is turned to Ouvrir and the vacuum level inside the chamber is 0 mmHg.

Problem: The machine does not turn on

Solution: Verify if the power supply and the machine are on the same voltage. Check if there is power on the main supply. If the voltage is not consistent, it is recommended to use a power stabilizer to avoid damage of electrical components.

9. Electrical schematic





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