

**LAARMANN**<sup>®</sup>

*Innovators in Solids*



# LM250 - LM1000 PULVERISER RING MILL USER MANUAL

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## 1 Safety instructions

Before using the machine, make sure to read and understand this manual thoroughly. Keep the manual close to the machine, easily accessible to all the users.

Improper operation can cause injury to persons or damage to the equipment.

### 1.1 Safety symbols



Failure to comply with the sections of text marked in this way result in danger. Injuries are possible. Damage to the mill and accessories is possible, special care is required.



This symbol marks instructions for correct execution of certain jobs of work, e.g. that the work may only be carried out by an electrician.



This symbol indicates risks associated with hot surfaces.

### 1.2 Safety instructions

#### **Safety instructions**



Claims for damages in any form whatsoever, for injury to persons or damage to the machine, caused through non-observance of the following safety instructions, are excluded.



#### **Use according to the intended purpose**

Do not make any alterations to the machine and use only approved spare parts and accessories. Otherwise the Declaration of Conformity will lose its validity and this will also lead to the loss of any



#### **Transport**

Do not knock, shake or throw the LM250/LM1000 during transport. Otherwise the electronic and mechanical components may be damaged.



#### **Packing material**

Please keep the packing material for the duration of the guarantee period. In case of a complaint and return of the machine in unsuitable packing material, your guarantee claim will be lost.

**Temperature variations**

If the LM250/LM1000 is subjected to high temperature variations, protect it against condensed water. Otherwise the electronic components may be damaged.

**Ambient temperature**

If the temperature drops below +5°C or exceeds +40°C, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

**Atmospheric humidity**

If the humidity exceeds 85%, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

**Electrical connection**

If the values for the mains power supply on the name plate are not observed, the electrical and mechanical components may be damaged.

**Inserting grinding media**

Ensure that the grinding media are inserted correctly in the machine. Otherwise they can be damaged, when starting the machine

**Removing and opening hot grinding media**

When removing and opening hot grinding media, always wear protective gloves. There is a danger of burning the hands

**Materials**

Observe the relevant regulations and directives for handling chemicals and hazardous materials. Milling of materials, which give a risk of fire or explosion, is prohibited.

**Cleaning**

Do not clean the LM250/LM1000 under running water. Danger to life through electric shock.

Use only a soft cloth moistened with water. Cleaning agents and solvents should not be used, not for cleaning the milling tools either.

**Electrical connection**

If the values for the mains power supply on the name plate are not observed, the electrical and mechanical components may be damaged.

## 2 General Discription

The LM250/LM1000 is a laboratory machine, which is suitable for pulverizing and homogenizing hard and brittle materials in the dry and wet state.

It is used for fast pulverizing.

The closed milling pulverizing system guarantees complete recovery of the samples.

Final finenesses of down to 20-40  $\mu\text{m}$  can be achieved, depending on the milling time and the specific properties of the sample material. The optimum filling of a LM250/LM1000 is around 1-1.3 Liters of sample material.



### 2.1 Improper Usage



The sample quantity should not be less than 25% of the bowl volume.

**The puck may otherwise damage the bowl.**



The bowl, puck and lid must always be made of identical material.

### 3 Technical features

#### 3.1 Construction

The housing of LM250/LM1000 is made of steel plate with powder coated RAL5005 paint.

#### Protective equipment

The milling chamber of the LM250/LM1000 is safely closed by an electrical safety switch.

Starting of the machine is possible only when:

- power is connected;
- air pressure is sufficient;
- the emergency switch is not activated;
- all parameters are given to the digital program of the machine;
- There is a bowl inside of the machine when using the automatic program;
- Hood is locked;

#### 3.2 Technical data

Operating voltage:	380V ± 10% - 50/60Hz
Max power consumption:	1500W
Timer	5 sec - 99 min, timer HOLD function, in 1 sec steps (below 10 min), or 10 sec steps (above 10 min)
Max. bowl volume	300-400cc (LM250) / 1000cc (LM1000)
Dimensions W x D x H (inclusive base plate)	550 x 602 x 1032 mm
Weight	210 kg
Noise emission (without milling bowl)	70 dB(A)
Ambient temperature	+5°C - +40°C
Atmospheric humidity	< 85% RH

## 4 Installation

### 4.1. Unpacking

Before the installation, carefully examine the delivery for possible damage or missing parts. Open the crate and take the machine out of the box. Check that the machine has not been visibly damaged during the transport.

Please keep the packing material for the duration of the guarantee period. In case of a complaint and return of the machine in unsuitable packing material, your guarantee claim will be lost.

Check that the mains cord is compatible with the local standard.

If any kind of damage occurred during transport, immediately make a complaint to the carrier. Any incorrect delivery or missing parts should be reported to the distributor.

### 4.2 Selecting the right place

When selecting the right place for the machine, please consider the following:

- Put the device on smooth, horizontal and stable place.
- Leave enough space beyond the device for normal air circulation, min. 200 mm at the back of the machine.
- Leave enough space around the device, that you will easy control and maintain it.
- Don't use the device in surroundings, where there are fast temperature and humidity changes. Also avoid places exposed to direct sunlight and places nearby heating devices.
- Avoid places, where the possibility of shocks and vibrations exists.

**Note: The machine should not be placed so, that it is difficult to pull out the cord plug from mains power supply.**

### 4.3 Connecting the power cord

The correct voltage and frequency for the LM250/LM1000 are given on the name plate. Ensure that these values correspond to the available power supply system.

To avoid interference from noise, surges and spikes, a dedicated line is preferred. If no such line is available, avoid lines to which powerful electric motors, refrigerators and similar devices are connected.

The power can be turned on and off by the emergency switch, located on the front cover at the right side of the machine. Light in the switch indicates, when the power is on.

Note that when power is lost the saved programs will be lost!

### 4.4 Environmental conditions

The machine has been built for operating in laboratory environment. Therefore the environmental conditions should be the following:

- Temperature from +5°C to +40°C
- Humidity up to 85% RH, non-condensing

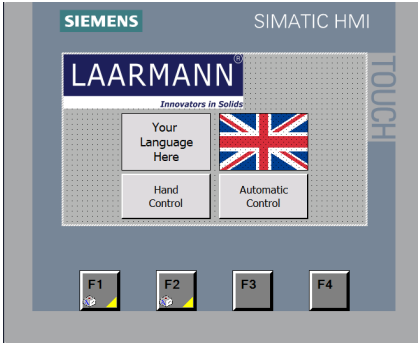
## 5 Instructions for use

### 5.1. Overall view





5.2 Instructions for use



This is the starting screen for the installation.

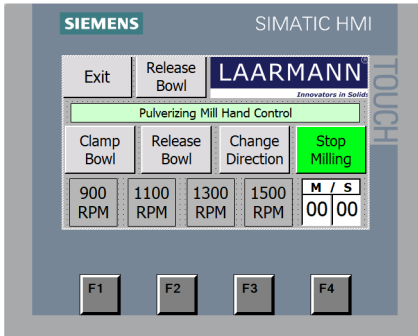
Here you can select "Hand Controls" for manual input or select "Automatic System" for automatic.

If you press "Hand Controls" go to step 2.

If you press "Automatic System" go to step 3.

If you press "Semi Automatic System" go to step 4.

You can also have the controls in your own **language**. Once bought your nations flag will appear next to the British flag and you can press it to switch languages. We have an additional option to change the **RPM** please contact LAARMANN for the options

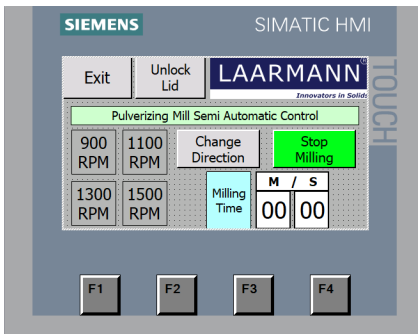


**Manual control**

Before starting the machine, you need to clamp the bowl. Press the "Clamp bowl" button and the button will change colour (green). You can press change direction while the machine is in motion to change the direction. To access the inside you must press Unlock the Lid to open the hood. Press "Start mill" to start the machine.

When you stop the machine by pressing "Stop mill" you must press "Release Bowl" to be able to remove the Bowl from the machine. Select between (if available) **900RPM / 1000RPM / 1300RPM / 1450RPM**

H/M/S count the passed time, these number can't be adjusted If you press exit, you will go back to the start screen. The hand control is mostly used for system checks and short milling. For operational use please use the automatic program.

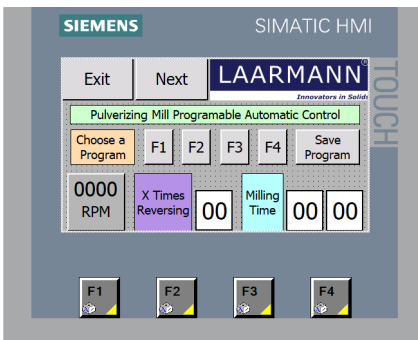


**Semi Automatic Control**

Semi automatic is very similar to hand control. With the semi automatic function the machine can be started without manually clamping the bowl. This will be done automatically

Select between (if available) **900RPM / 1000RPM / 1300RPM / 1450RPM** the chosen RPM will be colored in green. It's possible to change the RPM while running. Press change direction to run in the opposite direction, the button color will turn purple if this function is active.

Press "**Start Milling**" to begin the program. The program will keep running until the operator presses "**Stop Milling**" to stop the program.

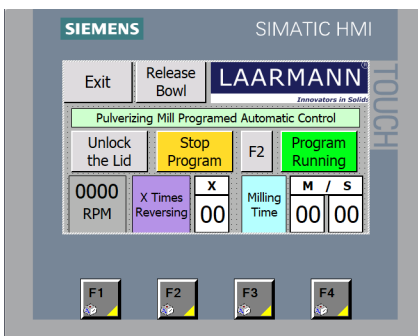


**Programmable Automatic Control**

There are 4 available programs, F1 to F4. These also correspond with the physical numbers on the machine. In this screen you can set the programs. You switch between the programs by pressing on them, the last know settings will load.

You can set the desired time by pressing H (Hours) / M (Minutes) / S (Seconds). A number pad will appear (see 5) and here you can give in the desired speed or rotations. You confirm it by pressing

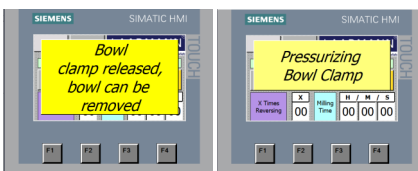
When you have put in the desired parameters press next to go to the starting screen (see 4) and the settings will be saved automatically. Select between (if available) **900RPM / 1000RPM / 1300RPM / 1450RPM**

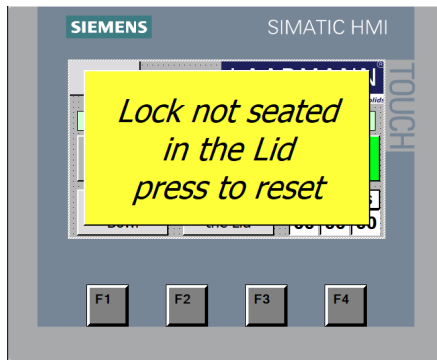


Here you see the overview of the automatic system starting screen.

Here you will see the selected parameters and are able to start the machine for use. The machine will automatically pressurize the bowl and start the program.

Once the programme has finished you can press "unlock the lid" and "release bowl" to open the hood and remove the bowl inside.





In case of this message, please close the hood and press "lock the Lid".

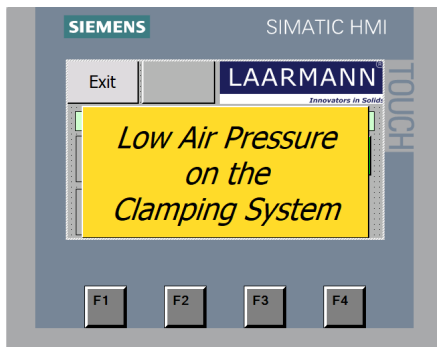
If this message comes up when the lid is closed and you have pressed "lock the Lid" carefully check if you can open the hood or not. After verifying press to reset and check again.



In case of this message, please check all the emergency stops and verify that the installation doors are correctly closed.

To release the emergency stop you need to turn it and it will come up.

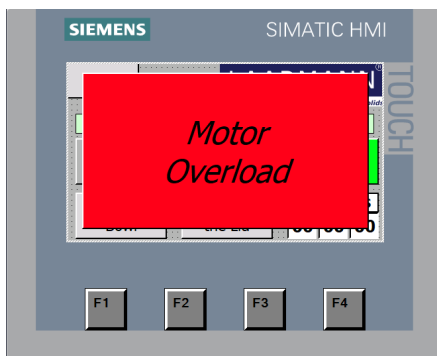
After verifying that all stops are checked press the message to continue.



In case of this message, please check the pressure coming from the supply.

The pressure should be around 7-8 to ensure smooth operation. Also check if there is no air escaping within the system.

Open the side panel with the delivered keys to verify that the machine receives enough pressure.



In case of this message please contact authorised personnel to check the motor of the machine.

After visual inspection and ensured that no parts are either broken or damaged, contact an electrical engineer to verify the connections.

When everything is checked, run the machine in hand control without grinding media inside. If the machine works properly you can resume using it as normal.

Should it still not work, please contact Laarmann.

## 6. Working Instructions

### 6.1 General

The LM250/LM1000 is a high performance product. It is used mainly in the processing minerals.

### 6.2 Starting the milling process

- Set the parameters as described before
- Open the lid of the machine and put in the sample on top of the puck in the bowl
- Close the machine lid and press start on the display.



The milling process can only be started, when the hood is closed, the power is connected and when the air pressure is high enough.



Do not open the hood during the milling process, also not by force.



Do not mill inflammable or explosive samples! For these kind of samples, please contact LAARMANN for special features.



Please note that the properties and therefore the dangerous nature of your sample, can change during the milling process.

### 6.3 Stopping the milling process

- Stop the milling operation by pressing the emergency switch.
- Pressing stop on the display
- When the milling time elapses, the milling process is automatically ended. The display is reset to the last set value.



When removing and opening the bowl, always wear protective gloves. There is a danger of burning the hands.

## 7. Troubleshooting

### Problem

Machine is not starting

### Explanation / Solution

Check the mains power supply.

Check the air pressure

Call the emergency knob and release it.

Check if you have the correct settings for running the program.

Display doesn't work.

Call authorized service.

Should the problem not resolve, please contact LAARMANN.

## 8. Maintenance

LM250/LM1000 needs to be greased first time after 20 hours.

Later intervals each 40 Hours.

LAARMANN advises to use LAARMANN GREASE. Similar can be graphite free, high temperature grease.

### 8.1 Wear

The milling tools can become worn out, depending on the frequency of the milling operation and the milled material. The milling bowl, lid and puck should be regularly checked for wear and replaced, if necessary.

### 8.2 Cleaning

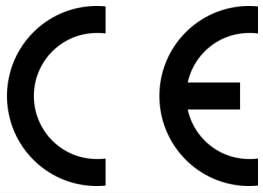


Before cleaning the machine, unplug the mains cord from wall socket.

Use only a soft cloth moistened with water. Cleaning agents and solvents should not be used, not for cleaning the milling tools either.



Do not clean the LM250/LM1000 under running water. Danger to life through electric shock.



Pulveriser  
Type LM250/LM1000

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Product	Pulveriser
Model	LM250/LM1000
Power supply	400V/50Hz

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This declaration of conformity confirms compliance of the above mentioned equipment to the relevant sections of the following European Directives:

91/368EWG	European machine guideline
73/23/EWG	EC Low Voltage Guidelines
EN 292, 294, 418	Safety guidelines
VBG 1,4,5 en 22	General electrical facilities
89/336/EEC	Electromagnetic Compatibility Directive (EMC)
EN 5008-1-1992	Emissions
EN 50082-1-1992	Immunity
EN 60204-1 Part 1	Safety of Machinery – Electrical Equipment of Machines

**WARNING:**

This equipment is required to be operated strictly in accordance with the instructions given in the operating manual supplied with the product. All supply voltages and frequencies as stated on the rating plate must be used. External power cables and connectors must be supplied by LAARMANN. Any additional equipment used must be of a type approved by LAARMANN.

This conformity certificate will lose its validity in case of:

- Usage of unlicensed spares
- Usage of unlicensed accessories
- Any self made modifications of the machine