

LAARMANN[®]

Innovators in Solids



LMMG100 MORTAR GRINDER USER MANUAL

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1 Foreword

Congratulations on your purchase of the LAARMANN Mortar Grinder

Please read this manual thoroughly before initial commissioning, and comply with the safety instructions!

The operating manual contains important information for operation, maintenance, Care and safety of the machine to guarantee the best possible preservation of your Investment.

Subject to changes in design, features and accessories in the interests of on-going developments. It is therefore not possible to derive any claims from the data, illustrations and descriptions contained in the manual.

Only original LAARMANN replacement parts respectively purchased parts complying with the original state may be used. Guarantee claims are only valid if no changes are made to the original state of the LMMG100 Mortar Grinder. We assume no liability for damage caused by failure to comply with these instructions or by inappropriate behaviour. This technical manual may not be duplicated or passed on to third parties, either totally or partially

1.1 Supplied technical documentation

The following documentation was supplied together with the machine:

Operating manual for the Mortar Grinder, including:

CE certificate

1.2 Serial number

The machine number is located on the nameplate. Enter your serial number here:

This machine number must be stated when making any technical inquiries. The nameplate is located on the back of the machine.

2 Description and proper use of Mortar Grinder

2.1 Description and proper use of the Mortar Grinder

This Mortar Grinder is intended for

- Dry Grinding / Wet Grinding / Ultra Fine Grinding / Cryogenic Grinding
- Laminar Blending / Liquid-Liquid Dispersion
- Mechanical Alloying
- Cell disruption for DNA / RNA extraction
- The MG100 can handle samples up to 200 ml

The Mortar Grinder consists essentially of a powerful drive with driven Mortar Plate. It can be loaded with various Mortar and pestle combinations.



2.2 Improper usage



The Mortar Grinder is designed to be used with properly fitted Mortar and Pestle always made of the same material. If any other kinds of material are fed into the machine, this can cause major accidents or damage to the Mortar Grinder.

3 Safety instructions

3.1 General safety instructions

The Mortar Grinder has been manufactured using state-of-the-art engineering and technology and complies with the valid safety requirements of EU directive 98/37/EG on the point in time of delivery.

The original state of the machine may not be changed. Safety devices may not be changed, removed or bridged. All maintenance and repair work may only be carried out by qualified staff when the machine is at a standstill and disconnected from the power supply.

3.2 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.



Symbol for supplementary information and remarks.

3.3 Safety clothing

The operating staff at the machine must always use the personal safety gear prescribed by law and provided by the employer. We recommend using safety gloves, working shoe's and a face mask when working with dangerous material.

3.4 Requirements made of the operating staff

The staff responsible for operating and maintaining the machine must be trained and suitable for these jobs of work. Precision and safety in machine checks must be guaranteed. The responsible staff must have read and understood this operating manual.

There is an added risk of accidents during maintenance and servicing work. This is why all jobs of work must be carried out with the machine at a standstill by experienced and skilled staff capable of taking the LAARMANN safety precautions for major maintenance work.

The machine may only be operated, maintained and repaired by trained staff. In particular, these people must have read and understood the complete operating manual in the interests of all those involved. This is the only way to guarantee safe, trouble free operation.

3.5 General safety instructions



Only switch the Mortar Grinder on when the easy clamp system is tightened properly



Bring the Mortar Grinder Mill directly to its operating position.

3.6 Safety clothing



Observe the same safety precautions as for maintenance! Switch off the Mortar Grinder before cleaning, safeguard the main switch. Do not use corrosive, easily flammable substances as cleaning agents.

3.7 Maintenance



To be carried out only by qualified staff (see also 3.4). Wear safety gloves. Switch machine off. After maintenance, fit all the safety devices back in their correct positions and check that they function properly.

Check every month:

- State and proper function of the easy clamp system. Check O-rings
- Functions of the limit switches (only by the company electrician)
- Condition of the Mortar and the pestle.

4 Electrical equipment of the Mortar Grinder

4.1 Maintenance



In the case of malfunctions, interrupt the power supply immediately and secure it to prevent the machine being switched on again. Only use the fuses stated in the circuit diagram. Connection, maintenance and servicing should only be carried out by an electrician.

4.2 Electrical connection

Operating voltage:	230 V/50Hz +/- 10%
Max power consumption:	200W
Enclosure:	IP 54
Storage temperature:	+5°C - +45°C
Working temperature:	+15°C - +40°C
Installation Height:	max. 2000 m above sea level

The electrical connection should generally be carried out by an electrician. The works guarantee becomes null and void when the motors are mounted by the customer.

The motors are connected up according to the operating manual of the motor manufacturer.

5 Transport and erection of the Mortar Grinder

5.1 General transport information

Guarantee or compensation claims are null and void when the damage has been caused by improper transport or improper handling. Examine the Mortar Grinder for any signs of transport damage immediately after transport, have any such damage acknowledged in writing by the carrier, inform the insurance company and the supplier.

5.2 Weight and dimensions

Mortar Grinder dimensions:

1 carton with Inlay / on Pallet 700x750x700mm

Total gross weight: 52 kgs for transport (with steel mortar and pestle)

5.3 Erection and assembly

Check as follows:

- Check all fixing screws
- Check all safety fasteners, and remove any foreign bodies from the Milling chamber.

Check electric system (only by an electrician)

- Operating voltage using a voltmeter
- Electrical fuses
- Check electric cables for any signs of damage
- Check connections

5.4 Erection site

The machine can be easily moved within the laboratory or the workshop.

The following points must be observed at the erection site of the machine:

- A constant temperature must be guaranteed. It should not be under +5°C or above +40°C.
- The humidity may not exceed 85% continuously.
- The main switch of the Mortar Grinder must be freely accessible.

5.5 Taking the Mortar Grinder into storage.

The Mortar Grinder is to be stored in a dry room. Protect from the damp, from a corrosive atmosphere and from temperatures below +5°C and above +45°C.

6 Electrical connection

6.1 Connection

When connecting the machine to your local power supply source please pay attention to the information on the sticker at the rear of the machine showing the technical information.



These jobs of work may only be carried out by qualified staff. The connections must be completed carefully. Errors can pose a mortal danger. The connection regulations of the responsible power utility company must be observed.

- Connect up the machine according to the circuit diagram.
- Check proper position of Mortar and Pestle

6.2 Starting up the Mortar Grinder

Only start the Mortar Grinder with properly inserted Mortar and Pestle.

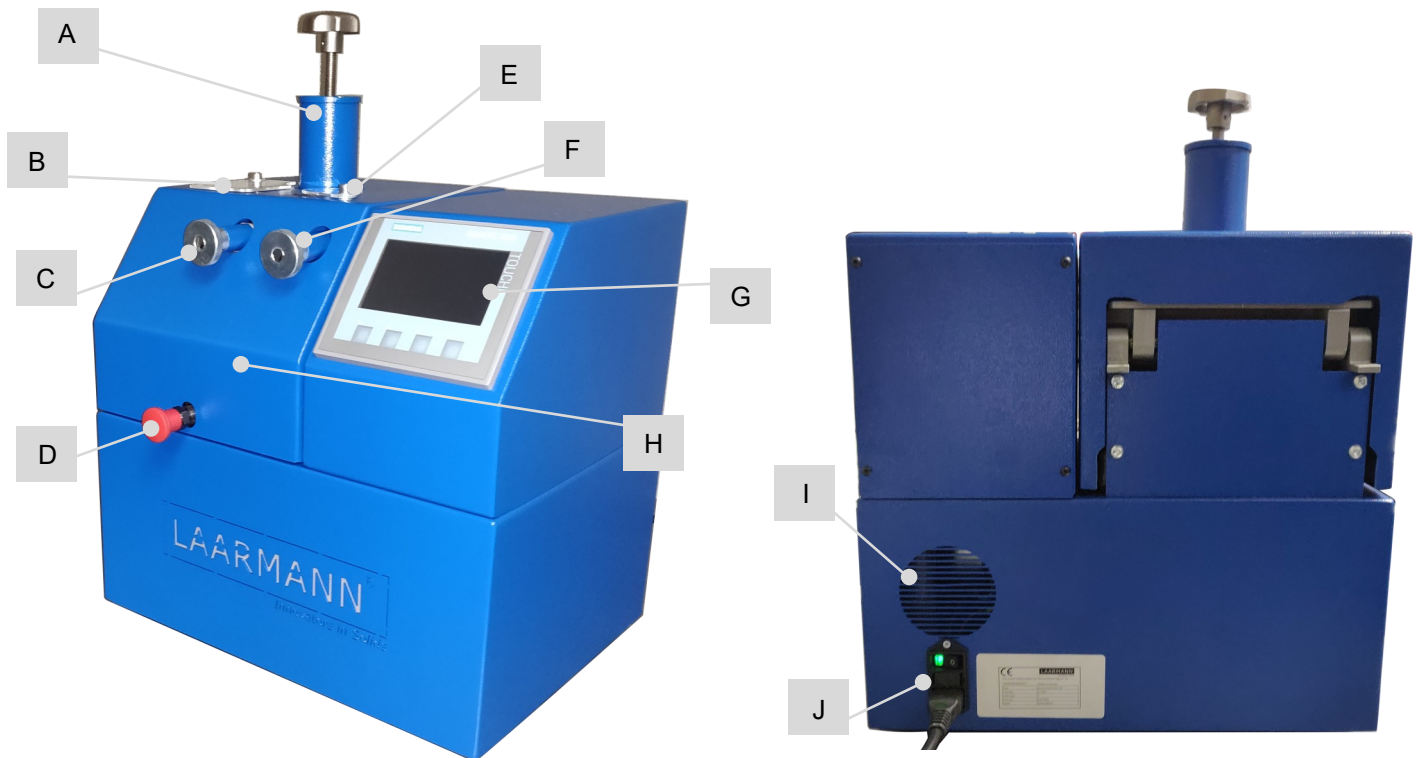
7 Operation

7.1 Control elements and their use

The machine can be easily moved within the laboratory or the workshop.

The following points must be observed at the erection site of the machine:

- A constant temperature must be guaranteed. It should not be under +5°C or above +40°C.
- The humidity may not exceed 85% continuously.
- The main switch of the Mortar Grinder must be freely accessible.



Element	Description	Function
A	Pressure regulating screw	Adjust the pressure of grinding pestle manually
B	Scraper window	Observe scraper position and the sample grinding
C	Scraper knob	Manually adjust the position between the scraper and the grinding set
D	Cover locking knob	Open or lock the instrument cover
E	Feed port	Sample feeding
F	Grinding pestle knob	Manually adjust the position of the grinding pestle
G	Control panel	Set grinding parameters and control the operation of the instrument
H	Grinding chamber cover	Seal grinding chamber
I	Ventilating window	Exhaust heat
J	Power supply socket (3 in 1)	Switch/fuse/socket

7.2 Mortar grinder part functions



Parts	Name	Function
M	Cover locking holder	Lock the cover
N	Scraper	Mixing and grinding material, scraping down the material from the mortar
O	Pestle	Mill the sample
P	Mortar	Sample mixing and grinding
Q	Scraper holder	Fix scraper
R	Scraper screw	Fix scraper
S	Pestle holder	Fix the pestle
T	Slotted seat	Fix the mortar

7.3 Switching the Mortar Grinder ON and Off

Functions Starting the MG100 The ON/OFF and switch G is located at the rear of the machine, **Figure 2**

The grinding parameters can now be selected and the machine is ready for operation. Push the START button.

The Motor starts and the Mortar base plate start the rotation.

When connecting the machine to your local power supply source please pay attention to the information on the sticker at the rear of the machine showing the technical information.



Figure 2

7.4 Inserting / replacing the Mortar and Pestle

In order to guarantee a smooth running operation of the MG100 it is necessary that both Mortar and Pestle are inserted and made from the same material.

For example: Mortar and Pestle made from stainless steel or made Mortar and Pestle from Agate.

Attention: Never Mix the Material (Agate and Steel) because of breakage.

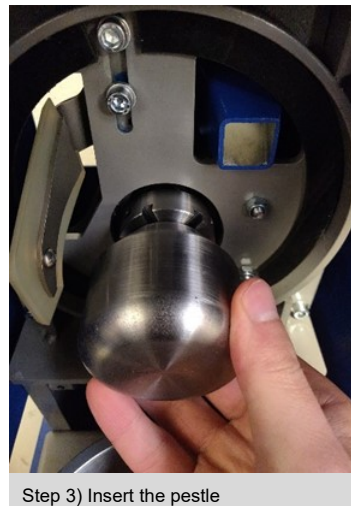
Make sure that the Mortar and pestle are properly in the Holders of the machine. When removing and opening hot or cold grinding jars always wear protective gloves.



Step 1) Open the Cover



Step 2) Insert the Mortar



Step 3) Insert the pestle



Step 4) Bring Pestle into proper position

7.5 Program setting



Starting Screen

This is the starting screen for the installation.

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

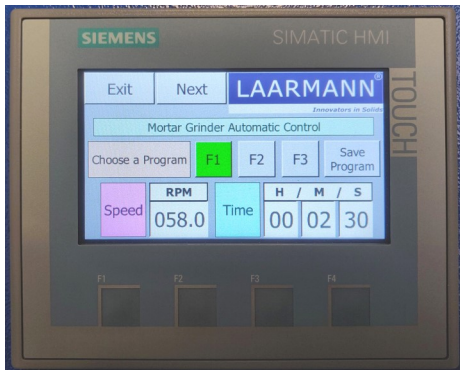
Additional languages can be added on request



Hand control

Here you see the overview of the manual system.

With hand control you can start the machine and change the rpm and time during the run

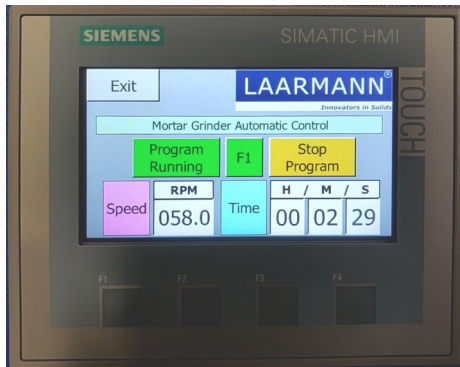


Automatic control

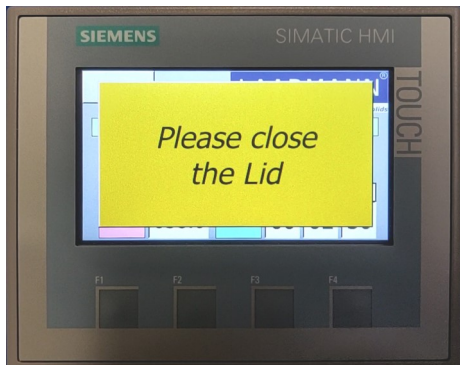
This is the overview for the automatic system.

You can save up to 3 programs. The programs will be stored even after removing the power. The first time you need to set the parameters and press “save program” afterwards the system will save the parameters and these won't be needed to put in again.

You can load each program (after saving it) by pressing on the program number. Now the machine will load the parameters corresponding



After setting the parameters or after loading the program you can press Next. You will see overview of the program and from here you can press Start program after that the machine will start running the program. You can press Stop programs any time you like if you wish to stop the program



Safety

For safety measures the program will not start if not lid is not closed properly. If this happens close the lid or check if the cover locking knob is not locked completely

8 Working instructions for operation**8.1 Selection Guide Mortar and Pestle**

Material grinding set	Feed size	Wear behaviour	Type of sample characteristics	Dry	Wet	Cyrogenic
Stainless steel	10mm	good	middle hard, brittle samples	yes	yes	yes
Hardened steel	10mm	good	middle hard, brittle samples	yes	no	no
Tungsten carbide	10mm	very good	middle hard, brittle samples	yes	yes	yes
Agate	8mm	good	soft to medium hard samples	yes	no	no
Sintered alumina	8mm	normal	soft to medium hard samples	yes	no	no



LAARMANN
Mortar Grinder
Type LMMG100

Product	Mortar Grinder
Model	LMMG100
Power supply	200V/50/60Hz

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