

LAARMANN

Innovators in Solids

USER'S MANUAL

LAARMANN Ball/Rod Mill LMBM-150

<u>Edition</u>	<u>Month</u>	<u>Year</u>
1.	March	2012

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1. SAFETY INFORMATION







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. WARNING SYMBOLS

The following are the warning symbols that are used in this manual.

	This symbol indicates a potential risk and alerts you to proceed with caution.
	This symbol indicates the presence of high voltage and warns the user to proceed with caution.
	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 guarantee claims.
	Transport Do not knock, shake or throw the LMBM-150 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 LMBM 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.

	<p>Atmospheric humidity If the humidity exceeds 85%, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.</p>
	<p>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.</p>
	<p>Inserting grinding barrel Ensure that the grinding barrel are inserted correctly. Otherwise they can be damaged, when starting the machine.</p>
	<p>Removing and opening hot grinding barrel When removing and opening hot grinding barrel, always wear protective gloves. There is a danger of burning the hands.</p>
	<p>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.</p>
	<p>Cleaning Do not clean the LMBM-150 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.</p>
	<p>Repair For your own safety, repairs must be carried out only by authorized service technicians.</p>

2. GENERAL DESCRIPTION

The LMBM-150 is a process and laboratory machine, which is suitable for milling and homogenizing soft, fibrous, hard and brittle materials in the dry and wet state.

The ball/rod mill is designed to accept a ball/rod charge to 30% of the total volume. The barrel is charged with balls/rods and sample and allowed to grind for the desired time.



Ball mill with open safety cabinet

3. TECHNICAL FEATURES

3.1. CONSTRUCTION

The barrel of LMBM-150 is made of steel plate varnished with high resistant powder coating on the outside, RAL 5005.

Protective equipment

The milling chamber of the LMBM-150 is surrounded by a safety cabinet, with safety locking system.

Starting of the machine is possible only with the cabinet is closed and the safety switch is correctly fitted.

3.2. TECHNICAL DATA

Power supply	380/400V \pm 10% - 50Hz
Rated power	1,1kW brake motor
Max. volume of grinding barrel	150Liter for the BM-150 series
Dimensions W x D x H	170x170x170
Weight	Approx. 750 kg
Noise emission (without milling balls)	70 dB(A), with ball charge not measured
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 box and take the machine carefully out of the box. Check that the machine has not been visibly damaged during the transport. If the machine is 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, if applicable.

4.2. SELECTING THE RIGHT PLACE

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

- Put the device on smooth and stable concrete floor.
- Leave enough space beyond the device.
- 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.
- Bolt the ball/rod mill securely to a floor that can safely support the weight of the mill using anchors.

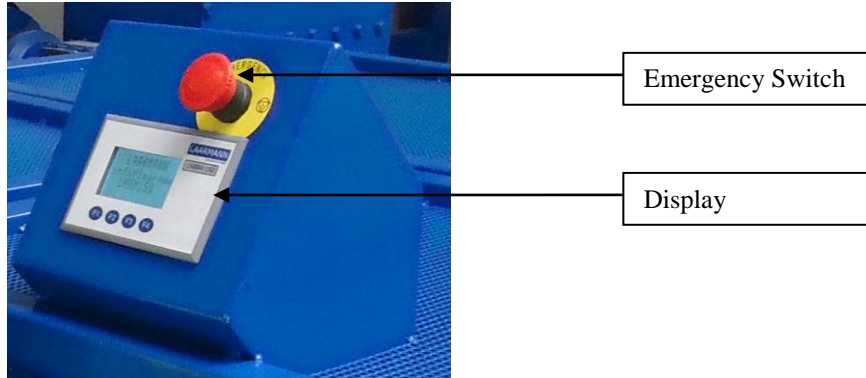
Note: The machine should not be placed so, that it is difficult to pull out the cord plug from mains power supply.

4.3. CONNECTING THE POWER CORD

The correct voltage and frequency for the LMBM-150 are given on the name plate. Ensure that these values correspond to the available power supply system. Connect the power cord to a grounded wall socket. 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.

If the plug has been put into network, the display on the machine will be initializing the program. Check if the Emergency POWER switch is not activated, located on the top of the machine at the front (RED button).



4.4. ENVIRONMENT CONDITIONS

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

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



**Starting of the machine is possible only with the hood closed.
Always start and stop the machine by touching the keypad.**

5. INSTRUCTIONS FOR USE

5.1. FILLING THE GRINDING BARREL

When the machine is connected to the power net and the PLC has been initialized, the ball mill will be automatically stop in the loading position as shown on the below picture 1.

To charge the mill remove the lid as shown on Picture 1.



Picture 1, opening the lid of the LMBM-150



Picture 2, filling the LMBM-150 with product



Picture 3, adding the ball/rod charge



Picture 4, closing the lid



Picture 5, closing the safety cabinet

5.2. EMPTYING THE GRINDING BARREL



Picture 6, opening the lid of the barrel



Picture 7, close doors and look at display



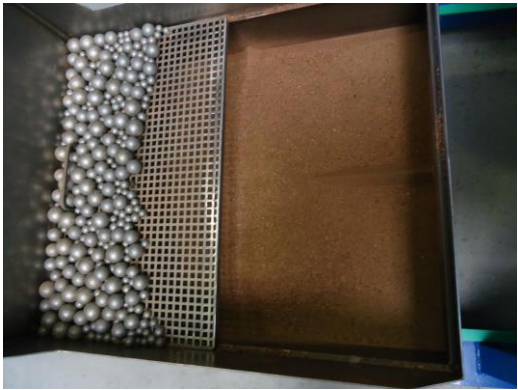
Picture 8, removing any left balls/product



Picture 9, pull back the receptacle



Picture 10, ball separation form milled product



Picture 11, remove balls and product

5.3. WORKFLOW KEYPAD

Following instruction are valid for working with the LMBM-150 keypad:



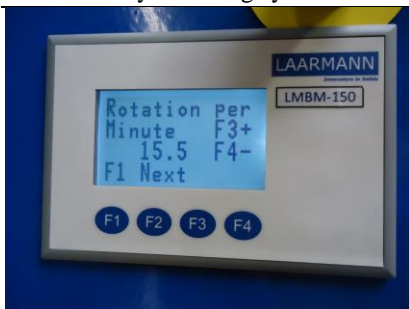
Emergency stop after resting the switch press F4 to reset. After 2 minutes of no key or unit activity a screen saver appears with "Laarmann" and the machine number when you press any of the 4 keys it goes back to the last menu that was in use.



Menu 1 choice Automatic or Hand (For navigating through the automatic menu F1 is to go forward to the next screen F2 is back to the pervious screen)



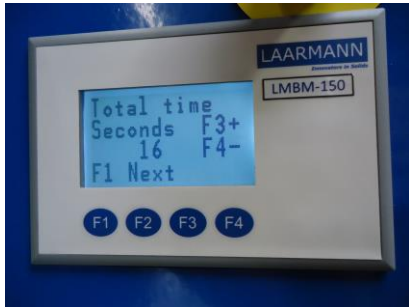
Hand control F1 fixed speed forwards F2 Fixed speed Backwards as long as you push the button, F3 Opens the electric lock on the gate, it is on for 60 seconds or until the gate is opened, when the gate is closed again it locks automatically. F4 brings you back to the first menu.



First menu of the automatic mode choosing the speed of rotation for the drum between 15.5 to 46.5 rpm



Second menu of the automatic mode choosing the amount of minutes for the drum to turn between 0 – 99



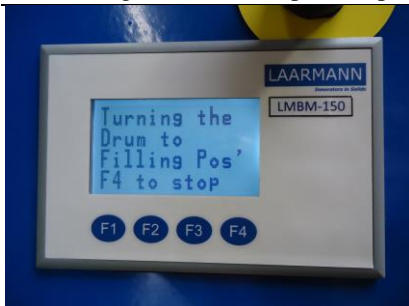
Third menu of the automatic mode choosing the amount of seconds for the drum to turn between 0 – 60



Forth menu of the automatic mode choosing the amount of times for the drum to change direction during rotation 0-60 the time is divided equally of amount of changes of direction.



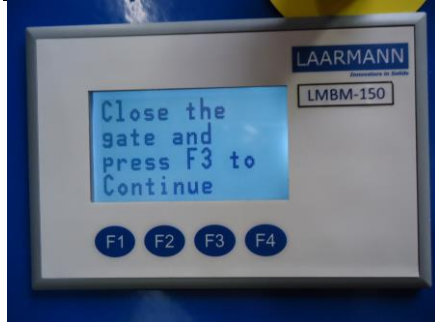
Fifth Menu of the automatic mode is telling you the total time the drum will turn and asking you to push F3 to start, during the automatic process pressing F4 will stop the drum and return you to this menu point.



Step 1 moving the drum to filling position.



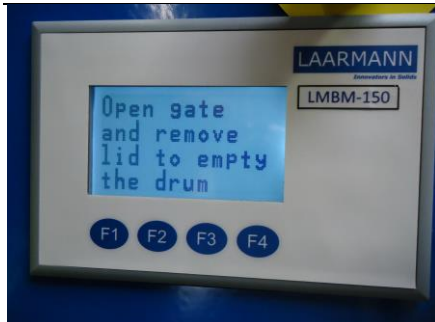
Step 2 Open the gate fill the drum with product and balls/rods.



Step 3 after filling close the gate and press F3 to start the process.



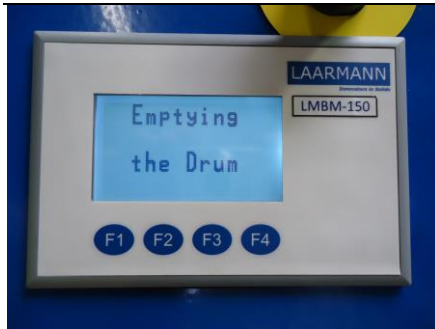
Step 4 wait until the drum stops the remaining time is displayed and counts down. The main screen is displayed when it is returning to the start position for removing the lid.



Step 5 Open the gate and remove the lid to empty the contents.



Step 6 after removing the lid close the gate and press F3 to continue



Step 7 the drum turns slowly to empty the contents into the bin under it.



Step 8 after the drum stops open the gate by pressing F4 and remove any product that is still in the drum.







After closing the gate the menu returns to standard.

6. WORKING INSTRUCTIONS

6.1. GENERAL

The LMBM-150 is a high performance product. Because of the robust execution, the LMBM-150 is a machine with many different application possibilities in laboratories, industry and research. It is used mainly in the chemical and pharmaceutical sectors and in mineralogical applications etc.

	The milling process can only be started, when the safety cabinet is closed.
	Do not force to open the cabinet during the milling process, although the grinding barrel are brought to a standstill immediately after the opening of the hood.
	Do not mill inflammable or explosive samples!
	Please note that the properties and therefore the dangerous nature of your sample, can change during the milling process.



6.2. MAINTENANCE

LMBM-150 is maintenance free. When used properly, no maintenance and setting is necessary. Do not make any alterations to the machine and use only approved spare parts and accessories.

6.3. WEAR

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

6.4. 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 LMBM -150 under running water. Danger to life through electric shock.

Note: Subject to technical modifications.

7. CE DECLARATION OF CONFIRMITY

LAARMANN

**BALL/ROD MILL
Type LMBM-150**



Product	Ball/Rod Mill
Model	LMBM-150
Power supply	380-400V/50Hz

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**

LAARMANN GROUP B.V.

Roermond, March 2012

A handwritten signature in blue ink, appearing to read 'G. van Laarhoven', is written over a horizontal line.

Ing. Guido van Laarhoven

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