

# LAARMANN

*Innovators in Solids*

## USER'S MANUAL

### LAARMANN Ball/Rod Mill

### LM-BRM

### SUITABLE TO PERFORM BOND TESTS

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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 the equipment.




In case of an emergency or if you are experiencing difficulties, first contact the technical department and your supervisor. If the problem can't be solved please contact LAARMANN Group B.V. at +31 475 470 217.










### 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

	<b>Safety instructions</b> 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.
	<b>Use according to the intended purpose</b> 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.
	<b>Transport</b> Do not shake or throw the LM-BRM during transport. Otherwise the electronic and mechanical components may be damaged.

	<p><b>Packing material</b></p> <p>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.</p>
	<p><b>Temperature variations</b></p> <p>If the LM-BRM is subjected to high temperature variations, protect it against condensed water. Otherwise the electronic components may be damaged.</p>
	<p><b>Ambient temperature</b></p> <p>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>
	<p><b>Atmospheric humidity</b></p> <p>If the humidity exceeds 85%, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.</p>
	<p><b>Electrical connection</b></p> <p>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><b>Inserting grinding drum</b></p> <p>Ensure that the grinding barrel are inserted correctly. Otherwise they can be damaged, when starting the machine.</p>
	<p><b>Removing and opening hot grinding drum</b></p> <p>When removing and opening hot grinding barrel, always wear protective gloves. There is a danger of burning the hands.</p>
	<p><b>Materials</b></p> <p>Observe the relevant regulations and directives for handling chemicals and hazardous materials.</p> <p>Milling of materials, which give a risk of fire or explosion, is prohibited.</p>
	<p><b>Cleaning</b></p> <p>Do not clean the LM-BRM under running water. Danger to life through electric shock.</p> <p>Use only a soft cloth moistened with water. Cleaning agents and solvents should not be used, not for cleaning the milling tools either.</p>

**Repair**

For your own safety, repairs must be carried out only by authorized service technicians.

## 2. GENERAL DESCRIPTION

The LAARMANN Ball/Rod mill type LM-BRM is a process and laboratory machine, which is suitable for milling and homogenizing soft, fibrous, hard and brittle materials in dry and wet phase.

The LM-BRM is suitable for normal and Bond grinding, depending on the (size) drum. Because the machine has a changeable opening, different sizes of drums can be fitted in the machine.

With a manual and automatic operating system it is suitable for many applications. With changeable time, rotation and speed settings the LM-BRM can be fully set to your requirements.

The drum lifting device insures that the lifting and positioning is easy. The device has two guide-openings at the bottom receiving the wheels to ensure that the lifting device is positioned correctly releasing the drum in the machine.

The drum lifting device comes with a foot paddle and a lowering knob to reducing the physical load to a minimum.



### 3. TECHNICAL FEATURES

#### **3.1. CONSTRUCTION**

The housing of LM-BRM is made of steel plate varnished with high resistant powder coating. Colour is RAL5005.

##### **Protective equipment**

The milling chamber of the LM-BRM is enclosed by a strong covering door. Starting of the machine is possible only with the hood closed.

Automatic return to upright position drum (in loss of air pressure). Sensors to position and control the internal frame for the drum.

Sound enclosing with sound reducing material (optional)

Automatic stop when the door is opened.

Light indicators on the top of the machine to see in what state the program of the machine is actually in.

#### **3.2. TECHNICAL DATA**

Power supply	230V $\pm$ 10% - 50/60Hz
Rated power	800w
Max. volume of grinding barrel	42L, volume and shape depending on version
Dimensions W x D x H	120*60*155 (cm)
Weight	
Noise emission (without milling balls)	35 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 box 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 and stable concrete floor.
- 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 LM-BRM 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.





#### ***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


## 5. INSTRUCTIOS FOR USE

<p>This is the overview for the operator. In case of an emergency, press the red button to stop the machine.</p> <p>To release the emergency stop you need to turn it (see arrow) and it will come up.</p> <p>When this doesn't happen please contact the technical department or authorised personnel to check the stop. It is possible that the spring is broken.</p>	 <p>The image shows a red emergency stop button with a yellow base and a red arrow indicating the rotation direction. Below it is a control panel with a screen displaying a red emergency stop message: "Emmergency Stop Press to Reset". The panel has four function buttons labeled F1, F2, F3, and F4.</p>
<p>1 This is the starting screen for the installation.</p> <p>If you press on one of the flags the language will change to the pressed language.</p> <p>Here you can select "Hand Controls" for manual input or select "Automatic System" for automatic.</p> <p>If you press "Hand Controls" go to <b>step 2</b>.</p> <p>If you press "Automatic System" go to <b>step 3</b>.</p> <p>If you experience errors please proceed to <b>step 5</b></p>	 <p>The image shows the starting screen of the LAARMANN control panel. The screen displays the LAARMANN logo and the slogan "Innovators in Solids". Below the logo are three flags: French, German, and British. Underneath the flags are two buttons labeled "Hand Control" and "Automatic Control". The panel has four function buttons labeled F1, F2, F3, and F4.</p>

2

Here you see the overview of the manual system.

You can set the speed of the drum by pressing on the numbers. In image #27

A number pad will appear (**see 4**) and here you can give in the desired speed. You confirm it by pressing 

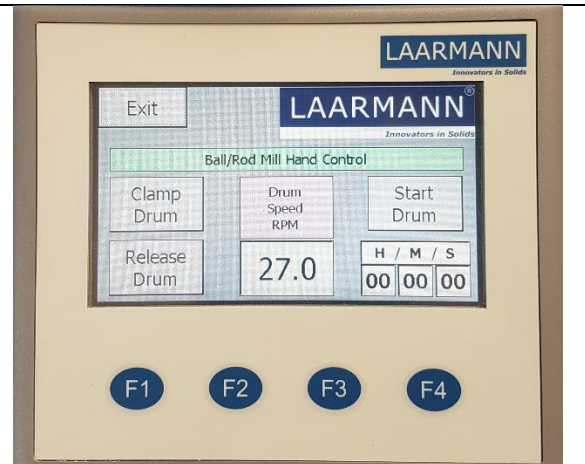
Before starting the machine, you need to clamp the drum.  
Press the “Clamp drum” button and the button will change colour (green).

Press “Start drum” to start the machine.

When you stop the machine by pressing “Stop drum” you must press “Release Drum” to be able to remove the drum from the machine.


**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 of the selected language.




3 Here you see the overview of the automatic system.

You can set the speed of the drum by pressing on the numbers. In image #27

A number pad will appear (see 4) and here you can give in the desired speed. You confirm it by pressing 

You can set the desired time by pressing **H**(our) / **M**(inutes) / **S**(econds).

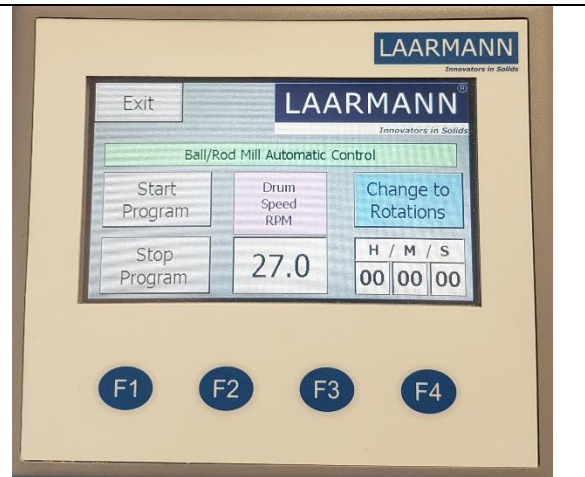
If you want to set a fixed amount of rotation press “Change to Rotations” and press the number.

A number pad will appear (see 4) and here you can give in the desired speed or rotations. You confirm it by pressing 

After this step you can press “Start Program” and the machine will start using the set time or rotations.

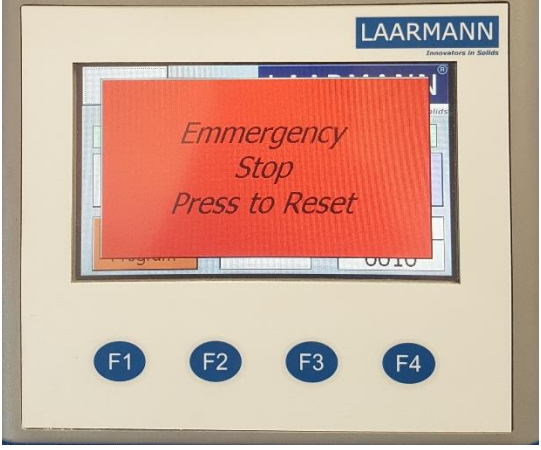


You can stop the machine by pressing “Stop Program” before the set time.

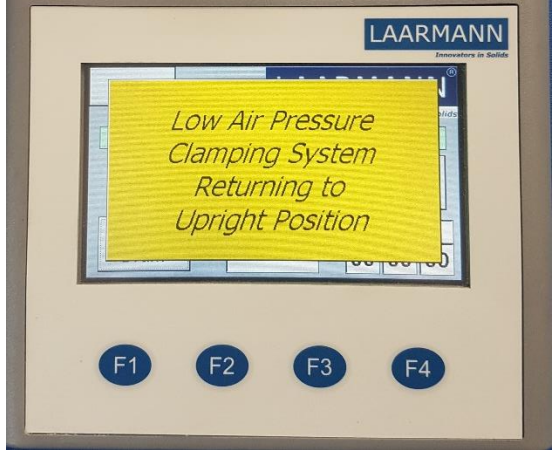
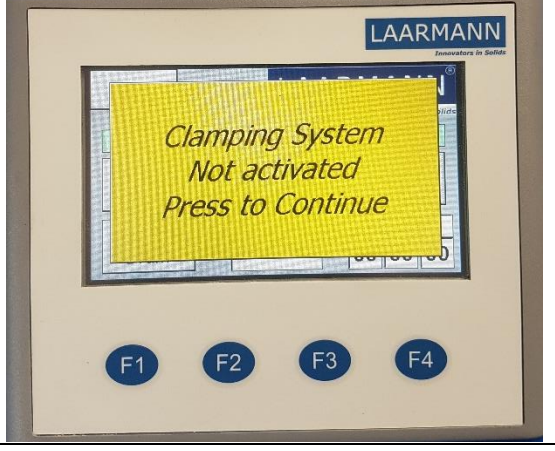
If you press exit, you will go back to the start screen of the selected language



4 Here you see the number pad.



<p>5</p> <p>In case of this message, please check all the emergency stops and verify that the installation doors are correctly closed.</p> <p>To release the emergency stop you need to turn it and it will come up.</p> <p>After verifying that all stops are checked press the message to continue.</p>	
<p>In case of this message please check the door</p> <p>After verifying that the door is fully closed and press the message to continue.</p> <p>If the message doesn't disappear, please contact the technical department or authorised personnel. It is possible that the sensor is broken.</p>	
<p>In case of this message please check the airpressure on the machine. Verify that the local air supply produces enough pressure.</p> <p>After verifying that there is enough pressure press the message to continue.</p> <p>If the message doesn't disappear, please contact the technical department or authorised personnel. Please check the following:  The hoses ,also inside the machine, for punctures  Check if the regulator gauges works properly  Check if the air clamps don't have a puncture  Check if the hoses (connectors) are correctly connected</p>	

<p>In case of this message please check the pressure on the machine.</p> <p>This message is displayed when the machine is in motion and there's not enough pressure.</p> <p>Verify that the connection produces enough pressure.</p> <p>After verifying that there is enough pressure press the message to continue and restart the machine.</p> <p>If the message doesn't disappear, please contact the technical department or authorised personnel. Please check the following:  The hoses ,also inside the machine, for punctures  Check if the regulator gauges works properly  Check if the air clamps don't have a puncture  Check if the hoses (connectors) are correctly connected</p>	 <p>The image shows a control panel with a central screen displaying a yellow error message. The message reads: "Low Air Pressure Clamping System Returning to Upright Position". Below the screen are four buttons labeled F1, F2, F3, and F4. The LAARMANN logo is visible at the top of the panel.</p>
<p>In case of this message please check the clamp position inside the machine. This message will display when trying to release the drum when the drum is not clamped.</p> <p>After verifying that the drum is not clamped press the message to continue.</p>	 <p>The image shows a control panel with a central screen displaying a yellow error message. The message reads: "Clamping System Not activated Press to Continue". Below the screen are four buttons labeled F1, F2, F3, and F4. The LAARMANN logo is visible at the top of the panel.</p>
<p>In case of a different error or the message doesn't disappear, stop working, please contact your (electrical) engineer and superior.</p>	<p>If the problem can't be solved or require additional assistance please contact Laarmann at +31 475 470 217</p>

The crane is build in 2 parts, the lifting mechanism and the (turn) cover.  
 The lifting part is the foot paddle and the turnknob for lowering.  
 The (turn) cover exist from a cover for the drum, safety revolver, handlebars.





To operate the crane, you can increase the height by pumping the paddle below by foot. You can lower the crane by turning the turnknob counter clockwise gently by hand. Position the crane with the guidance rails and by pumping/lowering the cover over the drum, when in position lower the cover over the drum and secure it with the safety pin. ALWAYS secure the drum with the safety pin to the crane before lifting the drum.

Use the safety “revolver” to lock the cover in place, use the handlebars to set it in the desired position. Always lock the cover in place when lifting/lowering, regardless whether the drum is attached or not.

## 6. WORKING INSTRUCTIONS

### 6.1. GENERAL

The LM-BRM is a high performance product. Because of the large selection of accessories, the LM-BRM 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 door is closed.
	Do not open the door during the milling process. Although the grinding barrel are brought to a standstill immediately after the opening of the door.
	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**

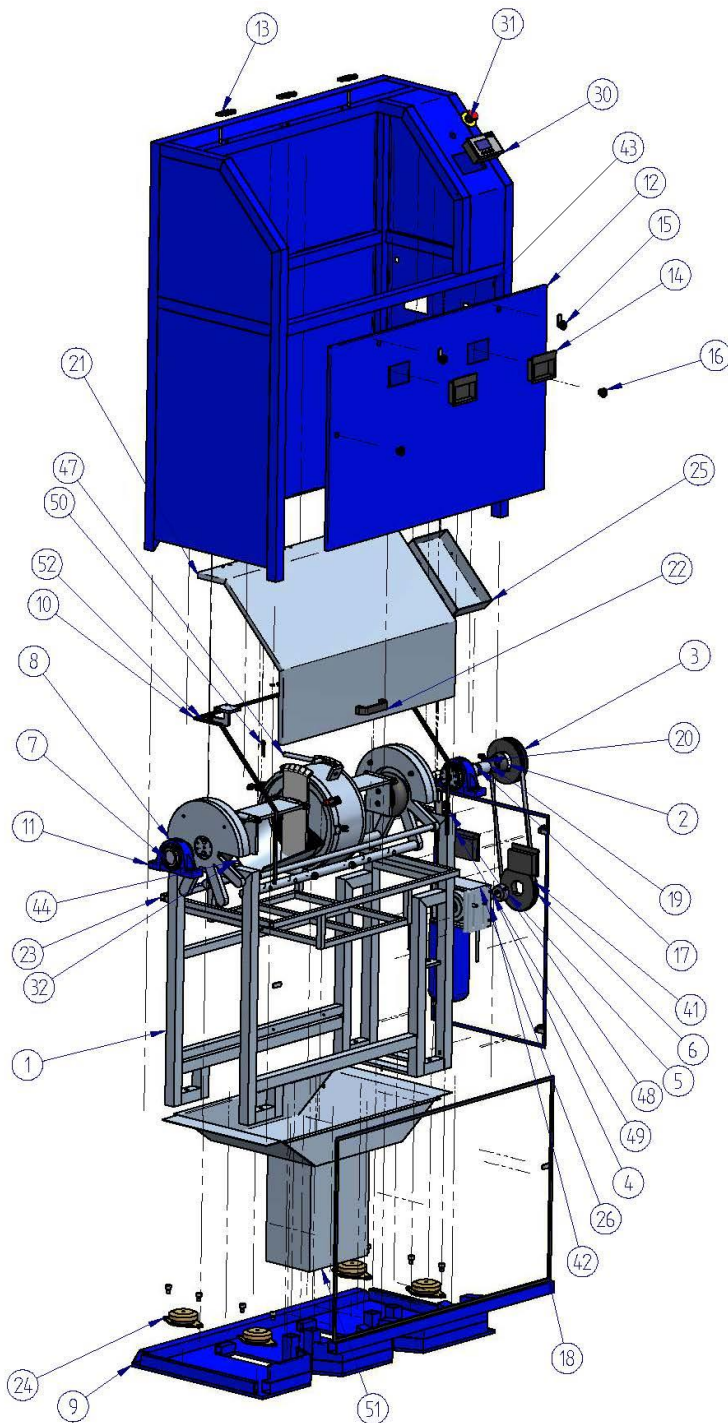
LM-BRM is maintenance free. When used properly, no maintenance and setting is necessary. Do not make any alterations to the machine and use only approved spare parts and accessories.

## **6.3. WEAR**

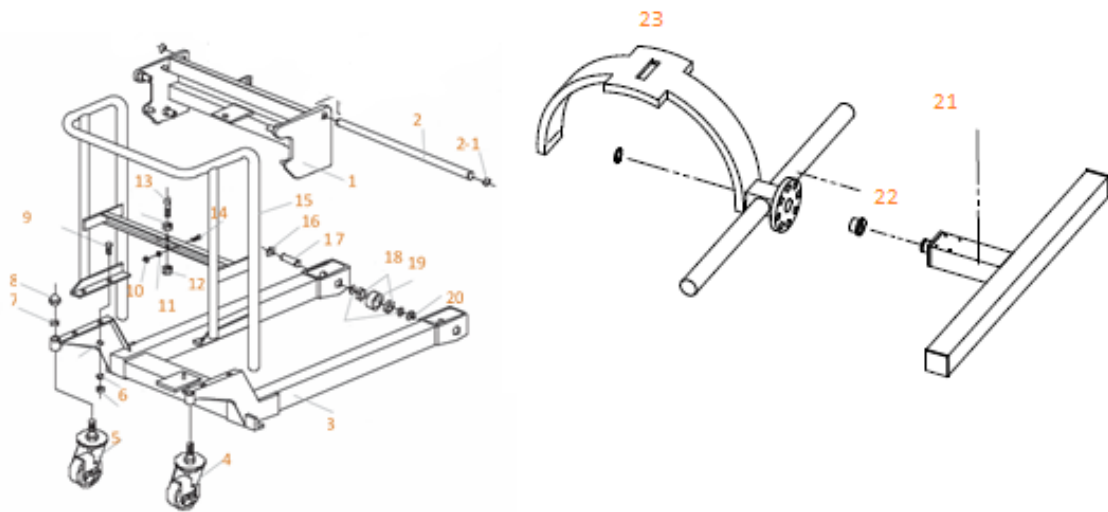
The milling tools can become worn out, depending on the frequency of the milling operation and the milled material. The grinding drum and balls should be regularly checked for wear and replaced, if necessary.



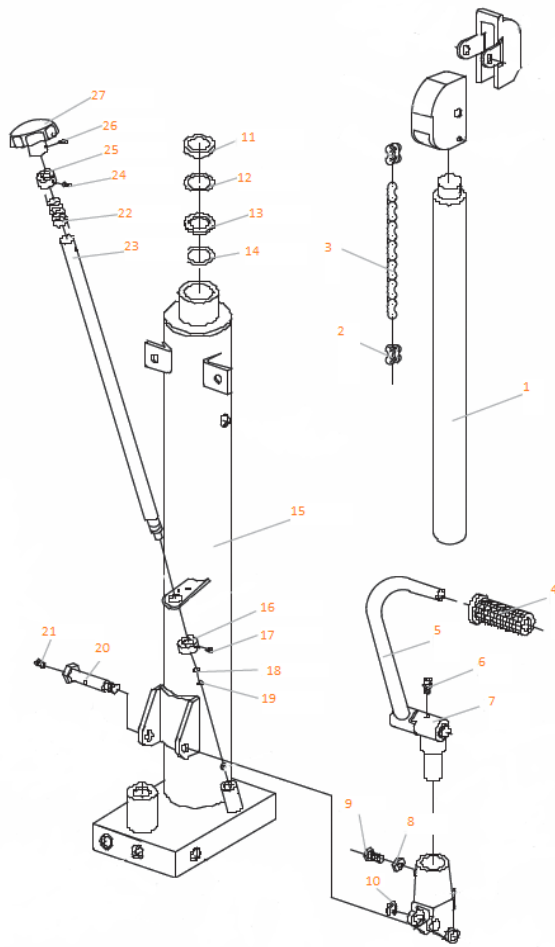
## PARTS LM-BRM



Item Number	Part/product Name	Quantity
1	23112016-01-00A	1
2	Taperlock	1
3	V-Pulley	1
4	23112016-00-01A	1
5	Taperlock	1
6	V-Pulley	1
7	23112016-00-02A	1
8	23112016-02-00	1
9	23112016-03-00A	1
10	Foam Lid	1
11	Bearing	1
12	23112016-00-03A	1
13	Hinge	1
14	Handle Removable frontplate	1
15	Latches upside Removable Front	1
16	Latches Side Removable Front	1
17	23112016-00-04	1
18	Foam Removable Front Plate	1
19	Rotating Clutch	1
20	Bended Push-in Connection	1
21	23112016-00-05A	1
22	Handle	1
23	23112016-05-00	1
24	Machinefoot	1
25	23112016-00-06	1
26	Motorreductor	1
30	logo display	1
31	noodstop	1
32	23112016-00-07	1
41	V-Belt	1
42	23112016-07-00A	1
43	23112016-00-08	1
44	23112016-06-00A	1
47	23112016-00-10	1
48	23112016-00-11	1
49	23112016-00-12	1
50	Split/Cotter Pin	1
51	elektric case	1
52	23112016-13-00	1





Item Number	Part/product name	Quantity
1	Plate	2
2	Connector bar	1
2-1	Connector tip	2
3	Stabilizer	2
4	Wheel	1
5	Wheel	1
6	Bolt	1
7	Ring	1
8	Nut	1
9	screw	1
10	Nut	1
11	Ring	1
12	Nut	1
13	Screw	1
14	Screw	1
15	Handle bars	1
16	Nut	1
17	Axle	1
18	Washer	1
19	Roller	1
20	Spring	1
21	T-Bar	1
22	Handle	1
23	Cover and safety pins	1



Item Number	Part/product name	Quantity
1	Piston Rod	1
2	Chain lock	2
3	Chain	1
4	Foot paddle	1
5	Bar	1
6	Securing pin	1
7	Switch	1
8	Safety nut	1
9	Bolt	1
10	Covering pin	1
11	Outer bearing	1
12	Ring	1
13	Inner Bearing	1
14	Ring	1
15	Pump body	1
16	Bush	1
17	Screw	1
18	O-ring	1
19	O-ring	1
20	Axle foot padal	1
21	Grease nipple	1
22	Spring	1
23	Turn bar	1
24	Screw	1
25	Bush	1
26	Screw	1
27	Turn knob	1

## 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 LM-BRM under running water. Danger to life through electric shock.

Note: Subject to technical modifications.

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Contact details:



Laarmann Application Centre  
and Warehouse

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Fax +31 472 470 242*

E-Mail [info@laarmann.eu](mailto:info@laarmann.eu)

## 7. CE CERTIFICATE

**LAARMANN**

LAARMANN Ball Mill



Product: Ball Mill  
Model: Ball Mill 42L  
Power supply: 230v/60Hz/3Kw

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 (EMC) EN 5008-1-1992	Electromagnetic Compatibility Directive 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, May 2017

Ing. Guido van Laarhoven

LAARMANN

**Lifting Crane**



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Product	Lifting Crane
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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
EN 292, 294, 418	Safety guidelines
2006/42/EG	Machine guideline
EN 1757-1: 2001	Applied, Harmonic standards

**WARNING:**

This equipment is required to be operated strictly in accordance with the instructions given in the operating manual supplied with the product. 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, May 2017

Ing. Guido van Laarhoven