

LAARMANN[®]

Innovators in Solids



CM1000 CUTTING MILL USER MANUAL

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1 General machine information

Machine type:	CM1000
Motor output:	3,0 kW
Operating voltage:	3 x 400V
Control voltage	230 V
Frequency	50 Hz

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1.1 Important notice

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

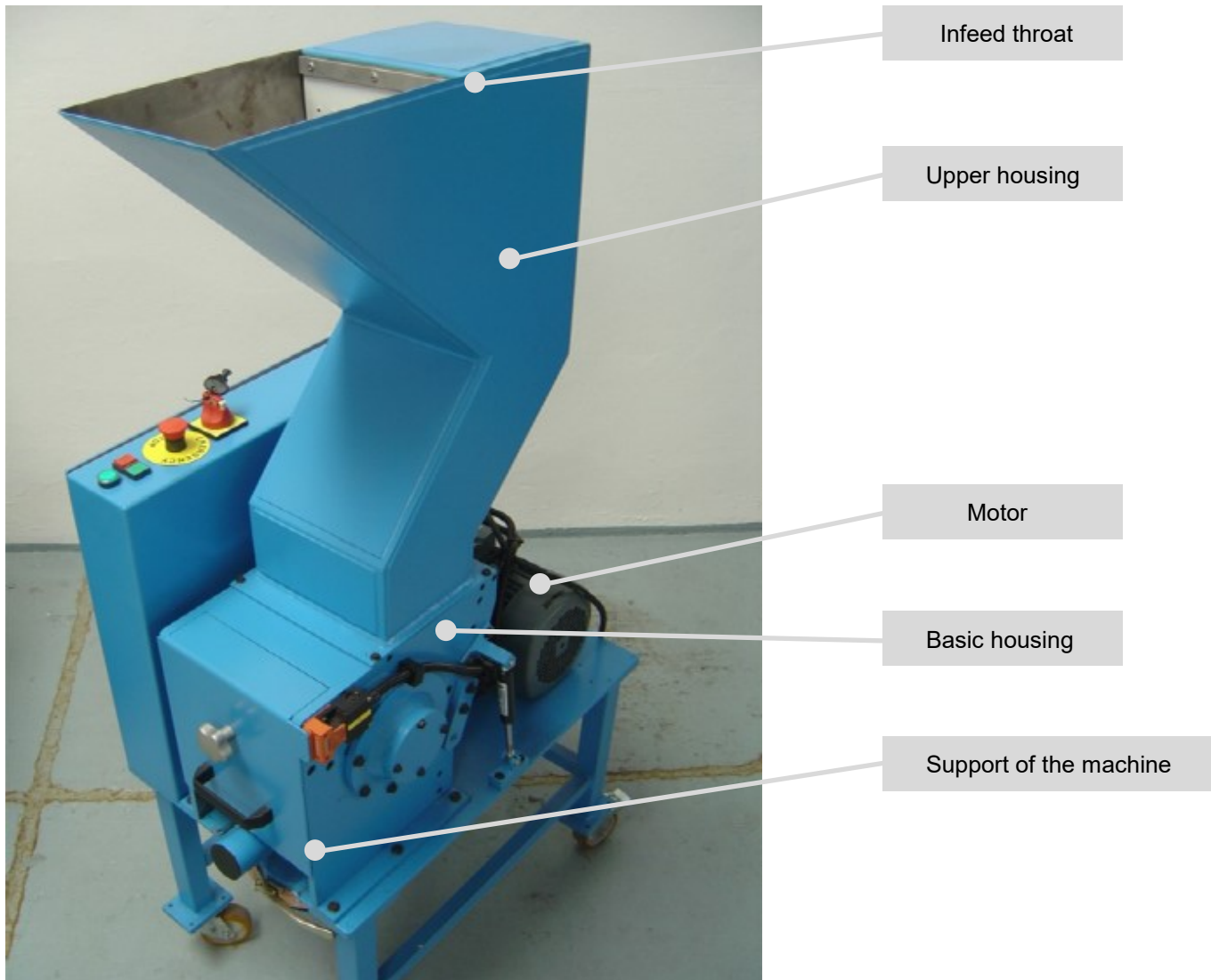
on-going developments. It is therefore not possible to derive any claims from the data, illustrations and descriptions contained in the manual. Subject to errors.

2 Description of the cutting mill

2.1 Description and proper use of the cutting mill

This cutting mill is intended for the cutting of materials such as Plastics, rubber, leaves, foils, paper, wood and similar materials with an output of max 20 - 60 kg/h for a sieve of 6/12 mm.

The cutting mill consists essentially of an upper housing, a basis housing, the infeed throat, the support of machine and the electric motor according to the following drawing.



No solid materials such as screws, nails or hard materials such as rocks etc. and other kinds of hard material may be fed into the machine. If any other kinds of material are fed into the machine, this can cause major accidents or damage to the cutting mill.

2.2 Improper purpose

In addition, plastics containing additives such as flammable or corrosive substances etc. may not be crushed with the cutting mill. The material being crushed may not be easily flammable or toxic. Hollow bodies may not be pressurised and must be completely empty before being crushed.

3 Safety instructions

3.1 General safety instructions

The cutting mill 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 accident prevention regulations of the plastics industry VBG 4, VBG 5, VBG 22 and valid standards DIN EN 292 T1+T2, E DIN EN 954 T1, DIN VDE 0113 T1 and E DIN VDE 0113 valid at the point in time of delivery have been taken into account in manufacturing the machine.

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 operating staff at the machine must always use the personal safety gear prescribed by law and provided by the employer. 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 necessary 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 Initial commissioning



Remove the preservative. Always wear safety gloves to prevent cuts and injuries. Initial commissioning only by a qualified fitter. Electrical connection by an electrician. Only switch the cutting mill on when it is empty.



Open the cutting chamber (chapter 8.3) and check whether any foreign bodies, for example tools or other items, have been left in the cutting chamber or intake opening. Close the cutting chamber (chapter 8.4) again. Bring the cutting mill directly to its operating position.

3.6 Cleaning



Observe the same safety precautions as for maintenance! Always open the cutting chamber up to the trip dog. Switch off the cutting mill before cleaning, safeguard the main switch. Do not use corrosive, easily flammable substances as cleaning agents. Wear safety gloves as protection from cuts or injuries.

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.

3.8 Emergency-off function

In the case of an emergency, put the main switch in the "off" position immediately.

3.9 Description of the safety closures

See chapter 7

3.10 Remaining danger



During operation of the cutting mill always wear safety gloves and goggles. Never keep hands, head or other extremities into the infeed throat. Do not force in clogged or stranded material with long parts (risk of back kicks). Always keep a foam or powder fire extinguisher in clear visibility and in easy reach. Don't keep the hands in the cutting chamber when closing the upper part.

4 Electrical equipment of the cutting mill

4.1 Electrical safety

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:	400 V
Control voltage	230 V
Frequency	50 Hz
Drive motor	VEM
Motor output	3,0 kW
Rated speed	1420 rpm

The electrical connection should generally be carried out by an electrician. The motors are supplied by LAARMANN ready mounted. 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. The machine must be grounded, with the cable cross section for grounding corresponding to the power lead.

5 Transport and erection of the cutting mill

5.1 General transport information

Guarantee or compensation claims are null and void when the damage has been caused by improper transport, improper handling or erection of the rotary cutter. Examine the cutting mill 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.

Transport of the cutting mill on a pallet by forklift



Fasten the cutting mill on the pallet with tension straps. Insert the forks completely. Ensure that the mill is not top-heavy on the pallet. Move the forklift at the lowest speed, only lift the load as far as absolutely necessary.

5.2 Weight, Demensions

Cutting mill dimensions:

1 wooden crate 80x120x135cm

1 box 60x80x76 cm

Total gross weight: 282 kgs

5.3 Erection and assembly

Some types of infeed throats have to be fixed on the upper part with 4 screws M6 x 12 DIN 151-8.8. Ensure that the interior walls of the infeed throat flush with the interior walls of the upper part. At protruding edges material can get jammed. After assembly, check as follows:

- Check all fixing screws
- Check all safety fasteners, and remove any foreign bodies from the cutting 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
- Check safety closures (when the closure flap is open, it must not be possible to switch on the rotary cutter).



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.

5.4 Erection site

The machine is supplied on castor wheels and can be 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 +50°C. The humidity may not exceed 85% continuously. The emergency-off (main switch) of the cutting mill must be freely accessible.

5.5 Removing the preservative

Blank parts such as rotor, blade, inside parts of the housing etc. are covered with preservative before delivery. This preservative is wiped off with a clean, dry cloth. Do not use any rough materials. Never use compressed air or pressurised liquids.

5.6 Taking the cutting mill into storage

The cutting mill is to be stored in a dry room. Protect from the damp, from a corrosive atmosphere and from temperatures below +5°C and above +50°C.



Caution, it is easy to cut yourself on the knives! Always wear safety gloves. Comply with all the accident prevention regulations!

6 Electrical connection

6.1 Connection

When wiring the machine, pay attention to the direction of rotation of the rotor. When the machine is slowing down, when looking at the motor the fan blade must turn clockwise. In addition, the direction of rotation is marked by an arrow on the motor respectively on the safety hood.



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 safety fasteners

6.2 Starting up the Cutting Mill



Only start the cutting mill in no-load state!

7 Safety devices

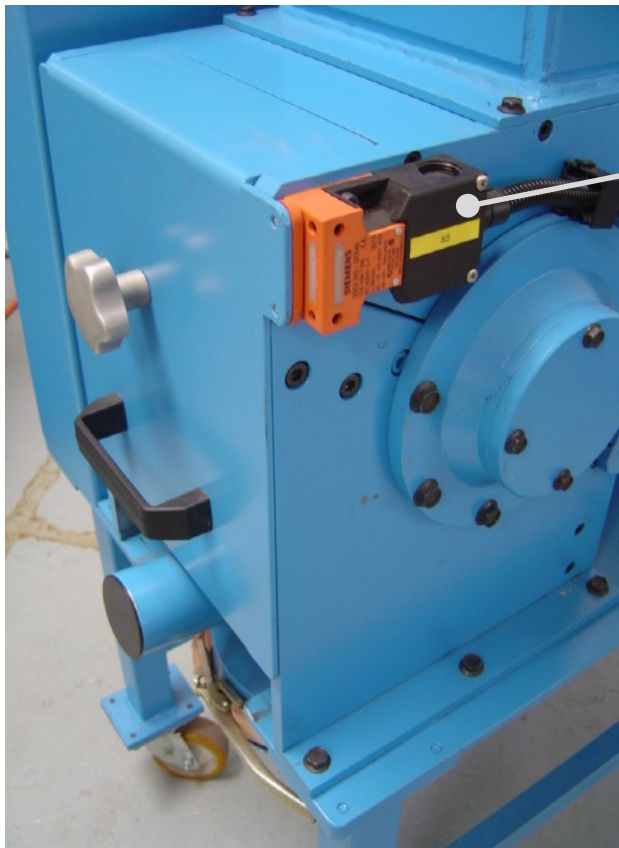
The safety closure of the cutting mill safeguards the cutting chamber and protects the operating and maintenance staff from dangerous operating conditions. It consists of the following devices:

7.1 Mechanical opening device

The mechanical opening device (knob + closure flap + knob) delays the opening of the machine. It may never be removed or changed. It ensures that the rotor has finished moving before the upper part can be swivelled open.

7.2 Starting up the Cutting Mill

This limit switch prevents any access to the closure screws of the cutting chamber and the sieve frame. The machine can be stopped using the main switch in every operating mode and condition.



Limit switch

8 Operating the cutting mill

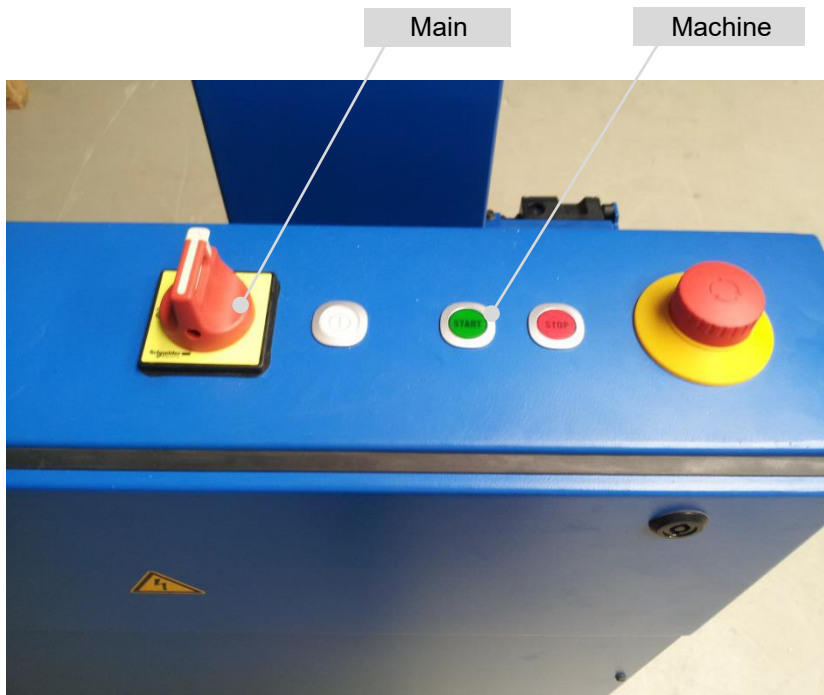
8.1 First steps



Electrical connection only by electrician. Check operating voltage. Ground the rotary cutter. Check the safety closures.

- The works guarantee is null and void if the customer mounts the motor.
- Comply with the operating manual issued by the motor manufacturer.
- Check the cutting mill for foreign bodies.
- Only start the machine in no-load state.
- Check all safety elements.

8.2 Switching the machine on and off



Switch the mill on as follows:

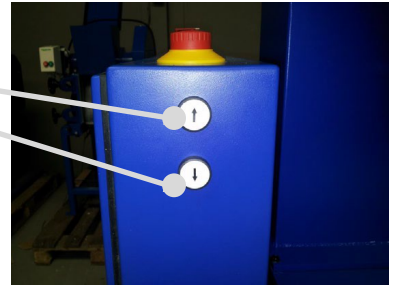
1. Main switch to position on
2. Push green button (release key, green lamp is on)
3. The cutting mill must be fed with material quickly and evenly. The best grinding performance is reached when there is a constant flow of grinding material. Do not "overfeed" the cutting mill.

If the rotor stops because of too much material, proceed as follows:

1. Put main switch in position 0.
2. Open machine upper part (see 8.3).
3. Clean grinding chamber thoroughly.
4. Close mill again in reverse order.
5. The company electrician should unlock the motor protection switch if this was triggered automatically.
6. Put main switch in position 1
7. Start mill

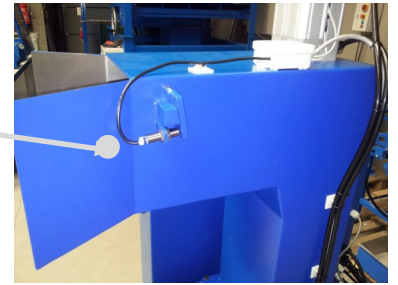
8.3 Operating the pneumatic pusher

The up and down buttons are used to operate the pneumatic pusher



There is a system measuring the amperage of the motor to prevent overloading the machine. The pneumatic pusher will go back to starting position.

A safety switch prevents accidental access to the pusher chamber. The pneumatic pusher cannot be operated when the feed opening is not closed completely.



8.4 Opening the cutting mill

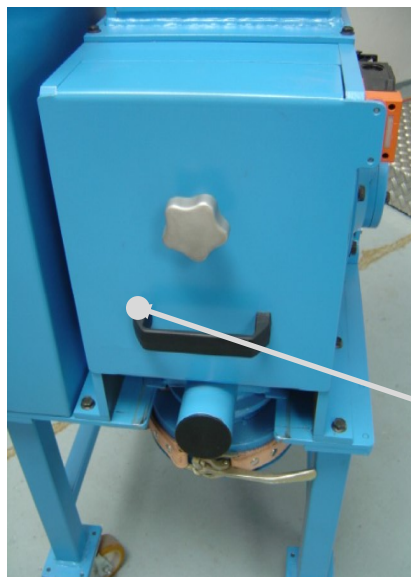
Proceed as follows to open the machine:

Switch main switch off and secure it.

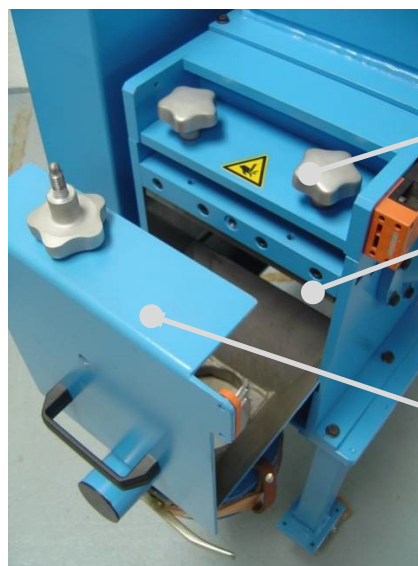
Wait until the rotor has finished moving.

Loosen the knob of the collecting bin and put out the bin, this activates the limit switch. The knobs for the upper part and the sieve frame are now accessible, loosen the knobs.

Swivel the upper part and the infeed throat backwards by hand. The sieve frame can be swivelled downwards, the sieve can be put out.



Machine closed



Star handle top part

Star handle frame of screen

Star handle collection bin

Clean the machine and check that the grinding housing is clean and that no material can get jammed.

Close the infeed throat and lift up the frame with the sieve.

Lock upper part with the two star handles. Put in the collector bin. Screw in star handle of the collector bin.

8.5 Closing the cutting mill

Clean the machine and check that the grinding housing is clean and that no material can get jammed.

Close the infeed throat and lift up the frame with the sieve.

Lock upper part with the two star handles.

Put in the collector bin.

Screw in star handle of the collector bin.

8.6 Lubrication of the cutting mill

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.

8.7 Lubrication intervals

Lubricating	No. of operating hours
Rotor bearing	Every 2000h
Motor bearing	Account manufacturer
closure	Oil every week

8.8 Maintenance table

Lubrication see lubrication table

To be checked every week:

- Cutting rails
- Check wear of safety curtain
- V-belt tension and wear should be checked once a month.

9 Handling the sieve



Always wear protective gloves for these tasks!

9.1 Inserting and removing the sieve

Open machine as described in chapter 7.3. Loosen the star handles, hold sieve frame and then swivel downwards. Reach under the sieve and unhook it. Take sieve out to the front. When fitting the sieve, ensure that the sieve frame contact surfaces are clean.



Always wear protective gloves for these tasks!



Sieve

Frame for sieve

9.2 Inserting and removing the sieve



Always wear safety gloves for these jobs of work! Only brush the sieve clean. Never use compressed air. Press jammed parts through from behind.

10 Handling the knives



Caution, it is easy to cut yourself on the knives. Always wear safety gloves.

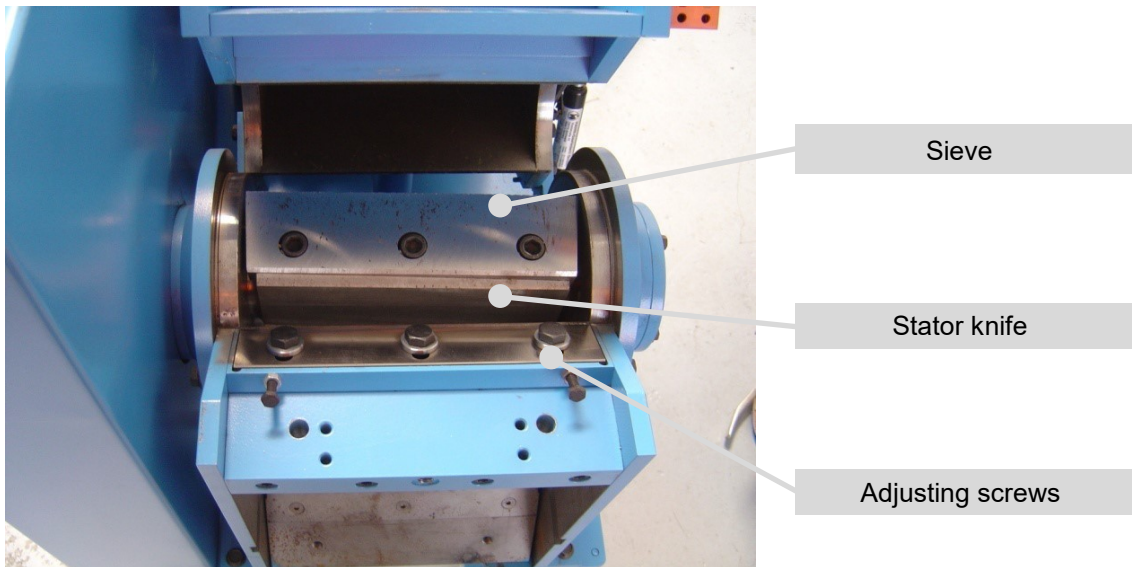
10.1 Inserting and removing the sieve

Screws rotor knife	Tightening torque	Screws stator knife	Tightening torque
M12 12x25 DIN 912-12.9	110 Nm	M10 10x25 DIN 933-10.9	67 Nm

Insertion:

Open the machine as described in chapter 8.3.

- Press the knives sharpened in sets against the back of the machine and tighten the cylinder head screws hand tight. (3 each M12x25 DIN 912-12.9).
- Tighten the screws with a torque of 67 Nm using a torque wrench.
- Tighten the stator knife slightly with hexagonal screws (3 each M10x25 DIN 933-10.9).
- Now move the stator knife using the adjusting screw (figure) toward the rotor knife until there is a gap of approx. 0.1 – 0.2 mm between the rotor and the stator knife. Check the gap by feeler gauge.
- Tighten the screws with a tightening torque of 67 Nm.
- Lock the adjusting screws with nuts.
- Turn the rotor slowly and check once again that all cutting knives run without any collisions.

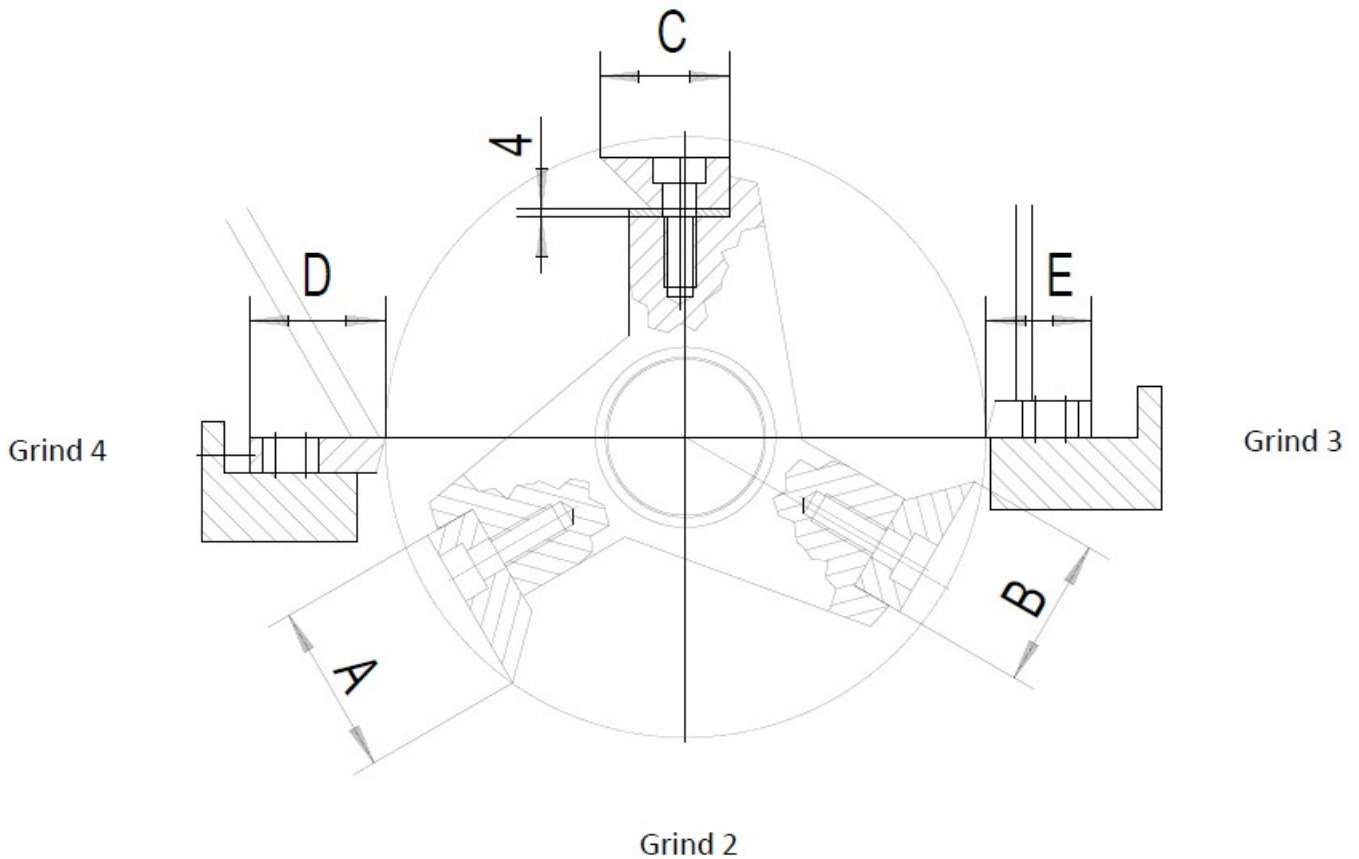


10.2 Sharpening the blades

The rotating cutting rails are always to be sharpened to the same extent and should therefore only be sharpened a set at a time. The cutting angle is 45° . The rotor cutting rail is 45 mm wide in new condition (fig. 10.2.1 size **A**) and can be sharpened down to a width of 33 mm (**dimension C**). If the cutting rail has been sharpened down to 37 mm (**dimension B**), then a 2 mm shim must be placed under it. Once **dimension C** has been reached, the cutting rail is no longer suitable for use.

The fixed cutting rail is sharpened individually as required. It has a cutting angle of 75° and a new dimension of 47 mm (**dimension D**). This cutting rail can be sharpened down to 36 mm (**dimension E**), after which it must be replaced.

Use a soft grinding wheel with good liquid cooling to sharpen the blades. We recommend sending your cutting rails in to our factory for sharpening to ensure that this is carried out properly.



11 Tightening the v-belts

Check the V-belt tension after the first 2 - 10 operating hours. Correct V-belt tension is incredibly important. Over tension causes damage to the bearings and inadequate tension causes premature failure of the belts.

If a V-belt fails, then replace with new ones.

Never put different makes together to make up a set.

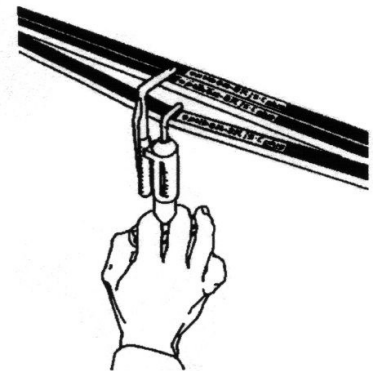
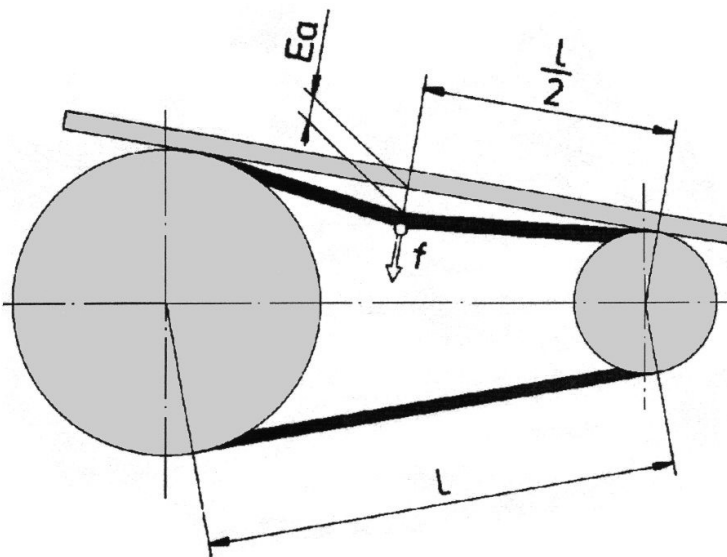
Checking the V-belt pre-tension:

- Dismantle the safety hood
- Place a ruler over both pulleys
- Pull one of the middle belts down at right angles to the tension line using the stated testing force and measure the sag "Ea".
- If the belt pre-tension is incorrect, correct the axle spacing by shifting the motor.
- To do so, loosen the fastening screws of the guide rail and shift the motor using the adjusting screws.
- Check the belt tension again and tighten the fastening screws again.



Shift the motor parallel and check that the v-belts are in line

Testing force:	$f = 25 \text{ N}$
Sag during first assembly:	$E_a = 9 \text{ mm}$
Sag during re-tightening:	$E_a = 10 \text{ mm}$





Cutting Mill
Type CM1000

Product	Cutting Mill
Model	CM1000
Power supply	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	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