Operating Manual

Translation of the original

PULVERISETTE 9

FRITSCH VIBRATING CUP MILL

Fritsch GmbH

Milling and Sizing

Industriestraße 8

D - 55743 Idar-Oberstein

Phone: +49 (0)6784/ 70-0

Fax: +49 (0)6784/ 70-11

Email: info@fritsch.de

URL: http://www.fritsch.de

Fritsch GmbH, has been certified by the
TÜV-Zertifizierungsgemeinschaft e.V.
Certificat registration number 71 100 J 596.

TGA-ZM-05-08-00

It was verified through an audit that Fritsch GmbH satisfies the requirements of DIN EN ISO 9001:2008.

The enclosed declaration of conformity calls the directives
which the „PULVERISETTE 9" Vibrating Cup Mill corresponds to.
This permitts us to mark the instrument with the CE-Sign.

Instrument number 09.5000.00 / 09.5001.00

Applies as of serial number 00100 / 01500

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FRITSCH

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1 Safety Instructions and Proper Use

1.1 Requirements on the Operator

This operating manual is intended for persons who are assigned the operation and supervision of the VIBRATING CUP MILL "PULVERISETTE 9".

Persons under the influence of health impairments, medications, drugs, alcohol or excessive fatigue may not operate the instrument.

The instrument may only be operated by authorised persons and may only be maintained and repaired by trained experts. All commissioning, maintenance and repair work may only be performed by qualified personnel!

The instructions of this manual must be heeded in order to avoid danger to the user.

This operating manual is not a complete technical description. Only the details required for operation and preserving the operability of the instrument are described here.

Fritsch created and checked this operating manual with great care. However, no guarantee can be provided with regard to completeness and the absence of errors.

Subject to technical changes.

1.2 Proper Use

1.2.1 Fields of application

The vibrating disc mill is a mill for quick and set-wise fine dry and wet grinding of brittle to very hard material samples e.g. in the fields of mining (coal, ores, minerals), metallurgy (slags, casting samples), ceramic industry, cement and building material industry, agriculture and forestry.

1.2.2 Method of operation

The vibrating disc mill operates on the principle of a vibrating mill i.e. the griding set is fixed on a freely vibrating structure and the griding media (disc and rings) inside the grinding set are accelerated by centrifugal force and pulverise the grinding material by means of impact and friction.

The grinding sets (made of hardened steel, hard metal tungsten carbide or agate) are closed by means of sealing inserted to prevent losses during wet or dry grinding operations.

The powerful drive motor allows different rotational speeds to choose from 600 - 1100 rpm in steps of 50 rpm. This way the grinding effect can be customsed to the practical requirements. While using the grinding set sensitive to impact made of agate, speeds higher than 750 rpm are automatically limited to 750 rpm.

CAUTION

The grinding set made of agate can be operated at a maximum speed of 750 rpm only (danger of damage to the grinding set).

1.3 Obligations of the Operator

This manual must be carefully read and understood before using the product. Use of the product requires specialised knowledge and may only be undertaken by commercial users.

The operating personnel must be familiar with the contents of the operating manual. It is therefore very important that this operating manual is actually made available to these persons. It must be ensured that this operating manual always remains alongside the instrument.

The product may only be used within the scope of possible uses described in this manual and within the framework of the rules and regulations defined in this manual. In the event that these principles are violated or in event of improper use, the customer shall bear the full liability for the functionality of the product or for damages or injuries resulting from failure to heed this obligation.

By using this product, the customer agrees to this and recognises that defects, faults or errors cannot be completely excluded. In order to avoid the risk of damage to property or personnel injuries arising from this or any other circumstance or the risk of other indirect or direct damages, the customer must take sufficient and full safety precautions while working with the products.

Fritsch GmbH is unable to monitor compliance with this manual or the conditions and methods employed during installation, operation, use and maintenance of the product. Improper completion of the installation can result in material damage and subsequently endanger human beings. For this reason, we accept no responsibility or liability whatsoever for losses, damages or costs resulting from or in any way associated with faulty installation, improper operation or incorrect use and maintenance.

The applicable accident prevention regulations must be complied with.

General legal and contractural regulations in regards to environmental protection must be adhered to.

1.4 Warnings Used

The following symbols are used in this description to indicate important information and possible dangers.

DANGER

Indicates a direct danger with high risk that will lead to death or severe physical injury if not avoided.

WARNING

Indicates a possible danger with moderate risk that could lead to death or (severe) physical injury if not avoided.

CAUTION

Indicates a danger with low risk that could result in slight or moderate physical injuries or material damages if not avoided.

1.5 Explanation of the symbols used on the machine and in the operating instructions

Attention! Warning against danger spot Observe operating instructions	
Attention! Mains voltage	
Attention! Hazard of explosion	
Attention! Hot surface	
Attention! Inflammable substances	
Wear protective gloves!	
Wear safety goggles!	
Wear ear protectors!	
Do not step below lifted load!	
Do not spray with water!	

1.6 Instrument Safety Notices

- Only use original accessories and original spare parts. Failure to adhere to this may jeopardise the protection of the machine.
- Care must be taken during all work to prevent accidents.

CAUTION

Wear protective gloves!

After a grinding operation, the grinding set can be very hot.

CAUTION

Wear protective glasses!

During wet grinding, the high temperature could lead to positive pressure. Risk of splashing.

CAUTION

Risk of Overheating!

Do not operate the Vibrating Cup Mill in quick successions.Girinding durations of a few minutes are mostly sufficient, otherwise the risk of overheating and / destruction of the grinding set may occur!

CAUTION

Wear ear protectors!

If the noise level reaches or exceeds 85dB (A), wear ear protection to prevent hearing damage.

WARNING

The MAK values of the valid safety instructions must be observed and if necessary, ventilation should be provided or the machine should be operated under an outlet.

DANGER

Danger of explosion!

- When oxidizable materials such as metals, organic materials, wood, coal, plastic, etc. are ground or sieved, the risk of spontaneous ignition (dust explosion) exists whenever the fine particles exceed a specific percentage. While such materials are being ground, it is therefore necessary to take special safety precautions (e.g. wet grinding) and a specialist must supervise the work.
- The design of the vibrating disc mill is not protected against explosions; hence it is not suitable for grinding explosive materials.

- Do not remove the instruction labels.
- Arbitrary changes to the instrument undertaken by the user may result in cancellation of conformity to European guidelines as declared by Fritsch.
- If questions and problems arise after reading the operation manual please contact our specialised personnel.

1.7 Protective Devices

NOTE

- Protective devices should be used for the intended purpose and must not be made unserviceable or removed.
- All protective devices should be regularly checked for completeness and to ensure that they are functioning correctly. See chapter 6 Maintenance.

The vibrating disc mill is equipped with a safety locking system with a protective function for the operating personnel.

During operation, this device locks the hood and prevents the vibrating disc mill from operating when the hood is open:

- The hood cannot be opened during operation.
- The machine does not start if the hood is open.

1.7.1 Ways to open the hood

- The hood is locked when the vibrating disc mill is in operation. To open the hood, press the STOP key on the control panel. The hood can be opened once the motor comes to a standstill.

- Auxiliary unlocking:

DANGER **Mains voltage!**

Prior to beginning of the unlocking, disconnect the mains plug and thereby securing the device against unintentional restart.

If the power fails during operation, the hood can be opened as described below.

1. Open the door on the left hand side of the instrument with the included socket key.

2. A red unlocking handle with a cylindrical screw which is attached to the housing becomes visible.
3. Loosen and remove the cylindrical screw which secures the unlocking handle with an Allen wrench SW4. Put the screw aside.
4. Take the unlocking handle, slowly pull the hood open. with the rope.

5. Is the hood unlocked, the unlocking handle may be attached again in the housing.
6. During the next start of the instrument the hood-lock will be set automaticlly to its starting position and work may be resumed.

1.8 Electrical Safety

1.8.1 General information

- Once the STOP key is pressed, the vibrating disc mill stops running. The hood can be opened when the motor comes to a standstill.
- When using the grinding set made of agate, the speed is automatically limited to 750 rpm.
- Unplug the instrument from the mains, if the mill is not going to be used for a considerable period of time (e.g. overnight).

1.8.2 Protection against warm restart

In case of power outage during operation or on disconnecting from the mains supply, the hood gets locked. On resumption of power, the hood locking is released again.
As a safeguard, the vibrating disc mill requires manual restart.

1.8.3 Overload protection

In case the vibrating disc mill is overloaded, a motor current monitoring system reduces the speed automatically and in case of a blockage the drive cuts off directly.

2 Technical Data

Dimensions and

Dimensions: 1220 x 770 x 760mm (Height x Width x Depth)

Weight

Weight: 260kg (without grinding set)

Operating Noise

On an average, the noise level is 81 dB (A). This value has been measured in a soundproof room using a 250 ml steel griding set at 1500 rpm.

The value can change depending on the gridning set and grinding material used as well as the speed settings. Also the size and the characteristics of the walls, floor and ceiling of the room affect the noise level.

Voltage

The vibrating disc mill will be delivered according to country specific voltages either 110V or 220V. Operating the machine on other voltage is not permitted.

Current consumption

Max. 15A at 110V mains voltage
Max. 14A at 115V mains voltage
Max. 8A at 230V mains voltage
Max. 8A at 240V mains voltage

Power consumption

Max. 1500W at 100V mains voltage
Max. 1610W at 115V mains voltage
Max. 1840W at 230V mains voltage
Max. 1920W at 240V mains voltage

Electrical fuses in the control unit

(See Chapter 7 Troubleshooting Checklist)

- Automatic safety fuse 15 A (inserting box on the side)

Material

- The volume of the material depends on the size of the grinding set used and is maximum 50, 100 or 250 ml.
- The volume of material also depends on the type and size of griding set and is maximum 7 or 12 mm.

Final Fineness

Up to 10-20µm

3 Installation

3.1 Transport

The Instrument will be delivered on a transportable pallet with a wooden hood. For the transport of the still boxed instrument we recommend a fork lift or a hand pallet truck.

DANGER During transport do not step under the transport palette.

3.2 Unpacking

- Remove the pins meant for holding the hood onto the transportation pallet. The hood is the wooden box put over the transportation pallet.
- Lift the hood from the transportation pallet.

CAUTION **Danger of Crushing!**

Always lift with two people.

- Compare the contents of the consignment with your order.

3.3 Erection

- Lift the Vibrating Cup Mill off the transport palette. The mill is situated on two hollow profiles with four instrument feet. It can be picked up with a fork lift and lifted off the transport palette.

DANGER

During transport do not step under the transport palette

- Place the vibrating disc mill indoors on an even and stable base. The instrument need not be fixed to the base.

NOTE

Operating the vibrating disc mill when it is standing on the transportation pallet is not permissible.

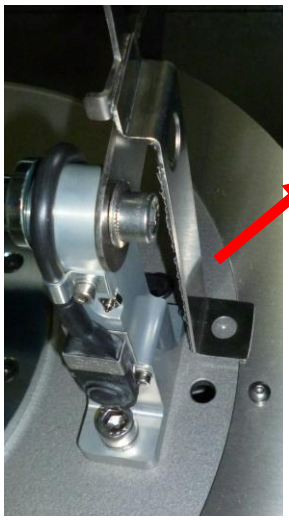
- Make sure that the vibrating disc mill is easily accessible.
- The ambient temperature must be between 0 and 40°C.
- **If the floor surface is uneven, adjust the machine feet to achieve an absolutely vertical and stable position.**

3.4 Transportation Lock

NOTE

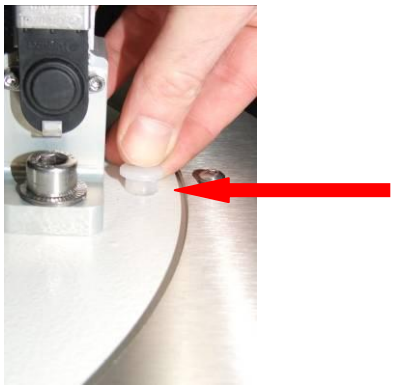
Please remove all parts of the transportation lock before putting the instrument into operation.

1. As a safety transportation device serve two cylinder-head screws M10x150 and safety lock sheets. These are situated on the left and right side next to clamp of the eccentric tensioning lock. Remove the screws with the included Allen wrench (SW8) and the safety lock sheets.



Remove safety lock sheet!

2. Afterwards, press the (included in the delivery) plastic plugs into the mounting hole of the transportation safety device.



Plastic plugs

3. Be sure to keep the transportation safety devices.

3.5 Electrical Connection

DANGER **Electrical Safeguard!**

Danger of damages due to short-circuit.

- Ensure that the socket is connected to a power line secured with a circuit breaker.

- Before making the connection, compare the voltage and current values shown on the nameplate with the values of the mains supply to which the instrument is to be connected.

CAUTION Non-observance of the values on the type plate may damage electrical as well as mechanical components.

NOTE Operate the vibrating disc mill only when the grinding set is in place.

- Connect the included cable to the socket on the right side.

- Turn on the main switch on the righ side.

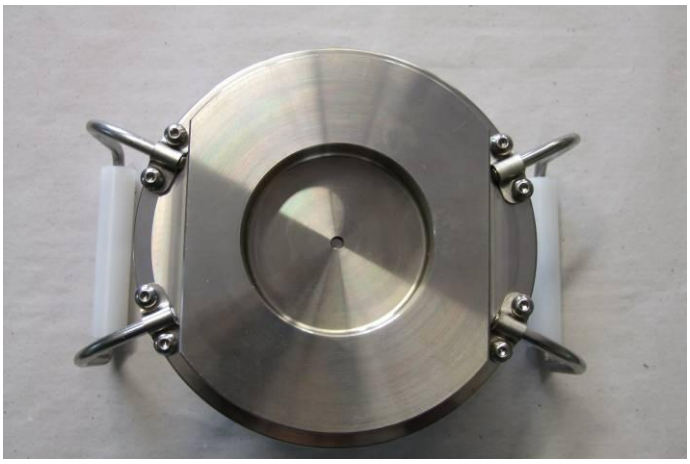
- Now you can - like described in chapter 4 - load the mill and start operation.

3.6 Dismantling of the Anti-twist protection for the use of older grinding sets

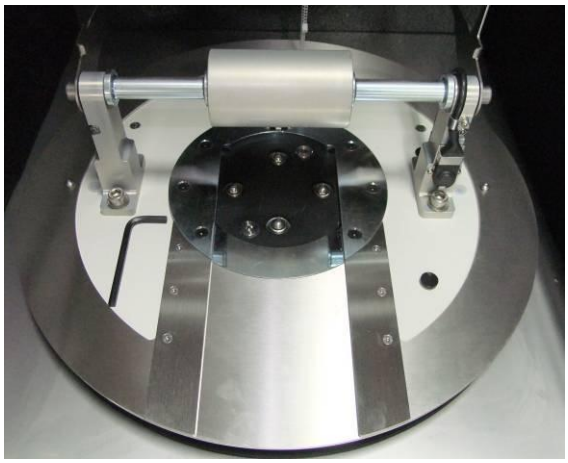
If grinding sets produced prior to 2012 shall be utilized, two bolts on the instrument which act as the Anti-Twist protection for the new grinding sets have to be removed.

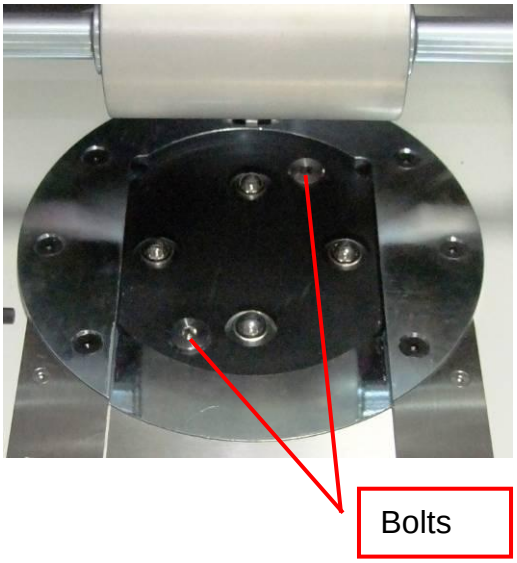
Bottom view of the grinding sets produced 2012

Bottom view of grinding sets PRIOR to production year 2012

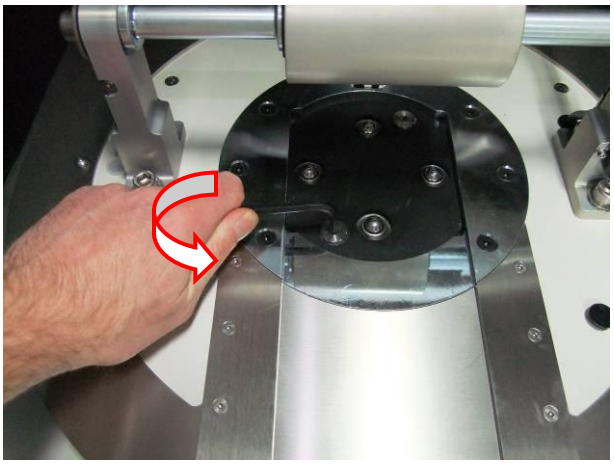


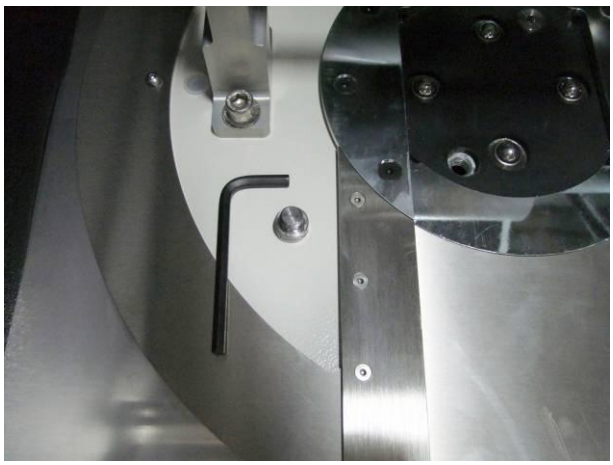
3.6.1 Demontage





1. Remove the bolts with an Allen wrench size 6.





2. Seal the threads with the inluded sealing plugs.

3. Save the bolts removed, in order to maybe reinstall them when working with newer grinding sets (of 2012)

4 Working with the Vibrating Cup Mill

NOTE

Grinding sets purchased prior to 2012 may be used in your Vibrating Cup Mill. For this, two bolts on the instrument which serve as the anti- twist protection have to be removed as described in chapter 3.6.

WARNING

We don't honour the warranty or accept complaints for instrument damage or personal injuries occurring with the use of non-genuine grinding tools for the instrument.

WARNING

Before starting the machine, ensure that the grinding set is correctly braced and there are no loose parts inside the device.
If this instruction is not observed, no guarantee or claims will be accepted for damages to the device or injuries to persons.

NOTE

During milling, high temperatures can build up in the grinding set.

In encased grinding sets, the covers are glued with a two-component construction adhesive.

The adhesive is temperature-resistant up to approx. 140°C. Above 140°C, the adhesive becomes liquefied. When the adhesive cools down, the cover could get damaged. This always makes the cover unusable.

At temperatures above 200°C, the adhesive is ruined. The same applies for encased grinding bowl lids.

4.1 Function test

- Connect the appliance to the power supply.
- Open the hood.
- Fill the grinding set and fix it (see chapter 4.2.5 and 4.2.6).

CAUTION

Never operate the machine without grinding material because the grinding set would be damaged!

- Shut hood.
- Select the speed, grinding duration, pause times and repetitions in advance. In most cases, a grinding duration of 2-4 minutes is sufficient to achieve satisfactory results. Prolonged grinding does not yield any lesser final fineness. If dry grinding is used for long time, the grinding material gets baked onto the grinding media making it difficult to clean.
- Press the START key on the control panel.
- The hood is locked and the vibrating disc mill begins to run.
- Press the STOP key on the control panel.
- Once the motor comes to a standstill, the hood can be opened.

4.2 Preparing a grinding operation

4.2.1 Grinding sets

Grinding vessel volume	50 ml	100 ml	250 ml
Grinding media	1 disc	1 disc, 1 ring	1 disc, 1 ring

4.2.2 Using the grinding sets

Grinding container
50, 100 and 250 ml ..... tempered steel
50, 100 and 250 ml ..... chromium-free steel
50, 100 and 250 ml ..... hardmetal tungsten carbide
50 and 100 ml ..... agate (operate at 750 rpm only)
50 and 100 ml ..... zirconium oxide

CAUTION

Never mix grinding media and grinding sets of different materials, since the grinding set may be damaged!

NOTE

Always place all discs and rings as per the above table.

In case of steel grinding sets, always place the outer ring with the outer radius pointing below. Inside the grinding vessel too, there is a radius at the bottom.

4.2.3 Dry Grinding

Surface forces predominate in case of particle size of less than approx. 20 µm and the material will start to "stick".

Further dry grinding can be achieved if surface-active substances are added to the material.

Examples (maximum quantity to be added in % by mass)

- Stearic acid 2-3%
- Aerosil (highly dispersible silicic acid) 0.5-2%
- Quarry sand 2 %
- Glass powder 2 %

4.2.4 Wet Grinding (Grinding in Suspension)

When shifting to grinding operation in suspension you can add liquid agents with high boiling point (> 80°C) and less vapour pressure.

DANGER

Explosion Hazard!

Ignition Hazard!

The machine is not explosion-proof. When using flammable liquids, it must be ensured that the heating in the grinding set will not reach the boiling point of the solvent. Corresponding cooling phases must be programmed in. If the vapour pressure is too high, escaping vapours may ignite. If possible, we recommend using either non-flammable liquids or liquids with a high boiling point. The boiling point should be over 80°C

Do not use any easily inflammable or combustible fluids such as ketones and petroleum.

With wet grinding you can achieve higher grades of final fineness.
When using wet grinding, high pressure and temperatures may result in the grinding vessel. Exercise caution while opening the eccenteric lever, as hot vapours may be released at high pressure. Open the lever slowly. Allow the grinding set to cool down inside the machine.

CAUTION

Wear protective gloves!

After a grinding operation, the grinding set can be very hot.

CAUTION

Wear protective glasses!

During wet grinding, the high temperature could lead to positive pressure. Risk of splashing.

4.2.5 Filling the grinding set

Maximum filling quantities are as per the specified volumes (50, 100 or 250 ml).
Minimum filling quantities are 30% of the specified volumes.

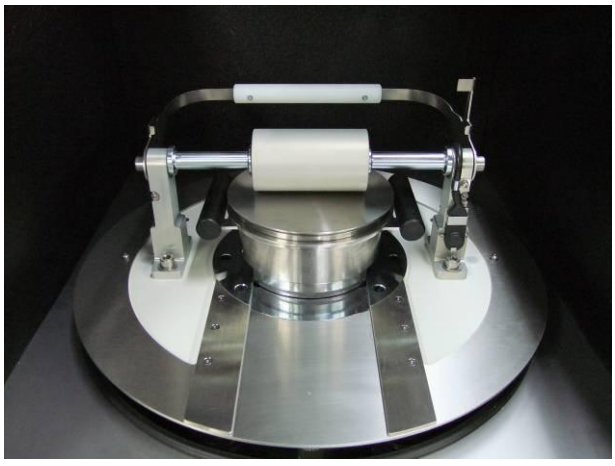
1. Place all grinding media with the rounded edge pointing downwards ino the grinding vessel.
2. Put the grinding material between the grinding media into the grinding vessel.
3. If necessary, clean the edge of grinding vessel to remove grinding material as well as the sealing ring on the lid.
4. Place the lid on top.

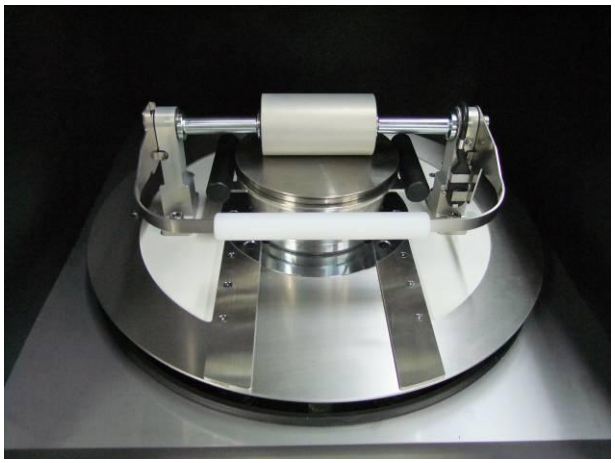
4.2.6 Fixing the grinding sets

Check the complete fixing device and the bow lever before each grinding operation for firm grip.

Insertion

1. Insert the filled grinding set in front into the takeup groove and turn until it is fixed securely into the groove. The lever must be turned fully backwards.
2. Hold the grinding set in front at the handles and slide it up to the limit stop towards the back below the eccentric roller.
3. Hold the bow lever directly over the point of rotation and turn towards the front.
4. Hold the bow lever at the handle in front and press it downwards till the limit stop. The eccentric cam is moved beyond the lowest point and it fixes the grinding set.
5. A small lever on the right side of bow lever presses a safety switch that releases the machine, only when the fixutre is activated. If the fixture becomes loose during the grinding operation, the machine should be switched off immediately. The machine cannot be switched on again without the grinding set.





6. **Check:**
   Certain amount of force is necessary to activate the fixing lever properly.

7. If the fixing lever can be moved easily, the grinding set is not correctly fixed in place and can move within the take-up groove. This results in increased wear on the sides of the anti-twist protection, the shock-absorbing ball press pieces and the fixing roller.

   The cause for insufficient tension is usually a rubber plate that is too thin due to excess wear. The defect can be repaired by replacing the worn rubber plate with a new one. If this does not have the desired effect, the grinding set can be raised by 0.5 mm by placing a spacer plate (no. 09.4133.09) underneath.

   In rare cases, it can also be that the eccentric shaft is bent upwards or the sliding bearing bushings to the right and left of the eccentric shaft are worn out.

8. If the bow lever cannot be pressed downwards or can be pressed only with great difficulty, the grinding set is not fixed properly into the rear groove. Pull out the grinding set once again and press it backwards till the limit stop.

9. After the grinding operation, hold the bow lever on the handle and pull out carefully in the upward direction. The grinding set may be very hot and there may be excessive pressure build up in the grinding set.

CAUTION

Wear protective gloves!

After a grinding operation, the grinding set can be very hot.

CAUTION

Wear protective glasses!

During wet grinding, the high temperature could lead to positive pressure. Risk of splashing.

10. Thereafter, hold the bow lever directly over the point of rotation and shift it backwards till the limit stop.

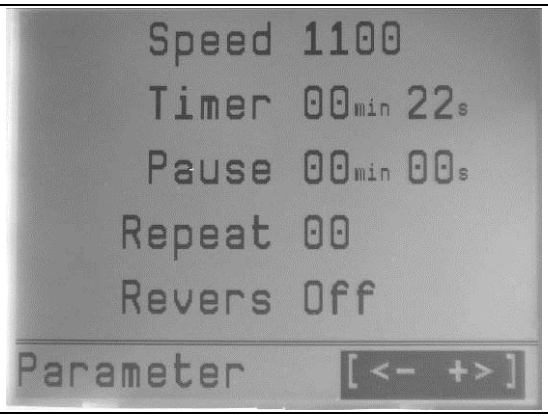
11. The grinding set is pressed by the ball press pieces upwards out of the groove and it can be drawn to the front towards the body by holding the handles.

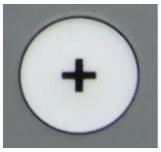
12. It may happen that the grinding set is stuck to the rubber plate and hence cannot be moved to the front. In such a situation, slide a thin but rigid object (e.g. a knife) between the rubber plate and grinding set and release the rubber plate. Apply some talcum powder to the rubber plate (bicycle or vehicle accessory) to minimize adhesion. This should be done once a week.

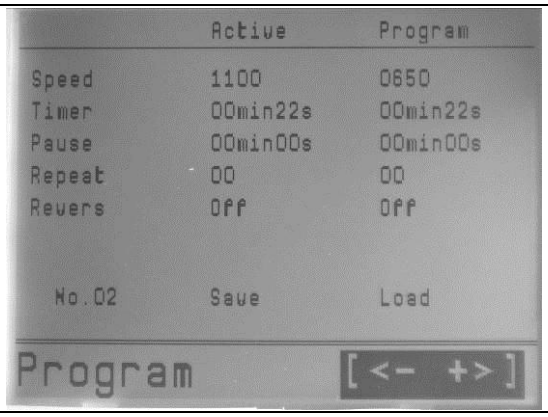
    The sticking occurs because the grinding set became too hot during grinding. The rubber is only resistant to temperatures up to 200 °C. If the rubber exhibits blistering, it should be replaced. The grinding set can also stick if it has been clamped in place for a prolonged period of time.

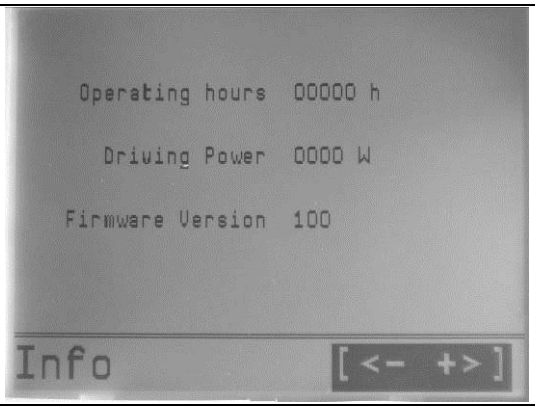
4.3 Menu navigation

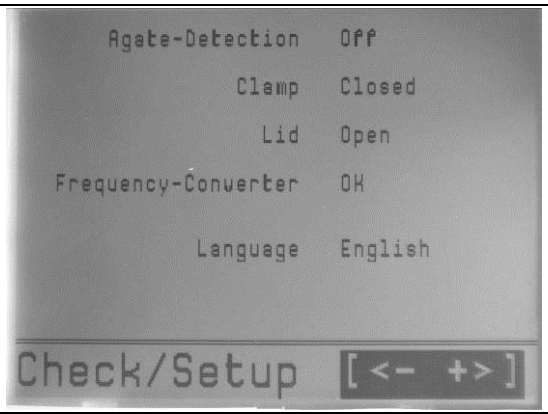
Once the menu navigation is in the status bar, the next or the prior menu structure may be accessed with the keys + /

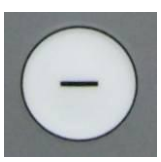




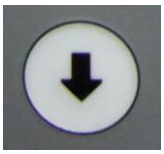


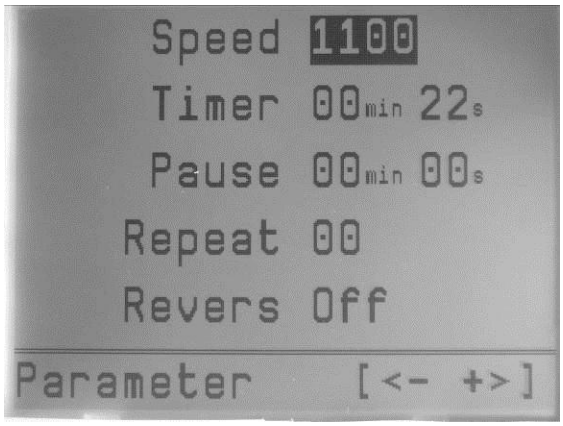






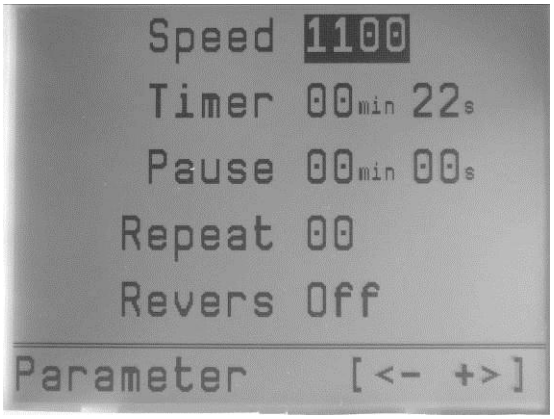
Switch between the individual parameters with the arrow keys.

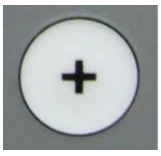




With the keys + /- the value of the parameters are altered.
By pushing the START key, the set parameters are saved.

The saved parameters are available when turning on the main switch.





NOTE

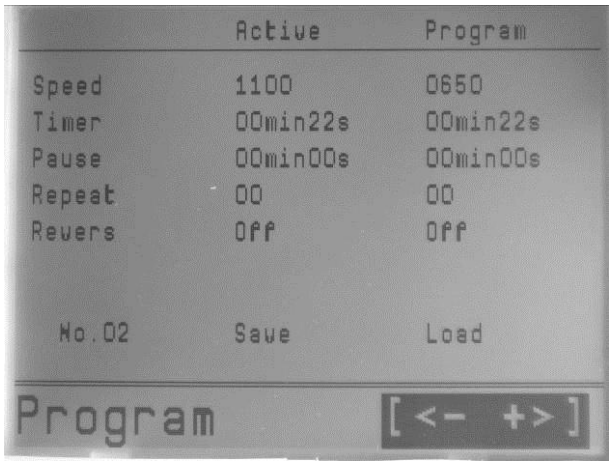
Only in this menu may the instrument be started with the start key.

Min – Max – Limits of the Parameter:

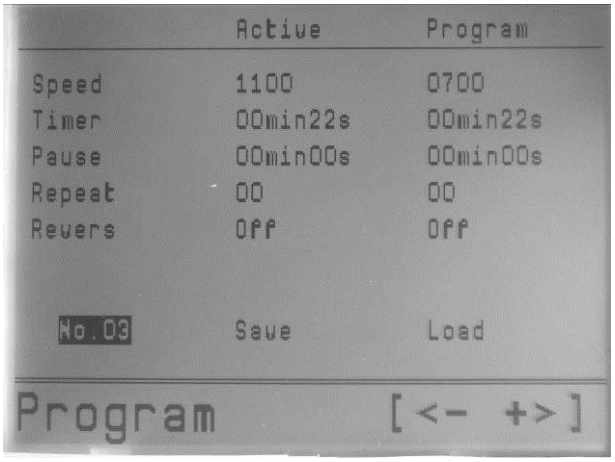
Rotational speed : 600 – 1500 1/min (increments of 50)
Time : 5sec – 60min
Pause: 0 – 60min
Repeats: 99
Reversion: On/Off

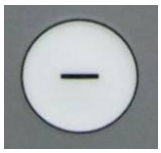
4.3.1 Retrieving program / saving

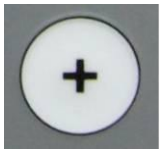
Switch of the functions via the arrow keys



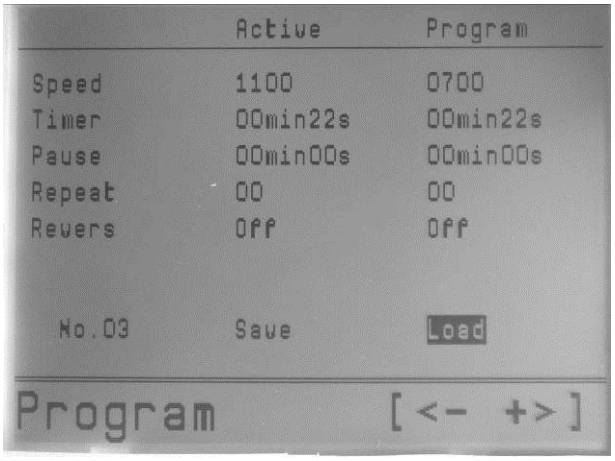
Program switch 1…9 with the + / - keys, in the display **Program** appears the corresponding saved data. The display **Activ** shows the parameter data of the parameter menu.

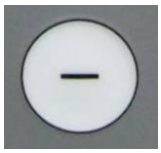


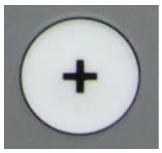




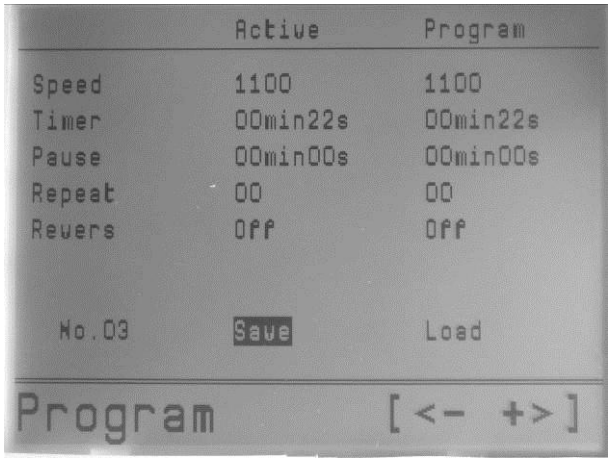
As soon as the menu item **loading** is active and one of the keys + or – is pressed then the data from the program **Nr. X** are loaded and visible in the display as **Activ**e.

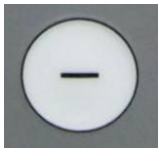


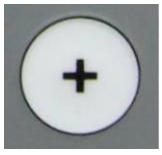




As soon as the menu item **Memory** is active and one of the keys + or – is pressed then the current data will be saved in program**Nr. X** and visible in the display as **Program**.





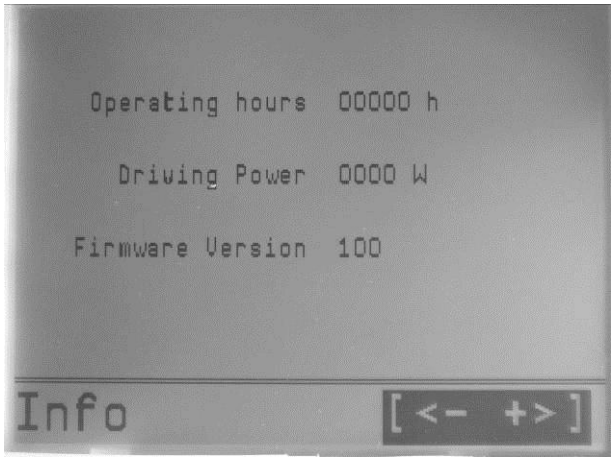


4.3.2 Information-Display

In this display the following is visible:

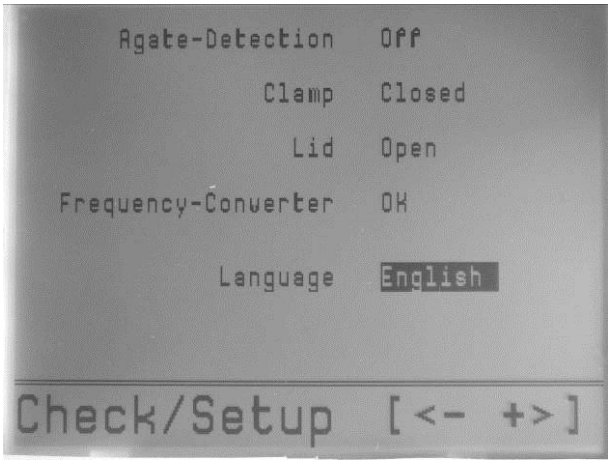
- The complete hours of operation (without breaks).
- The current output power during operations.
- The Version of controller software.

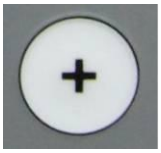
Alterations and entries are not possible here



4.3.3 Setup / Statusdisplay

Select the language selection with the arrow keys.

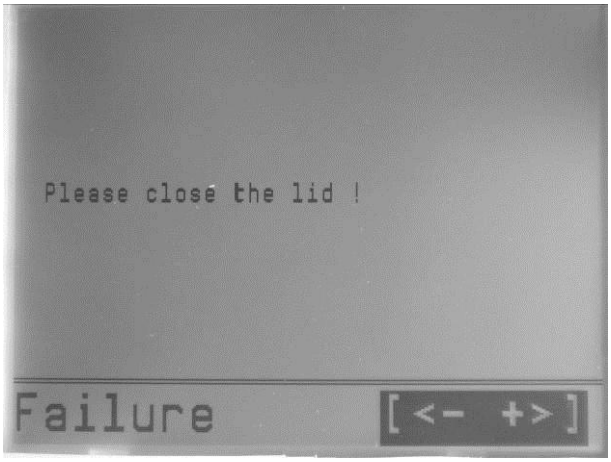




Wit the keys + / - alter the display language.

4.3.4 Error display

Operational mistakes or system messages will be shown in a seperate display. The window can be closed with any key.



4.4 Operating functions

Using the Timer functions, the grinding process can be controlled precisely up to seconds. Similarly, repeatable cycles can be set for grinding operations and passive cooling phases or can also be set in combination with REVERSE for rotation in the opposite direction.

4.4.1 Speed

The drive motor speed (= vibrating frequency of the grinding set) is between 600 and 1500 rpm that can be set in steps of 50. The speed is constantly regulated at close ranges of (+/- 1%), allowing grinding efficiency to be reproduced in an excellent manner. Especially, in case of heavy grinding sets, it might not be possible to achieve high speeds due to drive overloading. This will be displayed as reduced rotational speed in the display.

NOTE

A higher RPM increases the fineness and decreases the duration of grinding.

A lower RPM is easy on the grinding material and the grinding tools.

RPM is between 600 and 1500 rpm and can be selected in steps of 50 rpm.

4.4.2 Timer Pause

Here in case of extended grinding duration the duration of the cooling pause is determined in combination with REPETITIONS. A maximum of 60 min is possible, 00 means no pause.

NOTE

During the pause, the hood remains locked and the machine fan run at maximum cooling level.

4.4.3 Repetitions:

The combination of entered grinding and pause times or REVERSE setting is repeated at the number entered here. Basically, the programmed operation cycle runs first followed by the number of repetitions.

Example 1:
Time Milling = 10min, Time Pause = 1 min, Repetitions = 5 → total 60 min grinding, 5 min pause (last pause was ignored) .

Example 2:
Time Milling = 5 min, Pause = 2 min, Repetitions = 5, Reverse active → total 30 min grinding, 10 min pause and change in the direction of the rotation after each cycle

Example 3:
Time Milling = 1 min, Pause = 0 min, Repetitions = 19, Reverse active → total 20 min grinding, no pause and change in the direction of the rotation after every minute.

4.5 Switching the Vibrating Cup Mill on

The vibrating disc mill can be switched on after fixing the filled grinding set securely and closing the hood:

1. Select the grinding time
2. Press START on the control panel.
3. The hood gets locked and the vibrating disc mill begins to run.
4. As the countdown starts, the remaining time is displayed.

CAUTION

Watch for overheating of grinding material and grinding set; if running time is longer than normal, provide for intervals to allow the machine to cool down.

4.6 Switching Off

1. Press STOP on the control panel.
2. Once the motor comes to a standstill, the hood is unlocked and it can be opened.
3. If the machine is not in use for a long period, switch off the mains.

4.7 Cooling

Before a rerun, allow the grinding set to cool down to room temperature.

5 Cleaning

5.1 Grinding accessories

- Clean the grinding vessel and grinding media after every use:
  E.g. brush to clean the items under running water with commonly used cleaning agents.
- Fill the grinding bowl with some sand (1/3 of the utility volume) and water and allow it to run for 2 to 3 minutes (properly fixed) in the vibrating disc mill.
- After cleaning, dry the grinding vessel and griding media well.
- When sterilising the grinding set in the heat cabinet, heat only to 100°C.

CAUTION

Cool parts made of agate **slowly and carefully**.

Agate parts must never be heated in the microwave (they heat up too rapidly).

They must never be subjected to temperature shocks, such shocks may destroy the parts → They burst apart explosively.

5.2 Mill

GEFAHR

Mains voltage!

Before commencing maintenance work, disconnect the mains plug and secure the machine against being switched on again unintentionally!

Do not allow any liquids to seep into the machine.

- The Vibrating Cup Mill can be wiped clean with a wet cloth when the machine in switched off.

6 Maintenance

DANGER

Mains voltage!

- Before commencing maintenance work, disconnect the mains plug and secure the machine against being switched on again unintentionally!
- If maintenance work is in progress, this should be indicated with a warning sign.
- Maintenance work should be carried out only by qualified personnel.
- Switch on the safety devices after maintenance and/or repair work is over.

Cleaning at regular intervals is of utmost importance for maintaining the vibrating disc in good condition.

Functional part	Feed	Test	Maintenance interval
Fixture system	Tighten the grinding set securely.	Check for firm grip.	Before each use
		Grease the joints lightly with machine oil.	Every week or after every 10 hours of operation
		Check both the bearing bushings (DU-bushings) of the eccentric shaft. Replace themi if the bearing bushings are deformed.	after every 100 hours of operation
Rubber plate below the grinding set	Securely fasten the grinding set	Visually inspect the rubber plate, replace if worn, proper thickness 5 +/-0,4mm or place spacer plate (09.4133.09) underneath	Before each use
	Ensure firm grip for the grinding set	If grinding set is sticking to the rubber plate, apply talcum to the rubber plate.	Every week or after every 10 hours of operation

7 Troubleshooting Checklist

DANGER

Mains Voltage!

- Before commencing maintenance work, disconnect the mains plug and secure the machine against being switched on again unintentionally!
- If maintenance work is in progress, this should be indicated with a warning sign.
- Maintenance work should be carried out only by qualified personnel.
- Switch on the safety devices after maintenance and/or repair work is over.

Malfunction	Possible cause	Elimination of error
Instrument is not working	Power is disconnected	Insert the power plug
	Timer on 0	Set time
	Automatic safety fuse	Reset the automatic safety fuse on the side plate
Grinding set sticks to rubber plate	Grinding operation is too long, grinding set is overheated	Apply talcum to rubber plate or replace it
Grinding material spills out	Sealing on the lid of grinding set is defective or soiled	Clean the sealing and contact suface on the grinding vessel or replace sealing ring
Unsteady functioning with heavy vibrations	Suspension spring of take up is broken	Replace spring
The grinding set cannot be fixed firmly in place	Rubber plate too thin or worn	Replace rubber plate or place spacer plate underneath
	Bearing bushings of the eccentric shaft worn	Replace bearing bushings

8 Warranty

The warranty card enclosed with the machine upon delivery must be completely filled out and returned to the delivering factory so that the warranty can enter into effect.

Online registration is also possible. More information can be found on your warranty card or on our website http://www.fritsch.de

The company Fritsch GmbH in Idar-Oberstein and your "Technical Application Laboratory" or the corresponding national representatives would be happy to provide you with advice and assistance.

Please include the serial number given on the type plate along with any questions.

NOTE

Please note that the original Fritsch packaging must be used in the event that the machine is returned. Fritsch GmbH is not responsible for damages resulting from improper packaging (non-Fritsch packaging).

9 Disclaimer

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