Operating instructions

CUTTING MILL

PULVERISETTE 15

Valid as of: 15.40XX/2000

Read the instructions prior to performing any task!

Translation of the original operating instructions

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Certifications and CE conformity

Certification

Fritsch GmbH has been certified by the TÜV-Zertifizierungsgemeinschaft e.V.

TGA-ZM-05-08-00

An audit certified that Fritsch GmbH conforms to the requirements of the DIN EN ISO 9001:2008.

CE Conformity

The enclosed Conformity Declaration lists the guidelines the FRITSCH instrument conforms to, to be able to bear the CE mark.

Table of contents

1 Basic structure 6

2 Safety information and use 7

2.1 Requirements for the user 7
2.2 Scope of application 7
2.2.1 Operating principle 8
2.2.2 Drive motor 8
2.3 Obligations of the operator 8
2.4 Information on hazards and symbols used in this manual 9
2.5 Device safety information 12
2.6 Protective equipment 13
2.7 Hazardous points 14
2.8 Electrical safety 14
2.8.1 General information 14
2.8.2 Protection against restart 14
2.8.3 Overload protection 14

3 Technical data 15

3.1 Dimensions 15
3.2 Weight 15
3.3 Operating noise 15
3.4 Voltage, current consumption, power consumption 15
3.5 Electrical fuses 15
3.6 Material 16
3.7 Final fineness 16

4 Installation 17

4.1 Transport 17
4.2 Unpacking 17
4.3 Setting up 17
4.4 Ambient conditions 19
4.5 Electrical connection 19
4.5.1 Adapting to the mains 19

5 Initial start-up 20

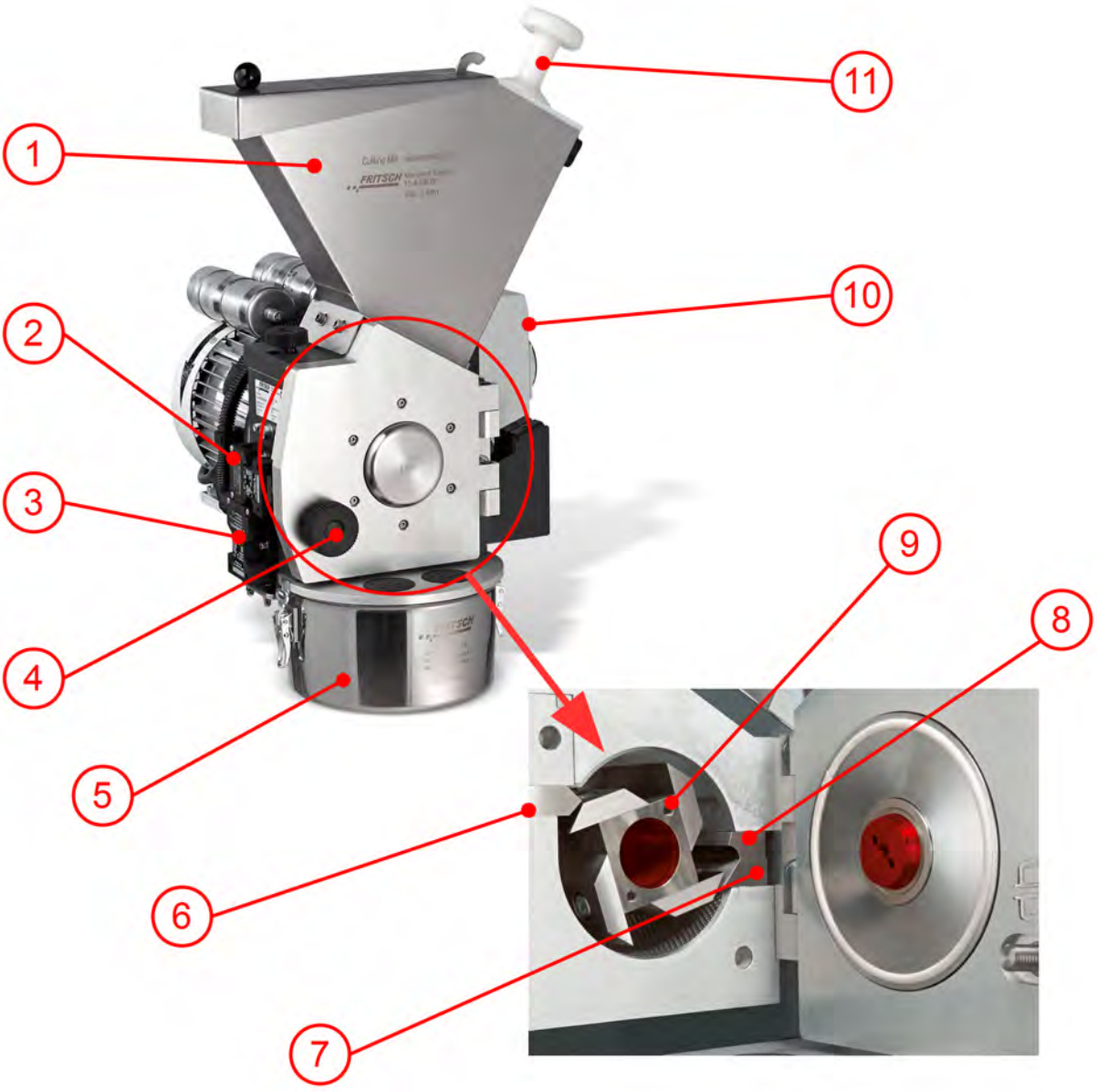
5.1 Switching on 20
5.2 Switching off 20

6 Using the device 21

6.1 Preparing a comminution 21
6.1.1 Opening the cutting mill 21
6.1.2 Inserting the bottom sieve 22
6.1.3 Checking the gap width 23
6.1.4 Closing the cutting mill 24
6.1.5 Attaching the collecting vessel 24

6.2 Comminution procedure with the protected funnel..... 24
6.3 Comminution procedure with the funnel for long and bulk solids..... 26
6.3.1 Using the plunger..... 26
7 Accessories..... 27
7.1 Filter hose and collecting vessel..... 27
8 Cleaning..... 28
8.1 Cutting chamber..... 28
9 Maintenance..... 29
9.1 Removing and installing the cutting knives..... 30
9.1.1 Assembling the rotating knives..... 30
9.1.2 Assembling the fixed knives..... 31
9.1.3 Removing the rotor..... 33
10 Disposal..... 34
11 Guarantee terms..... 35
12 Exclusion of liability..... 37
13 Safety logbook..... 39
14 Index..... 41

1 Basic structure



1 Funnel
2 Closing lid safety switch
3 Collecting vessel safety switch
4 Closing lid handle
5 Collecting vessel
6 Fixed knife 1
7 Fixed knife 2
8 Fixed knife 3
9 Rotor with 4 knives
10 Main switch
11 Plunger

2 Safety information and use

2.1 Requirements for the user

This operating manual is intended for persons assigned with operating and monitoring the Fritsch of the PULVERISETTE 15. The operating manual and especially its safety instructions are to be observed by all persons working on or with this device. In addition, the applicable rules and regulations for accident prevention at the installation site are to be observed. Always keep the operating manual at the installation site of the of the PULVERISETTE 15.

People with health problems or under the influence of medication, drugs, alcohol or exhaustion must not operate this device.

The of the PULVERISETTE 15 may only be operated by authorised persons and serviced or repaired by trained specialists. All commissioning, maintenance and repair work may only be carried out by technically qualified personnel. Qualified personnel are persons who, because of their education, experience and training as well as their knowledge of relevant standards, regulations, accident prevention guidelines and operating conditions, are authorised by those responsible for the safety of the machine to carry out the required work and are able to recognize and avoid possible hazards as defined for skilled workers in IEC 364.

In order to prevent hazards to users, follow the instructions in this manual.

Malfunctions that impair the safety of persons, the of the PULVERISETTE 15 or other material property must be rectified immediately. The following information serves both the personal safety of operating personnel as well as the safety of the products described and any devices connected to them: All maintenance and repair work may only be performed by technically qualified personnel.

This operating manual is not a complete technical description. Only the details required for operation and maintaining usability are described.

Fritsch has prepared and reviewed this operating manual with the greatest care. However, no guarantee is made for its completeness or accuracy.

Subject to technical modifications.

2.2 Scope of application

The Cutting mill PULVERISETTE 15 is used for the comminution of dry grinding stock of soft to medium-hard consistency, for fibrous materials or those containing cellulose, as well as for sample preparation according to RoHS.

The maximum feed size is 70 x 70 mm.

The final fineness is 0.25 - 20 mm depending on the sieve used.

Ideal for comminution of:	
Plastics and textiles	Plastics, rubber, leather, mesh wire, fibres
Agriculture and forestry	Wood, leaves, roots, animal feed, grain, corn, peat, tobacco
Environment	Paper, cardboard, refuse-derived fuel, metal-free refuse, household waste
RoHS	Unprinted circuit boards
Analysis	Coal, horn, coated tablets, pills, cork, drugs
Construction materials	Refuse-derived fuel
Chemistry	Heterogeneous mixtures
Food	Maize, malt, pasta, herbs, spices, dried meat

2.2.1 Operating principle

The material to be cut is moved in front of a plunger and fed into the cutting chamber by means of a funnel. There, four rotating knives in combination with three fixed knives cut the sample material. The cutting chamber is closed at the bottom by a sieve insert. Comminuted material is collected in a pot after it passes the sieve insert.

2.2.2 Drive motor

Driven by:

- 1~ 100 / 120 V motor,
- 1~ 230 V motor or
- 3~ 230 / 400 V motor.

A three-phase motor or single-phase motor without mechanical brake serves as the drive.

2.3 Obligations of the operator

Before using the of the PULVERISETTE 15, this manual is to be carefully read and understood. The use of the of the PULVERISETTE 15 requires technical knowledge; only commercial use is permitted.

The operating personnel must be familiar with the content of the operating manual. For this reason, it is very important that these persons actually receive the present operating manual. Ensure that the operating manual is always near the device.

The of the PULVERISETTE 15 may exclusively be used within the scope of applications set down in this manual and within the framework of guidelines put forth in this manual. In case of non-compliance or improper use, the customer assumes full liability for the functional capability of the PULVERISETTE 15 and for any damage or injury arising from failure to fulfil this obligation.

By using the of the PULVERISETTE 15 the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the of the PULVERISETTE 15.

Neither compliance with this manual nor the conditions and methods used during installation, operation, use and maintenance of the of the PULVERISETTE 15 can be monitored by Fritsch GmbH. Improper execution of the installation can result in property damage and thus endanger persons. Therefore, we assume absolutely no responsibility or liability for loss, damage or costs that result from errors at installation, improper operation or improper use or improper maintenance or are in any way connected to these.

The applicable accident prevention guidelines must be complied with.

Generally applicable legal and other obligatory regulations regarding environmental protection must be observed.

2.4 Information on hazards and symbols used in this manual

Safety information

Safety information in this manual is designated by symbols. Safety information is introduced by keywords that express the extent of the hazard.

DANGER!
This symbol and keyword combination points out a directly hazardous situation that can result in death or serious injury if not avoided.

WARNING!
This symbol and keyword combination points out a possibly hazardous situation that can result in death or serious injury if not avoided.

CAUTION!

This symbol and keyword combination points out a possibly hazardous situation that can result in slight or minor injury if not avoided.

NOTICE!

This symbol and keyword combination points out a possibly hazardous situation that can result in property damage if not avoided.

Special safety information

To call attention to specific hazards, the following symbols are used in the safety information:

DANGER!

This symbol and keyword combination points out a directly hazardous situation due to electrical current. Ignoring information with this designation will result in serious or fatal injury.

DANGER!

This symbol and keyword combination designates contents and instructions for proper use of the machine in explosive areas or with explosive substances. Ignoring information with this designation will result in serious or fatal injury.

DANGER!

This symbol and keyword combination designates contents and instructions for proper use of the machine with combustible substances. Ignoring information with this designation will result in serious or fatal injury.

WARNING!

This symbol and keyword combination points out a directly hazardous situation due to movable parts. Ignoring information with this designation can result in hand injuries.

WARNING!

This symbol and keyword combination points out a directly hazardous situation due to hot surfaces. Ignoring information with this designation can result in serious burn injuries due to skin contact with hot surfaces.

Safety information in the procedure instructions

Safety information can refer to specific, individual procedure instructions. Such safety information is embedded in the procedure instructions so that the text can be read without interruption as the procedure is being carried out. The keywords described above are used.

Example:

1. Loosen screw.
2.

   CAUTION!

   Risk of entrapment at the lid.

   Close the lid carefully.
3. Tighten screw.

Tips and recommendations

This symbol emphasises useful tips and recommendations as wells as information for efficient operation without malfunction.

Further designations

To emphasise procedure instructions, results, lists, references and other elements, the following designations are used in this manual:

Designation	Explanation
1., 2., 3. ...	Step-by-step procedure instructions
⇨	Results of steps in the procedure
↳	References to sections in this manual and relevant documentation
■	Lists without a specific order

Designation	Explanation
[Button]	Operating elements (e.g. push button, switch), display elements (e.g. signal lamps)
„Display“	Screen elements (e.g. buttons, function key assignment)

2.5 Device safety information

Please observe!

- Only use original accessories and original spare parts. Failure to observe this instruction can compromise the safety of the machine.
- Accident-proof conduct is to be strictly followed during all work.
- Comply with all currently applicable national and international accident prevention guidelines.

CAUTION!

Wear hearing protection!

If a noise level of 85 dB(A) is reached or exceeded, ear protection should be worn to prevent hearing damage.

WARNING!

The maximum accepted concentration (MAC) levels of the relevant safety guidelines must be observed; if necessary, ventilation must be provided or the machine must be operated under an extractor hood.

DANGER!

Explosion hazard!

– When Cutting oxidizable substances, e.g. metals or coal, there is a risk of spontaneous combustion (dust explosion) if the share of fine particles exceeds a certain percentage. When Cutting these kinds of substances, special safety measures must be taken and the work must be supervised from a specialist.
– The PULVERISETTE 15 is not explosion protected and is not designed to cutt explosive materials.

- Do not remove the information signs.

NOTICE!

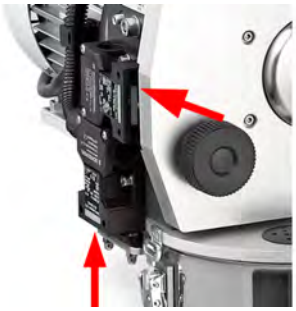
Immediately replace damaged or illegible information signs.

- Unauthorised alteration of the of the PULVERISETTE 15 will void Fritsch's declaration of conformity to European directives and void the guarantee.
- Only use the of the PULVERISETTE 15 when it is in proper working order, as intended and in a safety- and hazard-conscious manner adhering to the operating manual. In particular, immediately rectify any malfunctions that could pose a safety hazard.
- If, after reading the operating manual, there are still questions or problems, please do not hesitate to contact our specialised personnel.

2.6 Protective equipment

Protective equipment is to be used as intended and may not be disabled or removed.

All protective equipment is to be regularly checked for integrity and proper functioning.



The Cutting mill has a comprehensive safety system:

1. A safety switch monitors the closing of the closing lid during operation and prevents the Cutting mill from starting up when the lid is open.
2. There is a safety switch for monitoring the collecting vessel.

   During operation, it monitors the position of the collecting vessel for the material to be cut (3.5 l pot or 30 l container) and prevents the mill from starting up when the container has been removed.

- Both switches fulfil the directives concerning personal protection.
- The Cutting mill cannot be started when the closing lid is open or the collecting vessel has been removed.
- The Cutting mill stops when the closing lid is opened and the collecting vessel is unlocked.

2.7 Hazardous points

- Crushing hazard when opening and closing the closing lid.
- Crushing hazard when opening or closing the upper half of the housing.
- Risk of injury on sharp knives.
- Crushing hazard at the funnel lid.
- Crushing hazard when unclamping and clamping the collecting vessel.

2.8 Electrical safety

2.8.1 General information

Turning the main switch to Stop (0) switches off the motor. The mill comes to a standstill within seconds.

- The collecting vessel can be removed.
- The closing lid can be opened.

2.8.2 Protection against restart

The device shuts down if there is a power outage during operation. The mill comes to a standstill within seconds.

- The collecting vessel can be removed.

When electrical power returns, the cutting mill does not start up. The mill is secured against restarting.

Turning the switch to Start (I) switches on the motor, and the mill starts to work.

2.8.3 Overload protection

A motor protection switch turns the device off if there is an overload. (The rotary switch returns to "0").

3 Technical data

3.1 Dimensions

With stand: 1450 x 620 x 580 mm (height x width x depth)

On table: 690 x 420 x 480 (height x width x depth)

3.2 Weight

Net 42 kg

Gross 72 kg

3.3 Operating noise

Emissions value of workplace according to DIN EN ISO 3746:2005 L_{Pa} = 78 dB(A).

3.4 Voltage, current consumption, power consumption

Voltage	Current consumption	Power consumption
1~ 115 / 230 V +/- 10 %	100 - 120 V / 16.5 A 200 - 240 V / 9.5 A	1.76 / 2.1 kW under high load (significantly less during a normal application)
3~ 230 / 400 V +/- 10 %	230 V / 5.7 A 400 V / 3.3 A	1.9 kW under high load (significantly less during a normal application)

Transient overvoltages in accordance with overvoltage category II are permitted. (See also *Chapter 4.5 „Electrical connection“ on page 19*)

3.5 Electrical fuses

A thermal circuit breaker (motor protection switch) is integrated into the main switch and triggers in the event of overheating; after a brief cooling period, it is ready for operation.

3.6 Material

- Maximum feed size 70 mm
- Maximum feed quantity 800 ml

3.7 Final fineness

The final fineness depends on the sieve cassette used and is between 0.25 and 20 mm.

4 Installation

4.1 Transport

The device is delivered on a transport pallet with a wooden cover. We recommend using a forklift or pallet truck for transporting the packed device.

DANGER!
Do not step under the transport pallet during transport.

WARNING!
Improper lifting can lead to personal injury or property damage. The machine is only to be lifted with suitable equipment and by qualified personnel.

The guarantee excludes all claims for damage due to improper transport.

4.2 Unpacking

- Pull out the nails that fasten the cover to the transport pallet. The cover is the wooden box that has been placed over the transport pallet.
- Lift the cover off of the transport pallet.

CAUTION!
Crushing hazard!
Always lift with 2 persons.

- Compare the contents of the delivery with your order.

4.3 Setting up

DANGER!
Do not step under the transport pallet during transport.

Installation

CAUTION!

Ensure that the device is safely fastened. Considerable lateral forces can occur!

CAUTION!

The weight of the cutting mill is approx. 42 kg with cutting tools.

NOTICE!

Place the Cutting mill on a flat, stable surface. It may be screwed to this or a base plate.

NOTICE!

- Make sure that the cutting mill is easily accessible. On the right of the mill, there must be enough space to open the upper part of the housing together with the funnel.
- Make sure the ventilation grate on the back is not obstructed. **Risk of overheating!**

1. The Cutting mill is screwed to the transport palette using 4 screws. Remove the 4 screws.
2. Lift the Cutting mill from the transport pallet with 2 persons.
3. Assemble the device on a table or a stand:
   - Place the cutting mill on a sturdy table and connect the motor base to the tabletop using 4 screws so that the container flange extends beyond the edge of the table.
   - Or screw the cutting mill onto the stand which is available as an accessory. For this purpose, refer to the assembly instructions included with the universal stand.
   - Close the cutting chamber.
   - Attach the collecting vessel.

4.4 Ambient conditions

WARNING!

Mains voltage!

– The device may only be operated indoors.
– The surrounding air may not carry any electrically conductive dust.
– Maximum relative humidity 80% for temperatures up to 31°C, linearly decreasing down to 50% relative humidity at 40°C.

- The room temperature has to stay between 5 - 40°C.
- Altitudes up to 2000 m
- Degree of pollution 2 according to IEC 664.

4.5 Electrical connection

Before establishing the connection, compare the voltage and current values stated on the type plate with the values of the power supply system to be used.

CAUTION!

Ignoring the values on the type plate may result in damage to the electrical and mechanical components.

4.5.1 Adapting to the mains

Changes to the connection voltage, i.e. from 230 V 3~ to 400 V 3~, and / or the connection line may only be made by a qualified technician.

5 Initial start-up

After the PULVERISETTE 15 has been set up as described in *Chapter 4 „Installation“ on page 17* and the mains plug has been plugged into the mains socket, the device is ready for operation.

Check whether the rotor can turn freely before switching on for the first time. To do so, open the closing lid and turn the rotor one complete rotation by hand with the upper part closed. If the rotor can turn freely, the closing lid can be closed again. If not, check the cutting gap. (See *Chapter 6.1.3 „Checking the gap width“ on page 23*).

5.1 Switching on

Set the main switch to ON (I). The Cutting mill starts running.

5.2 Switching off

Set the main switch to OFF (0). The cutting mill stops within approx. 10 - 15 seconds.

6 Using the device

WARNING!
If the grinding elements used are not original accessories, we provide no guarantee and exclude all liability for damage to the device.

6.1 Preparing a comminution

6.1.1 Opening the cutting mill

NOTICE!
Before opening the Cutting mill, the main switch must be switched to *„OFF“*. Failure to observe this instruction may lead to personal injury and to damage of the device.

1. Turning the handle on the closing lid (4) to the left unlocks the lid.
2. Open the closing lid (4).

When open, the closing lid can be lifted upward out of the hinges.

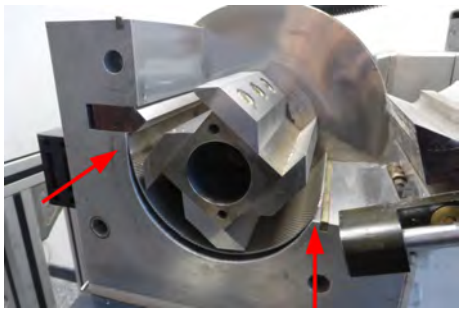
3. Unscrew the screw in order to open the upper half of the housing to the right side.

6.1.2 Inserting the bottom sieve

CAUTION!
Risk of injury due to sharp knives.

CAUTION!
Risk of injury!
Beware of the sharp edges of the rotor and the fixed knives!
Wear protective gloves when inserting the sieve, the fixed knives and the rotor!

1. Open the closing lid to insert the sieve.
2. Push the sieve from the front under the left and right fixed knives. Or take off the closing lid, open the upper part of the housing and then insert the sieve.



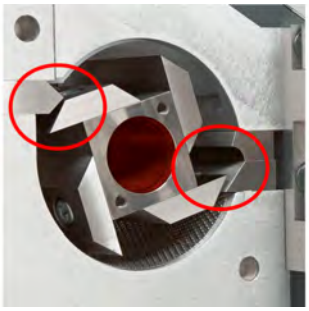
To insert the sieves, they have to be slightly bent to a curve by pressing the sides.
The sieves have to be inserted so that the welded surface lies against the left side in the grinding chamber.

3. Close the upper part of the housing and screw it on again.

Turn the cutting rotor carefully by hand. The rotor must be able to turn freely. If it does not, refer to ↳ Chapter 6.1.3 „Checking the gap width“ on page 23 and ↳ Chapter 9.1 „Removing and installing the cutting knives“ on page 30.

4. Screw the closing lid on tightly using the handle (2).

6.1.3 Checking the gap width



The rotating knives must not touch the fixed knives. A cutting gap of 0.2 - 0.3 mm has been set between them at the factory.

The rotating knives must be aligned parallel to the fixed knives. Turn the cutting rotor carefully by hand.

If the rotating knives are badly worn, it is possible to turn them over once. See ↯ Chapter 6.1.3.1 „Setting the gap width“ on page 23.

6.1.3.1 Setting the gap width

Set the gap width as follows:

1. Open the closing lid.
2. Before setting the fixed knives, check whether the rotor knives are parallel.

   If they are not parallel, correct the position of the movable knives as described in ↯ Chapter 9.1.1 „Assembling the rotating knives“ on page 30.

3. Position the rotating knife with the smallest gap by pushing it in the direction of the left fixed knife until the knives are edge-to-edge.

4. Depending on the degree of wear, loosen the retaining screw of the left fixed knife by turning it halfway.
5. Use a 4 mm hexagon socket key to alternately move the rear and front pressure screws parallel inward until at least a folded piece of paper (or a 0.2 mm feeler gauge) is slightly clamped between the fixed knife and the rotating knife.
6. Now, fasten the left fixed knife again with the retaining screw.

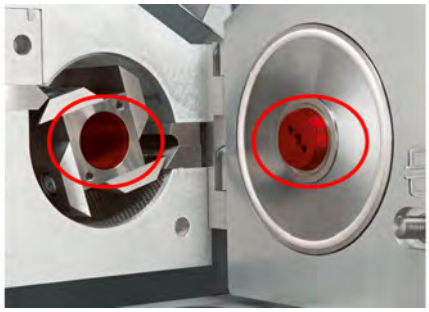
   This may slightly increase the gap again. Then, the retaining screws have to be loosened again slightly, and the pressure screws have to be readjusted slightly.

7. Mark the rotating knife which was used for the adjustment.
8. If the upper part of the housing is open, close it and screw it on.
9. Position the marked rotating knife opposite one of the right fixed knives so that the knives are edge-to-edge. Align it as described above using the retaining screw and pressure screws so that it is parallel and there is a gap of 0.2 - 0.3 mm.

10. Repeat the procedure for the third fixed knife.

Make sure the fixed knives are parallel. If they are not parallel, the fixed knives have to be realigned using the pressure screws.

6.1.4 Closing the cutting mill



Before closing the closing lid, please observe the following:

- Check whether the cutting rotor and sieve are securely fitted.
- Clean the conical guide on the cutting rotor.
- Clean the conical guide in the closing lid.

Close the closing lid and screw it on tightly using the handle. This engages the safety switch.

6.1.5 Attaching the collecting vessel

Hang the claws of the toggle latches into the flange of the PULVERISETTE 15 and close both toggle levers at the same time; the safety switch engages.

6.2 Comminution procedure with the protected funnel

Switch on the cutting mill first, and then add material to be cut.

1. Close the cutting mill.

2. Attach the collecting vessel.

3. Push in the plunger.

4. Switch on the cutting mill.

5. Open the funnel lid, add some comminution material and close the lid again.

> *The sample quantity varies depending on the particle feed size, the hardness of the material and the sieve size. It is best to start with small quantities and increase them depending on the success of the comminution.*

6. Close the funnel lid and pull the plunger slowly upward.

   ⇨ This causes the material to be cut to fall into the cutting chamber.

7. Lower the plunger slowly.

   ⇨ The remaining material to be cut is pressed into the cutting chamber.

8. Monitor the extent to which the grinding stock is heated; if necessary, arrange for pause times to allow it to cool down.

9. Make pumping movements with the plunger. These pumping movements draw in and press out air through the blower filter above the collecting vessel. This air feeds the comminution material through the sieve or lifts it off the sieve and back into the process.

10. When the operating noise becomes quieter, the cutting procedure is complete.

    ⇨ More comminution material can be added.

11. After grinding is finished:

    Switch off the cutting mill.

12. Carefully release both clamping devices of the collecting vessel at the same time and unhook the collecting vessel from the toggle latches in order to empty the sample material.

NOTICE!

Only add a quantity of material to be cut which the mill is able to process correctly.

Too large quantities can cause the cutting mill to become blocked. Switch off the blocked cutting mill and remove the material to be cut. Check the gap width before restarting (see *Chapter 6.1.3 „Checking the gap width“ on page 23*).

6.3 Comminution procedure with the funnel for long and bulk solids

CAUTION!

Wear safety goggles for comminution using the funnel for long and bulk solids!

There is a risk of particles from the funnel being projected, in the case of free-flowing material.

1. Close the cutting mill.
2. Attach the collecting vessel.
3. Switch on the device.
4. Add some comminution material and pull the plunger slowly upward. The material to be cut falls into the cutting chamber.

   ⇒An operating noise becomes audible.

   The quantity of comminution material varies depending on the particle feed size and the grindability of the comminution material. It is best to start with small quantities and increase them depending on the success of the comminution.
5. If necessary, press fibrous comminution material into the cutting chamber with the plunger.
6. When the operating noise becomes quieter, the comminution procedure is complete.

   ⇨ More comminution material can be added.

6.3.1 Using the plunger

The plunger has two different sides for feeding the sample material in the funnel for long and bulk solids into the grinding chamber. On the one hand, the smooth, round side is suitable for finer material. On the other hand, the cross-shaped, thinner side is suitable for long, fibrous material, such as straw.

7 Accessories

7.1 Filter hose and collecting vessel

Using a fabric filter hose between the PULVERISETTE 15 and the collecting vessel allows the air flow created by the rotating rotor to be exhausted and prevents a backup. Furthermore, it accelerates the material throughput and guarantees a gentle comminution process.

- Clamp the adapter with the sieve to the device using the toggle latches.
- Pull the filter hose over the sieve.
- Push the other end of the filter hose into the collecting vessel.

8 Cleaning

DANGER!

Mains voltage!

- Before beginning with cleaning work, disconnect the mains plug and protect the device against being unintentionally switched back on!
- Do not allow any liquids to flow into the device.
- Indicate cleaning work with warning signs.
- Put safety equipment back into operation after cleaning work.

CAUTION!

Risk of injury due to sharp knives.

The housing of the cutting mill can be rubbed down with a damp cloth.

8.1 Cutting chamber

CAUTION!

Beware of dust exposure caused by cleaning with compressed air!

Wear protective goggles!

- Open the closing lid.
- Position the rotor knives vertically.
- Flip open the upper part of the housing.
- Remove the sieve.

It is recommended to clean the cutting chamber with a vacuum cleaner and a brush or with compressed air.

Any stuck material, due to e.g. residual moisture in the sample, can be cleaned with alcohol.

9 Maintenance

DANGER!

Mains voltage

- Before beginning with maintenance work, unplug the mains plug and protect the device against being unintentionally switched back on again!
- Indicate maintenance work with warning signs.
- Maintenance work may only be performed by specialised personnel.
- Put safety equipment back into operation after maintenance or repair work

We recommend keeping a safety logbook Chapter 13 „Safety logbook“ on page 39, where all work (maintenance, repairs.....) performed on the device is entered.

The most important element of maintenance is regular cleaning:

Functional part	Function / Type	Inspection	Maintenance interval
Safety switch 1 (actuate by closing the closing lid)	Start-up block	Closing lid open: The rotary switch does not remain in the start position, it returns to the OFF position. **Caution!** If the switch is defective, the rotor will start up. Do not reach into the mill while it is running!	Before each use! Replace the switch if it is defective.
Safety switch 2 (actuate by attaching the collecting vessel)	Start-up block	Collecting vessel not attached: The rotary switch does not remain in the start position, it returns to the OFF position. **Caution!** If the switch is defective, the rotor will start up. Do not reach into the mill while it is running!	Before each use! Replace the switch if it is defective.

Functional part	Function / Type	Inspection	Maintenance interval
Conical guides on the cutting rotor and the lid	Guide of the rotor	Soiling	Before each use!
Cutting rotor gap width - fixed knives	Cutting function	Check distance and parallelism	Visual inspection before each use! Check dimensions every 500 h.
Rotating bearings	Permanent lubrication	Bearing clearance	Every 2,000 h
Drive motor	Permanent lubrication	Bearing clearance	Every 4,000 h
Silicone rubber seal for lid	Seal	Deformation and soiling	Before each use!

9.1 Removing and installing the cutting knives

Depending on the material to be cut and the duration of use, the rotating knives have to be turned over, resharpened or replaced like the fixed knives.

9.1.1 Assembling the rotating knives

NOTICE!

In order to turn or install the rotating knives, all 3 fixed knives have to be pushed toward the exterior, and then the gap has to be redefined. (see *Chapter 9.1.1 „Assembling the rotating knives“ on page 30* and *Chapter 6.1.3.1 „Setting the gap width“ on page 23*)

To remove the rotating knives, proceed as follows:

1. Open the closing lid.
2. Open the upper half of the device.
3. The rotating knives are then completely accessible.

To fasten the rotor, wedge a piece of wood or similar material between the rotating knife and the left fixed knife.

4. The fastening screws of the rotating knives can be unscrewed with a 6 mm Allen wrench.

5. Align one knife parallel to the edge of the rotor, push it toward the fixed knife and screw it on.
6. Align the remaining rotating knives in the same way and screw them on firmly.

9.1.2 Assembling the fixed knives

To remove the fixed knives, proceed as follows:

1. Open the closing lid.

2. Position the rotating knife with the smallest gap by pushing it in the direction of the left fixed knife until the knives are edge-to-edge.
3. Mark the rotating knife which was used for this purpose.

4. Unscrew the middle retaining screws of the knives on the exterior of the housing.
5. Pull the knives out.
6. Unscrew the pressure screws completely.
7. Position the new fixed knives.

NOTICE!

The fixed knives have to be completely retracted using the retaining screws.

8. If the fixed knives are positioned completely away from the rotor, unscrew the retaining screws again.

Observe a gap width of 0.2 - 0.3 mm between the knife edges.

9. Use a 4 mm hexagon socket key to alternately move the rear and front pressure screws parallel inward until at least a folded piece of paper is slightly clamped between the fixed knife and the marked rotating knife.

Make sure the fixed knives do not protrude on the front side.

10. Now, fasten the fixed knives again with the retaining screw.

This may slightly increase the gap again. Then, the retaining screws have to be loosened again slightly, and the pressure screws have to be readjusted slightly.

NOTICE!

After setting the fixed knives, always tighten the retaining screws firmly.

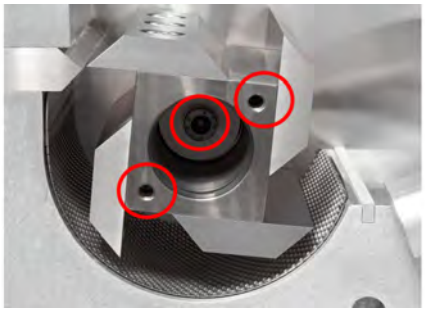
Make sure the fixed knives are parallel. If they are not parallel, the fixed knives have to be realigned using the pressure screws.

9.1.3 Removing the rotor

To remove the rotor, proceed as follows:

1. Open the closing lid.

> *To fasten the rotor, wedge a piece of wood or similar material between the rotating knife and the left fixed knife.*



2. Unscrew the hexagon screw in the interior of the rotor.
3. The two threads located on the front side can be used to screw on the extractor which is included in the scope of delivery. The extractor can be used to slowly withdraw the rotor.

10 Disposal

It is hereby confirmed that FRITSCH has implemented the directive 2002/95/EC of the European Parliament and Council from 27th January 2003 for the limitation of the use of certain dangerous substances in electrical and electronic devices.

FRITSCH has registered the following categories according to the German electrical and electronic equipment act, section 6, paragraph 1, clause 1 and section 17, paragraphs 1 and 2:

Mills and devices for the preparation of samples have been registered under category 6 for electrical and electronic tools (except for large stationary industrial tools).

Analytical devices have been registered under category 9, monitoring and control instruments.

It has been accepted that FRITSCH is operating only in the business-to-business area. The German registration number for FRITSCH is WEEE reg. no. DE 60198769

FRITSCH WEEE coverage

Since the registration of FRITSCH is classified for bilateral transactions, no legal recycling or disposal process is described. FRITSCH is not obliged to take back used FRITSCH devices.

FRITSCH declares it is prepared to take back used FRITSCH devices for recycling or disposal free of charge whenever a new device is purchased. The used FRITSCH device must be delivered free of charge to a FRITSCH establishment.

In all other cases FRITSCH takes back used FRITSCH devices for recycling or disposal only against payment.

11 Guarantee terms

Guarantee period

As manufacturer, FRITSCH GmbH provides – above and beyond any guarantee claims against the seller – a guaranty valid for the duration of two years from the date of issue of the guarantee certificate supplied with the device.

Within this guarantee period, we shall remedy all deficiencies due to material or manufacturing defects free of charge. Rectification may take the form of either repair or replacement of the device, at our sole discretion. The guarantee may be redeemed in all countries in which this FRITSCH device is sold with our authorisation.

Conditions for claims against the guarantee

This guarantee is subject to the condition that the device is operated according to the instructions for use / operating manual and its intended use.

Claims against the guarantee must include presentation of the original receipt, stating the date of purchase and name of the dealer, together with the complete device type and serial number.

For this guarantee to take effect, the answer card entitled "Securing of Guarantee" (enclosed with the device) must be properly filled out and despatched without delay after receipt of the device and be received by us within three weeks or alternatively, *online registration* must be carried out with the above-mentioned information.

Reasons for loss of the guarantee

The guarantee will not be granted in cases where:

- Damage has arisen due to normal wear and tear, especially for wear parts, such as: Crushing jaws, support walls, grinding bowls, grinding balls, sieve plates, brush strips, grinding sets, grinding disks, rotors, sieve rings, pin inserts, conversion kits, sieve inserts, bottom sieves, grinding inserts, cutting tools, sieve cassettes, sieve and measuring cell glasses.
- Repairs, adaptations or modifications were made to the device by unauthorized persons or companies.
- The device was not used in a laboratory environment and/or has been used in continuous operation.
- Damage is present due to external factors (lightning, water, fire or similar) or improper handling.
- Damage is present that only insubstantially affects the value or proper functioning of the device.
- The device type or serial number on the device has been changed, deleted, removed or in any other way rendered illegible
- The above-mentioned documents have been changed in any way or rendered illegible.

Guarantee terms

Costs not covered by the guarantee

This guarantee excludes any costs for transport, packaging or travel that accrue in the event the product must be sent to us or in the event that one of our specialist technicians is required to come to your site. Any servicing done by persons not authorised by us and any use of parts that are not original FRITSCH accessories and spare parts will void the guarantee.

Further information about the guarantee

The guarantee period will neither extend nor will a new period of guarantee begin in the event that a claim is placed against the guarantee.

Please provide a detailed description of the type of error or the complaint. If no error description is enclosed, we shall interpret the shipment as an assignment to remedy all recognisable errors or faults, including those not covered by the guarantee. Errors or faults not covered by the guarantee shall in this case be rectified at cost.

We recommend reading the operating manual before contacting us or your dealer, in order to avoid unnecessary inconvenience.

Ownership of defective parts is transferred to us with the delivery of the replacement part; the defective part shall be returned to us at buyer's expense.

NOTICE!

Please note that in the event that the device must be returned, the device must be shipped in the original Fritsch packaging. Fritsch GmbH denies all liability for any damage due to improper packaging (packaging not from Fritsch).

Any enquiries must include a reference to the serial number imprinted on the type plate.

12 Exclusion of liability

Before using the product, be sure to have read and understood this operating manual.

The use of the product requires technical knowledge; only commercial use is permitted.

The product may be used exclusively within the scope of applications set down in this operating manual and within the framework of guidelines put forth in this operating manual and must be subject to regular maintenance. In case of non-compliance, improper use or improper maintenance, the customer assumes full liability for the functional capability of the product and for damage or injury arising from violating these obligations.

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Not all parts shown here are necessarily installed in the product. The buyer is not entitled to delivery of these parts. If interested, please contact your local FRITSCH GMBH distributor or Fritsch GmbH, Industriestr. 8, D-55743 Idar-Oberstein.

FRITSCH GMBH takes the greatest care to ensure that the quality, reliability and safety of your products are continuously improved and adapted to the state of the art. The supplied products as well as this operating manual conform to the current state of the art when they leave the sphere of influence of FRITSCH GMBH.

By using the product the customer agrees with this and recognizes that defects, malfunctions or errors cannot be completely excluded. To prevent risk of damage to persons or property or of other direct or indirect damage, resulting from this or other causes, the customer must implement sufficient and comprehensive safety measures for working with the product.

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No permission is given expressly, implicitly or otherwise for the use of patents, brands or other copyrights. We also assume no liability for copyright infringements or infringements of the rights of third parties arising from the use of this product.

Neither compliance with this operating manual nor the conditions and methods used during installation, operation, use and maintenance of the product can be monitored by Fritsch GmbH. Improper execution of the installation can result in property damage and thus endanger persons. Therefore, we assume absolutely no responsibility or liability for loss, damage or costs that result from errors at installation, improper operation or improper use or improper maintenance or are in any way connected to these.

13 Safety logbook

Date	Maintenance / Repair	Name	Signature

Safety logbook

Date	Maintenance / Repair	Name	Signature

14 Index

A

Accident prevention 7
Ambient conditions 19
Attaching the collecting vessel 24
Authorised persons 7

C

Cleaning 28
Closing the cutting mill 24
Comminution procedure
  With protected funnel 24
  With the funnel for long and bulk solids 26
Current consumption 15

D

Dimensions 15
Disposal 34
Drive motor 8

E

Electrical connection 19
Electrical fuses 15
Exclusion of liability 37
Explanation of signs 9
Explanation of symbols 9

F

Feed size 16
Filter sack with 60 l collecting vessel 27
Final fineness 16
Fixed knives
  Installing 30
  Removing 30

G

Gap width
  Checking 23
  Setting 23
Guarantee terms 35

H

Hazardous points 14

I

Initial start-up 20
Inserting the bottom sieve 22

M

Mains 19
Maintenance 29
Maintenance list 29
Materials 16

O

Opening the cutting mill 21
Operating noise 15
Overload protection 14

P

Power consumption 15
Protection against restart 14
Protective equipment 13

R

Removing the rotor 33
Requirements for the user 7
Rotating knives
  Installing 30
  Removing 30

S

Safety information 9
Safety logbook 39, 40
Setting up 18
Skilled workers 7
Switching off 20
Switching on 20

Index

U

Using the device 21

V

Voltage 15

W

Warning information 9

WEEE 34

Weight 15

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