

Operating Instructions

Universal Cutting Mill

"pulverisette 19"

and

Power Cutting Mill

"pulverisette 25"



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Fritsch GmbH, Laborgerätebau has been certificated by the TÜV-Zertifizierungsgemeinschaft e.V. on June 24, 1994.



An audit certificated the accordance of the Fritsch GmbH to the DIN EN ISO 9001.

The enclosed declaration of conformity calls the directives which the „pulverisette 19“ resp. „pulverisette 25“ corresponds to. This permitts us to mark the instrument with the CE-Sign.



Instrument number 19.10x.00 / 25.20x.00
Applies as of serial number 0100

Table of contents

	page
1	General Information / Introduction 1
1.1	Notes about Operating Instructions 1
1.2	Explanations of the signs at the instrument and in the operating instructions..... 2
1.3	Brief Description of the Instrument 2
1.3.1	Applications 2
1.3.2	Method of Operation 3
1.3.3	Drive Motor 3
1.4	Technical Data..... 3
2	Operating Safety 5
2.1	General Safety Instructions 5
2.2	Operators..... 6
2.3	Protective Equipment 6
2.3.1	Opening the closure hatch when the machine is not connected to the mains supply 6
2.4	Danger Points..... 7
2.5	Electrical Safety..... 7
3	Installation 8
3.1	Unpacking..... 8
3.2	Transport 8
3.3	Erection..... 8
3.4	Ambience conditions 9
3.5	Electrical Connection..... 9
3.6	Before Switching On for the First Time 9
3.7	Switching On for the First Time / Test for Correct Functioning 9
4	Working with the Cutting Mill..... 10
4.1	Switching On / Switching Off 10
4.2	Preparation for Grinding 10
4.2.1	Inserting / Changing a Sieve Cassette..... 10
4.2.2	Inserting / Changing a Rotor 11
4.2.3	Closing the Cutting Mill 11
4.2.4	Mounting of rotating tools and fixed knives 12
4.2.5	Setting the Knife Gap Width..... 14
4.2.6	Choice of Sieve Cassette..... 14
4.3	Grinding Operation with Standard Funnel 15
4.4	Combi Funnel for Bulk- and Long Material..... 17
4.5	Exhaust System (Sample exhauster with cyclone dust chamber) ... 17
5	Cleaning 18
5.1	Cleaning the Exhaust system (Sample exhauster with cyclone dust chamber)..... 19
6	Maintenance 19
7	Warranty..... 20
8	Troubleshooting Checklist..... 20
9	List of keywords..... 21

1 General Information / Introduction

1.1 Notes about Operating Instructions

- The copyright to these technical documents is the property of Fritsch GmbH, Manufacturers of Laboratory Instruments.
- These operating instructions are not to be reprinted or copied without the express approval of Fritsch GmbH.
- Please study these instructions carefully before attempting to operate the machine.
- All operators must be familiar with the contents of the operating instructions.
- Please observe all notes concerning your safety.
- The cutting mill was designed with the user's safety in mind, however inherent risks cannot be excluded. Follow the advice in these instructions to avoid risks to users. The symbols in the right hand margin highlight the risks described in the text. Symbols are also to be found on the instrument warning users of possible risks.
Warning symbols are surrounded by a triangle.
- These operating instructions do not constitute a complete technical description. They describe only the details required for safe operation and maintenance for usage under normal conditions.



1.2 Explanations of the signs at the instrument and in the operating instructions

Attention! warning against danger spot observe operating instructions	
Attention! mains voltage	
Attention! risk of explosion	
Attention! hot surface	
Attention! inflammable substances	
wear protective gloves!	
wear ear protectors!	

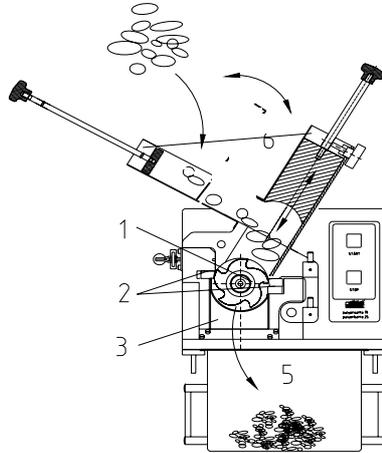
1.3 Brief Description of the Instrument

1.3.1 Applications

The cutting mill can be used for rapid comminution of soft to medium-hard and fibrous materials such as: sheet rubber, plastics, iron-free refuse, confectionery, dried meat, leather, wood, coal, malt, paper/cardboard, peat, animal feed, pasta, tablets, sheets, pellets, spices, fabric, straw, maize, bone, roots, tobacco ...

1.3.2 Method of Operation

The material is fed via a feed funnel (6) into the cutting chamber. There the material is cut by rotating knives (1) in cooperation with stationary knives (2). The fine material falls through a sieve cassette (3) into a collecting basin (5).



1.3.3 Drive Motor

Universal cutting mill p-19	Power cutting mill p-25
The machine is driven by a three-phase a.c. motor or an a.c. motor with a built-in mechanical brake.	The p-25 is driven by a three-phase a.c. gear motor with no mechanical brake.

1.4 Technical Data

Dimensions and weight

Universal cutting mill p-19	Power cutting mill p-25
450 mm x 630 mm x 550 mm (width x height x depth)	450 mm x 630 mm x 650 mm (width x height x depth)
56 kg (net weight)	75 kg (Net weight)
86 kg (gross weight)	105 kg (gross weight)

Noise level

The noise level is approx. 73dB (A) at idle and, including the cyclone, 95 dB (A) at idle. The value fluctuates considerably depending on the material being ground.

**Nominal voltage / Power consumption / Power output /
Current input or required supply-side fusing**

Universal cutting mill p-19	Power cutting mill p-25
400V / 3~ 1800W 1500W 16A	400V / 3~ 2500W 2200W 16A
230V / 3~ 1800W 1500W 16A	230V / 3~ 2500W 2200W 16A
230V / 1~ 2200W 1500W 16A	
115V / 1~ 1700W 1100W 15A	

(see also section [3.5](#) Electrical Connection)

Transient overvoltages according to overvoltage category II allowed.

Electric fuses

- Automatic circuit breaker in the machine
- Micro-Fuse in the machine
- Motor protection switch (see chapter [4.3](#)).
- In machines with a three-phase a.c. motor, a direction of rotation detection system is fitted (see chapter [2.5](#) Electrical Safety)

Material

Universal cutting mill p-19	Power cutting mill p-25
Feed size (relatively hard material) max. 10 mm; in other cases there is no reason why larger pieces could not be processed	Feed size size (relatively hard material) max. 20mm; in other cases there is no reason why larger pieces could not be processed
Batchwise feeding	Batchwise feeding

Final fineness

Universal cutting mill p-19	Power cutting mill p-25
Achievable mean final fineness 0.25-6 mm depending on sieve insert	Achievable mean final fineness 1-10 mm depending on sieve insert

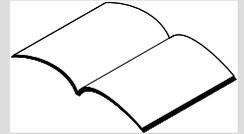
Speeds

Universal cutting mill p-19	Power cutting mill p-25
approx. 3000 rpm	approx. 300 rpm

2 Operating Safety

2.1 General Safety Instructions

- Read the operating instructions carefully before use.
- The instrument can only be used for the purpose described in Chapter 1.3.1 Applications.
- Use only original accessories and original spare parts. Failure to do so may call into question the performance of the instrument.
- Do not use damaged accessories.
- The operators must be familiar with the contents of the operating instructions.
To this end, for example, the operating instructions must be kept with the instrument.
- Do not remove labels.
- Protective devices must not be made unserviceable or removed.
- Unauthorized modification of the instrument or any part thereof will result in the loss of the conformity to European directives which is asserted by Fritsch and the warranty.
- Wear protective gloves while cleaning the cutting chamber.
- Wear ear protectors if the noise level is higher than 85dB(A).
- Behaviour at all times must be such as to strictly preclude any risk of accidents.
- Furthermore, the MAC values at place of work specified in the pertinent safety regulations must be adhered to. Where applicable, ventilation must be provided or the instrument must be operated under an exhaust hood.
- 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 or sieved, it is therefore necessary to take special safety precautions (e.g. wet grinding or wet sieving) and the work must be supervised by a specialist.
- The instrument is not explosion-proof and is unsuitable to grind or sieve materials which are explosive, combustible or promote combustion.
- The safety lock (see arrow in the drawing) becomes warm when the machine has been in operation for some time. This is not dangerous.



- p-19: The switch at the back is no mains switch, it is a control switch. For this reason you have to pull out the mains plug to disconnect the instrument from mains!
- p-25: The switch at the back is the mains switch. For this reason the switch has to be easy and quickly to reach.

2.2 Operators

- No one other than authorized persons should operate the instrument and it must be serviced and repaired by trained specialists.
- No one suffering from medical problems or under the influence of medications, drugs, alcohol or overtiredness should be permitted to operate the instrument.

2.3 Protective Equipment

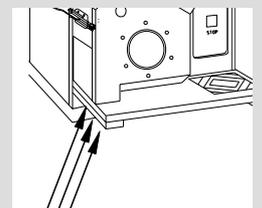
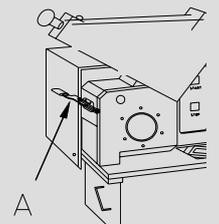
- Protective equipment must be used as intended and must not be rendered disabled or dismantled.
- All protective devices should be regularly checked for completeness and to ensure that they are functioning correctly.
- The cutting mill is equipped with a safety lock for personal protection, which locks the front closure hatch during operation.
- The safety switches prevent operation of the cutting mill when the grinding chamber is not closed and no collecting basin has been inserted.
- **Do not operate the machine without a feed funnel.** The feed funnels are mechanical protective devices which permit safe feeding.
- When changing the funnel, disconnect the machine from the mains supply and fit the new funnel immediately.
- Motor protection switch (see chapter 4.3).

2.3.1 Opening the closure hatch when the machine is not connected to the mains supply

Attention:

Before you start open the closure as explained below, ensure that the closure hatch and the toggle-type fastener (A) is closed!

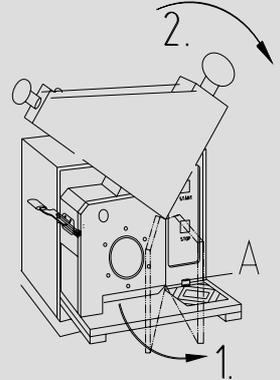
1. Insert the attached triangular wrench through the bore located below the safety lock (see right), and turn clockwise.
2. The closure hatch can now be opened after the toggle-type fastener (A) of the machine is opened.
3. The cutting mill can now not be switched on. For this, the safety lock must be activated by turning the triangular wrench anticlockwise, the closure hatch must be closed and the toggle-type fastener (A) thrown to fix the closure hatch!



2.4 Danger Points



- First open the closure hatch (1st) fully, and then open the housing upper section (2nd). An initial resistance will be felt when the housing upper section is being opened.
- Ensure that the closure hatch does not swing round violently and consequently drop out of the hinges.
- There is a danger of crushing when the housing upper section is being closed (see right) - for this reason, the housing upper section should be closed slowly.
- When opening the housing upper section, slowly open it until it is resting on the rubber buffer (A). Do not let it drop down violently.
- After checking that the rotor (section 4.2.3 Technical Data) rotates freely, the Allen key must be removed immediately!



2.5 Electrical Safety

General

- Press the STOP button: the cutting mill will slow down and stop.
- Switch off the main switch when the cutting mill is inoperative for an extended period (e.g. over night).

Protection against Restarting

In the event of a mains failure during operation or after the machine has been switched off with the main switch, the closure hatch will remain locked. When the mains voltage is restored, the lock of the hood will open. For safety reasons, however, the cutting mill will not start again.

Direction of Rotation Detection

In machines with a three-phase a.c. motor, a direction of rotation detection system is fitted: If, after the machine has been connected to the mains supply and the main switch has been switched on, the START button does not light up, the direction of rotation must be corrected. For this, two phases must be changed.

Overload Protection

- In the event of overloading, a motor current protection switch (see chapter 4.3) will switch off (STOP button will shine).

3 Installation

3.1 Unpacking

- Remove the nails with which the protective packing is fastened on the transport pallet. The transportation protective packing is either a wooden box or a cardboard box placed on the transport pallet.
- Lift the hood off the transport pallet.
- Check that the items supplied correspond to your order before proceeding.

3.2 Transport

- Transport the machine on the transport pallet using a fork lift truck or hand fork lift truck.
- To carry the machine, grip it below at the front and the back. Do not use the housing for carrying.

Carrying the machine will require at least two persons.

3.3 Erection

- The cutting mill is secured to the transport pallet by four screws. Undo the four screws.
- Lift the cutting mill off the transport pallet.

Lifting the machine down will require at least two persons.

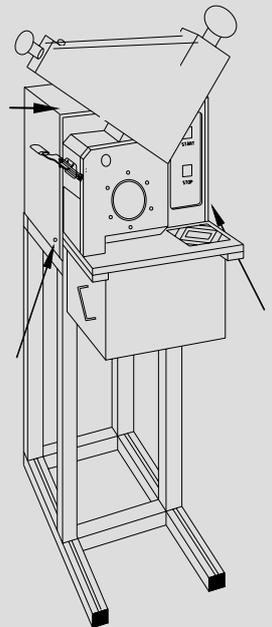
Fastening the Cutting Mill

Screw the cutting mill onto the frame supplied or onto a stable bench etc.

- Unscrew the oval head screws on the housing and remove the housing (see right).
- Two U-shaped rails are fitted on the bottom of the machine. Pass the attached screws through the holes drilled in the U-shaped rails, and screw them into the frame or the bench. Other screws of the same diameter may also be used.

Please ensure that the machine is fastened securely, as considerable transverse forces do occur.

Ensure that there is good access to the cutting mill. Ensure that to the right of the mill, there is sufficient space for the housing upper section including the funnel to be opened. Do not block the ventilation louver at the rear. There is a danger of overheating if the louver is blocked.



3.4 Ambience conditions

- Use the instrument only inside.
- The air must not contain any electrical conductive dust.
- The ambient temperature must be between 5 and 40°C.
- Height up to 2000m M.S.L.
- Maximum relative humidity of air 80% temperature up to 31°C, linear decreasing down to 50% relative humidity of air at 40°C
- Contamination level 2 (IEC 664)

3.5 Electrical Connection

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

(see section 1.4 Fehler! Verweisquelle konnte nicht gefunden werden.)

If, after the machine has been connected to a **three-phase** mains supply and the main switch has been switched on, the START button does not come on, the direction of rotation must be corrected. For this, two phases must be changed.



Attention! mains voltage

The connecting cable may be changed only by a trained expert.

3.6 Before Switching On for the First Time

Universal cutting mill p-19

Power cutting mill p-25

- | | |
|--|--|
| <ul style="list-style-type: none"> • Connect the machine to the mains supply. • Set the main switch at the rear of the machine to HAND. • Pass the attached hexagon socket screw key through the central hole in the closure hatch. Now turn the hexagon socket screw key and thus check whether the rotor rotates freely. • Remove the Allen key again. • If the rotor does not rotate freely, proceed as described in section 4.2.4. | <ul style="list-style-type: none"> • Set the main switch at the rear of the machine to 0. |
|--|--|

This check should also be made every time the rotor is changed.

3.7 Switching On for the First Time / Test for Correct Functioning

Switch on the machine only when all the work described in section 3 has been done.

4 Working with the Cutting Mill

4.1 Switching On / Switching Off

Universal cutting mill p-19	Power cutting mill p-25
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- Again check that the cutting mill is located securely.
- Check whether the feed funnel is fitted securely.
- Insert the collecting basin.
- Check whether the toggle-type fastener (A) is closed.
- Connect the machine to the mains supply - the START button must come on. (see 2.5 Fehler! Verweisquelle konnte nicht gefunden werden.)

- | | |
|---|--|
| <ul style="list-style-type: none"> • Set the main switch at the rear of the machine to AUTO. | <ul style="list-style-type: none"> • Set the main switch at the rear of the machine to I. |
|---|--|

- Switch on the machine by pressing the START button. The closure hatch will now be locked.

To switch off the machine, press the STOP button. After waiting for a few seconds, open the closure hatch.

Switch off the main switch if the cutting mill is to be inoperative for an extended period (e.g. over night).

Never open the toggle-type fastener during operation, as this can seriously damage the rotor.

4.2 Preparation for Grinding

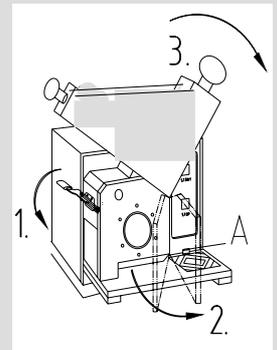
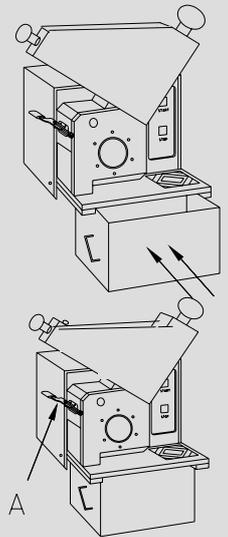
4.2.1 Inserting / Changing a Sieve Cassette

Switch on the machine at the main switch. After a few seconds, open the toggle-type fastener (1). Open the closure hatch (2) fully, and slowly open the housing upper section (3) (initial resistance will be felt) until the housing upper section is resting on the rubber buffer (A).

Pull the sieve cassette out towards the front.

If necessary, use the extracting tool 45.5550.10: Insert the extracting tool in the two holes in the sieve cassette to beyond the bends of the extracting tool. When inserting the extracting tool, move it up and down gently.

If the sieve cassette becomes jammed, remove the material to be ground below the left-hand stationary knife with a screwdriver. Before inserting the sieve cassette, clean the cutting chamber thoroughly so that the machine can be closed tightly again.



4.2.2 Inserting / Changing a Rotor

Universal cutting mill p-19	Power cutting mill p-25
<ul style="list-style-type: none"> • Set the main switch at the rear of the machine to AUTO. • Open the toggle-type fastener (1). Open the closure hatch fully (2), and slowly open the housing upper section (3) until it is resting on the rubber buffer. • Pull the rotor out towards the front; wear protective gloves. If necessary, carefully lever out the rotor. • Clean the cones of the rotor. • Clean the two cones of the cutting mill (1st in the closure hatch and 2nd in the receptacle). • When inserting the rotor, rotate it until it engages with the driver pins at the rear. The main switch must be set to AUTO (p-19). • Check whether the rotor rotates freely: Set the main switch to HAND. Pass the attached hexagon socket screw key through the central hole in the closure hatch. Now turn the hexagon socket screw key and thus check whether the rotor rotates freely. Remove the Allen key again immediately. If the rotor does not rotate freely, proceed as described in section Setting the Knife Gap Width. 	<ul style="list-style-type: none"> • Set the main switch at the rear of the machine to I.



This check should be made every time the rotor is changed.

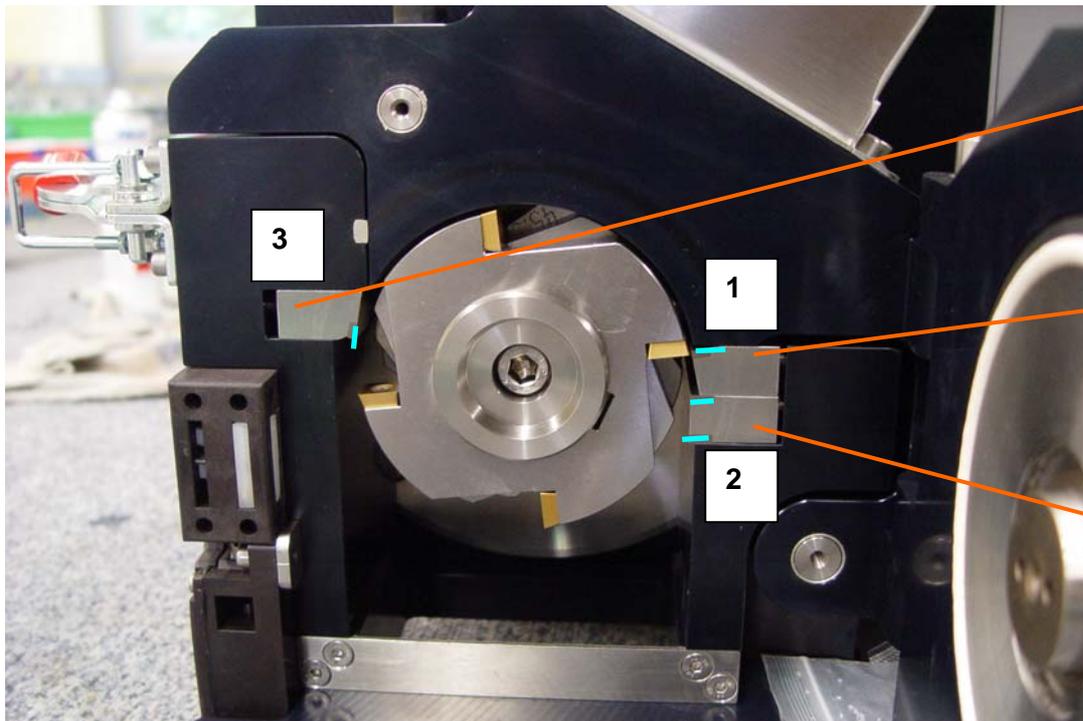
4.2.3 Closing the Cutting Mill

Before closing the cutting mill, clean the cutting chamber, the contact surfaces of the housing, and in particular the closing surfaces of the lock.

- Slowly close upper section of the housing until it rests in its closed position.
- Close the closure hatch.
- Hook in the loop of the toggle-type fastener and pull the handle of the toggle-type fastener over.
- Check whether the rotor rotates freely:
Set the main switch to HAND.
Pass the attached hexagon socket screw key through the central hole in the closure hatch. Now turn the hexagon socket screw key and thus check whether the rotor rotates freely.
Remove the Allen key again immediately.
If the rotor does not rotate freely, proceed as described in section Setting the Knife Gap Width.

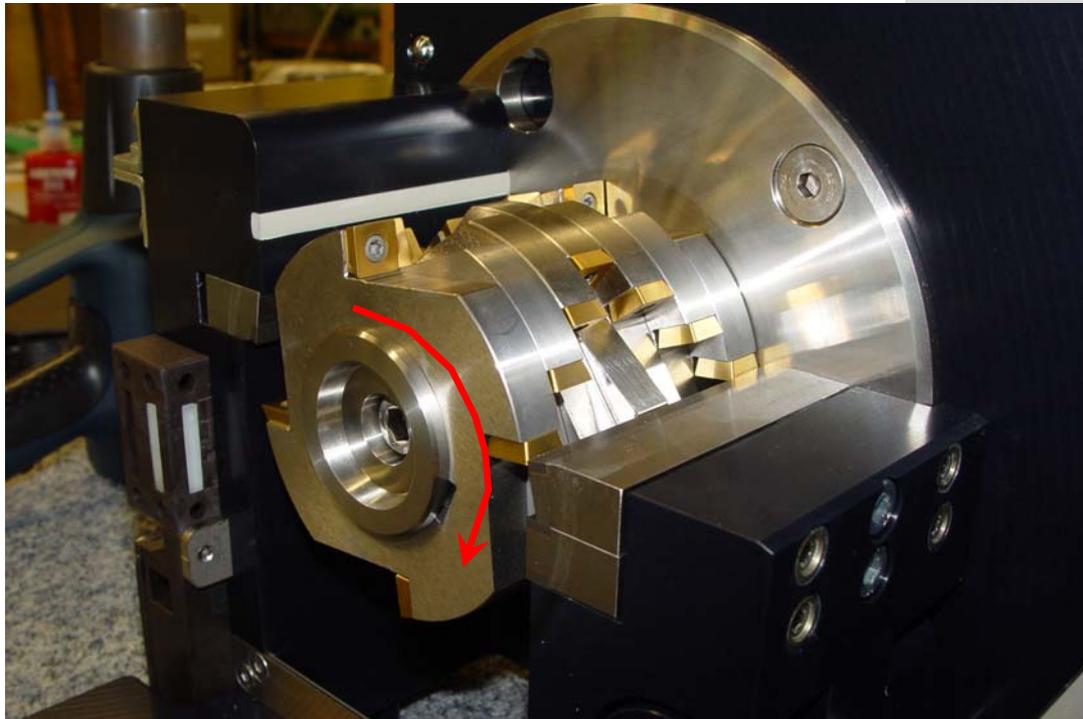
This check should be made every time the rotor is changed.

4.2.4 Mounting of rotating tools and fixed knives

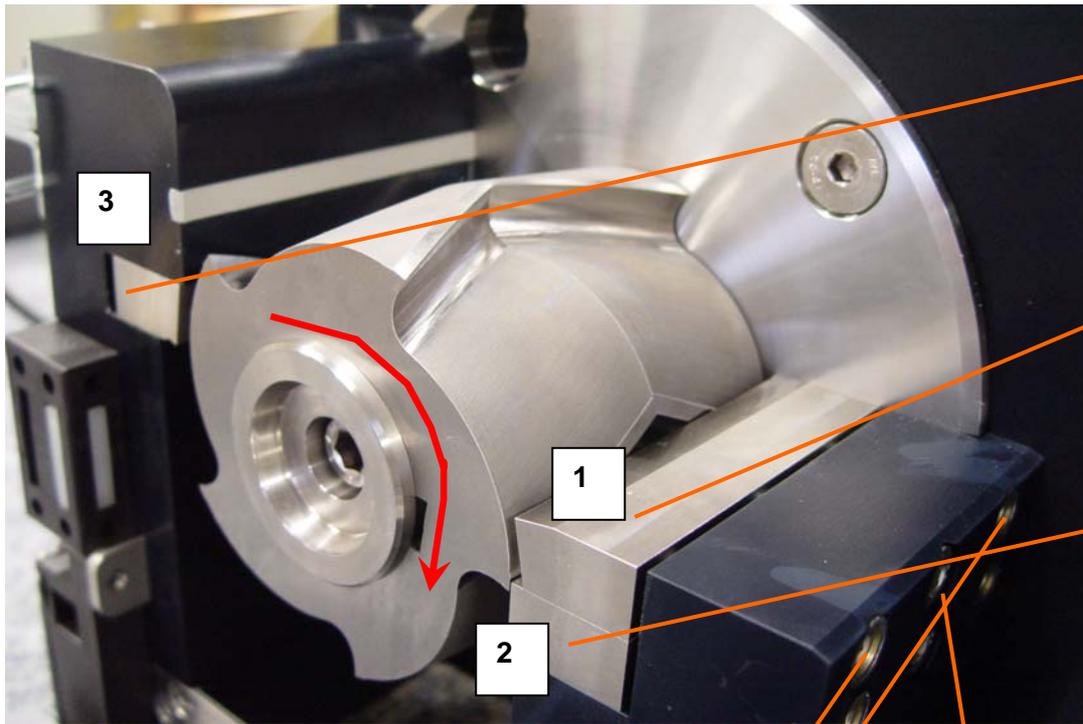


p-19 45.5320.00
p-25 45.7330.00
p-19 45.5310.00
p-25 45.7310.00
p-19 45.5320.00
p-25 45.7320.00

First insert the fixed knives. Consider the situation of the W+C tungsten carbide inserts (blue)



The rotary tools of the mills turn in the clockwise direction. Use indexed knives or v-shaped rotors by hand and thereby turn in clockwise direction until the tool at the back engages into the carrier bolts. Close then only the door of the mill



p-19
45.5160.09
45.5181.09

p-25
45.7180.09
45.7181.09

p-19
45.5160.09
45.5161.09

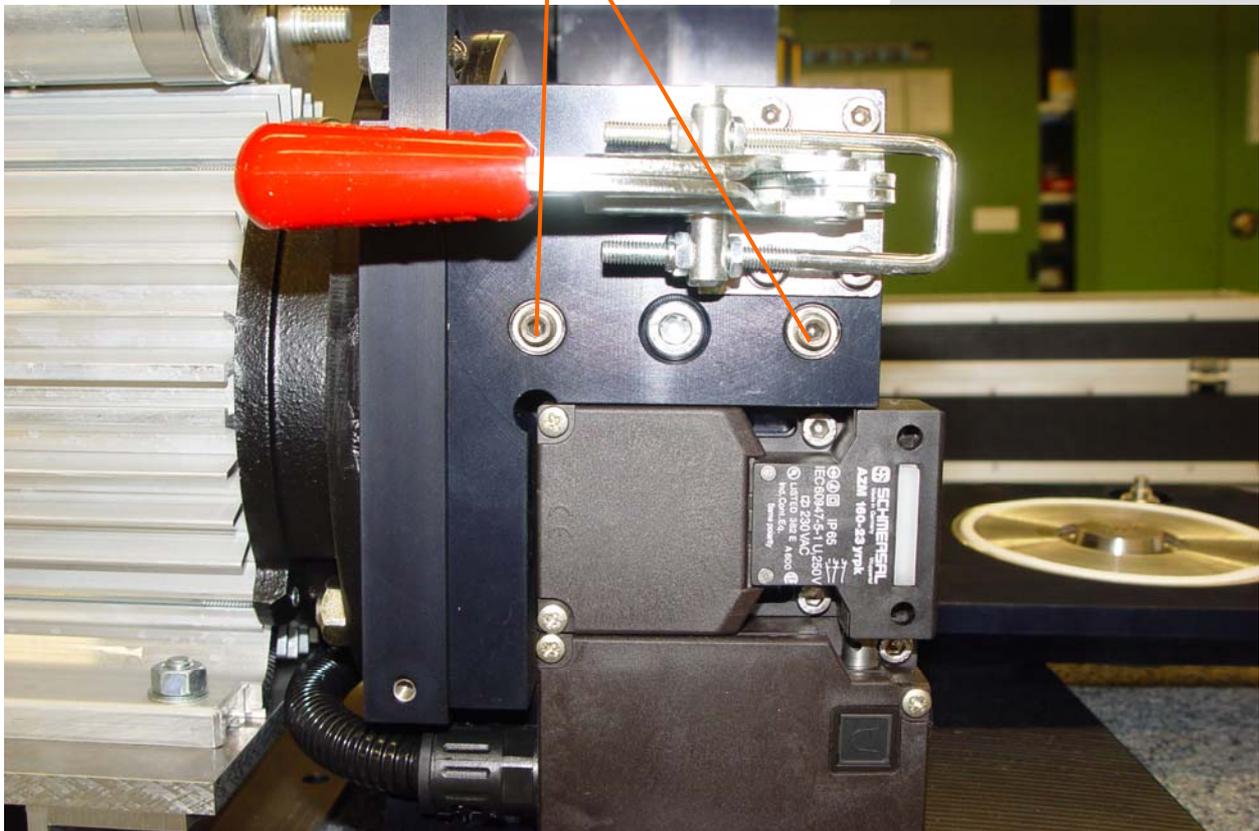
p-25
45.7160.09
45.7161.09

p-19
45.5170.09

p-25
45.7170.09
45.7171.09

Screws for setting the cutting gap.

Screws for fixing the fixed knives after setting.



4.2.5 Setting the Knife Gap Width

Factory settings:

Universal cutting mill p-19	Power cutting mill p-25
<ul style="list-style-type: none"> • approx. 0.2 mm 	<ul style="list-style-type: none"> • approx. 0.5 mm

Universal cutting mill p-19	Power cutting mill p-25
<ul style="list-style-type: none"> • Set the main switch to HAND. • Open the closure hatch, and open the housing upper section. • Loosen the central hexagon socket retaining screws for all three stationary knives, and unscrew them a short distance. • Rotate the rotor until the rotor knives and the stationary knives are located exactly opposite each other. • Screw in the headless pins to the right and left of the retaining screws uniformly until they contact the rotor knives. Then turn the headless pins back uniformly through 1/4 of a revolution and tighten the retaining screws again. 	<ul style="list-style-type: none"> • Set the main switch to I.

Using this method, a knife gap of approx. 0.2 mm can be set. This can be checked with a feeler gauge. This corresponds to 2 sheets printer paper 80gr..

The counter-knives must be parallel with the rotor knives so that the cutting load is distributed uniformly over the entire length.

- Close the cutting mill
- Pass the attached hexagon socket screw key through the central hole in the closure hatch. Now turn the hexagon socket screw key and thus check whether the rotor rotates freely.
- **Remove the Allen key again immediately.**

4.2.6 Choice of Sieve Cassette

Please note that the sieve cassettes for the machines p-19 and p-25 differ from each other.

Coarse pieces of material should be precomminuted with a coarse sieve 2-4 mm and comminuted to the desired final fineness in a second grinding step.

4.3 Grinding Operation with Standard Funnel

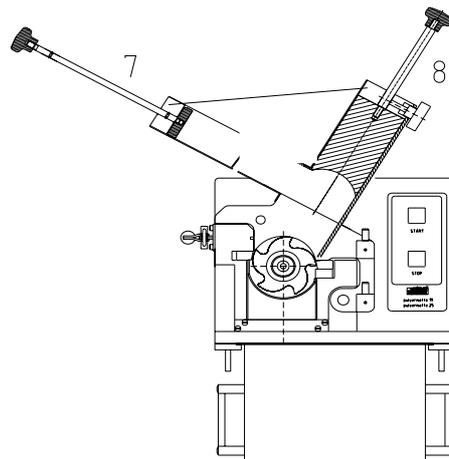
- Insert the collecting basin.
- Close the cutting mill; see section 4.2.3.
- Pull out the slide rod (7) fully.
- Move the press plunger (8) into the lower position.
- Open the cover, load some material to be ground, and close the cover again.

The quantity of material to be ground will depend on the feed grain size and the grindability of the material. It is best to start with small quantities and increase the quantity depending on the success of the grinding process.

- Switch on the machine (see section 4.1).
- Move the slide rod (7) to the right in the direction of the press plunger (8) until the material to be ground is in front of the press plunger.
- Pull the press plunger (8) upwards, and move the slider fully to the right until the material to be ground drops into the grinding chamber (slight grinding noise will be heard).
- Leave the slider at the right, and move the press plunger downwards (grinding noise will become louder).
- Push the press plunger up/down. This pumping results in air being sucked in and pumped out by the air filter on the right-hand side of the machine.

The air movement is critical to ensuring the fine material passes through the sieve for collection while the larger particles are returned for reprocessing.

- The grinding operation is finished when the grinding noise becomes quieter.
- Further material to be ground can then be loaded into the machine as above.



Overloading of the cutting mill:

During loading and during the downwards movements of the press plunger, attention should be paid to the noise of the grinding process. The volume of the noise corresponds very closely to the loading of the machine. It is also clear from the sound pitch if the motor speed is decreasing due to overloading. Pulling the press plunger back in good time will prevent overloading of the mill and prolong the life of the grinding parts and the sieve.

If the cutting mill is overloaded (motor protection switch), proceed as follows:

1. Unplug power cord
2. Allow the device to cool down
3. Remove the 3 screws on the housing (see image)



4. Carefully lift off the housing (see image)



5. The switch (see image 1) must be set to the "H" position with a screwdriver (see image 2).

Image 1

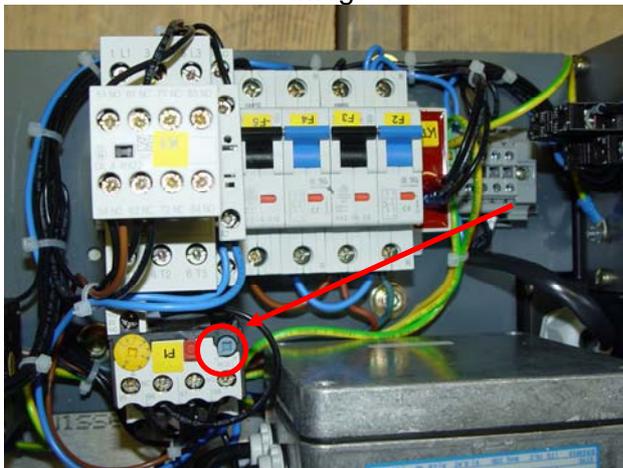
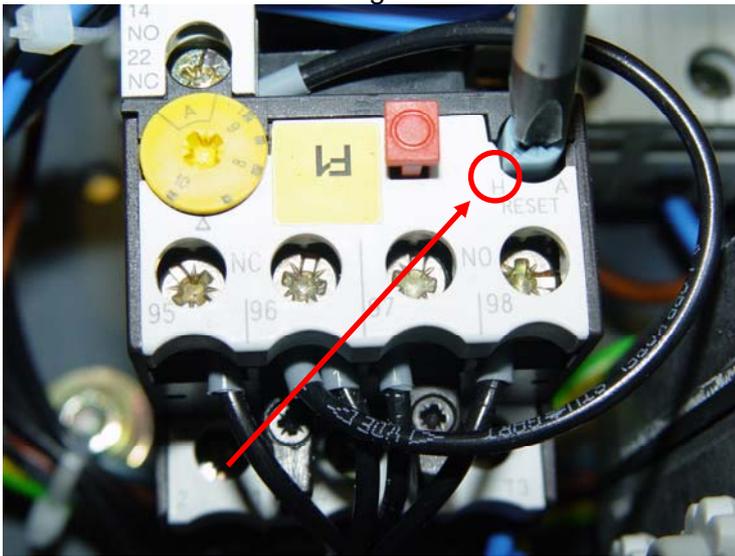


Image 2



For fine grinding or material with dust creation the exhaust system (section 4.5 Exhaust System) may be used.

4.4 Combi Funnel for Bulk- and Long Material

The combi funnel is used for:

1. freeflowing pourable material.
 2. grinding long pieces of material such as straw or wood.
- For fine grinding < 2 mm, the exhaust system (section 4.5 Exhaust System) must be used.

4.5 Exhaust System

(Sample exhauster with cyclone dust chamber)

- Insert the adapter for the exhauster in the same manner as a collecting vessel.
- Connect the connecting hose with the adapter and the exhaust system.
- Close the cutting mill.
- Screw the collecting glass on the cyclone (at the lower end of the exhaust system), ensure that the connecting hose fits securely, and switch on the exhaust system.

There are two opposing hose connectors on the exhaust system. Do not use the closed connection. Leave it closed. Noise Level will be higher

- Switch on the machine (as in section 4.1) and the exhaust system.
- Fill in a small quantity of material to be ground by hand, and note the grinding noises. If the motor speed decreases audibly, reduce the feed slightly. A rapid eddy with ground material should form in the collecting glass.

The quantity of material to be ground will depend on the feed grain size and the grindability of the material. It is best to start with small quantities and increase the quantity depending on the success of the grinding process.

When the collecting glass is 2/3 full, grinding must be interrupted (switch off the cutting mill and the cyclone) and the collecting glass emptied.

If grinding is not interrupted when the collecting glass is 2/3 full, the separator effect will decrease and the material will increasingly clog the filter of the exhaust system.

If the ground material eddying in the collecting glass slows down, this means that the air throughflow or the air speed has decreased:

- the sieve must be cleaned and /or
- the filter of the exhaust system must be cleaned.

The fine fraction (fine dust) of the sample is deposited in the filter of the exhaust system. Clean the filter from time to time by suction or blowing.

The exhaust system is especially recommended in combination with the combination-funnel for long- and bulk solids.

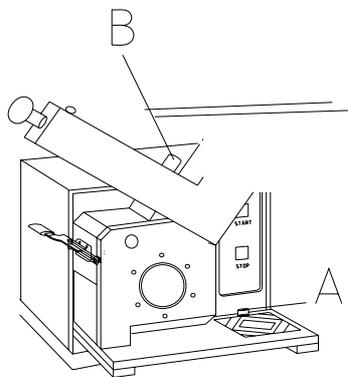
5 Cleaning

When disconnected from mains, the instrument can be wiped over with a moistened cloth.

It is recommended that the cutting chamber be cleaned with a vacuum cleaner and dry paint brush or by blowing out with compressed air.

Do not allow any liquids to seep into the machine.

1. Unscrew the rubber buffer (A).
2. Open the closure hatch and pull it upwards to detach it.



3. (Slowly) open the housing upper section fully.
4. Screw the rod of the press plunger (to the right of the funnel) fully out of the plunger; at the same time, push the press plunger out to the left.
5. Grip the press plunger from the left, and pull it out.

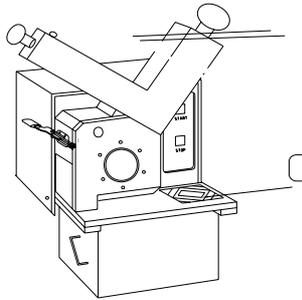
The press plunger and the interior of the funnel can then be cleaned.

During reassembly, ensure that all the parts fit securely.

5.1 Cleaning the Exhaust system (Sample exhauster with cyclone dust chamber)

The exhaust system can be dismantled and cleaned after the clips are opened. To open and clean the cyclone, two Phillips screws in the inner base part must be undone.

6 Maintenance



Disconnect mains connector before starting any work.
Disconnect mains connector and secure instrument against being turned on again accidentally
When maintenance work is being performed, this should be indicated with a warning sign.

Regular cleaning is the most important maintenance function for the cutting mill.

Functional part	Task	Test	Maintenance interval
Filter of the cutting mill	Filtering exhaust air	Clean the filter insert (C) as described above; lever it out in an upwards direction with a screwdriver or similar tool	Before each grinding operation
Safety lock	Locking the closure hatch	Check that the closure hatch remains shut when the main switch is off?	Before each use
Safety switch	Securing the lower opening of the cutting chamber	Check the machine runs without the collecting vessel or the adapter for the exhaust system?	Before each use
START button	Indicating readiness for operation	Check that the START button comes on when the main switch is on?	Before each use
Rotor	Comminuting material	Check that the rotor sharp? Maintenance: resharpening	Before each use
Stationary knife	Comminuting material	Check that the knife sharp? Maintenance: resharpening	Before each use
Cutting gap	Cutting operation	Measure the gap width	After every rotor change
Cones	Centring the rotor	Check the cones for cleanness and grooves	After every rotor change

7 Warranty

The warranty card accompanying this instrument must be returned to the manufacturer, duly filled out, in order for the warranty to become effective.

We, Fritsch GmbH, Germany, our application technology laboratory and our agent in your country will gladly provide advice and assistance with this instrument.

Always include the serial number shown on the nameplate with any queries.

8 Troubleshooting Checklist

Malfunction	Possible cause	Elimination of error
START button not illuminated	Not connected to mains	Plug in mains plug
	Main switch	Switch on the main switch
	In case of three-phase a.c. motor: Incorrect direction of rotation	Change two phases
	Circuit breaker of the building	Press in the circuit breaker
	Fuse burnt out	Remove the housing and replace the fuse
START button pressed but Mill does not start up	hatch not properly closed	Clean the contact surface Close the closure hatch
	Collecting basin or adapter for the exhauster not pushed in properly	Push in the collecting vessel or the adapter for the exhaust system properly so that the switching tongue engages
Motor stops STOP button comes on	Mill protection switch triggered	Motor protection switch (see chapter 4.3).
		Eliminate cause of malfunction
		Reduce the feed quantity
Material escapes	Material is extremely fine	
Uneven running with severe vibration	<ul style="list-style-type: none"> • Rotor imbalance • Bearing in closure hatch defective • Parts broken off the rotor 	<ul style="list-style-type: none"> • Cones contaminated • Replace bearing • Replace rotor

There is a copy of the circuit diagrams in the machine.

9 List of keywords

A

Applications 2

D

direction of rotation 7

drive 3

E

electrical connection 9

electrical safety 7

exhaust system 17, 19

M

main switch 20

maintenance 19

material 4, 17

O

overloading 7, 16

P

Protection against Restarting 7

protective device 6

Protective devices 5

purpose 5

S

Sample exhauster with cyclone dust chamber 17, 19

switching on 9