Manual
Cross Beater Mill SK300

Translation

1 Notes on the Operating Manual

This operating manual is a technical guide on how to operate the device safely and it contains all the information required for the areas specified in the table of contents. This technical documentation is a reference and instruction manual. The individual chapters are complete in themselves.

Familiarity (of the respective target groups defined according to area) with the relevant chapters is a precondition for the safe and appropriate use of the device.

This operating manual does not contain any repair instructions. If faults arise or repairs are necessary, please contact your supplier or get in touch with Retsch GmbH directly.

Application technology information relating to samples to be processed is not included but can be read on the Internet on the respective device's page at www.retsch.com.

Changes

Subject to technical changes.

1.1 Explanations of the safety warnings

In this Operating Manual we give you the following safety warnings

Serious injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ WARNING

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ WARNING

Moderate or mild injury may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.

⚠ CAUTION

Type of danger / personal injury
Source of danger

– Possible consequences if the dangers are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:

⚠ CAUTION

In the event of possible **property damage** we inform you with the word “Instructions” and the corresponding content.

NOTICE

Nature of the property damage
Source of property damage

– Possible consequences if the instructions are not observed.

• **Instructions on how the dangers are to be avoided.**

We also use the following signal word in the text or in the instructions on action to be taken:

NOTICE

1.2 General safety instructions

CAUTION

Read the Operating Manual
Non-observance of these operating instructions

– The non-observance of these operating instructions can result in personal injuries.

- **Read the operating manual before using the device.**
- **We use the adjacent symbol to draw attention to the necessity of knowing the contents of this operating manual.**

Target group : All persons concerned with the machine in any form

This machine is a modern, high performance product from Retsch GmbH and complies with the state of the art. Operational safety is given if the machine is handled for the intended purpose and attention is given to this technical documentation.

You, as the owner/managing operator of the machine, must ensure that the people entrusted with working on the machine:

- have noted and understood all the regulations regarding safety,
- are familiar before starting work with all the operating instructions and specifications for the target group relevant for them,
- have easy access always to the technical documentation for this machine,
- and that new personnel before starting work on the machine are familiarised with the safe handling of the machine and its use for its intended purpose, either by verbal instructions from a competent person and/or by means of this technical documentation.

Improper operation can result in personal injuries and material damage. You are responsible for your own safety and that of your employees.
Make sure that no unauthorised person has access to the machine.

CAUTION

Changes to the machine

– Changes to the machine may lead to personal injury.

- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

NOTICE

Changes to the machine

– The conformity declared by Retsch with the European Directives will lose its validity.

– You lose all warranty claims.

- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

1.3 Repairs

This operating manual does not contain any repair instructions. For your own safety, repairs may only be carried out by Retsch GmbH or an authorized representative or by Retsch service engineers.

In that case please inform:

The Retsch representative in your country
Your supplier
Retsch GmbH directly

Your Service Address:

2 Confirmation

This operating manual contains essential instructions for operating and maintaining the device which must be strictly observed. It is essential that they be read by the operator and by the qualified staff responsible for the device before the device is commissioned. This operating manual must be available and accessible at the place of use at all times.

The user of the device herewith confirms to the managing operator (owner) that (s)he has received sufficient instructions about the operation and maintenance of the system. The user has received the operating manual, has read and taken note of its contents and consequently has all the information required for safe operation and is sufficiently familiar with the device.
As the owner/managing operator you should for your own protection have your employees confirm that they have received the instructions about the operation of the machine.

I have read and taken note of the contents of all chapters in this operating manual as well as all safety instructions and warnings.

User
_____
Surname, first name (block letters)
_____
Position in the company
_____
Signature

Service technician or operator
_____
Surname, first name (block letters)
_____
Position in the company
_____
Place, date and signature

3 Transport, scope of delivery, installation

3.1 Packaging

The packaging has been adapted to the mode of transport. It complies with the generally applicable packaging guidelines.

NOTICE

Storage of packaging

– In the event of a complaint or return, your warranty claims may be endangered if the packaging is inadequate or the machine has not been secured correctly.

• **Please keep the packaging for the duration of the warranty period.**

3.2 Transport

NOTICE

Transport

– Mechanical or electronic components may be damaged.

• **The machine may not be knocked, shaken or thrown during transport.**

3.3 Temperature fluctuations and condensation

NOTICE

Temperature fluctuations

The machine may be subject to strong temperature fluctuations during transport (e.g. aircraft transport)

– The resultant condensed water may damage electronic components.

• **Protect the machine from condensed water.**

3.4 Conditions for the place of installation

Ambient temperature: 5°C to 40°C

NOTICE

Ambient temperature

– Electronic and mechanical components may be damaged and the performance data alter to an unknown extent.

• **Do not exceed or fall below the permitted temperature range of the machine (5°C to 40°C / ambient temperature).**

Atmospheric humidity:

Maximum relative humidity 80% at temperatures up to 31°C, decreasing linearly up to 50% relative humidity at 40°C

NOTICE

Atmospheric humidity

– Electronic and mechanical components may be damaged and the performance data alter to an unknown extent.

• **Do not exceed the admissible range for atmospheric humidity.**

3.5 Electrical connection

⚠ WARNING

When connecting the power cable to the mains supply, use an external fusethat complies with the regulations applicable to the place of installation .

- Please check the type plate for details on the necessary voltage and frequency for the device.
- Make sure the levels agree with the existing mains power supply.
- Use the supplied connection cable to connect the device to the mains power supply.

NOTICE

Electrical connection

– Mechanical or electronic components may be damaged.

• **Please observe the information on the type plate.**

3.6 Type plate description

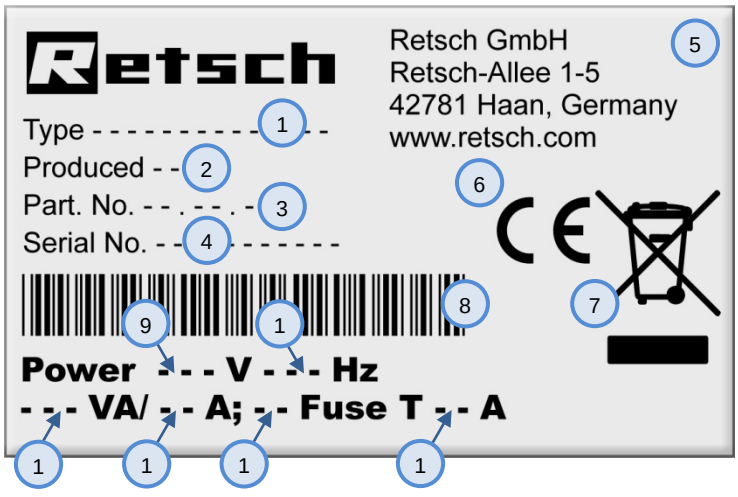

Fig. 1: Type plate lettering

1 Device designation
2 Year of production
3 Part number
4 Serial number
5 Manufacturer's address
6 CE marking
7 Disposal label
8 Bar code

9 Power version
10 Mains frequency
11 Capacity
12 Amperage
13 Number of fuses
14 Fuse type and fuse strength

In the case of questions please provide the device designation (1) or the part number (3) and the serial number (4) of the device.

3.7 Transport

WARNING

Serious personal injury
Falling loads

– The appliance is very heavy and can therefore cause serious personal injuries if it falls down.

• **Lifting above head height is not permissible!**

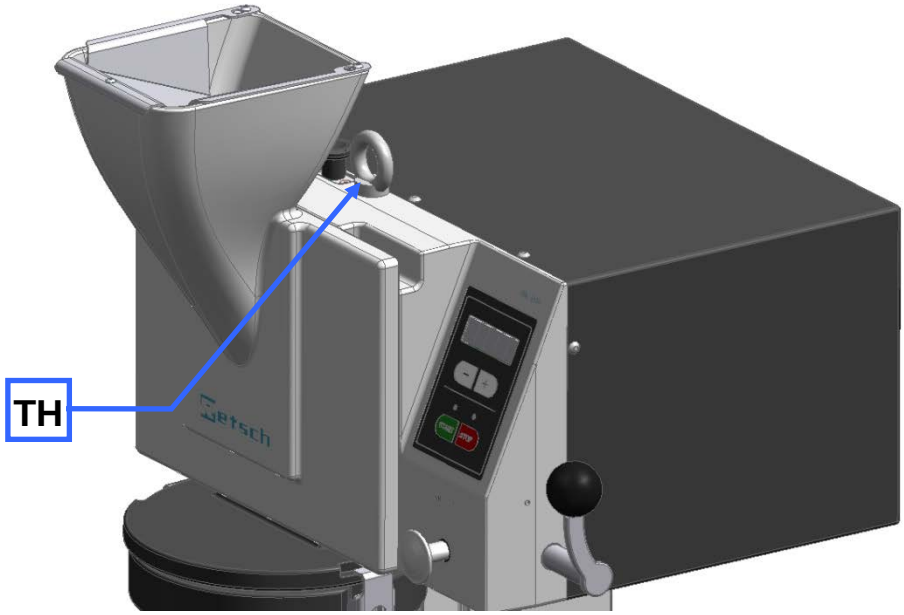

Fig. 2: Removing the transport aid

Only lift and transport the device using the transport lug (TH) provided. Net weight approx. 70 kg.

NOTICE

Only use transport belts that are approved for the weight.

• Remove the transport lug.

NOTICE

Transport

– Mechanical or electronic components may be damaged.

• **The machine may not be knocked, shaken or thrown during transport.**

3.8 Frame assembly

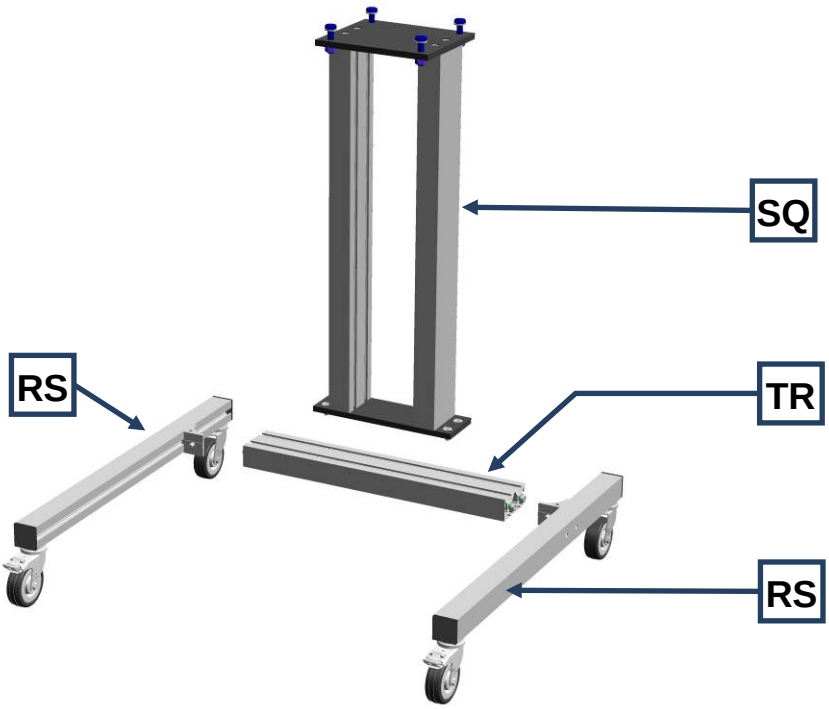

Fig. 3: Individual parts of stand

Individual parts of the frame (optional accessory) have been pre-assembled for easier assembly.

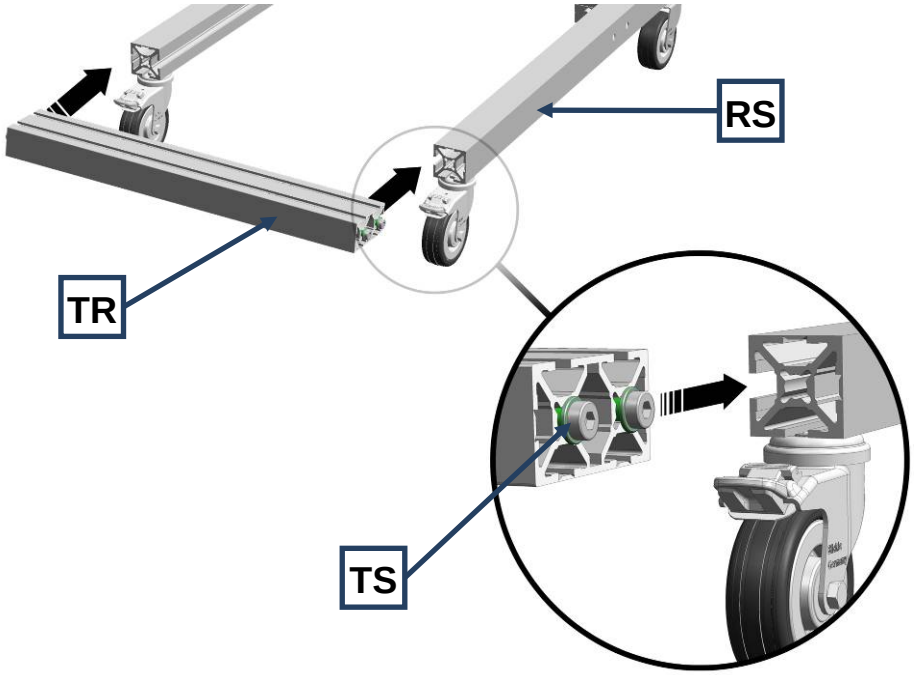

Fig. 4: Assembling the cross beam

- Where necessary, loosen the four screws (**TS**) on the cross beam (**TR**) slightly.
- Slide the cross beam into the guides at the side of the left-hand and right-hand roller track (**RS**).

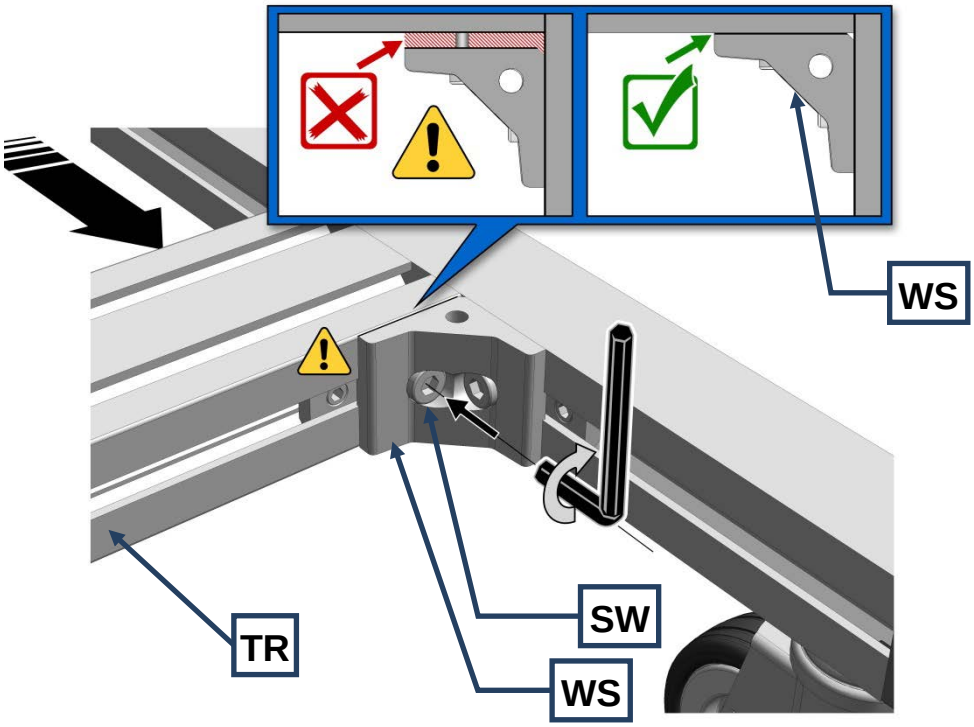

Fig. 5: Securing the cross beam bracket

NOTICE

Ensure that the cross beam (**TR**) lies flush on the pre-assembled bracket element (**WS**).

Tighten the screw (**SW**) on the left-hand and right-hand bracket element.

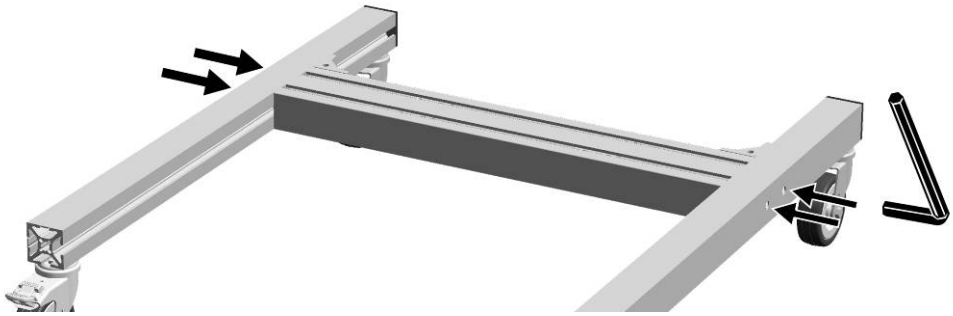

Fig. 6: Screwing the cross beam tight

- Screw the four Allen screws tight.

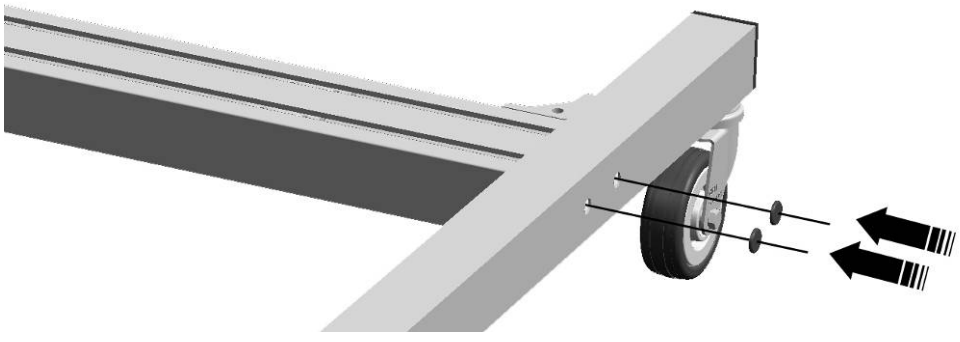

Fig. 7: Fitting the side protective caps

- Place the four black plastic caps on the openings.

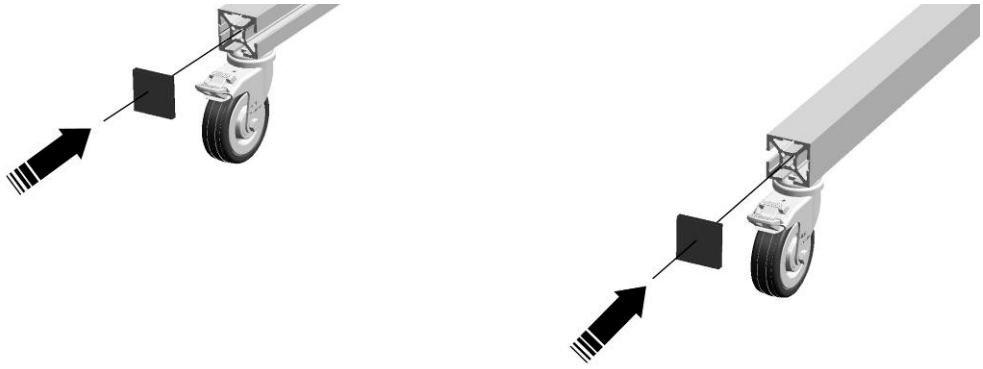

Fig. 8: Fitting the front protective caps

- Place both caps on the ends of the roller track.

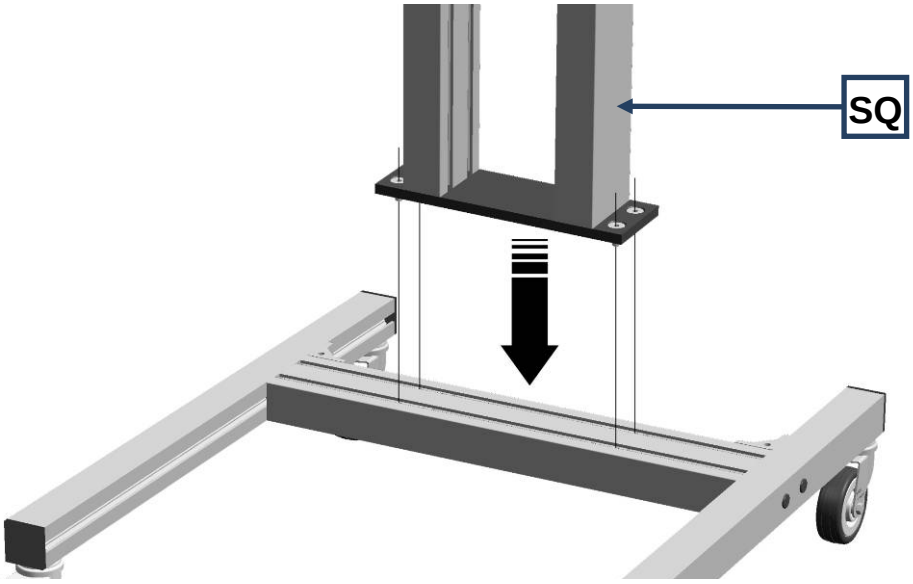

Fig. 9: Placing the stand on the cross beam

- Place the stand (**SQ**) on the cross beam.

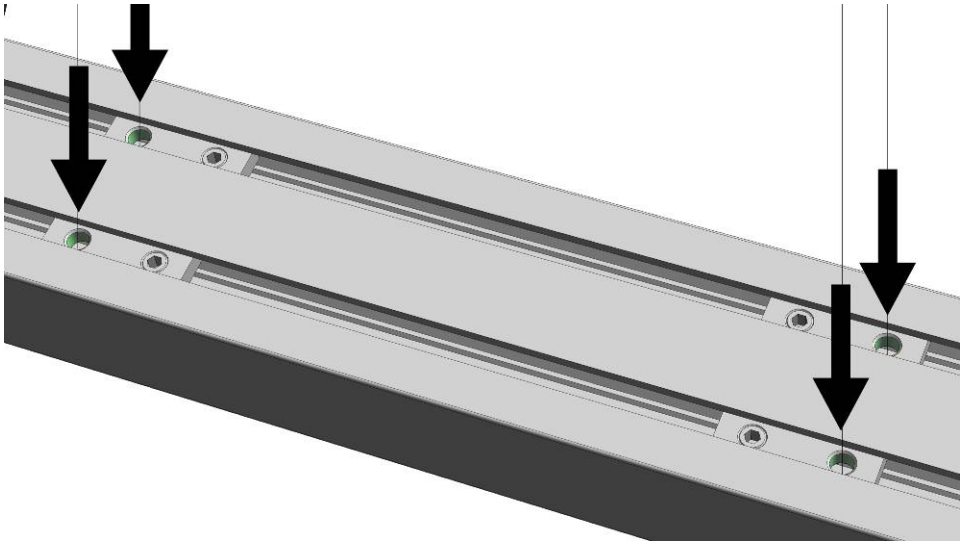

Fig. 10: Attachment points on the stand

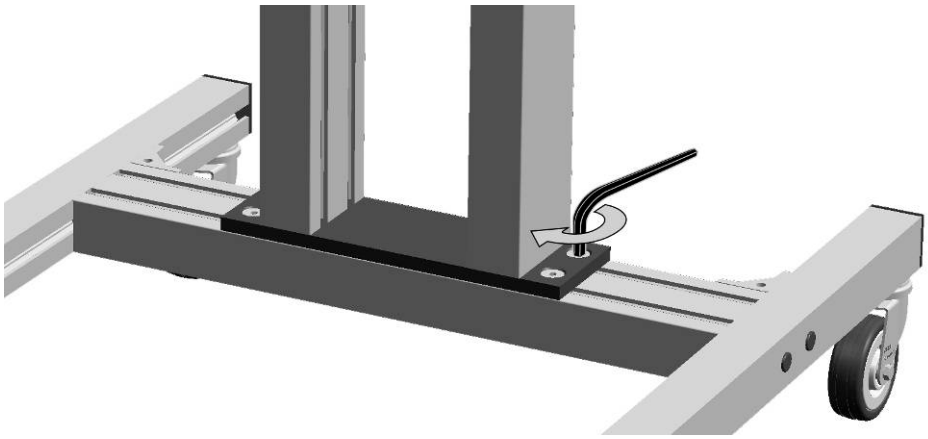

Fig. 11: Screwing the stand tightly onto the cross beam

- Screw the stand (**SQ**) onto the cross beam.

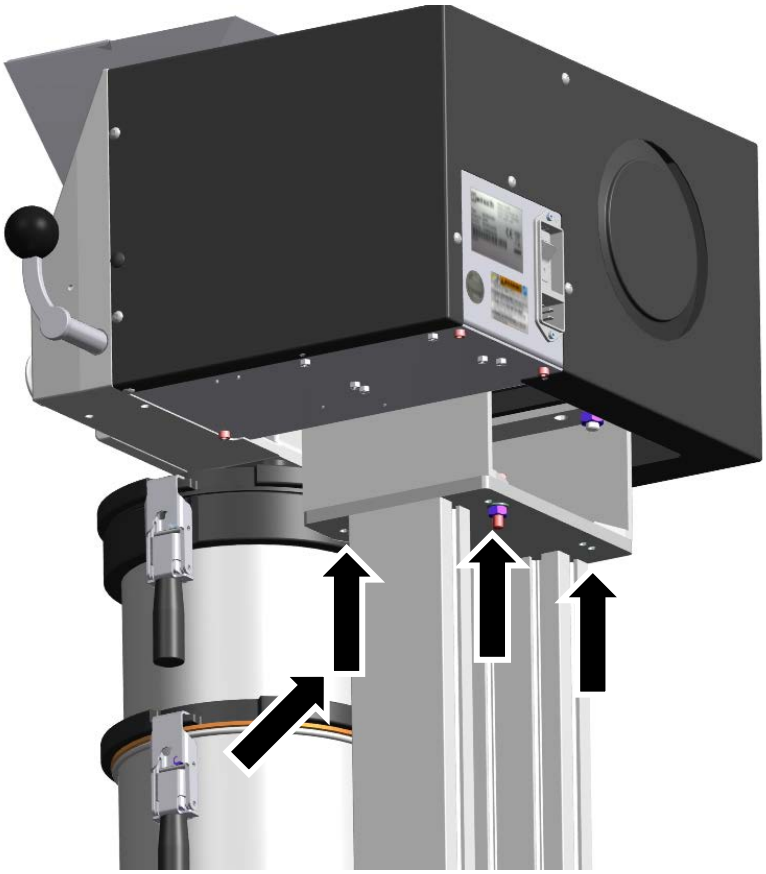

Fig. 12: SK 300 assembly

- Then place the SK300 on the base frame.
- Screw the SK300 housing tightly to the base frame using the 4 screws.

3.9 Installation of the machine

Installation height: maximum 2000 m above sea level

NOTE

Installation

– Depending on the operating status of the mill, there may be slight vibrations.

• **Place the mill on an even, flat and balanced supporting surface only. The supporting surface must be stable and must not vibrate.**

NOTICE

Installation of the machine

– It must be possible to disconnet the machine from the mains at any time.

• **Install the machine such that the connection for the mains cable is easily accessible.**

4 Technical data

4.1 Use of the machine for the intended purpose

Target group: Operating companies, operators

Machine type designation: SK300

This high performance cross beater mill is used for batch-wise or continuous grinding of elastic and fibrous products and product mixes. This device has also fundamentally not been designed for the grinding of wet or damp materials. The special shape of the cutting tools in conjunction with the drive achieves a fast, efficient grinding without putting any strain on the ground material.

Special features

The new high performance cross beater mill is impressive when used for difficult grinding tasks where other cross beater mills fail. The device permits a particularly effective grinding of heterogeneous material mixes such as slag, chalk, rock samples or ores. Analytical fineness is usually achieved in a single step. The cross beater mill is also used successfully for a large number of other materials. The sample material is only slightly heated in the process, so that the mill is also suitable for temperature-sensitive materials.

Together with the large selection of sieves, hoppers and collecting vessels, it is possible to adjust it to suit individual tasks.

– Fast, gradual grinding using 3-blade rotor
– Rotor made from high quality material
– High level of operator convenience due to central locking and control console
– Consistent operating safety in all operator-related device components
– Diverse application possible due to device versions and wide range of accessories
– Powerful grinding thanks to 1.5 kW motor with high torque
– Very quick cleaning thanks to push-fit rotor
– Defined final fineness using bottom sieves with mesh sizes of 0.12 - 10 mm

NOTICE

Area of use of the machine

– This machine is a laboratory machine designed for 8-hour single-shift operation.
• **This machine may not be used as a production machine nor is it intended for continuous operation.**

4.2 Emissions

CAUTION

Damage to hearing
The level of noise can be high depending on the type of material, the knife used, the speed set and the duration of the grinding process.

- Noise that is excessive in terms of level and duration can cause impaired or permanently damaged hearing.

- **Ensure suitable sound-proofing measures or wear hearing protection.**

Noise measurement in accordance with DIN 45635-31-01-KL3.
Emission at a distance of 1m:

– approx. 68 dB (A) during idling

During grinding, depending on the sample material:

– approx. 85 to 95 dB (A) with peaks of up to 110 dB (A)

4.3 Degree of protection

– IP41

4.4 Motor rotation speed

The motor speed is 2000-4000 min^{-1}.

4.5 Receptacle volume

The material capacity is < 5 l and can be increased to up to 30 l using accessories.

4.6 Rated power

– 1150 W

4.7 Dimensions and weight

Height: 1200 mm
Width: 580 mm
Depth: 700 mm
Weight: approx. 45 kg plus optional 12 kg base frame

4.8 Required floor space

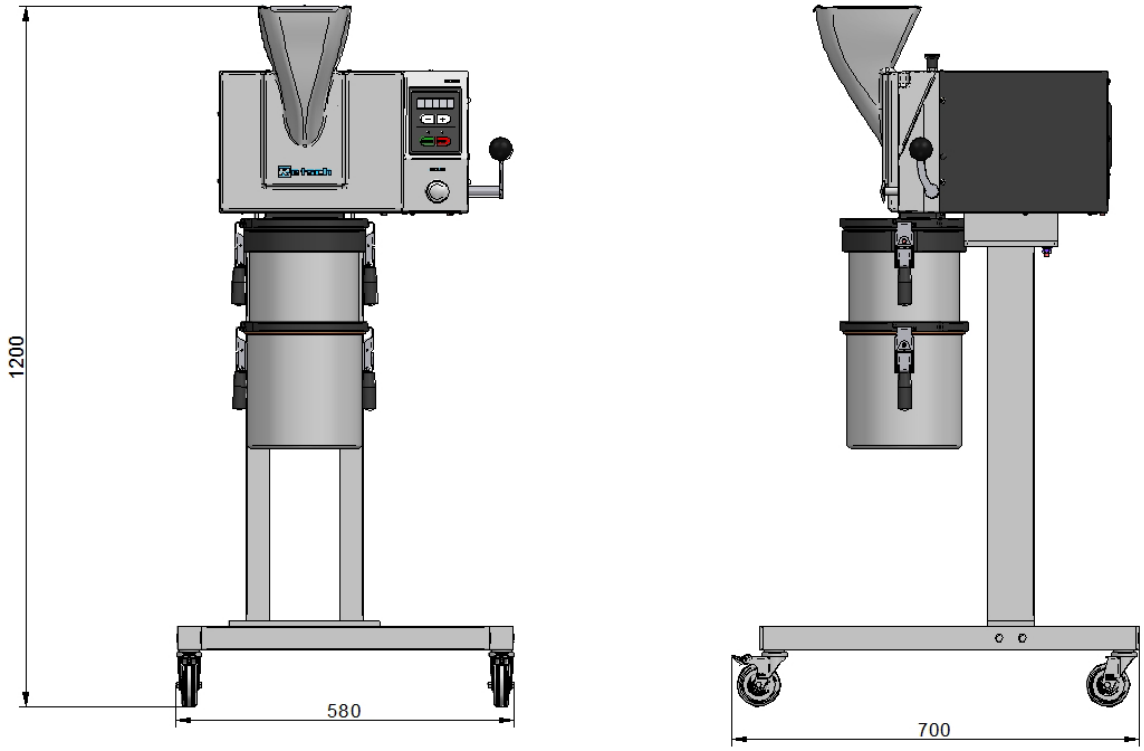

Fig. 1: View of the footprint
With optional “base frame” accessory.

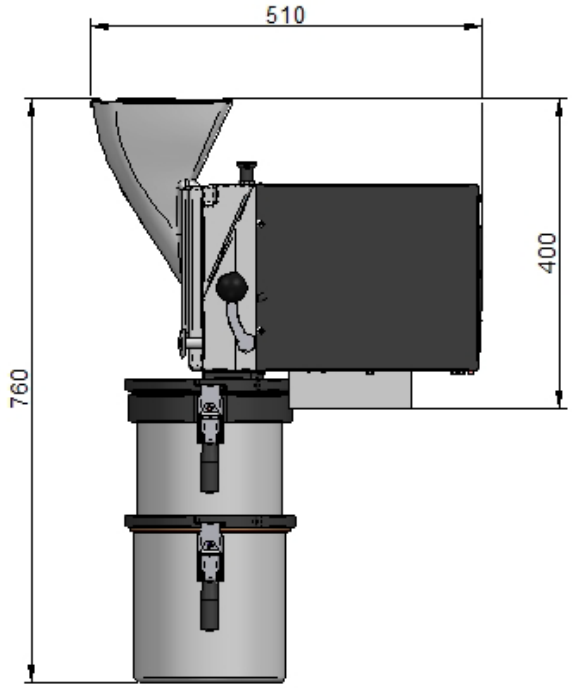

Fig. 2: View of the footprint from the side

5 Operating the machine

5.1 Views of the Instrument

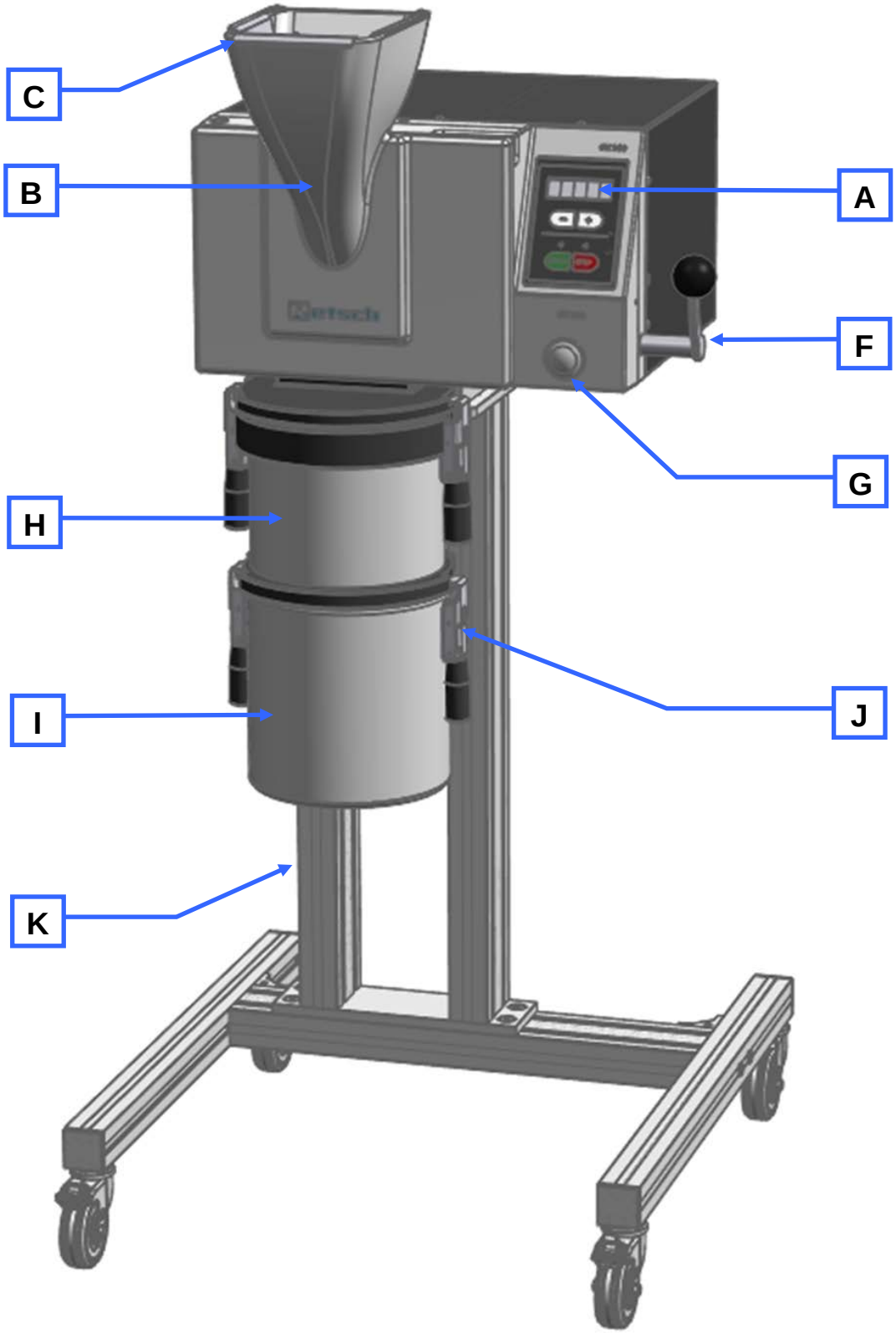

Fig. 3: Front view

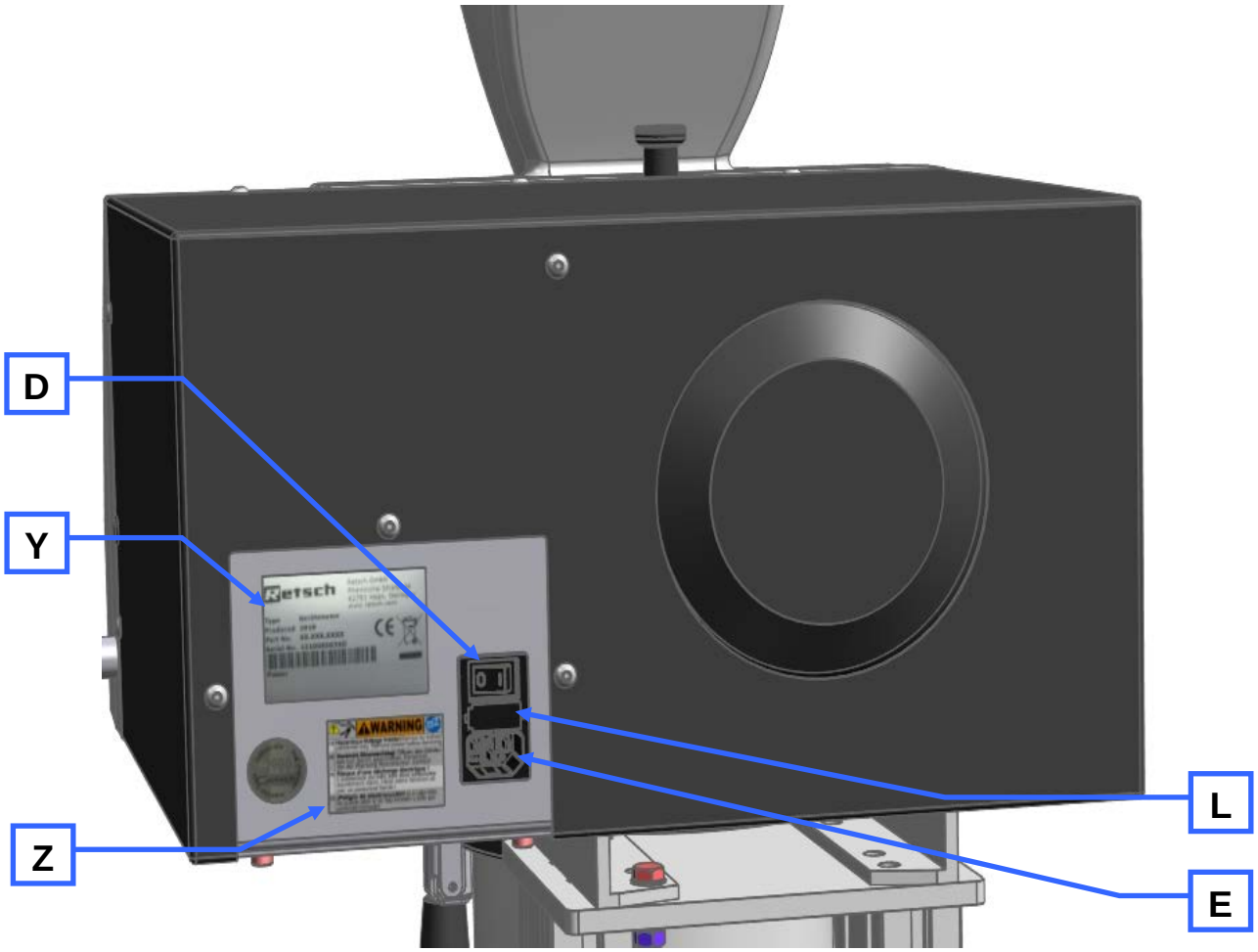

Fig. 4: Back view

5.2 Overview table of the parts of the device

Element	Description	Function
A	Control panel	Controls the device
B	Fill hopper	Receives the grinding material
C	Splash-back protection	Prevents material being ejected
D	Main switch	Disconnects/ connects the device from/to the mains
E	IEC socket	Power supply for the power cable
F	Door bolt	Locks the door
G	Lock	Locks the door bolt
H	Ring filter	Ensures pressure compensation
I	Collecting receptacle	Receives the ground material

J	Lifting and clamping lever on collecting receptacle	This enables the collecting receptacle to be carried when unfolded or to be tightly sealed when clamped.
K	Base frame	Supports the mill
Y	Type plate	Description of device parameters
Z	Warning sign to pull out the plug	Warning of electric shock
L	Safety fuse	To protect user and device in the event of an electrical fault on the device

5.3 Operating elements and displays

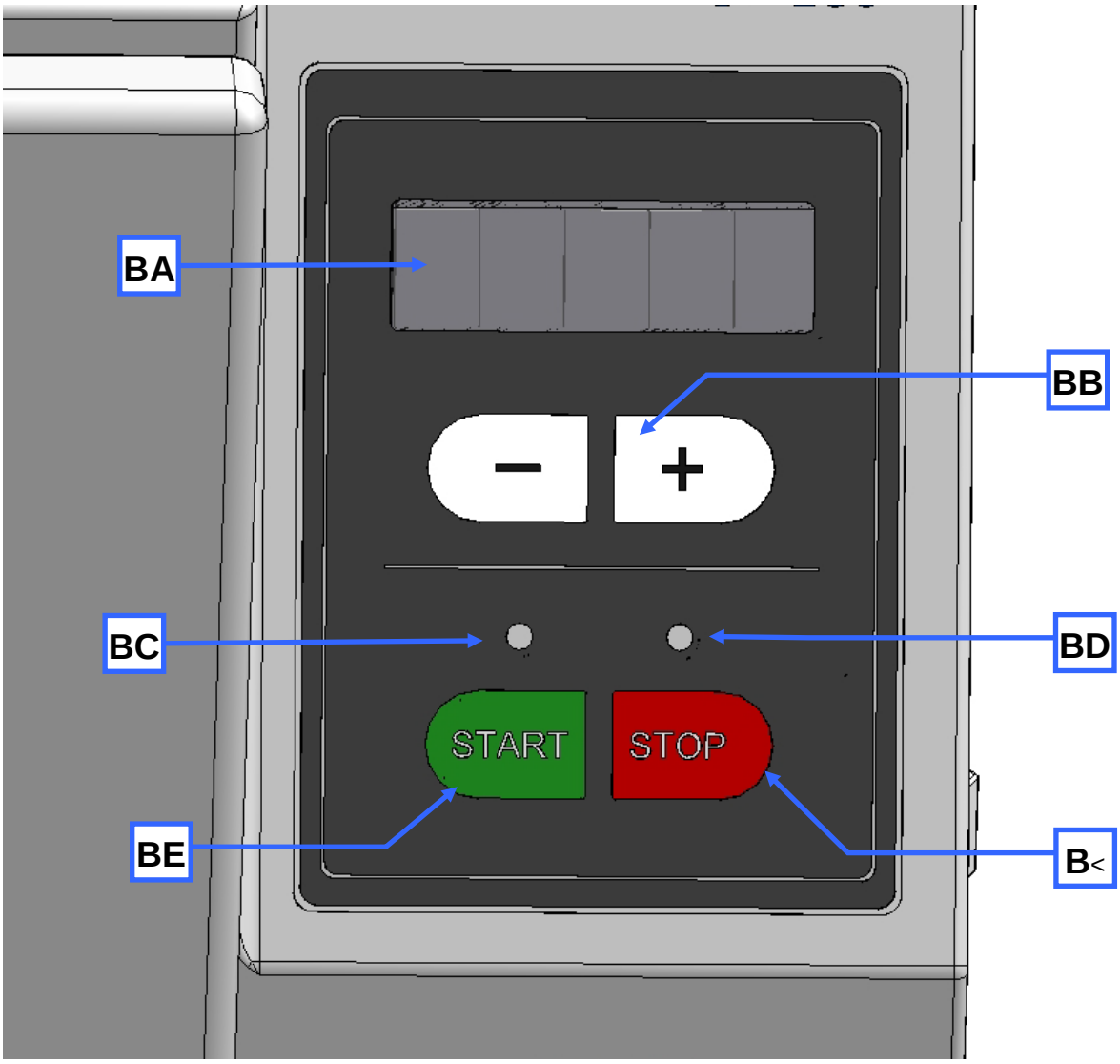

Fig. 5: Diagram of the control panel

5.4 Overview Table of the Operating Elements and the Display

Element	Description	Function
BA	Display	Displays the control functions and parameters
BB	+ and - buttons	Used to set the speed
BC	Status LED START	Lights up when Start is pressed
BD	Status LED STOP	Lights up when STOP is pressed
BE	START button	Starts grinding
BF	STOP button	Stops grinding

5.5 Opening and closing of the grinding chamber

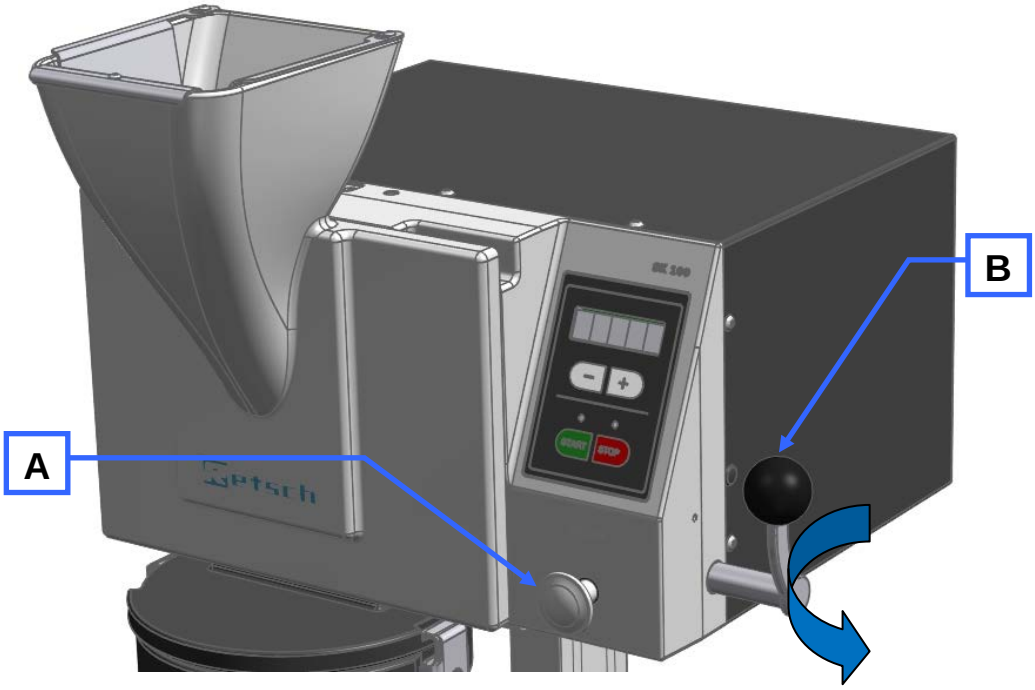

Fig. 6: View of locking device

5.5.1 Opening the device

The following steps are required to start the grinding process.

- Connect the device to the mains supply.
- Switch the main switch on the back on.
- H42 appears in the display
- Pull the knob (**A**) forward and hold.
- Turn the lever (**B**) to the front.

The door can then be opened.

5.5.2 Closing the device

It is only possible to lock the grinding chamber when the device is connected to the mains and the main switch on the back of the device has been switched on.

- Close the door.
- Turn the lever (**B**) to the back.
- The knob (**A**) engages.

The electric interlock is only activated on starting.

CAUTION

Injuries in the form of cuts

Sharp cutting edges on the rotors and cutting bars

– The sharp cutting edges on the rotors and cutting bars can injure hands.

• **Wear protective gloves when replacing the cutting rotors and cleaning the grinding chamber.**

• **Use the rotor extraction tool when handling the cutting rotors**.

NOTE

Reduction of tool service life

Abrasive sample materials

– The presence of abrasive composite materials during grinding can considerably reduce tool service life.

• **When grinding electronic scrap, take the properties of the composite materials into account.**

NOTE

Damage to mechanical components

Blockages typical of cutting mills

– When coarse, solid material is fed in for grinding, the high feeding capacity of the standard rotor can cause blockages that are typical of the cutting mills.

• **If blockages occur, switch off the mill immediately and remove the clogging material.**

5.6 Inserting the grinding chamber cassettes, bottom sieve and cross beater

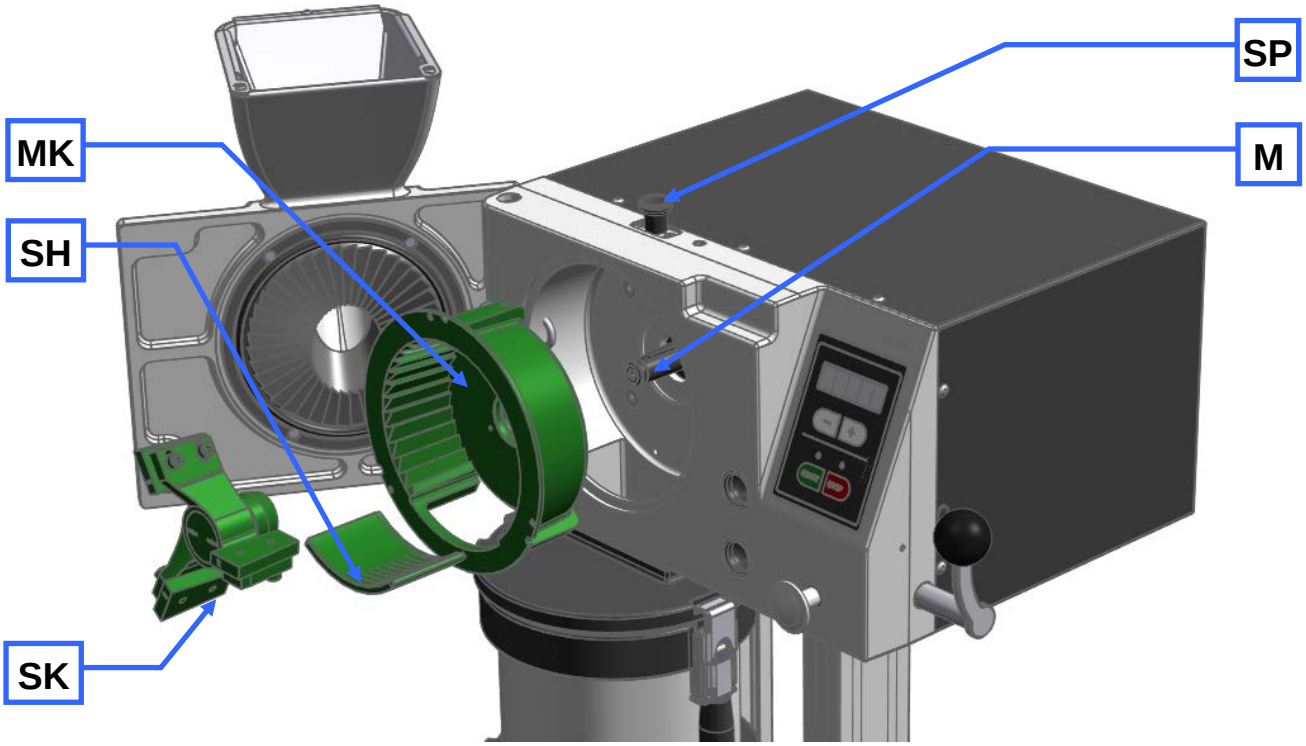

Fig. 7: Inserting the grinding set

NOTICE

The steps must be performed in this order. Before assembling, it is essential to ensure that both the motor shaft and the mounting hole of the cross beater have been cleaned.

5.6.1 Inserting the grinding chamber cassette

- Pull the button (**SP**) up.
- Align the grinding chamber cassette (**MK**) against the bolt in the housing.
- Slide the grinding chamber cassette (**MK**) into the housing and allow the bolt of the button (**SP**) to engage in the hole of the grinding chamber cassette.

5.6.2 Inserting the bottom sieve

- Slide the sieve frame (**SH**) into the grinding chamber cassette (**MK**).
  - Different versions of bottom sieve are available. Please refer to information on the Retsch website as necessary

5.6.3 Inserting the cross beater

- Slide the cross beater (**SK**) onto the motor shaft and align it by twisting towards the feather key until the safety ring engages in the groove on the motor shaft.
- Slide it onto the motor shaft until it engages.

After these steps you can close the device.

5.6.4 Removing the grinding set

- Carry out the steps in the previous chapter in reverse order.

5.7 Inserting the filter unit and collecting receptacle

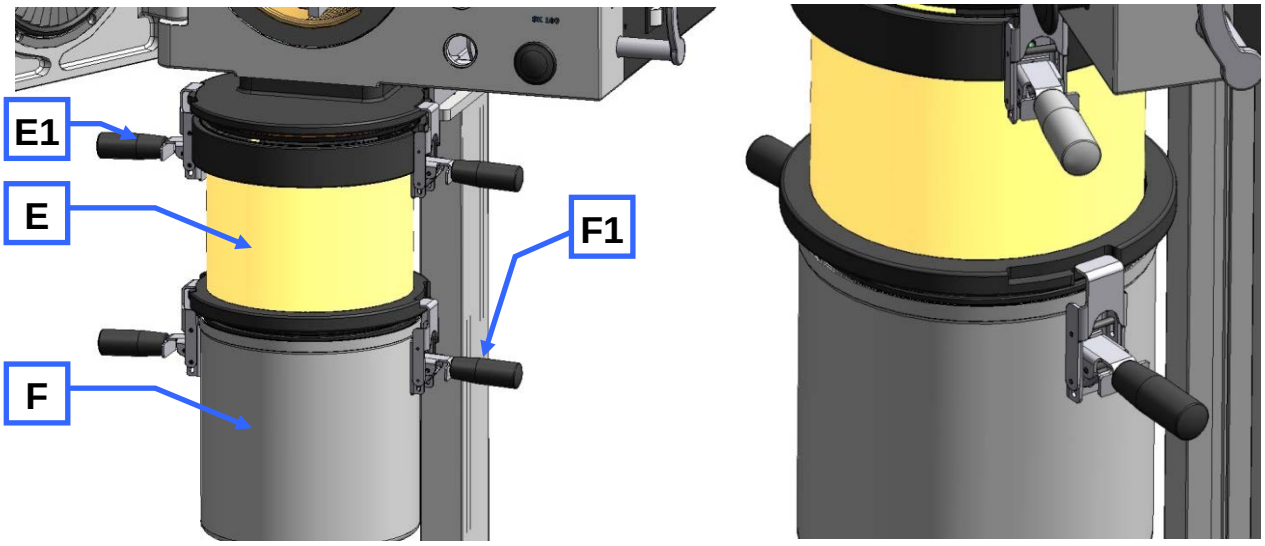

Fig. 8: View of securing the filter unit

Through the use of the textile filter hose or a filter available as accessory, which is secured between the SK 300 and the collecting receptacle, the air flow generated by the rotating rotary beater can be led away and directed downwards to the material discharge. It furthermore accelerates the material throughput and guarantees separation of the solid fraction in the air flow

- Slide the filter hose **E** onto the flange, keeping the locks at an angle
- Clamp lock **E1**
- Insert the collecting receptacle **F**
- Clamp the locks **F1** (hold at an angle)

If the collecting receptacle is attached without filter hose, dust may be expected to escape from the fill hopper; for this reason you should never operate the SK 300 without filter hose or filter.

Place grinding material in

Do not exceed the maximum feed size of 25mm.

For batch-wise or continuous operation, the SK 300 can be retrofitted with a 30 l plastic container and a model DR 100/75 vibratory feeder available as accessories.

5.8 Manual operation

5.8.1 Switching on / off

Switching the device on/off.

- Switch the device on using the on/off switch at the back.

5.8.2 Speed

2000 – 4000 revolutions per minute.

The speed can be adjusted in steps of 200 min-1.

5.8.3 Adjusting the speed

The speed can be adjusted in steps of 200 using the “+” and “-” buttons (BB).

5.8.4 Starting the grinding process

Start grinding.

- Press START (**E**) to start grinding.

The motor then starts running.

5.8.5 Stopping the grinding process

Stop grinding.

- Press STOP (**F**) to end grinding.

– The cross beater is slowed down. The door can be opened once the motor has come to a halt.

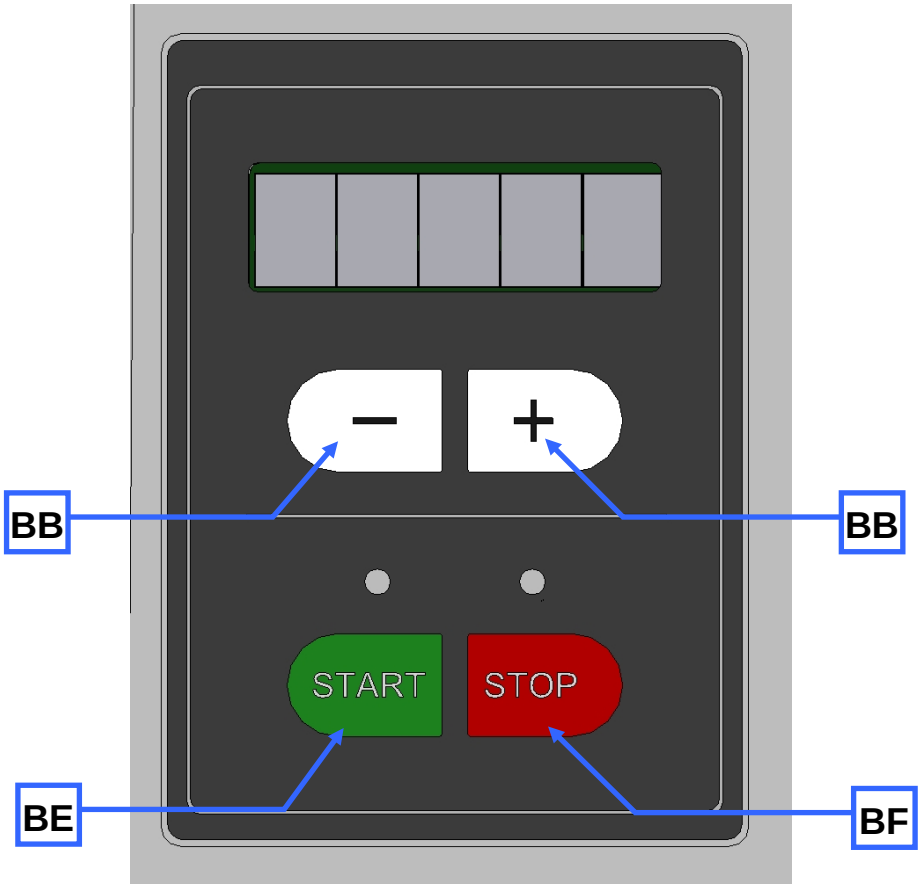

Fig. 9: Start / Stop

6 Cleaning, wear and service

WARNING

Risk of a fatal electric shock

- An electric shock can cause injuries in the form of burns and cardiac arrhythmia, respiratory arrest or cardiac arrest.

- **Do not clean the blender under running water. Use only a cloth dampened with water.**
- **Disconnect the power supply plug before cleaning the blender.**

WARNING

W0012

The device must always be switched off and disconnected from the mains before any interventions for cleaning or servicing purposes.

6.1 Cleaning the Grinding Tools

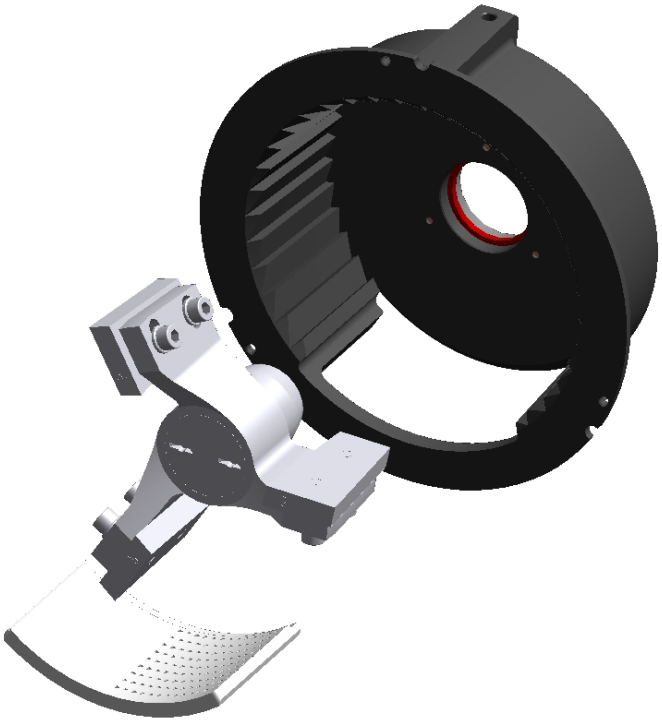

Fig. 10: Grinding chamber cassette, bottom sieve and cross beater

The grinding chamber cassette, bottom sieve and cross beater can be removed to simplify cleaning. Cleaning should take place regularly.

- Refer to Chapter 5.6, Inserting the grinding chamber cassette, bottom sieve and cross beater, for the order of dismantling. Before assembling, it is essential to ensure that both the motor shaft and the mounting hole of the rotary beater have been cleaned.

When you have removed the grinding set, you should grease the felt ring with a few drops of machine oil once a week (see Fig. Felt ring)

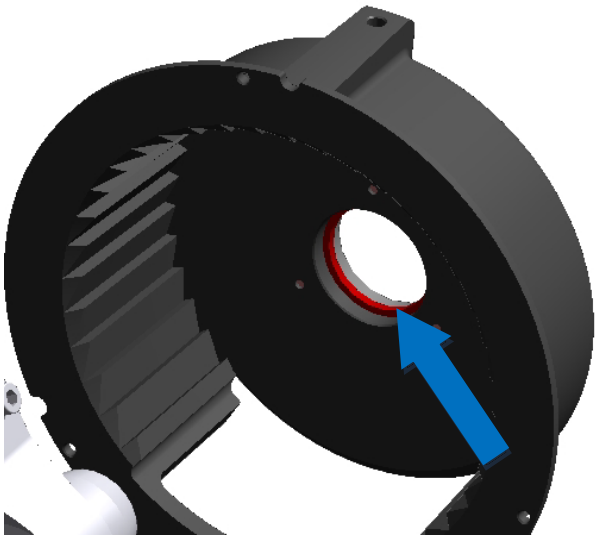

Fig. 11: Felt ring

If the felt ring is worn , remove the grinding set. There are three screws on the back of the grinding chamber cassette.

- Remove these.
- Remove the metal ring (M) and replace the felt ring (F).
- Assemble everything in reverse order.

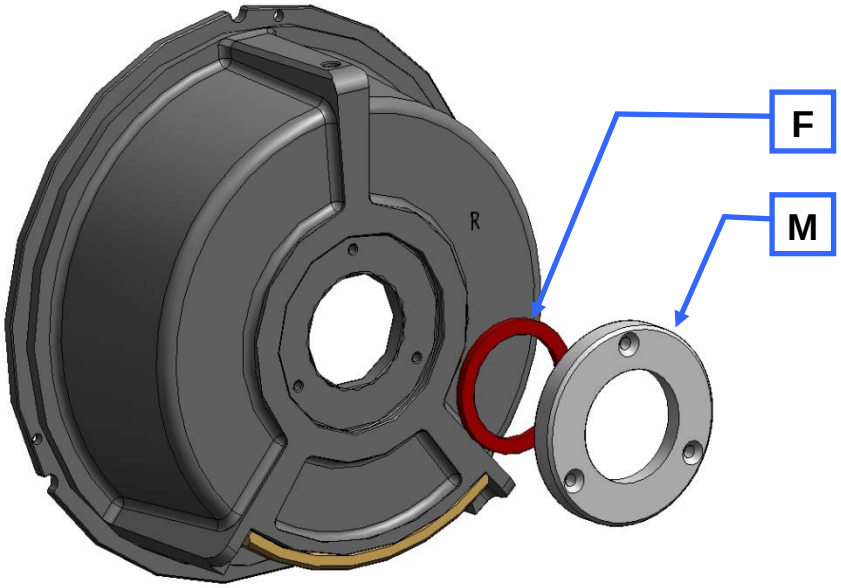

Fig. 12: View of the back of the grinding chamber cassette

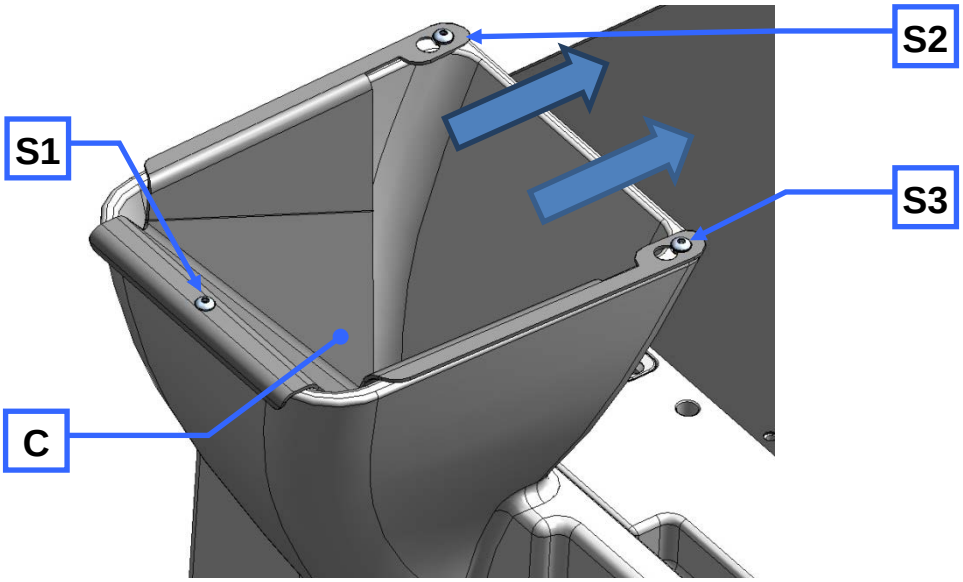

Fig. 13: Removing the splash-back protection

The splash-back protection can be removed to enable the fill hopper to be cleaned better.

- Remove the screw (S1)
- Unscrew the two screws (S2 / S3).
- Slide the splash-back protection (C) back slightly.
- Lift the splash-back protection (C) up and out of the fill hopper..

6.2 Changing the fuse

WARNING

W00014

Mortal danger from electric shock
Exposed power contacts

– When replacing fuses on the cutout or fuse adapter you may come into contact with live contacts. An electric shock can lead to burns and to cardiac arrhythmias or to respiratory arrest and cardiac arrest.

- **Remove the mains cable before replacing fuses.**

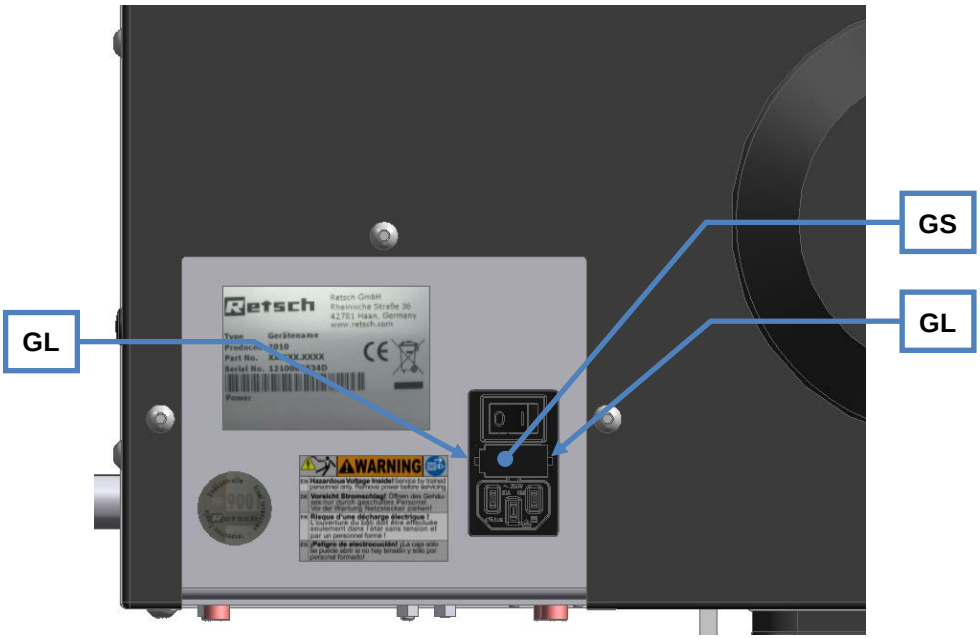

Fig. 14: Changing the fuse

NOTICE

Always replace both fuses.

– Fuse type: 2 x T10A 250V

- Press both lugs **(GL)** of the fuse holder **(GS)** together and pull the fuse holder out.
- Take the fuses out of the fuse holder and insert new fuses.
- Place the fuse holder with the inserted fuses in the opening.

7 Safety functions and fault display

Error code	(FEHLER) BESCHREIBUNG	FAULT DESCRIPTION TRANSLATION
E10	ANTRIEB ÜBERLASTET	DRIVE OVERLOAD
E11	FEHLER ANTRIEB/MOTOR	FAILURE DRIVE/MOTOR
E12	FEHLER MOTORBREMSE	FAILURE MOTOR BRAKE
E20	FEHLER STEUERUNG	FAILURE MAIN BOARD
E22	FEHLER TASTATUR	FAILURE KEYPAD
E26	FEHLER FREQUENZUMRICHTER	FAILURE FREQUENCY CONVERTER
E41	FEHLER DREHZAHLSENSOR	FAILURE SPEED SENSOR
E50	FEHLER SICHERHEITSKREIS	FAILURE IN SAFETY CIRCUIT
E51	FEHLER SICHERHEITSSCHALTER	SATETY SWITCH DEFECTIVE
E80	FEHLER SCHNITTSTELLE	FAILURE INTERFACE
H10	ANTRIEB ABKÜHLEN LASSEN!	ALLOW DRIVE TO COOL DOWN
H41	MAHLRAUM SCHLIESSEN	CLOSE GRINDING CHAMBER
H42	DECKEL/HAUBE ÖFFNEN UND SCHLIESSEN	OPEN AND CLOSE LID/COVER

8 Returning for service and maintenance

Fig. 13: Returned goods dispatch note

RETSCH devices and accessories can only be accepted for repair, maintenance or calibration if the returned goods despatch note has been correctly completed in full.

- When returning a device, attach the returned goods dispatch note to the outside of the packaging.

In order to eliminate any health risk to our employees, we reserve the right to refuse acceptance and to return the respective delivery at the expense of the sender.

9 Disposal

Please observe the respective statutory requirements with respect to disposal.

Information on disposal of electrical and electronic machines in the European Community.

Within the European Community the disposal of electrically operated devices is regulated by national provisions that are based on the EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Accordingly, all machines supplied after 13.08.2005 in the business-to-business area to which this product is classified, may no longer be disposed of with municipal or household waste. To document this they have the following label:

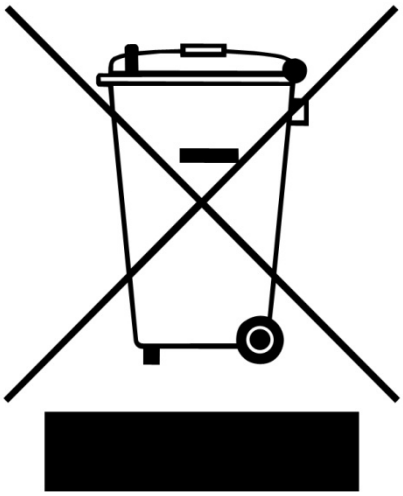

Fig. 14: Disposal label

Since the disposal regulations within the EU may differ from country to country we would request you to consult your supplier.

10 Index

CERTIFICATE OF CE-CONFORMITY

Translation

CROSS BEATER MILL

SK 300 20.751.xxxx

Certificate of CE-Conformity according to:

EC Mechanical Engineering Directive 2006/42/EC

Applied harmonized standards, in particular:

DIN EN ISO 12100	Security of machines
DIN EN 61010	Safety requirements for electrical equipment for measurement, control, and laboratory use
DIN EN 13683	Integrally powered shredders/chippers
EN 13849	Safety of machinery - Safety-related parts of control systems

EC Directive Electromagnetic Compatibility 2014/30/EU

Applied standards, in particular:

EN 61000	Electromagnetic compatibility (EMC)
EN 61326	Electrical equipment for measurement, control and laboratory use – EMC-requirements
IEC/CISPR 11 (EN 55011)	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement

Authorized person for the compilation of technical documents:
Dr. Loredana Di Labio (technical documentation)

The following records are held by Retsch GmbH in the form of Technical Documentation:
Detailed records of engineering development, construction plans, study (analysis) of the measures required for conformity assurance, analysis of the residual risks involved and operating instructions in due form according to the approved regulations for preparation of user information data.

The CE-conformity of the Retsch Cross Beater Mill Type SK300 is assured herewith.

In case of a modification to the machine not previously agreed with us as well as the use of not licensed spare parts and accessories this certificate will lose its validity.

Retsch GmbH Haan, April 2016

Dr.-Ing. Frank Janetta
Manager Development

CE