Manual

Cross Beater Mill SK 300

Translation

Table of Contents

1 Notes on the manual

This manual provides technical guidelines for the safe operation of the device. Read this manual through carefully before installing, putting into service and operating the device. Reading and understanding this manual is essential for handling the device safely and as intended.

This manual does not contain any repair instructions. Please contact your supplier or contact Retsch GmbH directly if anything is unclear or you have questions about these guidelines or the device, or in the case of any faults or necessary repairs.

You can find further information about your device at **https://www.retsch.com** on the pages for the specific device concerned.

Amendment status:
The document amendment 0003 of the "Cross Beater Mill SK 300" manual has been prepared in accordance with the Machinery Directive 2006/42/EC.

1.1 Explanation of signs and symbols

In this document the following **signs and symbols** are being used:

ⓘ	Reference to a recommendation and/or an important information
→	Reference to a chapter, table or figure
⇨	Action instruction
|Name|	Software menu function
[Name]	Software button
⟨Name⟩	Software checkbox

1.2 Disclaimer

This manual has been prepared with great care. We reserve the right to make technical changes. We assume no liability for personal injuries resulting from the failure to follow the safety information and warnings in this manual. No liability will be assumed for damage to property resulting from the failure to follow the information in this manual.

1.3 Copyright

2 Safety

Safety Officer

The operating company itself must ensure the following with respect to persons authorised to work on the device:

- that they have read and understood all regulations contained in the chapter on safety;
- that they are aware before they start work of all instructions and regulations for the target group related to the work;
- that they have easy access to the manual for this device at all times;
- that they have been familiarised with the safe and correct handling of the device before starting work on it, by means of a verbal introduction by a competent person and/or using this manual.

⚠ Improper operation can lead to personal injuries. The operating company itself is responsible for its safety and that of its staff. The operating company itself must ensure that no unauthorised persons have access to the device.

Target group

All those operating, cleaning or working with or on the device.

This device is a modern, powerful product from Retsch GmbH and has been developed in line with the state-of-the art. The device is safe to use when operated correctly and when following the instructions in this manual.

⚠ People under the influence of intoxicating substances (medications, drugs, alcohol) or who are overtired may not operate the device or work on the device.

2.1 Explanations of the Safety Instructions

The following **warnings** in this manual warn of possible risks and damage:

DANGER D1.0000

Risk of fatal injuries
Source of danger

– Possible consequences if the danger is ignored.
- **Instructions and information on how to avoid the risk.**

Fatal or serious injuries may result if the “Danger” sign is disregarded. There is a **very high risk** of a life-threatening accident or lasting personal injury. The signal word **DANGER** is additionally used in the running text or in instructions.

WARNING W1.0000

Risk of life-threatening or serious injuries
Source of danger

– Possible consequences if the danger is ignored.
- **Instructions and information on how to avoid the risk.**

Life-threatening or serious injuries may result if the “Warning” sign is disregarded. There is an **increased risk** of a serious accident or of a possibly fatal personal injury. The signal word **WARNING** is additionally used in the running text or in instructions.

CAUTION C1.0000

Risk of injuries
Source of danger

– Possible consequences if the danger is ignored.
- **Instructions and information on how to avoid the risk.**

Average to slight injuries may result if the “Caution” sign is disregarded. There is an average or slight risk of an accident or personal injury. The signal word **CAUTION** is additionally used in the running text or in instructions.

NOTICE N1.0000

Type of damage to property
Source of the damage to property

– Possible consequences if the information is ignored.
- **Instructions and information on how to avoid the damage to property.**

Damage to property may result if the information is disregarded. The signal word ***NOTICE*** is additionally used in the running text or in instructions.

2.2 General Safety Instructions

⚠ CAUTION C2.0002

Risk of injury
Lack of knowledge of the manual

– The manual contains all safety-related information. Disregarding the manual can therefore lead to injuries.
- **Read the manual carefully before operating the device.**

⚠ CAUTION C3.0015

Risk of injury
Improper modifications to the device

– Improper modifications to the device can result in injuries.
- **Do not make any unauthorised changes to the device.**
- **Only use the spare parts and accessories approved by Retsch GmbH!**

NOTICE N2.0012

Changes to the device
Improper modifications

– The conformity declared by Retsch GmbH with the European Directives will lose its validity.
– Any warranty claims will be terminated.
- **Do not make any modification to the device.**
- **Use spare parts and accessories that have been approved by Retsch GmbH exclusively.**

2.3 Repairs

This manual does not contain any repair instructions. For safety reasons, repairs may only be carried out by Retsch GmbH or an authorised representative or by qualified service technicians.

In case of repair, please inform…

…the Retsch GmbH representative in your country,
…your supplier, or
…Retsch GmbH directly.

Service address:

2.4 Confirmation Form for the Managing Operator

This manual contains essential instructions for operating and maintaining the device which must be strictly observed. It is essential that they be read by the user and by the qualified staff responsible for the device before the device is commissioned. This 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 he has received sufficient instructions about the operation and maintenance of the system. The user has received the 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.

The managing operator should for legal protection have the user confirm the instruction about the operation of the device.

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

User
Surname, first name (block letters)
Position in the company
Place, date and signature

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

3 Technical Data

3.1 Protective Equipment

- This device is equipped with a door lock. The locking mechanism prevents the device from being started when in an unsafe state.
- The device can only be started when the door is closed.
- It is only possible to open the door when the device has come to a halt.

3.2 Degree of Protection

- IP41

3.3 Emissions

⚠ CAUTION C.0020

Risk of injury caused by not hearing acoustic signals
Loud grinding noise

- Loud grinding noise may result in not hearing acoustic warning signals, leading to injuries.
- **Take the volume of grinding noise into consideration when designing the acoustic signals in the working environment.**
- **Where necessary, use additional visual signals.**

⚠ CAUTION C4.0044

Hearing damage
A high sound level may be generated depending on the type of material, the grinding set used, the grinding frequency set and the duration of the grinding

- Excessive noise in terms of level and duration can cause impairments or permanent damage to hearing.
- **Ensure that suitable noise protection measures are taken, or wear ear protection.**

Sound parameters:
The sound parameters are influenced by the properties of the sample material and the rotation speed.

Example 1:

Feed material:	Wood pellets (< 5 mm)
Bottom sieve:	0.5 mm
Speed:	2 000 rpm

At these operating conditions, the workplace related equivalent continuous sound level L_{eq} = 79.9 dB(A).

Example 2:

Feed material:	Wood pellets (< 5 mm)
Bottom sieve:	0.5 mm
Speed:	4 000 rpm

At these operating conditions, the workplace related equivalent continuous sound level L_{eq} = 75.1 dB(A).

3.4 Electromagnetic Compatibility (EMC)

- EMC class according to DIN EN 55011: B

3.5 Rated Power

~ 1 500 W (VA)

3.6 Motor Rotation Speed

- Rated motor rotation speed: 2 000 – 4 000 revolutions per minute (rpm)
- Adjustable in increments of 200 rpm

3.7 Dimensions and Weight

All specifications, unless otherwise stated, include the optional base frame.

- Height: 1 200 mm
- Height incl. vibratory feeder DR 100: ~ 1 450 mm
- Width: 580 mm
- Width incl. cyclone separator: 930 mm
- Depth: 700 mm
- Weight: ~ 60 kg
- Weight without base frame: ~ 50 kg

3.8 Required Floor Space

⚠ CAUTION C5.0007

Falling down of the device
Incorrect positioning or insufficient working space

- Due to its weight, the device can inflict personal injury if it falls down.
- **The device must, when used as table-top device, only be operated on a sufficiently large, strong and stable workplace.**
- **The device must, when used as table-top device, be firmly screwed to the working surface.**

- Width with open door: ~ 740 mm
- Depth with open door: ~ 640 mm
- Width of the base: 940 mm (without cyclone separator)
  1 130 mm (with cyclone separator)
- Depth of the base: 740 mm (without base frame)
  800 mm (with base frame)

Location requirements:
When used as table-top device, the device must be bolted to a vibration-free, plane, stable and free surface. When used as floor-standing device (mounted on the optional base frame), the device must be placed on a level base and secured against rolling away.

3.9 Receptacle Volume

The receptacle volume (feed volume) depends on the sample material and the collecting receptacle used.

- Feed volume: < 5 l (with 5 l collecting receptacle)
  max. 26 l (with 30 l collecting receptacle)

3.10 Feed Grain Size

- Feed grain size: ≤ 25 mm

3.11 Suitable Sieve Diameters

- Trapezoidal perforation: 0.12 mm / 0.20 mm / 0.25 mm / 0.35 mm / 0.50 mm / 0.75 mm / 1.00 mm / 1.50 mm / 2.00 mm
- Round perforation: 3.00 mm / 4.00 mm / 5.00 mm / 6.00 mm / 8.00 mm / 10.00 mm

4 Packaging, Transport and Installation

4.1 Packaging

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

NOTICE N3.0001

Complaint or return
Keeping the packaging

– Inadequate packaging and insufficient securing of the device can jeopardise the warranty claim in the event of a complaint or return.

- **Keep the packaging for the duration of the warranty period.**

4.2 Transport

WARNING W2.0005

Risk of injury due to the device falling down
Lifting the device above head height

– The device can fall causing serious injuries when lifted above head height.

- **Never lift the device above head height!**

NOTICE N4.0017

Damage to components
Transport

– Mechanical or electronic components may be damaged during transport. The device must not be knocked, shaken or thrown during transport.

- **Move the device gently during transport**.

NOTICE N5.0014

Complaints
Incomplete delivery or transport damage

– The forwarding agent and Retsch GmbH must be notified immediately in the event of transport damage. It is otherwise possible that subsequent complaints will not be recognised.

- **Please check the delivery on receipt of the device for its completeness and intactness.**
- **Notify your forwarding agent and Retsch GmbH within 24 hours.**

Fig. 1: Transportation lug

CAUTION The weight of the SK 300 without collecting receptacle and base frame amounts approx. 50 kg. The device may only be lifted or transported by at least two people.

The SK 300 has a transportation lug (**A**) at which the device can be lifted and transported by means of hoists.

⇨ Attach the hoist only to the supplied transportation lug (**A**).
⇨ Please insert a piece of cloth, polystyrene or cardboard between the rear edge of the feed hopper and the sling or hoisting chain, in order to avoid scratches on the feed hopper.
⇨ Lift the device slowly and stabilise it to prevent tipping backwards.

CAUTION Only use suitable hoist that is designed for the weight of the device.

If desired, the transportation lug can be removed after installation and the threaded hole can be sealed with the supplied plastic screw (**PS**).

4.3 Temperature Fluctuations and Condensation

NOTICE

N6.0016

Damaged components due to condensation
Temperature fluctuations

– The device may be exposed to substantial fluctuations in temperature during transport. The ensuing condensation can damage electronic components.
- **Wait until the device has acclimatised before putting it into service.**

Temporary storage:
Also in case of an interim storage the device must be stored dry and within the specified ambient temperature range.

4.4 Conditions for the Installation Site

– Installation height: max. 2 000 m above sea level

– Ambient temperature: 5 °C – 40 °C

NOTICE N7.0021

Ambient temperature
Temperatures outside the permitted range

- Electronic and mechanical components may be damaged.
- The performance data alter to an unknown extent.
- **Do not exceed or fall below the permitted temperature range (5 °C to 40 °C ambient temperature) of the device.**

- Maximum relative humidity < 80 % (at ambient temperatures ≤ 31 °C)

For ambient temperatures U_T between 31 °C and 40 °C, the maximum relative humidity value L_F linearly decreases according to $L_F = -(U_T - 55) / 0.3$:

Ambient temperature	Max. rel. humidity
≤ 31 °C	80 %
33 °C	73.3 %
35 °C	66.7 %
37 °C	60 %
39 °C	53.3 %
40 °C	50 %

NOTICE N8.0015

Humidity
High relative humidity

- Electronic and mechanical components may be damaged.
- The performance data alter to an unknown extent.
- **The relative humidity in the vicinity of the device should be kept as low as possible.**

4.5 Electrical Connection

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

- Check the type plate for details on the necessary voltage**,** frequency, and maximum external current source fuse for the device.
- The listed values must agree with the existing mains supply.
- Only use the supplied power cable to connect the device to the mains supply.

NOTICE N9.0022

Electrical connection
Failure to observe the values on the type plate

- Electronic and mechanical components may be damaged.
- **Connect the device only to a mains supply matching the values on the type plate.**

4.6 Type Plate Description

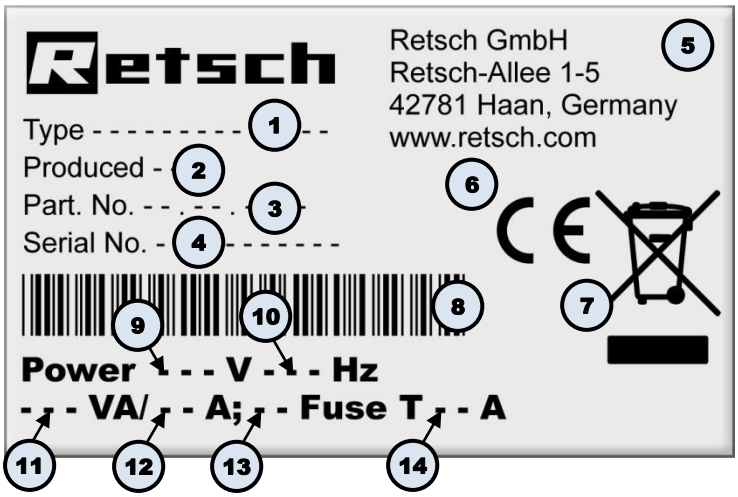

Fig. 2: Type plate

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 queries please provide the device designation (**1**) or part number (**3**), as well as the serial number (**4**) of the device.

5 First Commissioning

WARNING W3.0002

Danger to life through electric shock
Damaged power cable

– Operating the device with a damaged power cable or plug can lead to life-threatening injuries caused by an electric shock.

- **Before operating the device, check the power cable and plug for damage.**
- **Never operate the device with damaged power cable or plug!**

NOTICE N10.0002

Setting up the device
Disconnecting the device from the mains

– A separation of the device from the mains must be possible at any time.

- **Set up the device in such a way, that the connection for the power cable is always easily accessible.**

NOTICE N11.0004

Setting up the device
Vibrations during operation

– Depending on the operating mode of the device, slight vibrations may occur.

- **Set up the device only on a vibration-free, plane and stable surface.**

5.1 Setting up as Table-top Device

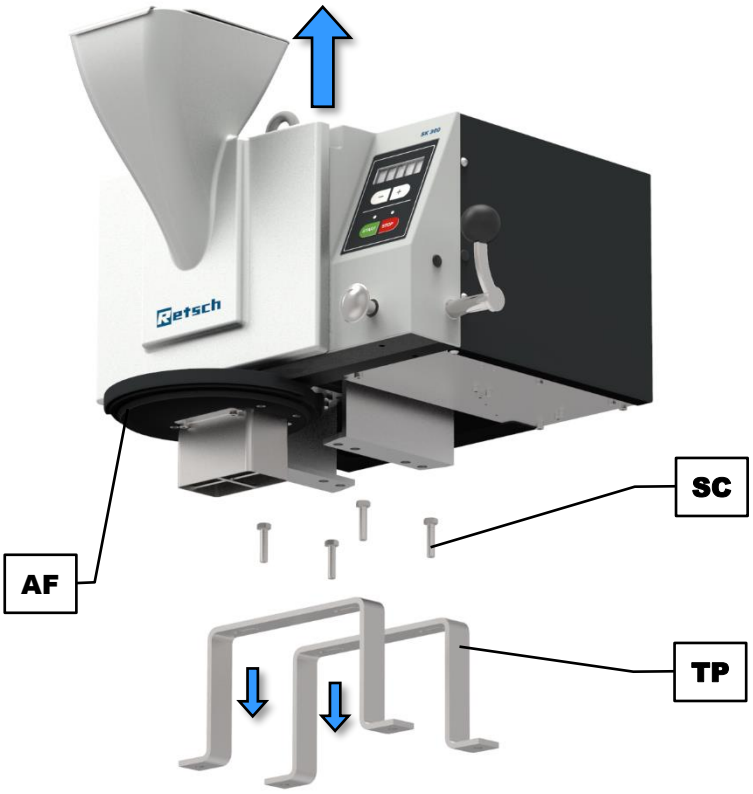

Fig. 3: Removing the transport profiles

⇨ Loosen the four hexagon socket head screws (**SC**) to remove the transport profiles (**TP**) from the SK 300.

⇨ Position the SK 300 on the designated table as close as possible to the front edge of the table. Make sure that the discharge flange (**AF**) for the sample receptacle does not touch the edge of the table.

NOTICE The table must be designed for the weight of approx. 50 kg of the SK 300! Furthermore, the table must be plane, stable and vibration free!

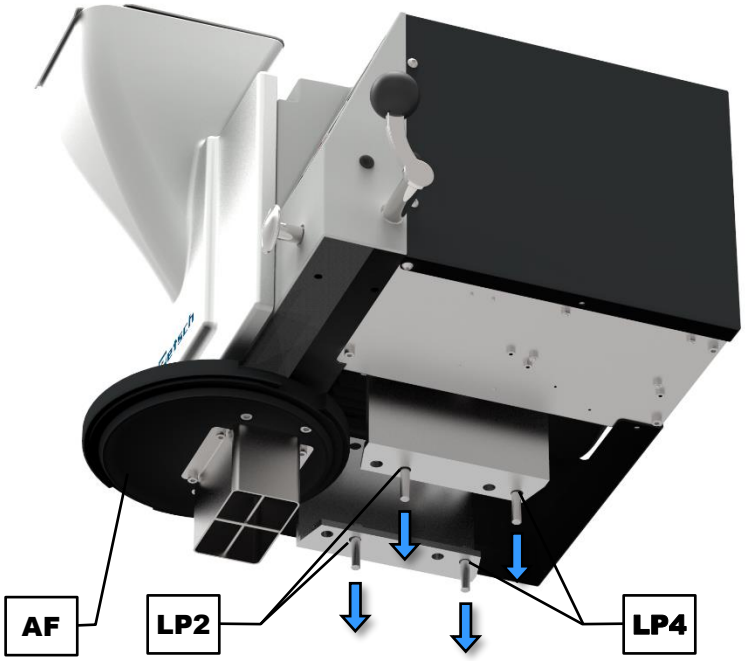

Fig. 4: Table mounting

⇨ Bolt the SK 300 to the tabletop by means of four M8 screws of the required length (not supplied). Use the second (**LP2**) and fourth pair of holes (**LP4**) of the U-profiles for this purpose.

5.2 Setting up on Base Frame

ⓘ The base frame for the SK 300 is available as an optional accessory from your supplier or from Retsch GmbH directly.

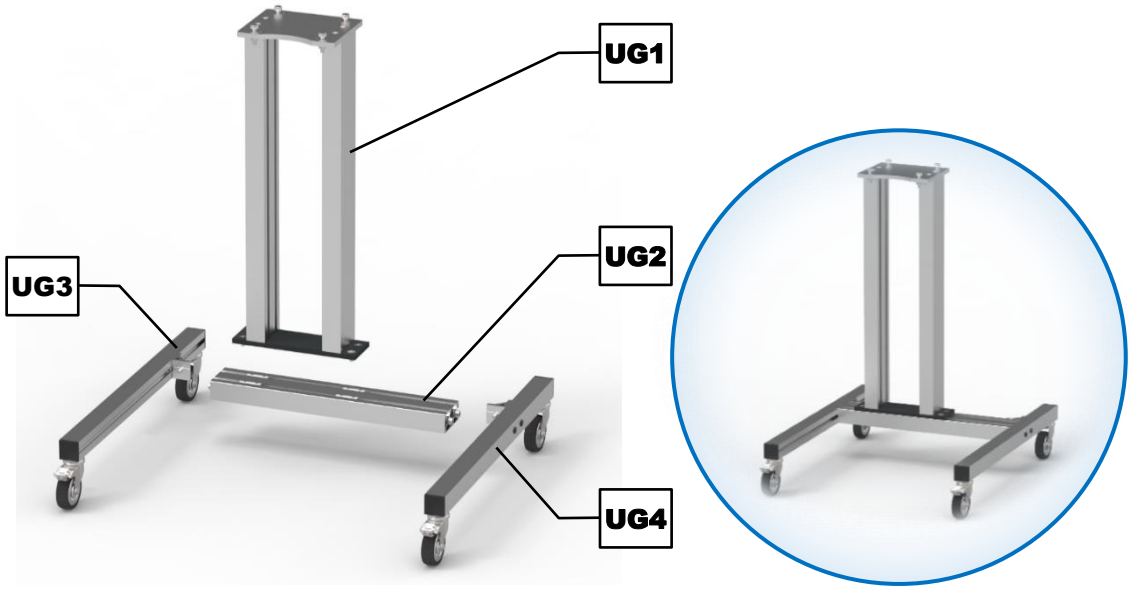

Fig. 5: Pre-assembled component parts of the base frame

The following component parts are already pre-assembled for an easier assembly of the base frame:

– base (**UG1**)

- cross bar (**UG2**)
- left roller rail (**UG3**)
- right roller rail (**UG4**)

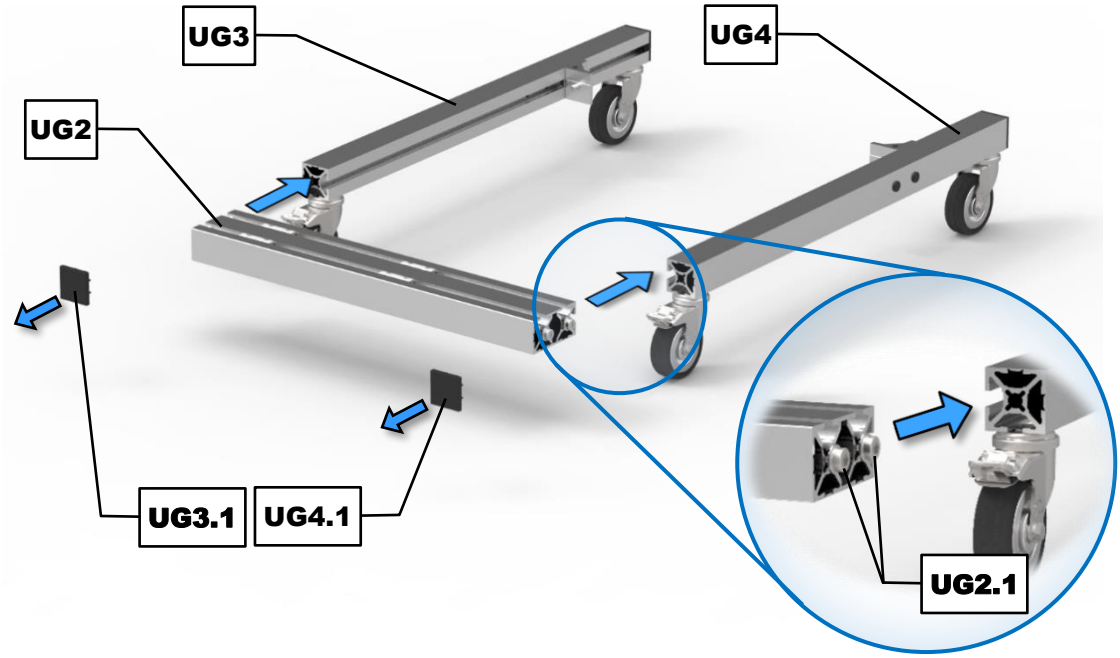

Fig. 6: Assembly of the cross bar

⇨ Remove the two front covers (**UG3.1**) and (**UG4.1**) from the left and right roller rails (**UG3**) and (**UG4**).

⇨ Loosen the four hexagon socket head screws (**UG2.1**) on the cross bar (**UG2**) by means of the supplied hexagon socket wrench (**IM**).

⇨ Slide the cross bar (**UG2**) into the lateral guides of the left and right roller rails (**UG3**) and (**UG4**). When doing so, make sure that the washers of the four hexagon socket head screws (**UG2.1**) are located inside the roller rails.

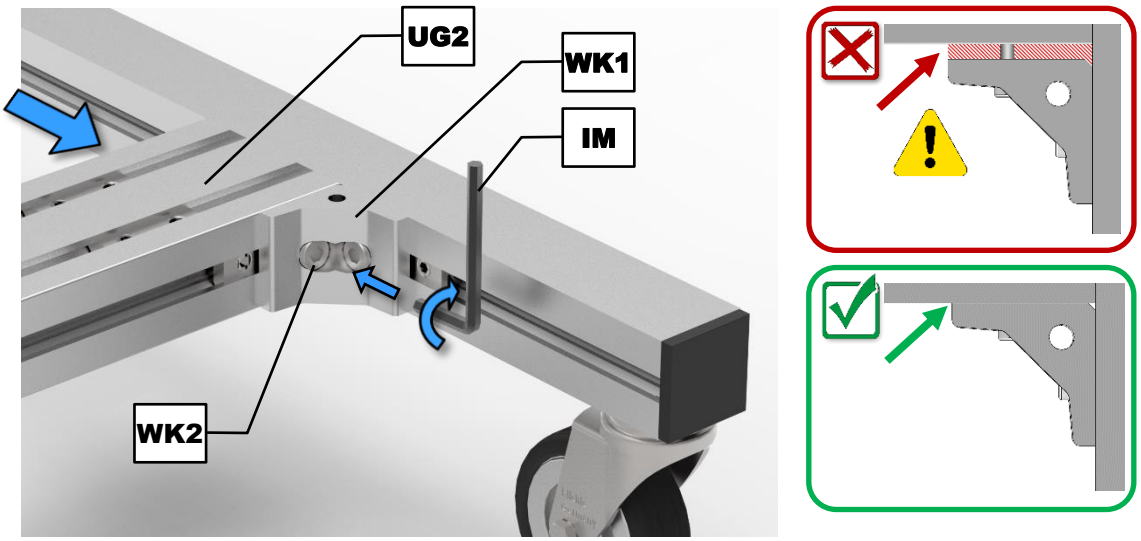

Fig. 7: Attaching the cross bar to the brackets

⇨ Use the two supplied M8x16 hexagon socket head screws (**WK2**) to screw the cross bar (**UG2**) to the two brackets (**WK1**) of the left and right roller rails.

⇨ Tighten the hexagon socket head screws (**WK2**) firmly to the left and right brackets (**WK1**).

NOTICE Ensure that the cross bar (**UG2**) lies flush against the two pre-assembled brackets (**WK1**).

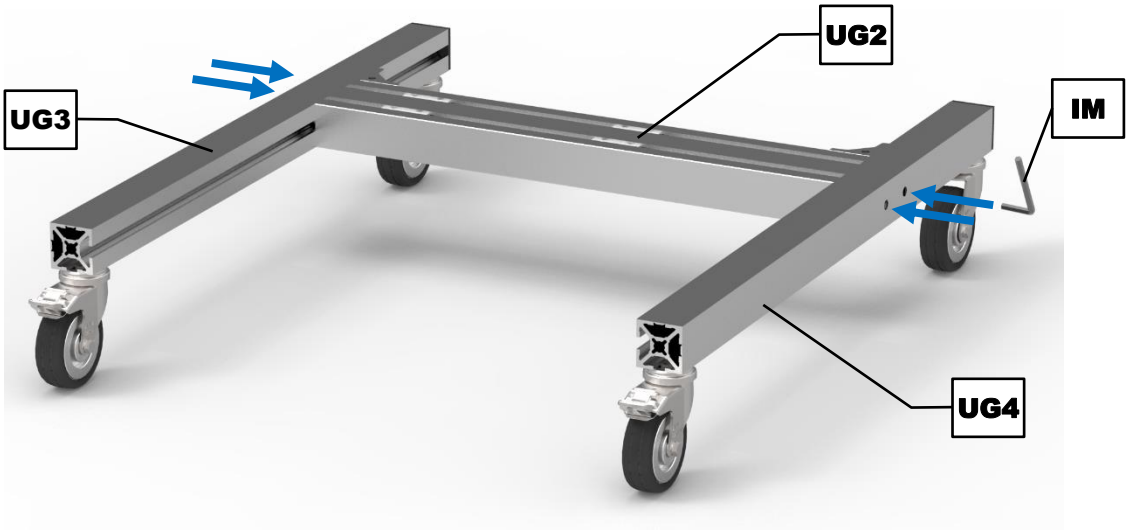

Fig. 8: Screwing tight the cross bar

⇨ Tighten again the four hexagon socket head screws (**UG2.1**) of the cross bar (**UG2**) firmly from the side of both roller rails.

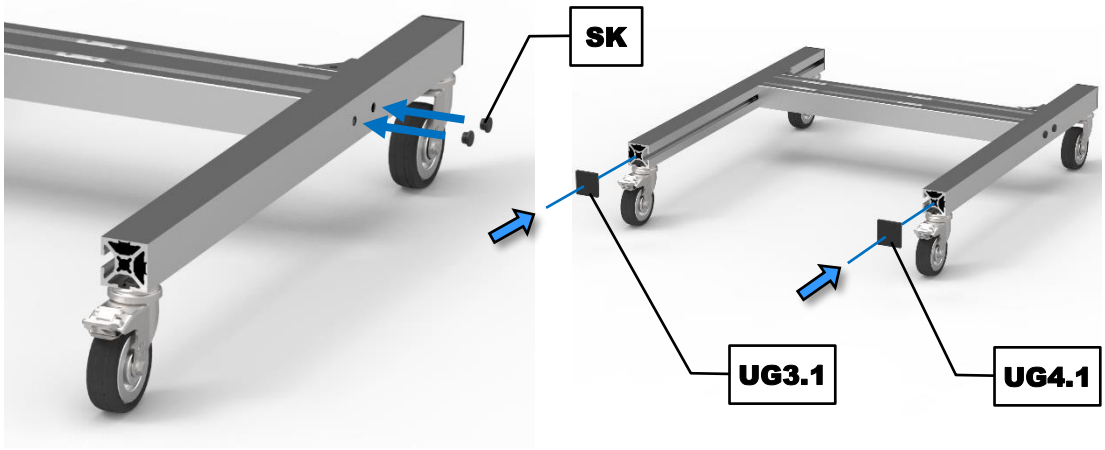

Fig. 9: Installing the protective caps and covers

⇨ Place the four supplied black protective caps (**SK**) on the lateral openings of the two roller rails.
⇨ Reinstall the two front covers (**UG3.1**) and (**UG4.1**) of the left and right roller rail.

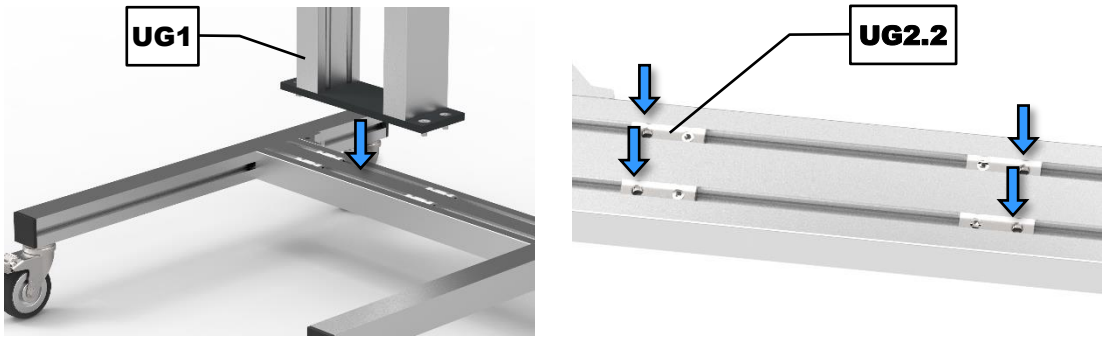

Fig. 10: Positioning the base

⇨ Place the base (**UG1**) on the cross bar (**UG2**) and use the four supplied M8x20 hexagon socket countersunk head screws (**UG1.1**) to tighten the base.

NOTICE The base should be positioned in such a way, that the left edge of the base is located 90 mm from the outer edge of the left roller rail (**UG3**).

⇨ If necessary, adjust the position of the sliding blocks (**UG2.2**).

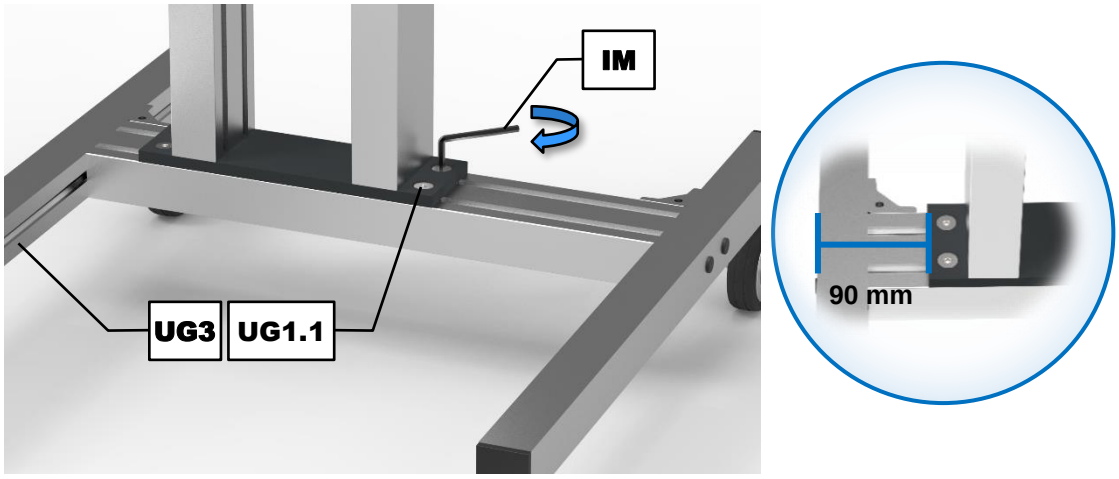

Fig. 11: Screwing tight the base

⇨ Place the SK 300 on the base frame.

⇨ Use the four supplied M8x35 hexagon socket head screws (**UG1.2**), including the lock nuts and washers, to screw the U-profiles of the SK 300 tight on the base (**UG1**).

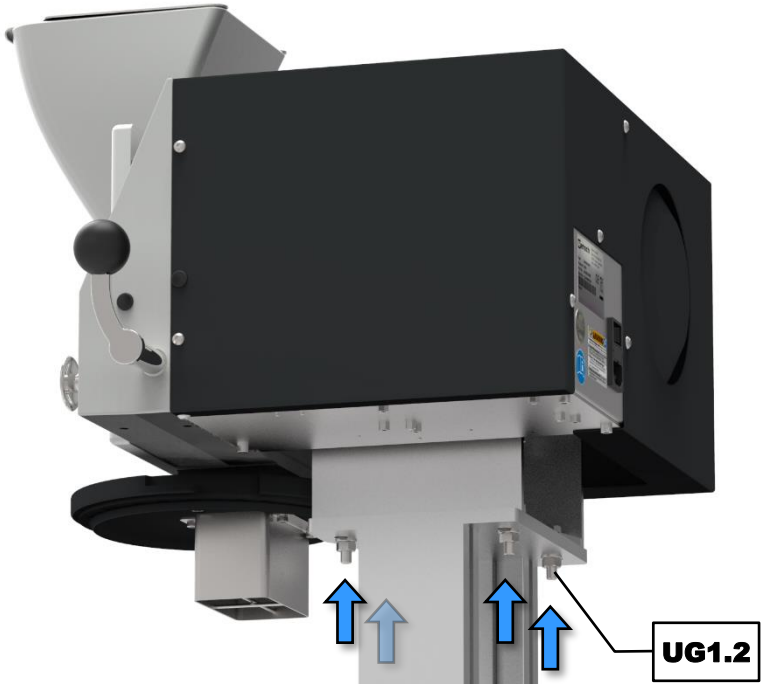

Fig. 12: Mounting the SK 300

6 Operating the Device

6.1 Use of the Device for the Intended Purpose

⚠ CAUTION C6.0005

Risk of injury
Potentially explosive atmosphere

– The device is not suitable for use in potentially explosive atmospheres. Operating the device in a potentially explosive atmosphere can lead to injuries caused by an explosion or fire.

- **Never operate the device in a potentially explosive atmosphere!**

⚠ CAUTION C7.0006

Risk of injury
Sample material that is harmful to health

– Sample material that is harmful to health can injure people (illness, contamination).

- **Use suitable extraction systems with sample material that is harmful to health.**
- **Use suitable personal protective equipment with sample material that is harmful to health.**
- **Take note of the safety data sheets for the sample material.**

⚠ CAUTION C8.0004

Risk of injury
Explosive or flammable samples

– Samples can explode or catch fire during the grinding process.

- **Do not use any samples in this device that carry a risk of explosion or fire.**
- **Take note of the safety data sheets for the sample material.**

⚠ CAUTION C9.0010

Risk of burns or poisoning
Varying sample properties

– The properties and therefore also the chemical reactivity of the sample can change during the grinding process and can cause burns or poisoning as a result.

- **Do not process any substances in this device whose chemical reactivity is so changed by grinding that there is a risk of explosion or poisoning.**
- **Take note of the safety data sheets for the sample material.**

This Cross Beater Mill of the Retsch GmbH is a laboratory device. It is used for the batch-wise or continuous coarse and fine grinding of dry, medium-hard and brittle materials such as soils, gypsum, glass, granite, coal, coke, minerals, oxide ceramics, chamotte, slag, gravel, cement clinker and many other substances. The device allows for a particularly effective grinding of heterogeneous material mixtures. The analytical fineness is usually achieved in a single step.

Thereby, the grinding material is hardly heated, so that the SK 300 is also suitable for temperature-sensitive materials. Depending on the mesh size of the bottom sieve and the fracture properties of the grinding material, the achievable final fineness can be < 100 µm.

The Cross Beater Mill of the Retsch GmbH is universally deployed in almost all areas of industry and research, from sample preparation in the laboratory to larger sample volumes in a technical centre or plant.

Only grinding sets from Retsch GmbH may be used. This device is generally not designed for the grinding of wet or moist materials.

NOTICE N12.0007

Handling foodstuffs, pharmaceuticals and cosmetic products
Products processed

- Foodstuffs, pharmaceuticals and cosmetic products that have been processed on the device may no longer be eaten, used or put into circulation,.
- **Dispose of these substances according to applicable directives.**

NOTICE N13.0007

Range of application of the device
Long-term operation

- This laboratory device is designed for eight-hour single-shift operation with a duty cycle of 30 %.
- **This device may not be used as a production machine nor is it intended for continuous operation.**

6.2 Principle of Operation

The grinding and deagglomeration in the SK 300 is achieved by impact and collision effects. The feed material passes through the feed hopper into the grinding chamber where it is comminuted between the baffle plates of the rotor and the serrated grinding insert. As soon as the grinding material is smaller than the mesh size of the selected bottom sieve, it enters the collecting receptacle.

6.3 Views of the device

6.3.1 Front

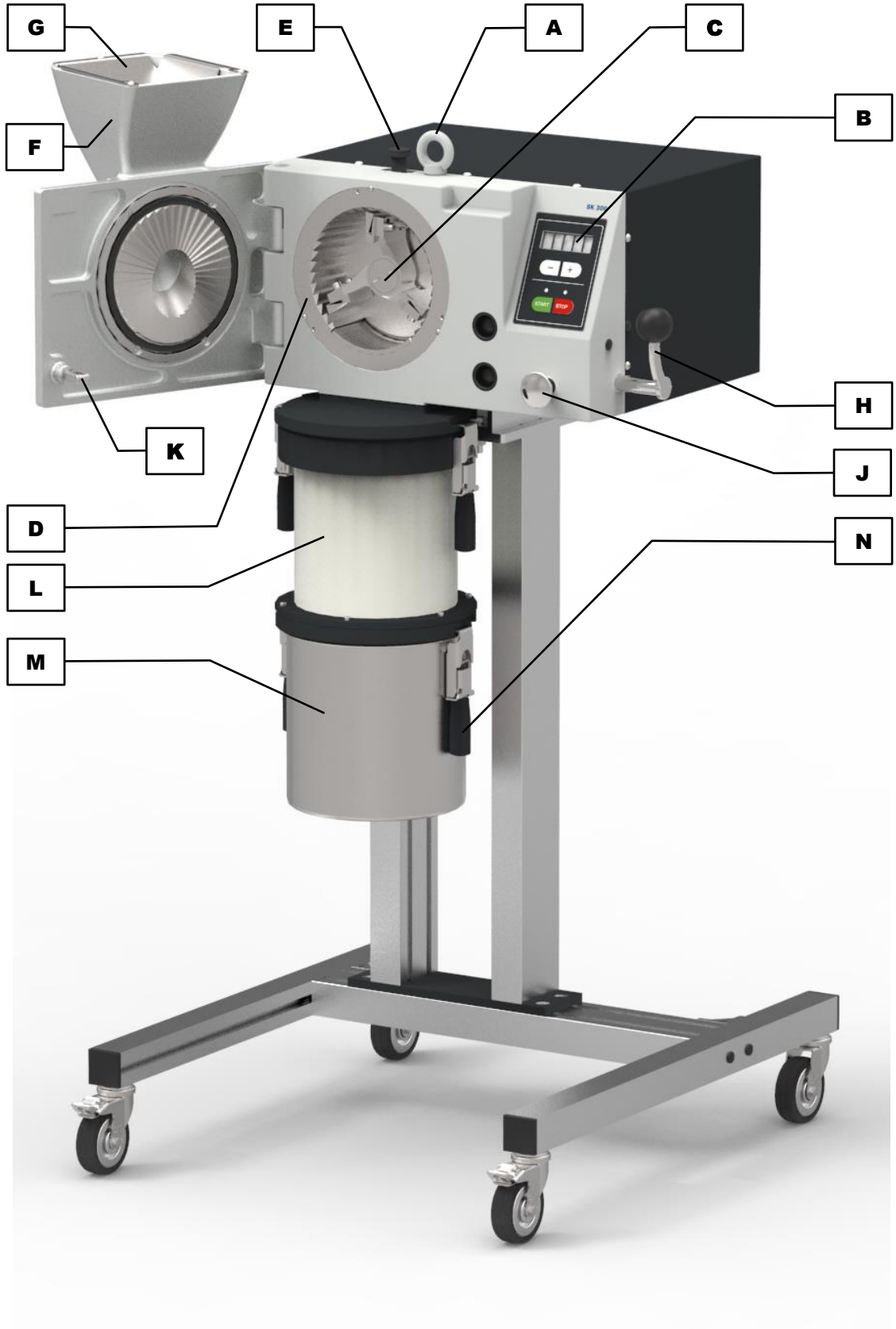

Fig. 13: Front view of the device

Element	Description	Function
A	Transportation lug	Attachment point for hoist
B	Operating controls	Operation of the device
C	Rotor	Crushes the sample material
D	Grinding insert with bottom sieve	Grinds and sieves the grinding material
E	Locking pin	Holds the grinding chamber cartridge in position
F	Feed hopper	Takes the sample material
G	Splashback protection	Prevents material ejection
H	Locking lever	Locks or opens the door
J	Catch mechanism	Locks the locking lever
K	Locking mechanism	Keeps the device closed
L	Filter hose	Ensures pressure compensation
M	Collecting receptacle	Receives the crushed grinding material
N	Clamping lever	Seals the collecting receptacle or the filter hose. Also serves to carry the collecting receptacle in unfolded state

6.3.2 Back

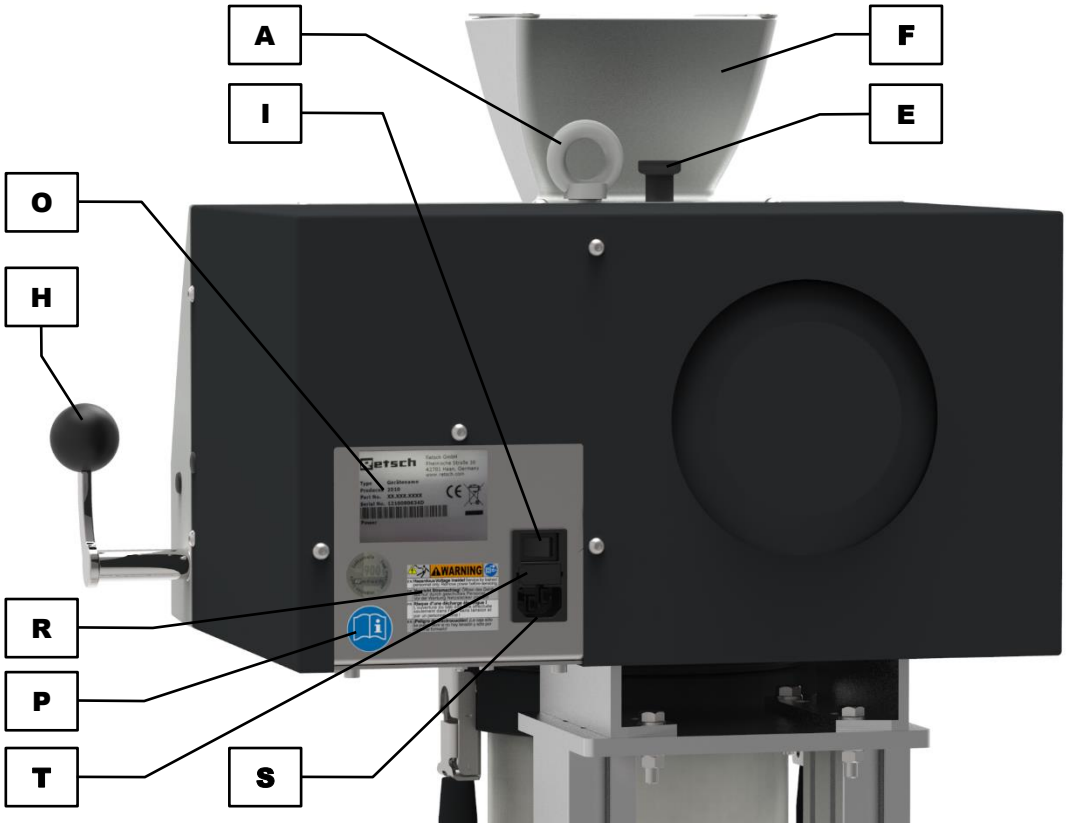

Fig. 14: Back view of the device

Element	Description	Function
A	Transportation lug	Attachment point for hoist

Element	Description	Function
E	Locking pin	Holds the grinding chamber cartridge in position
F	Feed hopper	Takes the sample material
H	Locking lever	Locks or opens the door
I	Mains switch	Switches the device on and off, disconnects the device from the mains
O	Type plate	Lists, among others, the voltage type, the serial number and the type of the device
P	Sticker "Manual"	Reminds to read the manual
R	Warning sign "Disconnect from the mains"	Warning of electric shock
S	Mains connection	Connection for the power cable
T	Fuse drawer	Contains the fuses protecting against overvoltage (fuse: 10 A delay-action at 100 – 240 V)

6.4 Switching On / Off

⇨ Turn on the SK 300 with the mains switch (**I**) on the back side of the device.

When the device is switched off, it is completely disconnected from the mains.

6.5 Opening and Closing of the Device

The SK 300 has a locking mechanism (**K**) that locks the door mechanically. The mechanical locking mechanism is closed or opened by actuating the locking lever (**H**) and the catch mechanism (**J**).

6.5.1 Opening

Fig. 15: Opening the device

⇨ Connect the device to the mains.
⇨ Switch the device on by means of the mains switch (**I**).
⇨ Pull and hold the catch mechanism (**J**) forwards.
⇨ Turn the locking lever (**H**) forwards. The locking mechanism (**K**) is released and the door can now be opened.

NOTICE If the device is opened mechanically during operation, the engine brake grips immediately and the error "E51" appears in the display. This indicates a fault in the safety switch.
⇨ Switch off the device by means of the mains switch (**I**).
⇨ Press the mains switch (**I**) again to turn the device on.

6.5.2 Closing

⇨ Close the door.
⇨ Turn the locking lever (**H**) backwards. The catch mechanism (**J**) snaps back into place by itself.

If the door is not correctly locked, the information note "H41" appears in the display when the START button is pressed. This instructs the user to close the door.

6.6 Inserting the Grinding Set

CAUTION C10.0085

Cutting injuries
Sharp cutting edges

- The sharp cutting edges on the rotors and/or the cutting bars in the grinding chamber can lead to hand lacerations.
- **Grasp the rotor only on the hub and do not touch the cutting edges or bars.**
- **Wear cut-resistant safety gloves.**

NOTICE N14.0066

Wear or damage of the device
Operation without grinding set

- During operation of the device without grinding set, excessive wear or damage to the device may occur.
- **Operate the device only with a grinding set mounted.**

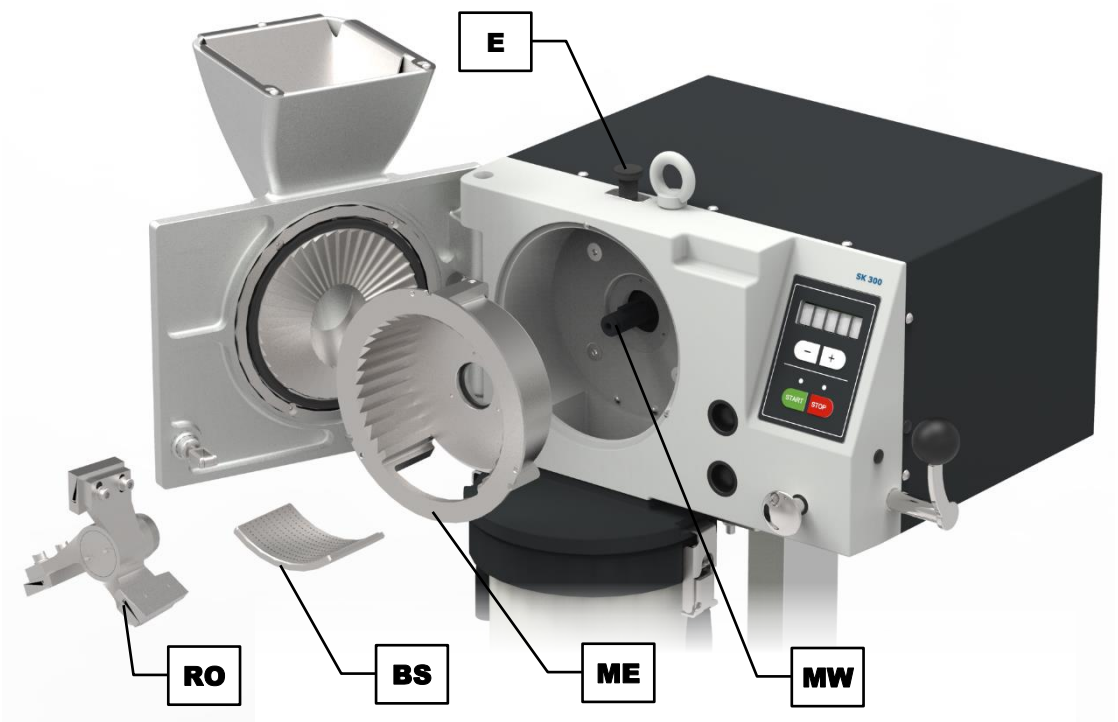

Fig. 16: Insertion of the grinding set consisting of grinding insert, bottom sieve and rotor

6.6.1 Inserting the Grinding Insert

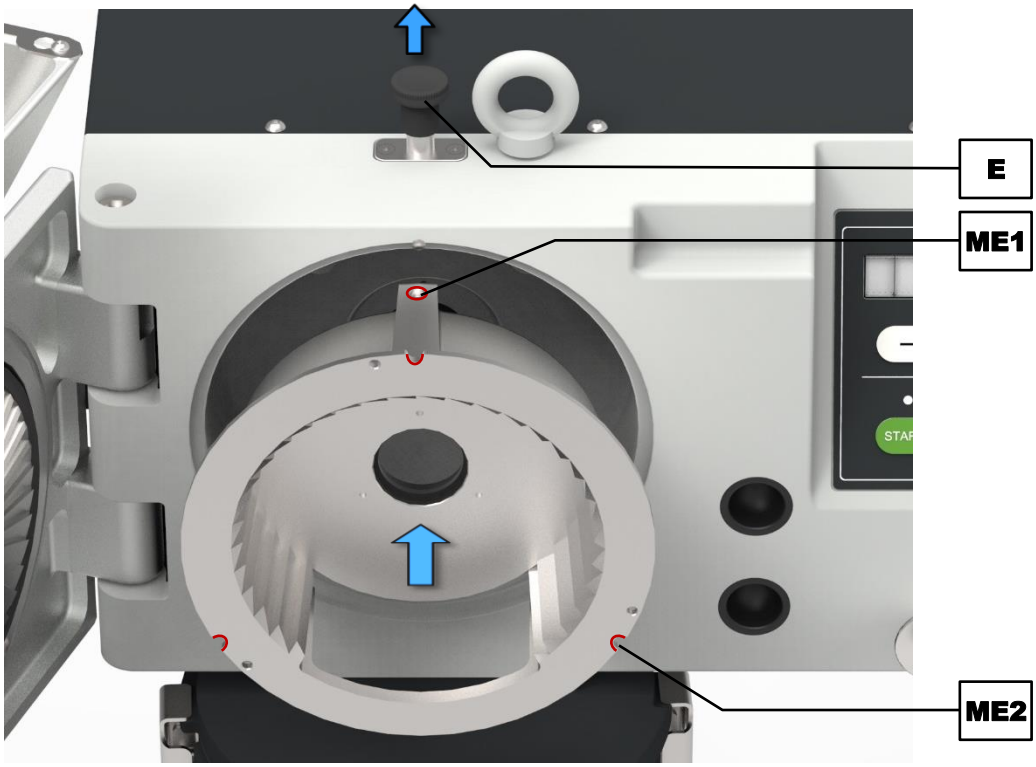

Fig. 17: Inserting the grinding insert

- ⇨ Pull up and hold the locking pin (**E**).
- ⇨ Align the grinding insert so that the opening (**ME1**) for the locking pin is at the top, and the three recesses (**ME2**) are aligned with the corresponding cylinder pins.
- ⇨ Slide the grinding insert into the grinding chamber.
- ⇨ Release the locking pin (**E**) to lock it into the opening (**ME1**) of the grinding insert.

6.6.2 Inserting the Rotor

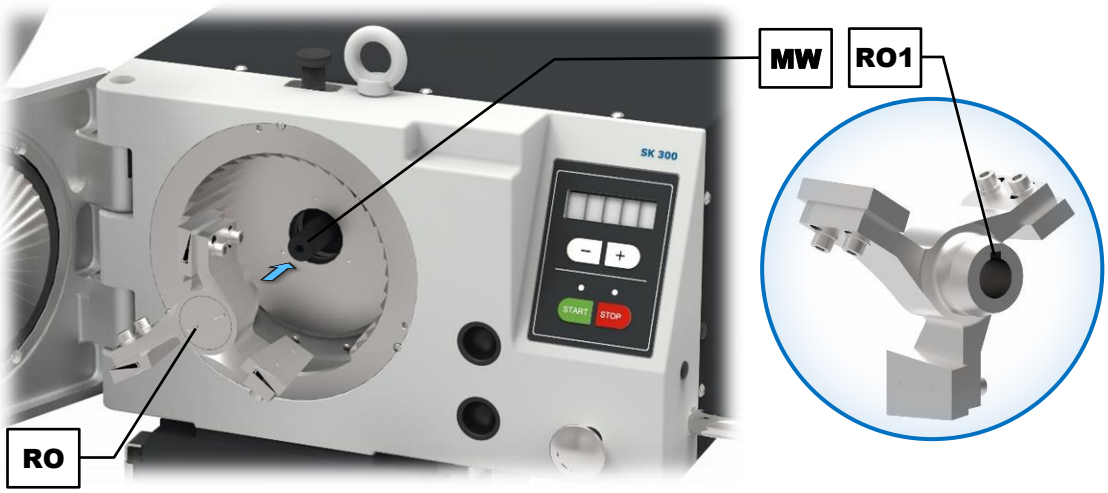

Fig. 18: Inserting the rotor

- ⇨ Grasp the rotor (**RO**) so that the rear hub (**RO1**) is aligned properly with the feather key (**PF**) on the motor shaft (**MW**).

⇨ Slide the rotor up to the stop onto the motor shaft, which is prevented from rotating by the engine brake.

NOTICE If it is hard to slide the rotor or if it cannot be pushed up to the stop, check the correct and firm fit of the feather key (**PF**) on the motor shaft (**MW**). In addition, the motor shaft can be oiled with some machine oil.

6.6.3 Inserting the Bottom Sieve

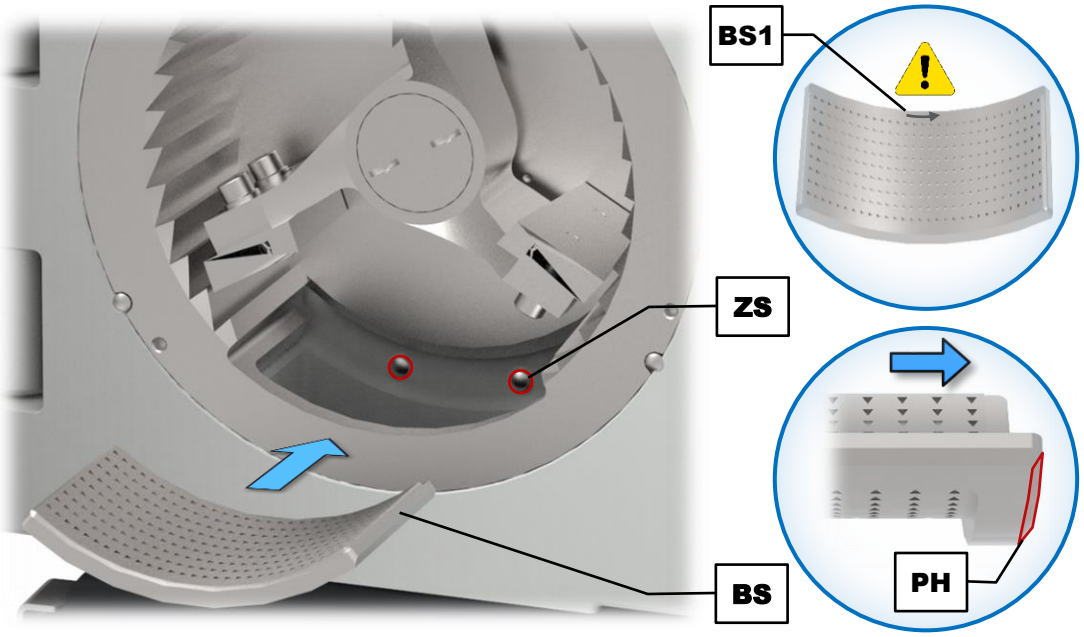

Fig. 19: Correct orientation of the bottom sieve

The bottom sieve (**BS**) has a direction arrow (**BS1**), which indicates the direction of rotation of the rotor (counterclockwise). Furthermore, the bottom sieve is provided with a phase (**PH**) on one side so that only this side fits over the two cylinder pins (**ZS**) in the grinding chamber.

⇨ Align the bottom sieve so, that the direction arrow (**BS1**) corresponds with the direction of rotation of the rotor and the side with the phase is facing towards the grinding chamber.

⇨ Slide the bottom sieve (**BS**) into the grinding insert (**ME**) up to the stop.

NOTICE If the door of the SK 300 cannot be closed, check the correct alignment of the bottom sieve, and make sure that the bottom sieve has been completely pushed in.

6.7 Removing the Grinding Set

The removal of the grinding set is preferably carried out in the following sequence:

1. Bottom sieve
2. Rotor
3. Grinding insert

6.8 Mounting the Sample Receptacle

By the use of the textile filter hose (**L**), or a ring filter that is available as an optional accessory, attached between the discharge flange (**AF**) and the collecting receptacle (**M**), the airflow generated by the rotating rotor can be dissipated and the material throughput can be accelerated.

NOTICE If the collecting receptacle is installed without the filter hose or ring filter, it is to be expected that dust will be emitted out of the feed hopper (**F**). Therefore, never operate the SK 300 without the filter hose or ring filter!

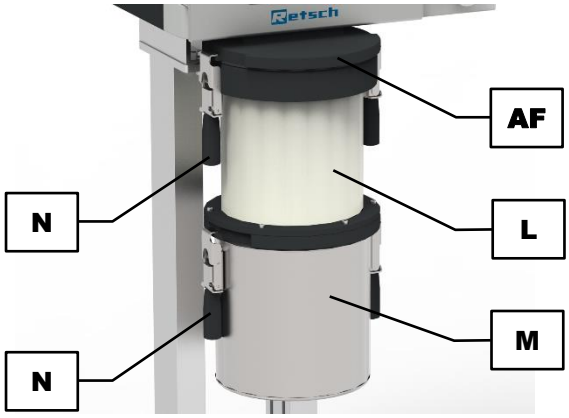

Fig. 20: Sample receptacle consisting of filter hose and collecting receptacle

⇨ Use the two horizontally unfolded clamping levers (**N**) to lift up the filter hose (**L**).
⇨ Position the filter hose (**L**) flush over the groove (**AF1**) of the discharge flange.
⇨ Turn the filter hose (**L**) clockwise until the clamping lever is situated over the clamping edge (**AF2**).
⇨ Press the clamping levers (**N**) downwards with the open palm to clamp the filter hose (**L**).

Fig. 21: Clamping the filter hose

⇨ Use the two horizontally unfolded clamping levers (**N**) to lift up the collecting receptacle (**M**).
⇨ Position the collecting receptacle (**M**) flush over the groove of the filter hose (**L**).
⇨ Turn the collecting receptacle (**M**) clockwise until the clamping lever is situated over the clamping edge.
⇨ Press the clamping levers (**N**) downwards with the open palm to clamp the collecting receptacle (**M**).

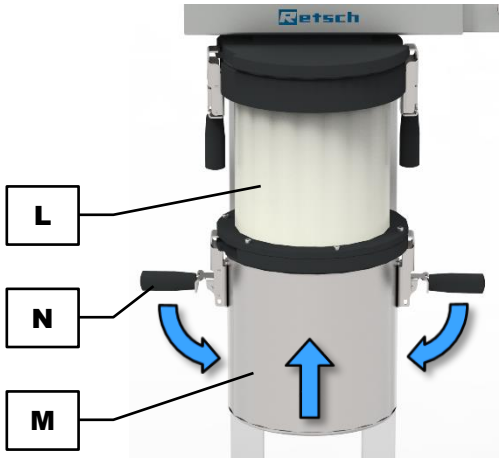

Fig. 22: Clamping the collecting receptacle

CAUTION

C11.0032

Danger of crushing

Clamping the clamping levers

- If the clamping levers are completely enclosed by the hand, the fingers can be pinched.

- **Do not clasp the clamping levers completely with the fingers during clamping.**
- **Press down the clamping levers only with the palm.**

7 Controlling the Device

7.1 Operating Controls, Displays and Functions

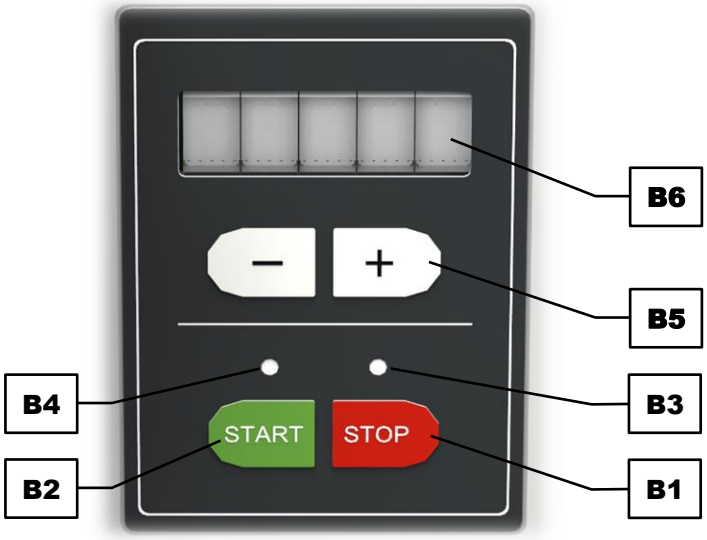

Fig. 23: Operating controls and functions

Element	Description	Function
B1	STOP button	Stops the grinding process
B2	START button	Starts the grinding process
B3	Status LED STOP	Lights up when STOP is pressed
B4	Status LED START	Lights up when START is pressed
B5	Rotation speed setting	Decreases or increases the rotation speed by pressing the "–" or "+" button, respectively in the range of 2 000 to 4 000 revolutions per minute
B6	Display	Displays the rotation speed as well as notifications

7.2 Manual Mode

7.2.1 Setting the Rotation Speed

The rotation speed can be set between 2 000 and 4 000 revolutions per minute (rpm) using the "+" and "–" buttons (**B5**).

⇨ Press the "+" button to increase the rotation speed in steps of 200 rpm.

⇨ Press the "–" button to decrease the rotation speed in steps of 200 rpm.

The rotation speed can also be changed during operation by pressing the "+" or "–" button (**B5**). An exceeding or falling below of 4 000 rpm or 2 000 rpm respectively is not possible.

7.2.2 Start Process

⇨ Press the START button (**B2**) to start the grinding process.

The status LED (**B4**) lights up and the rotor starts running.

NOTICE Always start the grinding process fist, before start feeding the sample material!

7.2.3 Feeding Sample Material

NOTICE N15.0003

Damage to mechanical components
Rotor blocking

- Due to the high pulling power of the rotor, blockages can occur when feeding large-grained, harder sample material.
- **Switch off the device immediately after blocking and remove the blocking grinding material.**
- **Reduce the feed of the sample material into the feed hopper.**
- **Fill larger and harder sample material slowly and gradually into the feed hopper.**

NOTICE Start the SK 300 first, before start feeding the sample material!

The maximum feed grain size must not exceed 25 mm.

⇨ Fill the sample material slowly and continuously into the feed hopper (**F**) **while the device is running.**

⇨ Pay attention to the motor noise during the filling. If the rotor speed changes audibly due to excessive sample amount, immediately reduce the supply of the sample material.

⇨ During the grinding process, pay attention to the amount of grinding material in the collecting receptacle (**M**). The collecting receptacle must be emptied as soon as the filling level reaches 90 % of its volume.

ⓘ For the batch-wise or continuous operation, the SK 300 can be retrofitted with a 30 l collecting receptacle and the vibratory feeder DR 100, both available as optional accessories.

7.2.4 Stop Process

⇨ Press the STOP button (**B1**) to stop the grinding process.

The status LED (**B3**) lights up and the rotor is immediately stopped by the engine brake.

NOTICE Stop the grinding process only when there is no more sample material left in the grinding chamber!

8 Error Messages and Information Notes

8.1 Error Messages

Error messages inform the user about detected device or programme errors. In the event of an error message, a fault has occurred, in which the operation of the device or the programme is automatically interrupted. Such faults must be resolved before next startup.

Error code	Description	Measures
E10	Drive overload	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E11	Failure drive / motor	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E12	Failure engine brake	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E20	Failure main board	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E22	Failure keypad	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E26	Failure frequency converter	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E41	Failure speed sensor	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E50	Failure safety circuit	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E51	Failure safety switch (locking mechanism)	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E80	Failure interface	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.

8.2 Information Notes

Notices inform the user on specific device or programme processes. The operation of the device or programme may be interrupted briefly, but there is no fault. The information notice must be acknowledged by the user to continue the process. Information notices provide additional information for the user as an aid, but do not represent any device or programme errors.

Notice code	Description	Measures
H10	Allow drive to cool down	⇨ Stop the grinding process. ⇨ Allow the device to cool down.
H41	Close grinding chamber	⇨ Close the door.

9 Return for Service and Maintenance

Fig. 1: Return form

The acceptance of devices and accessories of the Retsch GmbH for repair, maintenance or calibration can only be effected, if the return form including the decontamination declaration service has been correctly and fully completed.

⇨ Download the return form located in the download section "Miscellaneous" on the Retsch GmbH homepage (http://www.retsch.com/downloads/miscellaneous/).

⇨ When returning a device, attach the return form to the outside of the packaging.

In order to eliminate any health risk to the service technicians, Retsch GmbH reserves the right to refuse the acceptance and to return the respective delivery at the expense of the sender.

10 Cleaning, Wear and Maintenance

⚠ CAUTION C12.0013

Risk of injury
Improper repairs

– Unauthorised and improper repairs can cause injuries.
- **Repairs to the device may only be carried out by the Retsch GmbH , an authorised representative or by qualified service technicians.**
- **Do not carry out any unauthorised or improper repairs to the device!**

10.1 Cleaning

⚠ WARNING W4.0003

Risk to life caused by an electric shock
Cleaning live parts with water

– Cleaning the device with water can lead to life-threatening injuries caused by an electric shock if the device has not been disconnected from the power supply.
- **Only carry out cleaning work on the device when it has been disconnected from the power supply.**
- **Use a cloth moistened with water for cleaning.**
- **Do not clean the device under running water!**

⚠ CAUTION C13.0031

Risk of injury
Cleaning with compressed air

– When using compressed air for cleaning purposes dust and remnant of the sample material can be flung around and injure eyes.
- **Always wear safety glasses when cleaning with compressed air.**
- **Observe the material safety data sheets of the sample material.**

NOTICE N16.0009

Damage to the housing and device
Use of organic solvents

– Organic solvents may damage plastic parts and the coating.
- **The use of organic solvents is not permitted.**

⇨ Clean the housing of the device with a damp cloth and if necessary, with a household cleaning agent. Pay attention that no water or cleaning agent enters the interior of the device.

⇨ Clean the grinding chamber and the motor shaft (**MW**) with a brush or paint brush and vacuum the loosened material residues with a vacuum cleaner.
⇨ Alternatively, the grinding chamber can also be cleaned with compressed air.

10.1.1 Cleaning the Grinding Set

The cleaning of the grinding set consisting of the grinding insert (**ME**), the bottom sieve (**BS**) and the rotor (**RO**) should be carried out regularly.

⇨ Remove the grinding set from the grinding chamber (→ Chapter "Removing the Grinding Set")

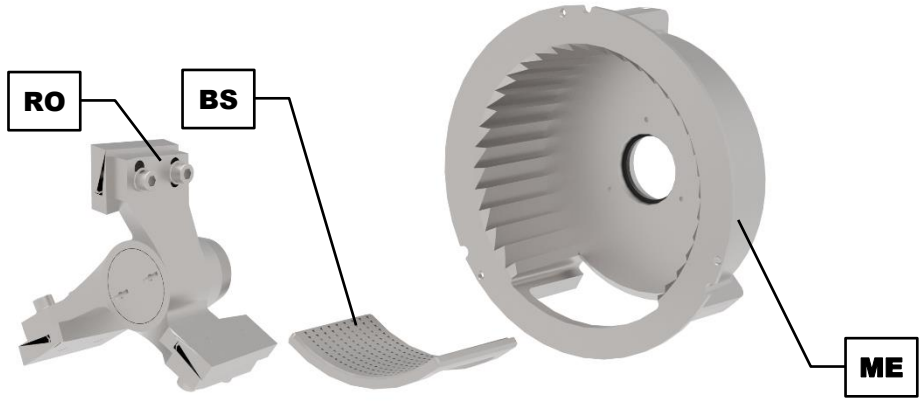

Fig. 24: Grinding set

Cleaning the grinding insert:
The grinding insert (**ME**) can be cleaned with alcohol, petrol or normal household detergent.

Cleaning the bottom sieve:
All bottom sieves (**BS**) can be easily and effectively cleaned dry or wet with a hand brush with plastic bristles. The bottom sieves are also dishwasher suitable.

Bottom sieves (**BS**) with finer mesh sizes can also be cleaned in an ultrasonic cleaning-bath. As cleaning agent, water together with a standard surfactant is recommended. The cleaning in the ultrasonic bath usually takes two to three minutes. After that the sieve inserts are thoroughly rinsed with water and dried. The cleaning with strong bases or acids is generally not recommended.

Drying ovens of various sizes can be used for drying bottom sieves.

Additional information concerning ultrasonic cleaning-baths and drying ovens can be found on the Retsch GmbH homepage (https://www.retsch.com).

Cleaning the rotor:
The rotor (**RO**) can be cleaned with alcohol, petrol or normal household detergent.

⇨ Make sure that the hub (**RO1**) is thoroughly cleaned and no material residues are left inside.

10.1.2 Cleaning the Feed Hopper

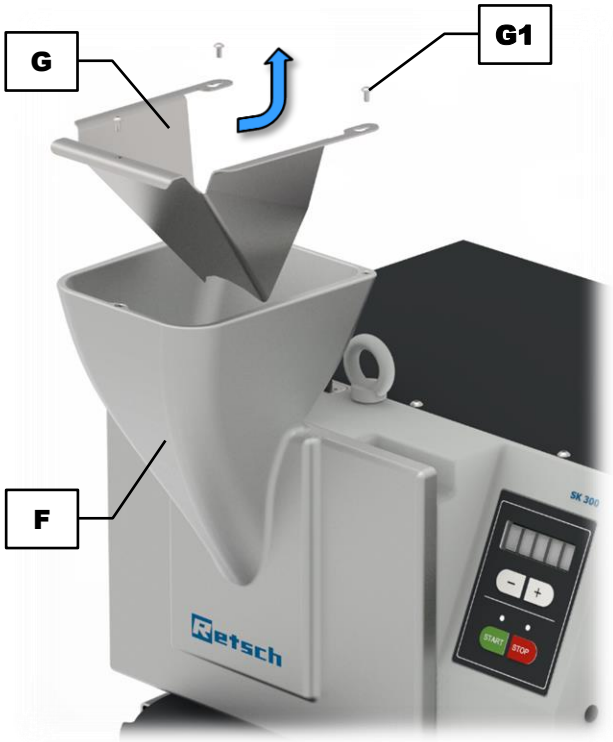

Fig. 25: Cleaning the feed hopper

⇨ Unscrew the three M4 oval-head screws (**G1**).
⇨ Pull the splashback protection (**G**) slightly backwards, then remove it upwards.
⇨ Clean the feed hopper (**F**) and the splashback protection (**G**) with alcohol, petrol or normal household detergent. The splashback protection (**G**) is also dishwasher suitable.
⇨ Alternatively, the feed hopper (**F**) can also be cleaned with compressed air.

WARNING W5.0011

Risk of injury caused by rotating rotor
Operation without safety equipment

– If the device is operated without safety equipment (splash-back protection or fill hopper), items of clothing or parts of the body can get into the grinding chamber. The rotating rotor can then cause injuries.
- **Never operate the device without the safety equipment.**

10.2 Wear

The grinding tools may become worn, depending on the frequency of the grinding operation and the sample material. The rotor and the grinding sets should be regularly checked for wear and replaced if necessary.

Likewise, all existing sealing gaskets (of grinding tools and in the device) should be checked for wear regularly and replaced if necessary.

10.2.1 Replacing the Felt Ring

The felt ring (**ME3**) is located on the backside of the grinding insert (**ME**). In order to replace it when worn, the grinding insert must be removed from the grinding chamber.

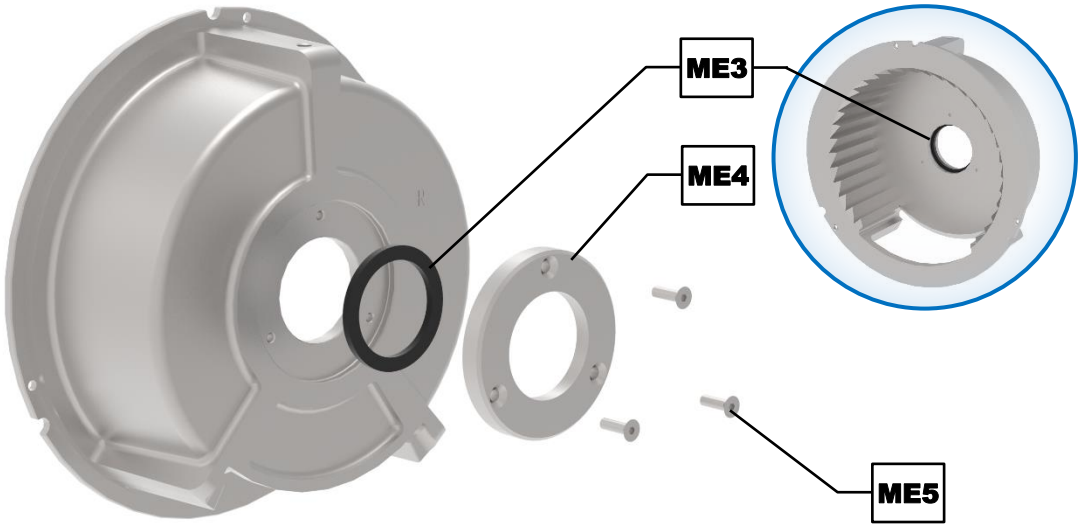

Fig. 26: Replacing the felt ring

- ⇨ Remove the three M4 hexagon socket countersunk head screws (**ME5**).
- ⇨ Remove the flange (**ME4**).
- ⇨ Replace the felt ring (**ME3**).
- ⇨ Reassemble the grinding insert in reverse order.

10.2.2 Adjusting the Baffle Plates

If the baffle plates (**RO2**) on the rotor are worn out and hence, the gap between the baffle plates and the grinding insert is too large, the baffle plates can be readjusted by means of the supplied 1 mm (thick) adjustment sheet (**EB**).

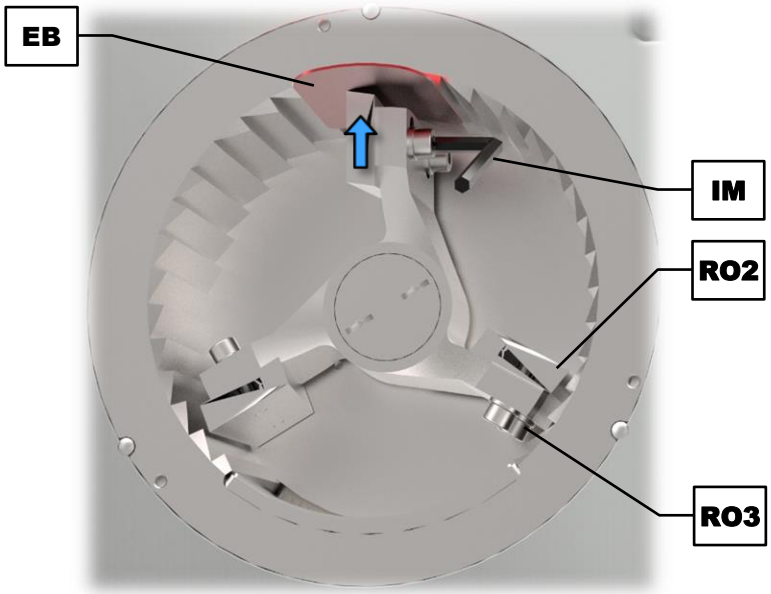

Fig. 27: Adjusting the baffle plates

- ⇨ Slide the adjustment sheet (**EB**) between the baffle plate (**RO2**) and the serrated inner surface of the grinding insert and hold it in position.
- ⇨ Loosen the two M6 hexagon socket head screws (**RO3**) using the supplied hexagon socket wrench (**IM**).
- ⇨ Press the baffle plate (**RO2**) up to the stop against the adjustment sheet (**EB**).
- ⇨ Retighten the two M6 hexagon socket head screws (**RO3**).
- ⇨ Repeat the procedure with the other two baffle plates.
- ⇨ Remove the adjustment sheet (**EB**) from the grinding chamber.

NOTICE The correct gap can only be set at a serrated inner surface of the grinding insert. If the baffle plate is positioned towards the bottom sieve, the rotor must be turned slightly by hand. To rotate the rotor, sufficient force must be applied to work against the engine brake.

11 Maintenance

The SK 300 is largely maintenance-free.

With each cleaning, it is recommended to additionally lubricate the feather key (**PF**) on the motor shaft (**MW**) with a few drops of machine oil.

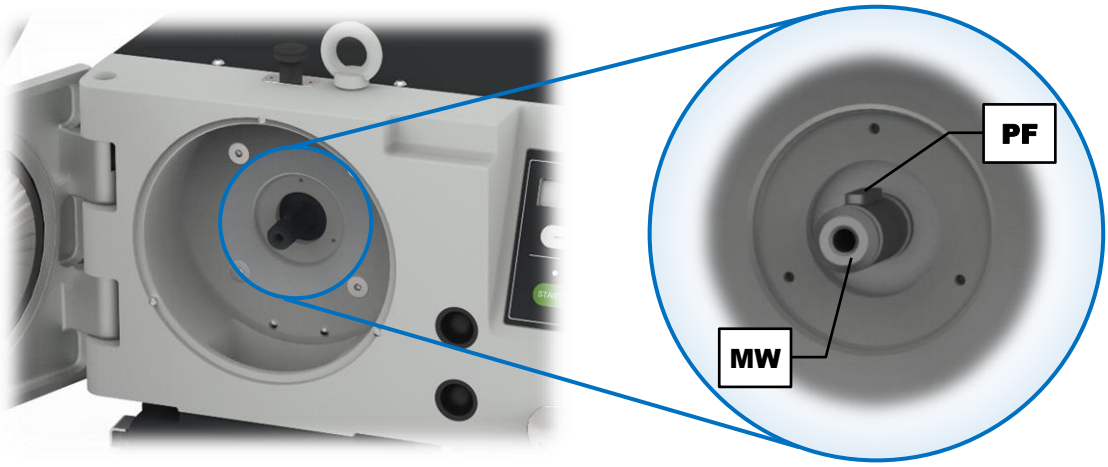

Fig. 28: Feather key on the motor shaft

In order to ensure the operational safety of the device, the roller (**K1**) of the locking mechanism (**K**) should be checked monthly for free movement and, if necessary, re-oiled with machine oil.

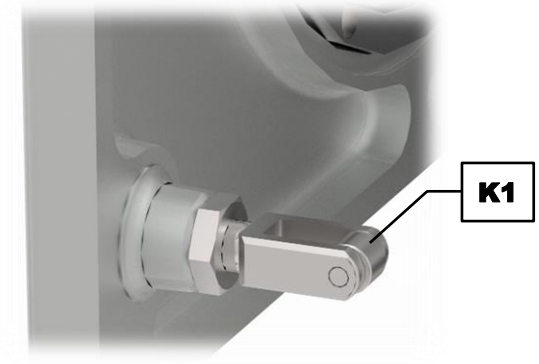

Fig. 29: Locking mechanism

11.1.1 Replacing the Fuses

WARNING

W6.0014

Risk to life caused by an electric shock
Exposed contacts

- Replacing the fuses without pulling out the mains plug can lead to life threatening injuries caused by an electric shock on contact with the fuse holder or the live contacts on the fuse.
- **Pull out the mains plug before replacing the fuses.**

Voltage	Fuse
100 – 240 V	10 A delay-action

Two fuses are located in the fuse drawer (**T**) on the backside of the device. Fuses can be replaced by trained qualified personnel.

⇨ Remove the fuse drawer by pressing the two latches on the side of the fuse drawer.
⇨ Replace the defective fuse in the fuse drawer.
⇨ Slide the fuse drawer back in again, until is audibly locks in place.

12 Accessories

Information on available accessories as well as the respective manuals are accessible directly on the Retsch GmbH homepage (https://www.retsch.com) under the heading "Downloads" of the device.

Information on wear parts and small accessories can be found in the Retsch GmbH general catalogue also available on the homepage.

In case of any questions concerning spare parts please contact the Retsch GmbH representative in your country, or Retsch GmbH directly.

12.1 Vibratory Feeder DR 100

Fig. 30: SK 300 with vibratory feeder DR 100

When feeding larger quantities, it is generally recommended to use the vibratory feeder DR 100 for uniform conveyance of the feed material. This mainly avoids an unnecessary load on the grinding set and ensures reproducibly exact results, as well as the economical use of the downstream device.

NOTICE Observe the supplied manual before installing and operating the vibratory feeder DR 100.

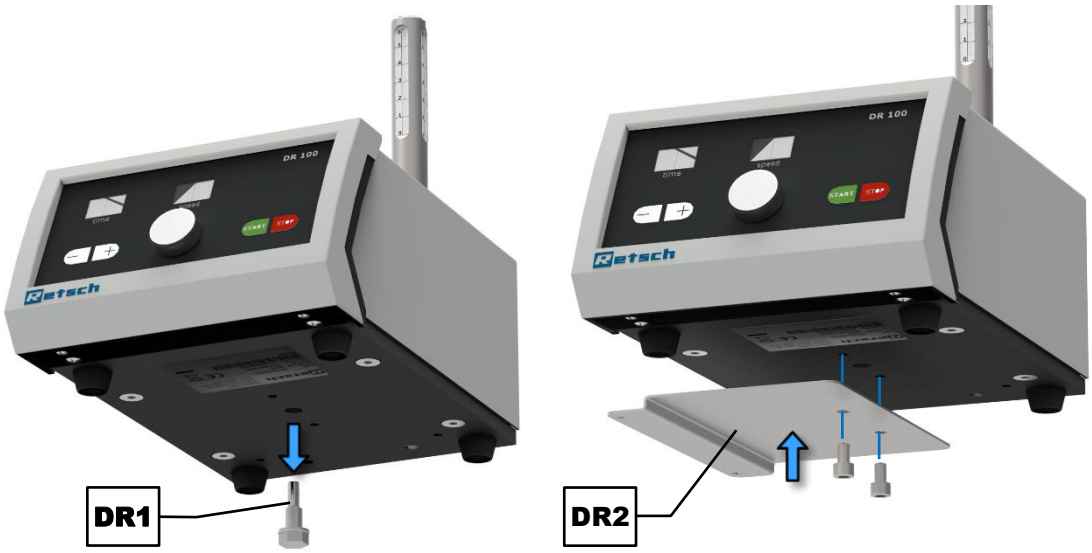

Fig. 31: Removing the transportation lock (left) and mounting the angle plate (right)

⇨ Remove the transportation lock (**DR1**).
⇨ Mount the angle plate (**DR2**) to the bottom of the DR 100 with the two M6 hexagon socket head screws supplied, so that it protrudes under the vibratory feeder on the left hand side.

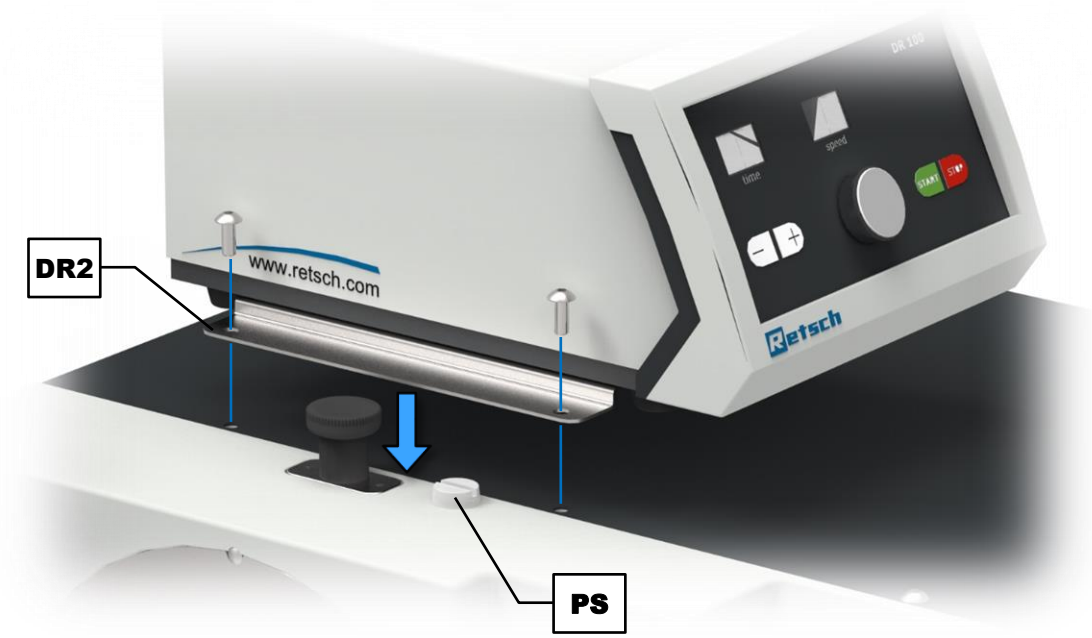

Fig. 32: Mounting the vibratory feeder DR 100

⇨ If not already done, replace the transportation lug (**A**) on the SK 300 with the supplied plastic screw (**PS**).
⇨ Loosen the two M5 oval-head screws at the housing of the SK 300 and use them to screw the angle plate (**DR2**) to the SK 300.
⇨ Mount the feed chute holder, the feed chute, the hopper holder and the hopper as described in the separate manual of the vibratory feeder DR 100.

Fig. 33: Rear side of the vibratory feeder DR 100

- ⇨ Plug the power cable into the mains connection on the rear.
- ⇨ Set the operating mode selector switch (**DR3**) to "Standard". A control via "Extern" (external) is not possible in conjunction with the SK 300.
- ⇨ Turn on the vibratory feeder DR 100 via the rear mains switch (**DR4**).
- ⇨ For detailed information on the controls, please refer to the manual of the vibratory feeder DR 100.

12.2 Cyclone Separator

⚠ CAUTION!

W7.0013

High risk of injury from spinning rotor

Operating any machinery without safety guards in place

- If the device is operated without safety guards in place (discharge flange), clothing or parts of the body can be drawn into the grinding chamber. The spinning rotor can cause serious injuries.

- **Never operate the device without all safety guards in place!**

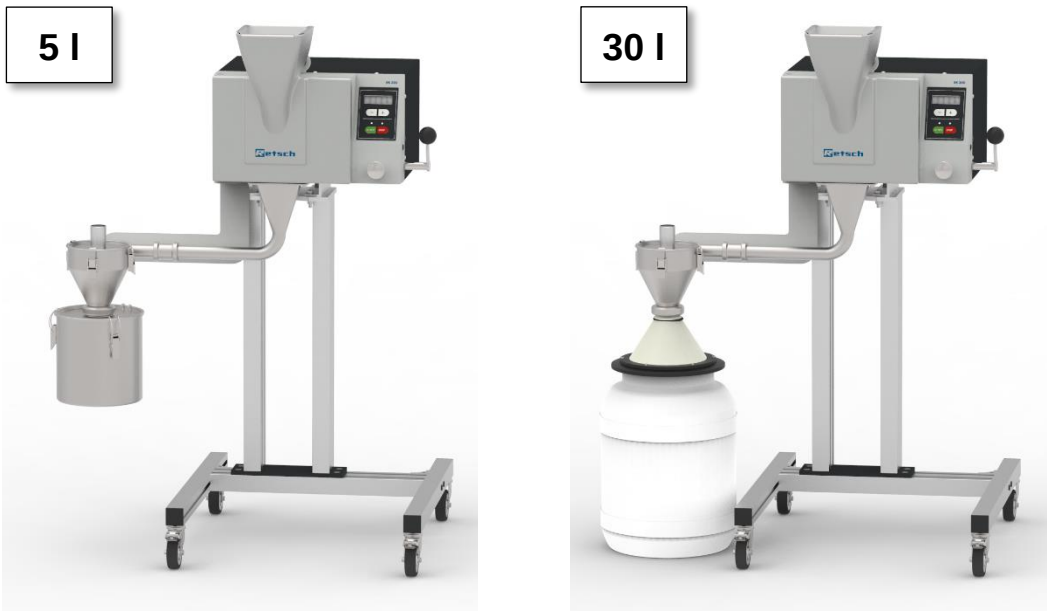

Fig. 34: SK 300 and cyclone separator with 5 l collecting receptacle (left) and 30 l collecting receptacle (right)

When grinding light sample material, the SK 300 can be operated with a cyclone separator, so that even light feed material or small quantities can be easily processed.

Depending on the amount of sample to be processed, the cyclone separator can be fitted with a 5 l or 30 l collecting receptacle.

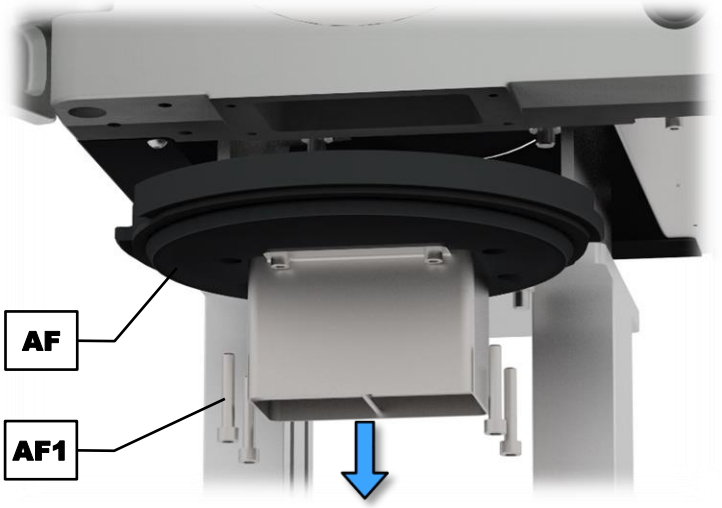

Fig. 35: Removing the discharge flange

⇨ Disconnect the device from the mains.
⇨ Loosen the four M6x35 hexagon socket head screws (**AF1**).
⇨ Remove the discharge flange (**AF**).

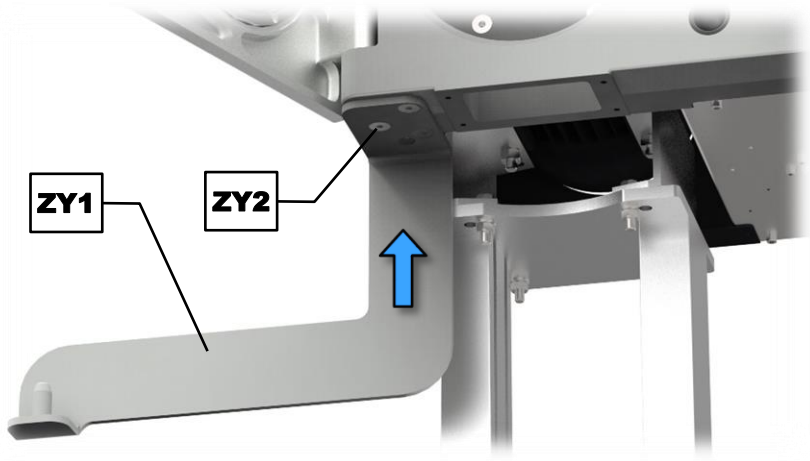

Fig. 36: Installing the mounting bracket

⇨ Use the three supplied M8 hexagon socket countersunk head screws (**ZY2**) to bolt the mounting bracket (**ZY1**) of the cyclone separator to the housing of the SK 300.

ⓘ Once installed, the mounting bracket (**ZY1**) does not need to be removed again for the operation without cyclone separator. The discharge flange (**AF**) can also be reassembled safely with the mounting bracket installed.

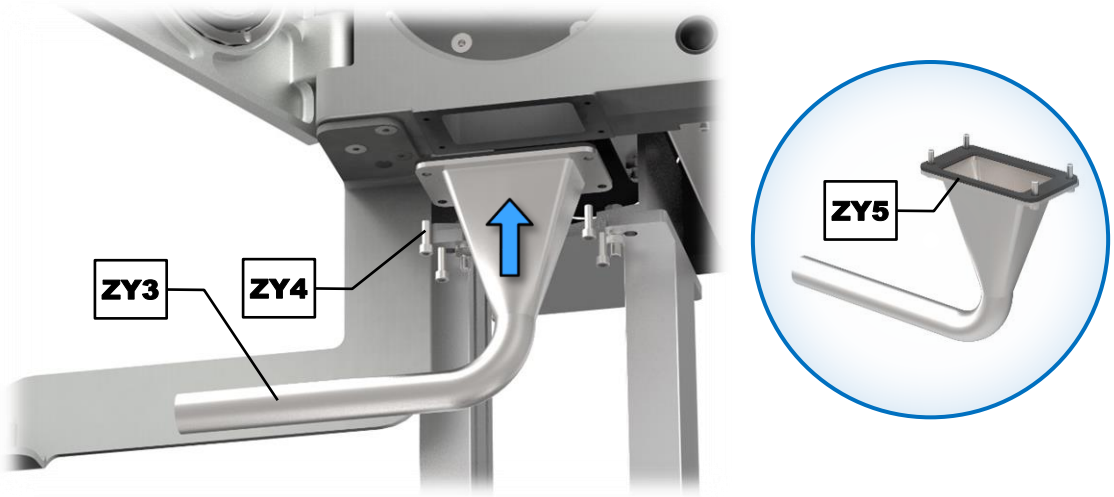

Fig. 37: Installing the cyclone adapter

⇨ Fasten the cyclone adapter (**ZY3**) to the housing of the SK 300 with the four supplied M6x20 hexagon socket head screws (**ZY4**).
⇨ Make sure that the sealing gasket (**ZY5**) rests correctly on the cyclone adapter.

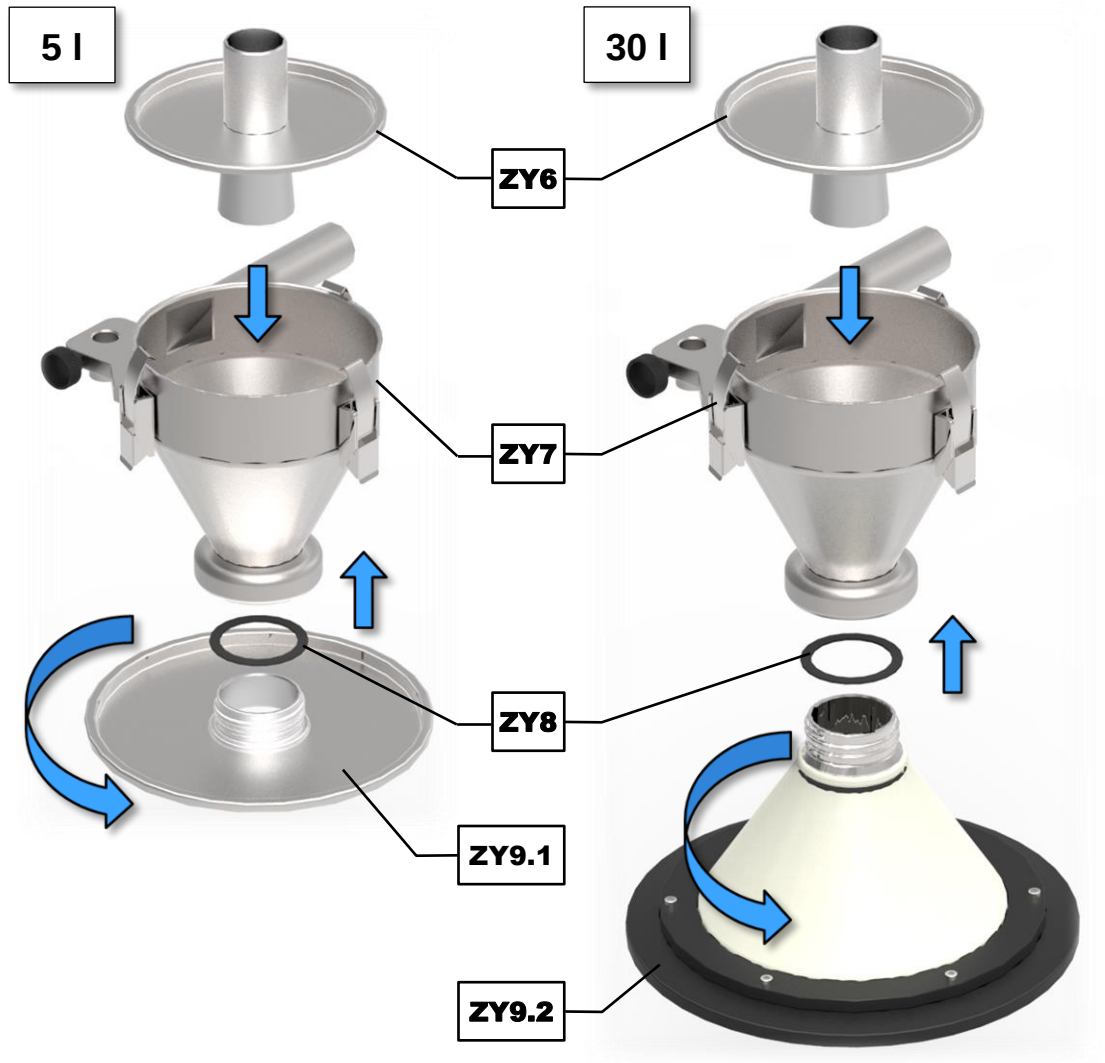

Fig. 38: Assembly of the cyclone funnel for the 5 l collecting receptacle (left) and the 30 l collecting receptacle (right)

⇨ Depending on the type of the cyclone separator, either screw the cover (**ZY9.1**) of the 5 l collecting receptacle together with the sealing gasket (**ZY8**) into the socket of the cyclone funnel (**ZY7**), or, in case of the 30 l collecting receptacle, screw the filter hose (**ZY9.2**) together with the sealing gasket (**ZY8**) into the socket of the cyclone funnel (**ZY7**).

⇨ Open the three snap locks on the cyclone funnel (**ZY7**), place the funnel cover (**ZY6**) onto the cyclone funnel and close the three snap locks again.

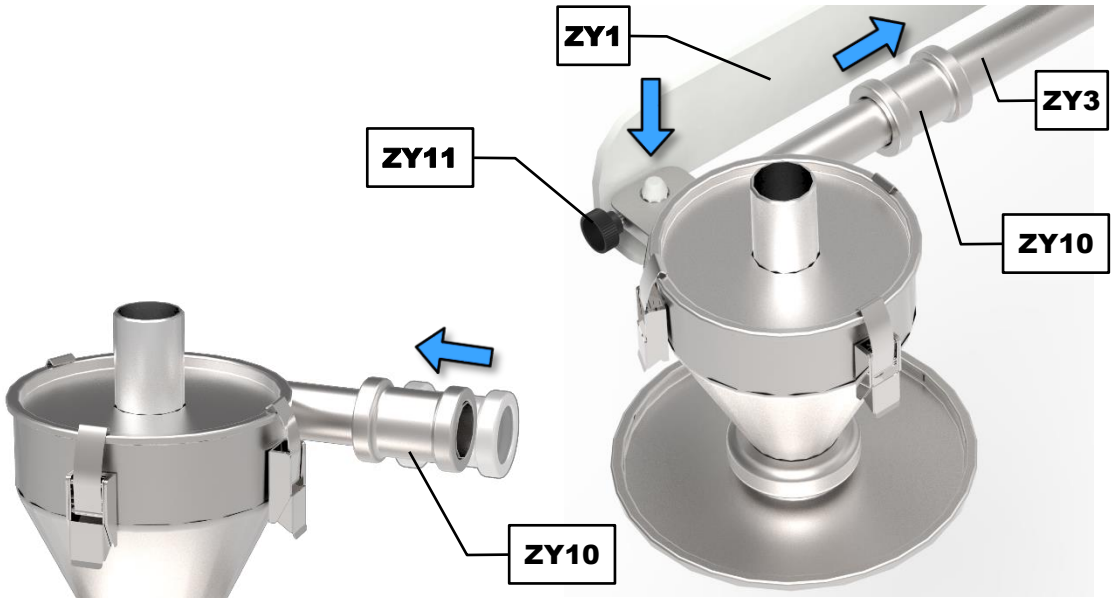

Fig. 39: Placing the coupling (left) and mounting the cyclone funnel (right)

- ⇨ Slide the coupling (**ZY10**) completely over the tube of the cyclone funnel.
- ⇨ Mount the assembled cyclone funnel into the mounting bracket (**ZY1**) and align it to the cyclone adapter (**ZY3**).
- ⇨ Slide the coupling (**ZY10**) over the cyclone adapter (**ZY3**) until it is situated half on the tube of the cyclone funnel and half on the cyclone adapter.
- ⇨ Secure the assembled cyclone funnel by means of the knurled head screw (**ZY11**).

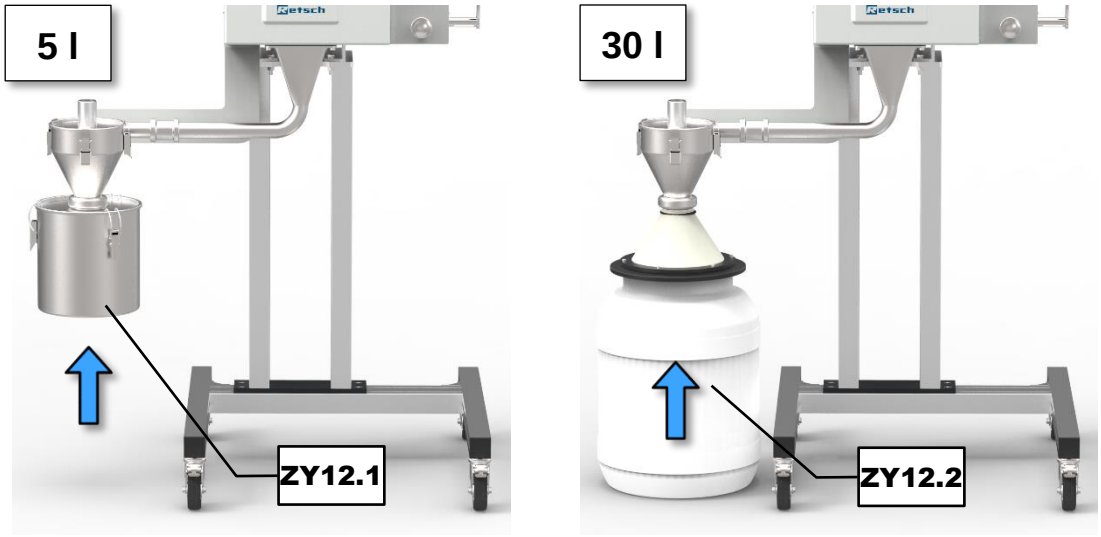

Fig. 40: Inserting the 5 l (left) and 30 l collecting receptacle (right)

- ⇨ Depending on the type of the cyclone separator, clamp the 5 l collecting receptacle (**ZY12.1**) to the cover (**ZY9.1**) by means of the three snap locks, or place the 30 l collecting receptacle (**ZY12.2**) underneath the filter hose (**ZY9.2**) so that its flange rests on the opening of the collecting receptacle.

Fig. 41: Connecting the industrial vacuum cleaner

⇨ Insert the connection of the industrial vacuum cleaner (**ZY13**) into the upper opening of the cyclone funnel.
⇨ Always switch on the industrial vacuum cleaner first, before starting the grinding process.

⚠ CAUTION Read the manual of the industrial vacuum cleaner before commissioning.

13 Disposal

In the case of a disposal, the respective statutory requirements must be observed. In the following, information on the disposal of electrical and electronic devices in the European Community are given.

Within the European Community the disposal of electrically operated devices is regulated by national provisions that are based on the EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE).

Accordingly, all devices supplied after August 13th 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, the devices are provided with the disposal label.

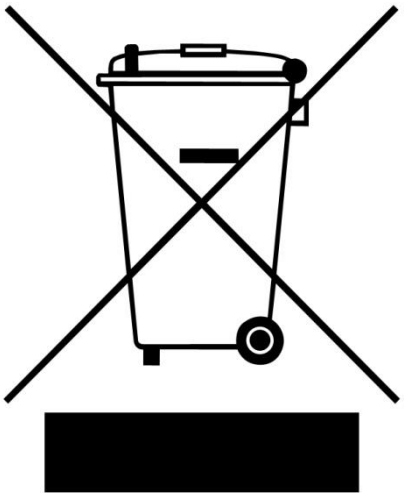

Fig. 42: Disposal label

Since the disposal regulations worldwide and also within the EU may differ from country to country, the supplier of the device should be consulted directly in case of need.

This labelling obligation is applied in Germany since March 23rd 2006. From this date on, the manufacturer must provide an adequate possibility of returning all devices delivered since August 13th 2005. For all devices delivered before August 13th 2005 the end user is responsible for the proper disposal.

14 Index

EU Declaration of Conformity
Translation

CROSS BEATER MILL

SK 300 | 20.751.xxxx

EU DECLARATION OF CONFORMITY

Herewith we declare, represented by the signatory, that the above mentioned device complies with the following directives and harmonized standards:

Machinery Directive 2006/42/EC

Applied standards, in particular:

DIN EN ISO 12100	Safety of machinery
DIN EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems
DIN EN 13683	Garden equipment - Integrally powered shredders/chippers - Safety

EMC Directive 2014/30/EU

Applied standards, in particular:

DIN EN 55011	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
DIN EN 61000-3-2	Electromagnetic compatibility (EMC)
DIN EN 61000-3-3	Electromagnetic compatibility (EMC)
DIN EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements

Low Voltage Directive 2014/35/EU

Applied standards, in particular:

DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use

Authorized person for the compilation of technical documents:

Dr. Loredana Di Labio (technical documentation)

Furthermore, we declare that the relevant technical documentation for the above mentioned device has been compiled according to Annex VII Part A of the Machinery Directive, and we undertake to submit this documentation on request to the market surveillance authorities.

In case of a modification of the device not previously agreed with Retsch GmbH, as well as the use of unauthorised spare parts or accessories, this declaration will lose its validity.

Retsch GmbH

Haan, 08/2017

Dr. Ing. Frank Janetta, Team Leader R&D Department

CE

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