Manual
Cross Beater Mill SK 300

Translation
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1 Notes on the Manual

Dear user,
please read the following manual referring to this device carefully before starting any installation, commissioning and operation.

This 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 per area) with the relevant chapters is a precondition for the safe and appropriate use of the device.

This manual does not contain any repair instructions. In case of any obscurities or questions with regards to this document or the device, as well as if faults arise or repairs are necessary, please contact your supplier or get in touch with Retsch GmbH directly.

Application-technical information relating to samples to be processed are not or only to a certain extent included. However, more information thereof can be found in the internet on the webpage of the respective device on the Retsch GmbH homepage (http://www.retsch.com).

Revision status:
This document revision 0003 refers to the manual "Cross Beater Mill SK 300" in compliance with the Directive of Machinery 2006/42/EC.

1.1 Disclaimer
This document has been prepared with due care. Technical and software based modifications are reserved. No liability is assumed for data loss, personnel injury or damage to the device which results from the failure to observe the instructions and/or warnings in this document.

1.2 Copyright
This document or parts of it or its content may not be reproduced, distributed, edited or copied in any form without prior written permission of Retsch GmbH. Damage claims shall be asserted in the case of infringements.
1.3 Explanations of the Safety Instructions

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>☭</td>
<td>Reference to a recommendation and/or an important information</td>
</tr>
<tr>
<td>➔</td>
<td>Reference to a chapter, table or figure</td>
</tr>
<tr>
<td>⏯</td>
<td>Action instruction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Name]</td>
<td>Software menu function</td>
</tr>
<tr>
<td>⟨Name⟩</td>
<td>Software checkbox</td>
</tr>
</tbody>
</table>

In this document the following safety instructions warn of possible dangers and damages:

**DANGER**

Type of danger / personal injury

Source of danger
- Possible consequences if the dangers are not observed.
  - Instructions and information on how the dangers are to be avoided.

Life-threatening personal injuries may result from disrespecting the safety instruction for danger. There exists a very high risk of hazard of life or permanent injury to personnel. Additionally, in continuous text or action instructions the signal word **DANGER** is used.

**WARNING**

Type of danger / personal injury

Source of danger
- Possible consequences if the dangers are not observed.
  - Instructions and information on how the dangers are to be avoided.

Serious personal injuries may result from disrespecting the warning notice. There exists an elevated risk of an accident or severe injury to personnel. Additionally, in continuous text or action instructions the signal word **WARNING** is used.

**CAUTION**

Type of danger / personal injury

Source of danger
- Possible consequences if the dangers are not observed.
  - Instructions and information on how the dangers are to be avoided.

Moderate or mild personal injuries may result from disrespecting the safety instruction for caution. There exists a medium or low risk of an accident or injury to personnel. Additionally, in continuous text or action instructions the signal word **CAUTION** is used.
1.4 General Safety Instructions

Non-observance of the operating instructions

Read the manual

Target group:

Safety manager:

Improper operation can result in personal injuries and material damage. The managing operator himself is responsible for his own safety and that of his employees. The managing operator himself is responsible that no unauthorised person has access to the device.

Persons who are under the influence of intoxicating substances (pharmaceuticals, drugs, alcohol), fatigue or health disorders must not operate the device.
### CAUTION

**Changes to the device**

Improper modifications

- Changes to the device can lead to personal injuries.
- **Do not make any modification to the device.**
- **Use spare parts and accessories that have been approved by Retsch GmbH exclusively.**

### NOTICE

**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.**

1.5 **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 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.

<table>
<thead>
<tr>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname, first name (block letters)</td>
</tr>
<tr>
<td>Position in the company</td>
</tr>
<tr>
<td>Place, date and signature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Managing operator or service technician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname, first name (block letters)</td>
</tr>
<tr>
<td>Position in the company</td>
</tr>
<tr>
<td>Place, date and signature</td>
</tr>
</tbody>
</table>
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**

Possible acoustic signals not being heard
Loud grinding noises
- Possible acoustic alarms and voice communication might not be heard.
- **Consider the volume of the grinding noise in relation to other acoustic signals in the work environment. Additional visual signals may be used.**

**CAUTION**

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:**

<table>
<thead>
<tr>
<th>Feed material:</th>
<th>Wood pellets (&lt; 5 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom sieve:</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>Speed:</td>
<td>2 000 rpm</td>
</tr>
</tbody>
</table>

At these operating conditions, the workplace related equivalent continuous sound level \( L_{eq} = 79.9 \text{ dB(A)} \).
Example 2:

<table>
<thead>
<tr>
<th>Feed material</th>
<th>Wood pellets (&lt; 5 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom sieve</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>Speed</td>
<td>4 000 rpm</td>
</tr>
</tbody>
</table>

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**

**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
Packaging, Transport and Installation

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**

Storage of the packaging
- In the event of a complaint or return, the warranty claim may be endangered if the packaging is inadequate or the device has not been secured correctly.
  - Keep the packaging for the duration of the warranty period.

4.2 Transport

**WARNING**

Serious personal injury
Falling loads
- Due to the heavy weight of the device, serious personal injuries can be caused if it falls down.
  - Lifting above head height is not permissible!

**NOTICE**

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

**NOTICE**

Complaints
Incomplete delivery or transportation damage
- The forwarding agent and Retsch GmbH must be notified immediately in the event of transportation 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.
**Packaging, Transport and Installation**

![Transportation lug](image)

**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**

**Temperature fluctuations**

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

- The resultant condensed water may damage electronic components.
- Wait before commissioning until the device has been acclimatised.

**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
PACKAGING, TRANSPORT AND INSTALLATION

NOTICE

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 $L_F = -(U_T - 55) / 0.3$:

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Max. rel. humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 31 °C</td>
<td>80 %</td>
</tr>
<tr>
<td>33 °C</td>
<td>73.3 %</td>
</tr>
<tr>
<td>35 °C</td>
<td>66.7 %</td>
</tr>
<tr>
<td>37 °C</td>
<td>60 %</td>
</tr>
<tr>
<td>39 °C</td>
<td>53.3 %</td>
</tr>
<tr>
<td>40 °C</td>
<td>50 %</td>
</tr>
</tbody>
</table>

NOTICE

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 and frequency 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

Electrical connection
Failure to observe the values on the type plate
- Electronic and mechanical components may be damaged.
- Connect the device only to 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

① 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

Danger to life through electric shock
Damaged power cable
- An electric shock can cause burns, cardiac arrhythmia, respiratory arrest, as well as cardiac arrest.
- Never use a damaged power cable to connect the device to the mains!
- Check the power cable and the plug for any damage before use.

NOTICE

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

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

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:
First Commissioning

- 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.
First Commissioning

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 locknuts 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

Risk of explosion or fire
Potentially explosive atmosphere
- On account of its design, the device is not suitable for use in potentially explosive atmospheres.
- Do not operate the device in a potentially explosive atmosphere.

⚠️ CAUTION

Danger of personal injury
Hazardous sample material
- Depending on the dangerous nature of the sample material necessary measures must be taken to rule out any danger of personal injury.
- Observe the material safety data sheets of the sample material.

⚠️ CAUTION

Risk of explosion or fire
Changing sample properties
- The properties and therefore also the hazardousness of the sample can change during the grinding process.
- Do not use any substances in this device which carry the risk of explosion or fire.
- Observe the material safety data sheets of the sample material.

⚠️ CAUTION

Chemical reactivity
Changing sample properties
- The properties and therefore also the chemical reactivity of the sample can change during the grinding process.
- Do not use any substances in this device which carry the risk of increasing chemical reactivity during the grinding process.
- Observe the material safety data sheets of the grinding 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.

**WARNING**

Handling of food, pharmaceutical and cosmetic products

Processed products

- Food, pharmaceutical and cosmetic products, which were processed with the device must not be consumed, used or circulated.
- **Dispose these substances in accordance with the applicable regulations.**

**NOTICE**

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 Instrument

6.3.1 Front

Fig. 13: Front view of the device
### Operating the Device

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

#### 6.3.2 Back

![Back view of the device](image)

**Fig. 14:** Back view of the device
### 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

- 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 button is pressed. This instructs the user to close the door.
6.6 Inserting the Grinding Set

**CAUTION**

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**

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](image)

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).
**CAUTION**

**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, Display and Functions

![Operating controls and functions](image)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>STOP button</td>
<td>Stops the grinding process</td>
</tr>
<tr>
<td>B2</td>
<td>START button</td>
<td>Starts the grinding process</td>
</tr>
<tr>
<td>B3</td>
<td>Status LED STOP</td>
<td>Lights up when STOP is pressed</td>
</tr>
<tr>
<td>B4</td>
<td>Status LED START</td>
<td>Lights up when START is pressed</td>
</tr>
<tr>
<td>B5</td>
<td>Rotation speed setting</td>
<td>Decreases or increases the rotation speed by pressing the &quot;−&quot; or &quot;+&quot; button, respectively in the range of 2 000 to 4 000 revolutions per minute</td>
</tr>
<tr>
<td>B6</td>
<td>Display</td>
<td>Displays the rotation speed as well as notifications</td>
</tr>
</tbody>
</table>

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.
Controlling the Device

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

### 7.2.3 Feeding Sample Material

**NOTICE**

**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.

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

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.

<table>
<thead>
<tr>
<th>Notice code</th>
<th>Description</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>H10</td>
<td>Allow drive to cool down</td>
<td>Stop the grinding process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allow the device to cool down.</td>
</tr>
<tr>
<td>H41</td>
<td>Close grinding chamber</td>
<td>➔  Close the door.</td>
</tr>
</tbody>
</table>
9 Return for Service and Maintenance

![Fig. 24: Return form](image)

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**

Personal injury
Improper 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.

**WARNING**

Danger to life through electric shock
Cleaning with water
- An electric shock can cause burns, cardiac arrhythmia, respiratory arrest, as well as cardiac arrest.
- The power cable must be unplugged before cleaning the device.
- Use a cloth dampened with water for cleaning.
- Do not clean the device under running water!

**CAUTION**

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**

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. 25: 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 (http://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

![Diagram of cleaning the feed hopper]

**Fig. 26:** 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]

**WARNING**

**Serious personal injury**

Intervention in rotating rotor

- Unintentional intervention in the grinding chamber and the rotating rotor can cause serious hand injuries.
- *Never operate the device without mounted splashback protection, or, if removable, without mounted feed hopper.*

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 on a regularly basis 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. 27: 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 adjustment sheet (EB).

Fig. 28: Adjusting the baffle plates
Cleaning, Wear and Maintenance

- 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.

10.3 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. 29: Feather key on the motor shaft](image)

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. 30: Locking mechanism](image)
10.3.1 Replacing the Fuses

**WARNING**

**Danger to life through electric shock**
Exposed power contacts

- When replacing the fuses, contact to live contacts on the fuse or the fuse receptacle can lead to an electric shock.
- An electric shock can cause burns, cardiac arrhythmia, respiratory arrest, as well as cardiac arrest.

- The power cable must be unplugged before exchanging the fuses.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 – 240 V</td>
<td>10 A delay-action</td>
</tr>
</tbody>
</table>

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 it audibly locks in place.
11 Accessories

Information on available accessories as well as the respective manuals are accessible directly on the Retsch GmbH homepage (http://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.

11.1 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.
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.

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.
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.

11.2 Cyclone Separator

**WARNING**

Serious personal injury
Intervention in rotating rotor

- Unintentional intervention in the grinding chamber and the rotating rotor can sever fingers and cause serious hand injuries.
- **The power cable must be unplugged before removing the discharge flange.**
- **Never operate the device without mounted discharge flange.**
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. 36: 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. 37: 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. 38: 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. 39:** 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. 40: 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. 41: 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. 42: 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.
12 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 13\textsuperscript{th} 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.

![Disposal label](image)

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 23\textsuperscript{rd} 2006. From this date on, the manufacturer must provide an adequate possibility of returning all devices delivered since August 13\textsuperscript{th} 2005. For all devices delivered before August 13\textsuperscript{th} 2005 the end user is responsible for the proper disposal.
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CROSS BEATER MILL
SK 300 | 20.751.xxxx

EU DECLARATION OF CONFORMITY
Hereewith 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 B 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

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

Haan, 05/2016

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