Manual

Ultra Centrifugal Mill ZM 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 0001 of the "Ultra Centrifugal Mill ZM 300" manual has been prepared in accordance with the Directive of Machinery 2006/42/EC.

1.1 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.

1.2 Copyright

1.3 Explanation of signs and symbols

The following **signs** and **symbols are** used in this Manual:

Signs and symbols	Meaning
	Reference to a recommendation and/or important information.
• • •	Lists
1. (…) 2. (…) 3. (…)	Actions in an instruction.
(1), (2), (…)	The relevant components are labelled with (numbers) in the instructions for better orientation. The components have a fixed numeric value. This value is specified in the “views of the device”.
➔	Result of an action
⇨	Optional instruction in the “Controlling the device using the touchscreen display” chapter.
(T1), (T2), (…)	The functions of the touchscreen display are labelled with a (T) in the “Controlling the device using the touchscreen display” chapter for better orientation.

	The **Retsch ZM 300 Ultra Centrifugal Mill** is usually described in the explanations in this Manual as **device**.

1.4 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 Safety

⚠ 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.**

Target group:
The Retsch ZM 300 Ultra Centrifugal Mill is intended for use in a laboratory environment for sample preparation. This manual is therefore addressed to personnel working with this device in a comparable environment who already have experience with similar devices.

This device is a modern, high-performance product from Retsch GmbH and state of the art. When used as intended with this device and with knowledge of the technical documentation available here, operational safety is assured.

2.1 Use of the Device for the Intended Purpose

The Retsch ZM 300 Ultra Centrifugal Mill is used for grinding dry bulk materials as well as soft, medium-hard and fibrous materials up to a particle size of 10 mm.

As a laboratory instrument, the Retsch ZM 300 Ultra Centrifugal Mill is to be used exclusively for sample preparation. The Retsch ZM 300 Ultra Centrifugal Mill is not a production machine. This laboratory instrument is designed for 8-hour single-shift operation at 30 % duty cycle.

The device is designed for stationary operation in a dry and clean working environment.

The operating company and operators must have read the manual and be familiar with the full range of functions of the device.

2.2 Improper use

The device may only be used for its intended use.

Any uses other than those described under intended use are considered to be improper.

The Retsch ZM 300 Ultra Centrifugal Mill is **not** suitable for grinding of:

- Minerals with a Mohs hardness > 4, e.g. silica sands, corundum, etc.
- Ferro alloys
- Abrasives
- Sample materials that can form explosive air mixtures

Claims for damages in any form are excluded for property damage and personal injury resulting from improper use and/or failure to comply with the safety instructions.

2.3 Obligations of the operating company

2.3.1 Provisions

The operator is responsible for ensuring that persons working with the device have taken note of and understood all relevant safety regulations.

2.3.2 Personnel

- Ensure that only skilled personnel are deployed who, due to their training and experience, are qualified to recognise risks and avoid potential hazards.
- Personnel should be instructed regularly on handling the device, in particular about the occurrence of sudden events.
- Trainee personnel should only be allowed to work on the device when supervised by qualified skilled personnel.
- Check the safety awareness of staff regularly.
- Define responsibilities of personnel according to qualifications and job description.
- Provide personnel with personal protective equipment (PPE).
- Ensure that the following prerequisites have been met:
  - Personnel have read and understood this Manual, and in particular the chapter on "Safety".
  - Personnel know and follow the pertinent accident prevention and safety regulations.
  - Personnel wear the designated personal protective equipment (PPE) when working with the device.

2.3.3 Workstation and device

- Ensure the workstation has sufficient lighting and ventilation.
- Ensure that exhaust air is correctly transported outside.
- All signs on the device must be maintained in a legible state.
- Ensure that all checks and maintenance work prescribed in this Manual are carried out.

2.3.4 Qualification of personnel

Work/operating phase	Qualification
• Transport • Installation • Putting into service • Operation • Control • Installing additional equipment • Maintenance • Disposal	• Qualified professionals who have been instructed in the safe handling of the device.
• Work on the electrical equipment on the device	• Qualified electricians who, on the basis of their technical training, knowledge and experience, are able to evaluate the work assigned to them and identify potential risks.

2.3.5 Personal protective equipment (PPE)

Work/operating phase	Personal protective equipment (PPE)
• Transport • Installation	• Safety shoes
• Putting into service • Installing additional equipment • Maintenance	• No PPE required
• Disposal	• Safety shoes
• Normal operation (operation and control)	• Protective goggles and hearing protection when operating the device without sound protection funnel • Possibly protective gloves for removing sample material at extreme temperatures.

2.4 Structural modifications and repairs

⚠ 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!**

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

Please notify the following in the event of a repair:

- The representative of Retsch GmbH in your country;
- Your supplier; or
- Retsch GmbH directly.

Service address:

2.5 Safety equipment

Hood lock
The device is equipped with an automatic hood lock. The device hood is automatically locked by the locking pin when the device hood is closed. The device can only be started with the device hood closed and locked. Unlocking and opening the device hood is only possible when the grinding gear has not been started.

Anti-rotation device
The grinding tools of the device are equipped with an anti-rotation device in the form of four grooves. These grooves must engage correctly when the grinding tools are inserted. Otherwise, the grinding gear cannot be started.

Noise protection funnel
The noise protection funnel keeps the noise level low and prevents sample material from being ejected during grinding.

	Grinding without noise protection funnel is recommended when feeding fibrous sample material. For this type of application, PPE (eye protection and hearing protection) must be worn.

Emergency release

In the event of an unforeseen interruption of the grinding process (e.g. due to a power failure), the device hood can be released with the enclosed key. Emergency release and opening of the device hood may only be carried out when the grinding gear is at an absolute standstill.

Emergency stop switch

The device is not equipped by default with an emergency stop switch. In case of emergency, the device must be switched off by pressing the main switch or by disconnecting the device from the power supply.

2.6 Emergencies

The device can be switched off at any time by the main switch at the back of the device.

	After the device has been switched off by the main switch, the grinding gear continues to run (approx. 30 secs) before coming to an complete halt.

2.6.1 Switching the device off in an emergency

In the event of a fault or unexpected interruption of operation, carry out the following steps:

1. Switch off the device with the main switch at the rear of the device and disconnect the device from the power supply.
2. Have the fault rectified.

2.6.2 Putting the device back into service following a fault or unexpected interruption

➔ The fault has been eliminated.

1. Reconnect the device to the power supply.
2. Switch on the device with the main switch at the rear of the device.

2.7 Preventing risks during normal operation

Non-compliance with the following safety instructions is contrary to the intended use and constitutes a danger to personnel and a risk to operational safety.

Transport and set up

- Do not carry the device alone during transport and set up.
- Wear protective footwear during transport and set up.
- The device may only be connected to sockets with PE conductor.
- When connecting the device, the values on the nameplate must match the values of the electrical connection.

Operation

- Read the manual before using the appliance.
- Only operate the device at a workstation with sufficient space for secure set up of the device.
- Check the mains lead for damage before operation.
- Do not operate the device if damage is visible or suspected.
- Only operate the device in accordance with technical limits of use.
- During operation, do not wear jewellery, open hair, a tie or similar loose clothing.
- Wear eye protection when operating without noise protection funnel.
- Wear hearing protection when operating without noise protection funnel.
- Before operating the device, take measures to allow for limited communication while the device is in operation.
- Emergency release of the device hood may only be carried out when the grinding gear is at an absolute standstill.
- Do not operate the device in potentially explosive atmospheres.
- Observe safety data sheets of samples and follow the instructions by taking appropriate measures in advance.
- Do not grind explosive and/or flammable substances.
- Do not grind substances that may become explosive and/or flammable during grinding.
- During operation, components that feed sample material can heat up or cool down considerably. Before sampling, wait for temperature equalisation and wear protective gloves if necessary.
- Pay attention to the surroundings during grinding, as it is difficult to notice acoustic signals due to the background noise.
- Emergency release of the device must not be carried out under any circumstances while the device is in operation.

Maintenance and repair

- Before maintenance, switch off the device with the main switch.
- Do not clean the device with running water.
- Do not clean the device with compressed air.
- Repairs may only be carried out by the manufacturer of the device or an authorised representative.

2.8 Avoiding damage to property

- Protect the device from condensation in case of expected strong temperature fluctuations (e.g. during air transport).
- When transporting the device to the place of use or when setting it up, avoid any impacts and vibrations.
- Observe the conditions for the installation site when setting up the device.
- When inserting the grinding tools, make sure that the anti-rotation device is correctly engaged. Otherwise, the device cannot be started and the ring sieve may be damaged.
- The device must not be started if the grinding tools are not complete and correctly inserted.
- The device must not be started without the ring sieve in place.
- Do not feed any sample material before the grinding gear is running. Mechanical components can be damaged when starting with sample material in the cassette.
- Do not feed sample material too quickly and do not overfill the cassette, which serves as a collecting vessel. Excessive filling can lead to overheating and damage to the housing.
- After grinding, do not remove the rotor by force, but wait for the temperature to equalise. Forcible removal will damage the rotor shaft and rotor.
- Use a damp cloth for cleaning.
- Do not use solvents or aggressive cleaning agents for cleaning.
- For maintenance, only use original spare parts.
- If the rotor is not used for a longer period of time, pull it off the rotor shaft, otherwise crevice corrosion may occur due to moisture and rust.
- Do not lock the device hood when it is not used for an extended time as this may damage the cassette seal.

2.9 Confirmation Form for the Managing Operator

This Manual contains fundamental information to be taken into consideration regarding the operation and maintenance of the device. It must be read by the operator and by the responsible skilled personnel before the device is put into service. This Manual must be permanently accessible and available at the application site.

The operator of the device hereby confirms to the operating company (owner) that s/he has received adequate instruction on operating and maintaining the device. The operator has received the Manual, taken note of it and as a consequence has all information needed for safe operation and is sufficiently familiar with the device.

For legal protection, the operating company should have the instruction on operating the device confirmed by the operators.

I have taken note of all chapters in this Manual and of all safety instructions and warnings.

Operator
Name, first name (block letters)
Position in the company
Place, date and signature

Operating company or service technician
Name, first name (block letters)
Position in the company
Place, date and signature

3 The ZM 300 Ultra Centrifugal Mill

The Retsch ZM 300 Ultra Centrifugal Mill is a laboratory instrument and is used for sample preparation. The device enables fast grinding of soft, medium-hard and fibrous materials up to a particle size of 10 mm.
The final fineness levels of the fed sample materials is essentially determined by the following factors:

- Rotor type
- Rotor speed
- Sieve
- Characteristics (fracture behaviour) of the materials fed in as sample material

Thanks to the effective grinding process and the wide range of accessories and additional equipment, the ZM 300 Ultra Centrifugal Mill ensures material-friendly sample preparation suitable for analysis in the shortest possible time.

NOTICE This laboratory instrument is designed for 8-hour single-shift operation at 30 % duty cycle. This device must not be used as a production machine or in continuous operation.

3.1 Technical data

Operating data	
Power (depending on the variant)	200-240 V, 50/60 Hz, 1~, 1750 W, 16 A 100-120 V, 50/60 Hz, 1~, 1400 W, 20 A
Protection ratings	IP20/IP42
Rotor speed	Adjustable from 6,000 – 23,000 rpm
Noise emissions	Noise measurement according to DIN 45635-31-01-KL3. The noise levels are influenced by the speed, the sample material, the feed size as well as the rotor and the ring sieve used. LpAeq = up to 78 dB(A)
Operating mode	S1 – Continuous operation Operation with constant load, the duration of which is sufficient to reach the thermal steady state (DIN VDE 0530 T1).
Electromagnetic Compatibility (EMC)	EMC class B according to EN 55011

Values for grinding	
Maximum feed quantity	The maximum feed quantity with the standard cassette is 300 ml. 600 ml with the large-volume cassette. This information only applies if there is no increase in volume of the sample during grinding.
Maximum fill quantity	The maximum fill quantity of the standard cassette is 300 ml. With the large-volume cassette, the maximum fill quantity is 600 ml.
Maximum feed size	Up to 10 mm
Maximum possible final fineness level	< 40 µm, depending on material and ring sieve

Dimensions	
Height: Height with DR 100 feed unit: Width: Width with cyclone separator: Depth: Weight:	431 mm 720 mm 452 mm 840 mm 426 mm Approx. 34 kg

Required floor space	
Required floor space Required floor space with DR 100 feed unit and cyclone separator	500 mm x 500mm 845 mm x 500mm For sufficient fan speed, a safety clearance of 200 mm is required at the rear.

Conditions for the installation site	
Installation height: Ambient temperature: Humidity:	Max. 2000 m a.s.l. 5 °C to 40 °C Maximum relative humidity 80 % up to 31 °C, decreasing linearly up to 50 % relative humidity at 40 °C

3.2 Views of the device

ⓘ	The numbering of components in the following views of the device is fixed and is used in further figures of components in the Manual.

3.2.1 Front

Fig. 1: Front with closed device hood

No.	Component	Function
0	Impact protection	This hopper is designed as splashback protection and should always be used, except for long-fibre material.
1	Feed hopper	For feeding of sample material. Guides the sample material into the interior to the grinding gear.
1.1	Hopper for noise reduction	When feeding sample material of < 4 mm, this hopper can be inserted into the feed hopper. This funnel reduces the discharge of fine sample material as well as noise.
2	Device hood	Closes the interior and guides the sample material.
3	Opening for through cassette	Opening for positioning the through cassette. Is closed by means of a rubber sleeve.
4	Emergency release opening	For inserting the key for emergency release of the interior.
5	Stand opening	For installation of the stand of the DR 100 feed unit.
6	Touch display	Displays the parameters and is used to start and stop the device.
7	Control dial	For parameter setting

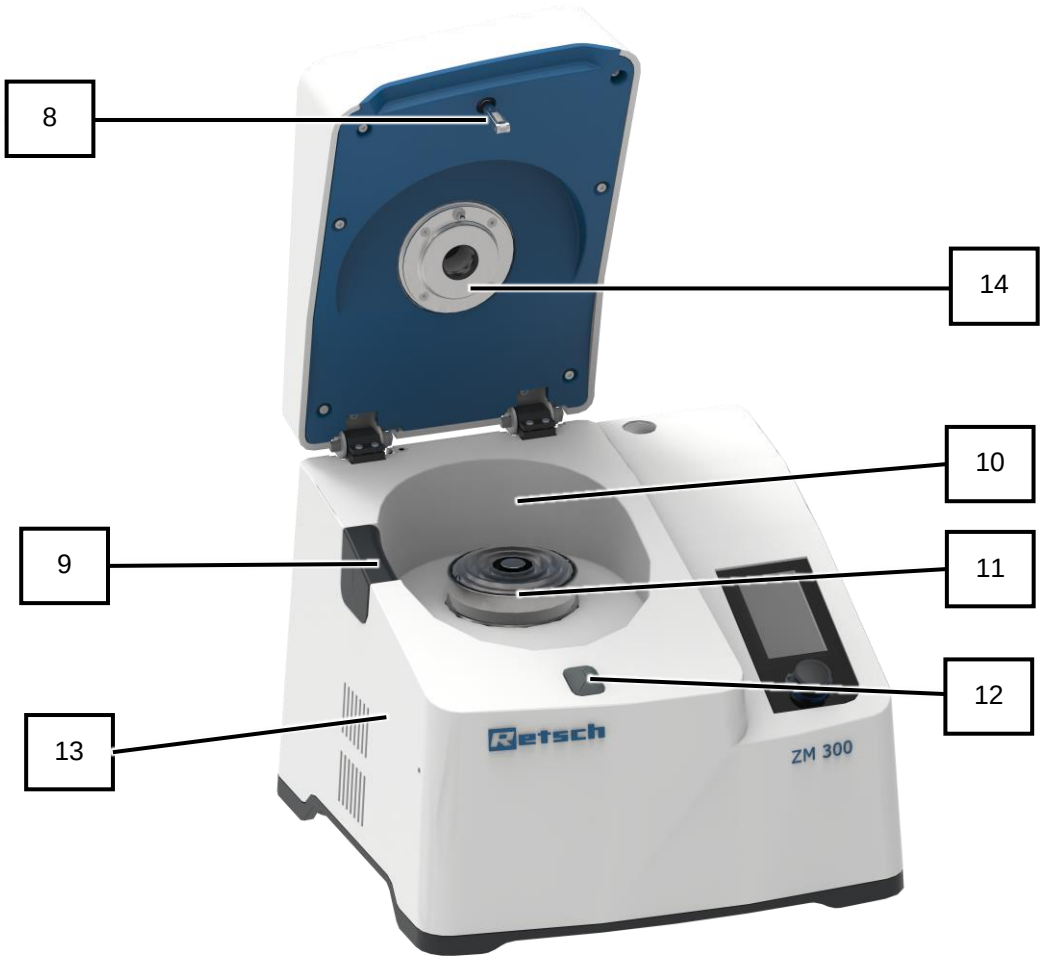


Fig. 2: Front with open device hood

No.	Component	Function
8	Locking pin	Locks the device hood
9	Rubber sleeve	Seals the opening for the through cassette and must be removed before positioning the through cassette.
10	Interior	This is where the grinding tools and the cassette are located.
11	Rotor shaft	Support for grinding tools and cassette.
12	Rubber seal	Seals the passage of the locking pin into the housing.
13	Vent	Outlet for cooling air.
14	Temperature sensor	The temperature sensor measures the temperature of the cassette lid. The temperature of the sample material is not measured!

3.2.2 Back

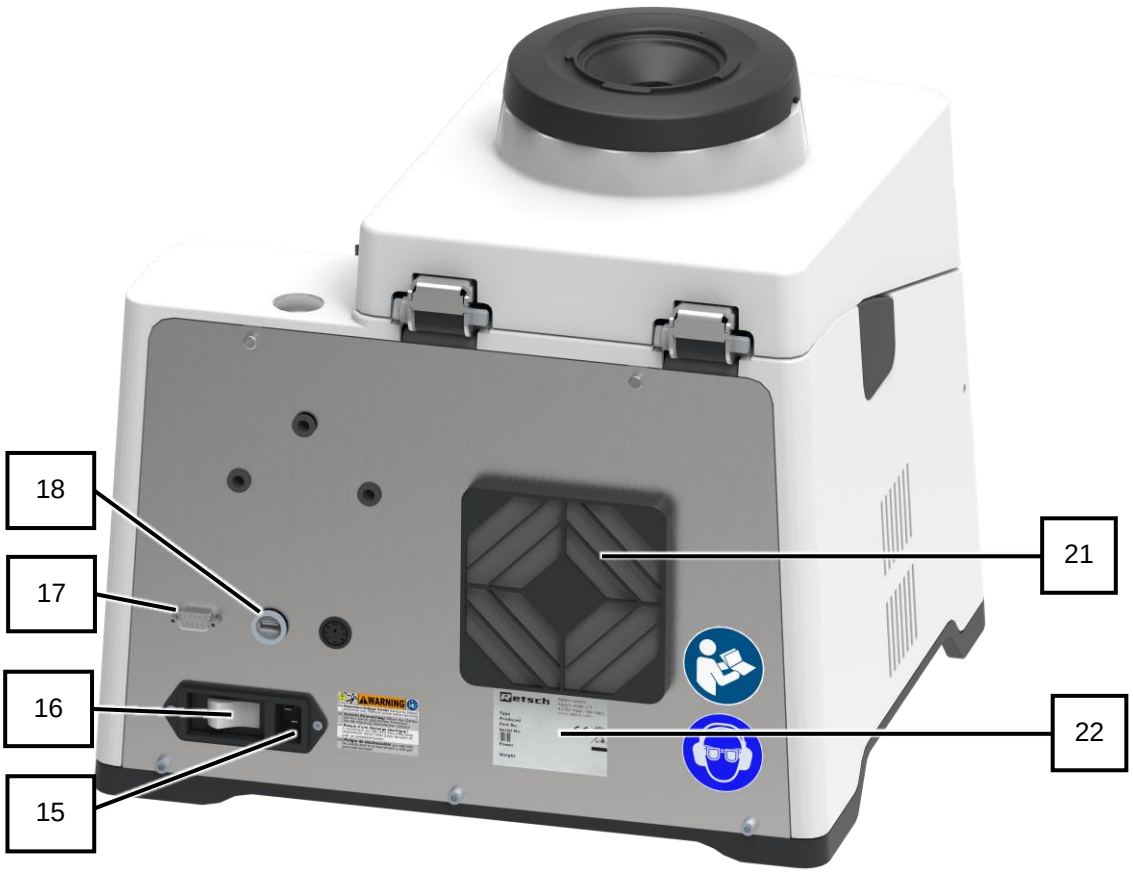


Fig. 3: Rear

No.	Component	Function
15	Power connection	Connects the device to the power supply.
16	Main switch	Switches the device on or off.
17	DR 100 interface	For connection to the DR 100 feed unit.
18	USB port	For connection of a USB medium to update the control software.
21	Filter frame	Protects the motor from dust particles.
22	Nameplate	Contains all device-specific information.

3.2.3 View of grinding tools and tools und cassette

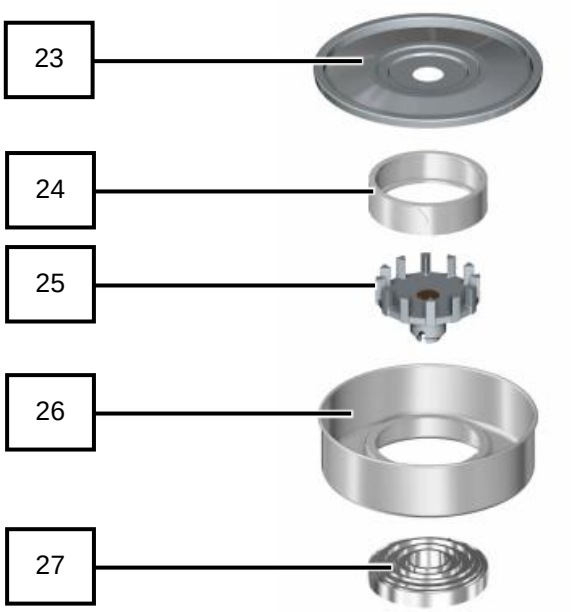


Fig. 4: Grinding tools and cassette

No.	Component	Function
23	Cassette lid	Closes the cassette.
24	Ring sieve	Selects the sample material.
25	Rotor	Grinds the sample material.
26	Cassette	For collection of the sample material after grinding.
27	Labyrinth disc	Sealing element between rotor, cassette and device.

3.2.4 View of the device with additional equipment

Fig. 5: Device view with additional equipment

No.	Component	Function
28	Chute of the DR 100 feed unit	For automatic feed of sample material with the DR 100 feed unit.
29	Cyclone separator	For the separation of the sample material.
30	Collection receptacle of cyclone separator	For collection of the sample material when using the cyclone separator.
31	Support	Support with fork for cyclone separator.
32	Hopper of the DR 100 feed unit	For feed of sample material with the DR 100 feed unit.
33	DR 100 feed unit	For automatic feeding of higher quantities of sample material (mostly in combination with the cyclone separator).
34	Toggle screw for hopper	Secures the position or height of the hopper of the DR 100 feed unit.
35	Display of the DR 100 feed unit	For control of the DR 100 feed unit. After synchronisation with the device, it is controlled via the touch display of the ZM 300.
36	Coupling	For connection between cyclone separator and through cassette.
37	Base plate for DR 100	Accessory for installation of the DR 100 feed unit on the ZM 300.

3.3 Instructions on the device

Fig. 6: Notice on the device

Position	Element	Meaning
A		Eye and hearing protection must be worn when operating the device without noise protection funnel. This PPE prevents eye injuries if sample material is ejected during grinding and exposure to noise that can be caused by the grinding noise of the device.
B		This instruction sign is located on the rear of the device near the main switch and indicates the need to read the operating instructions before using the device.

3.4 Description of the type plate

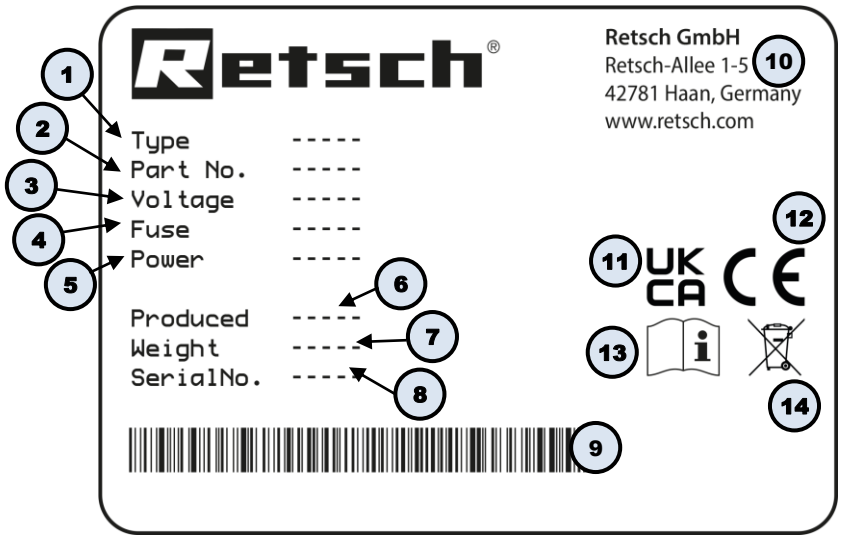


Fig. 7: Type plate

1 Device designation
2 Part number
3 Power version, Mains frequency
4 Fuse type and fuse strength
5 Capacity, Amperage
6 Year of production

7 Weight
8 Serial number
9 Bar code
10 Manufacturer’s address
11 UKCA marking
12 CE marking
13 Safety warning: Read the manual
14 Disposal label

ⓘ In the case of queries please provide the device designation (**1**) or part number (**2**), as well as the serial number (**8**) of the device.

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 N2.0001

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

NOTICE N3.0017

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 N4.0014

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.**

4.3 Temperature Fluctuations and Condensation

NOTICE N5.0016

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

NOTICE N6.0021

Ambient temperature
Temperatures outside the permitted range

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

- Installation height: max. 2 000 m above sea level
- Ambient temperature: 5 °C – 40 °C
- 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 N7.0015

Humidity
High relative humidity

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

5 First Commissioning

5.1 Electrical Connection

⚠ WARNING W2.0015

Risk to life caused by an electric shock
Connection to socket without a protective earth conductor

- Connecting the device to sockets without a protective earth conductor can lead to life-threatening injuries caused by an electric shock.
- **Always operate the device using sockets with a protective earth conductor (PE).**

⚠ 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 N8.0022

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.**

⚠ 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.

For initial commissioning of the ZM 300, the device must be connected to the power supply on site.

Before establishing the electrical connection, make sure that

- the place of use complies with the installation conditions,
- the device is set up stable and secure,
- the power values of the device (nameplate) match the values of the electrical connection on site.

5.2 Establishing the electrical connection

Establish the electrical connection as follows:

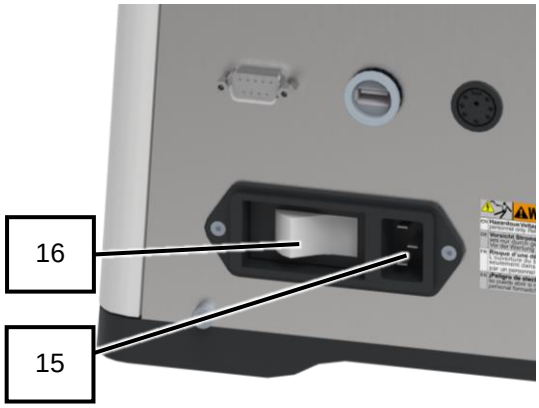


Fig. 8: Establishing the electrical connection

1. Match the voltage and frequency of the electrical connection with the values on the nameplate.

➔ Data of electrical connection and device match.

2. Plug the mains lead into the power connection (15) on the back of the device.
3. Connect the mains plug to the electrical connection socket.
4. Switch on the device with the main switch (16) at the rear of the device.

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

➔ The device is ready for use.

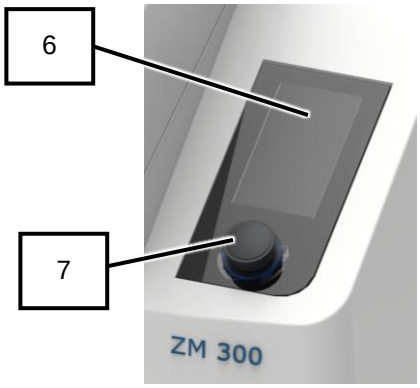


Fig. 9: Establishing the electrical connection

No.	Component
6	Touch display
7	Control dial
15	Power connection
16	Main switch

6 Operating the device

⚠ WARNING W4.0002

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!**

⚠ 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.**

⚠ 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.**

6.1 Switching the device on

Switch on the device as follows:

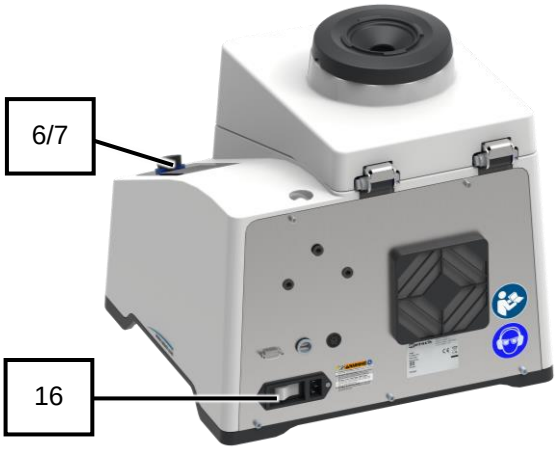


Fig. 10: Switching on the device

No.	Component
6	Touch display
7	Control dial
16	Main switch

1. Check whether the device is correctly connected to the power supply.

➔ The device is correctly connected to the power supply.

2. Switch on the device with the main switch (16) at the rear of the device (*Fig. 10*).

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

➔ The device is ready for use.

6.2 Switching the device off

Switch off the device as follows:

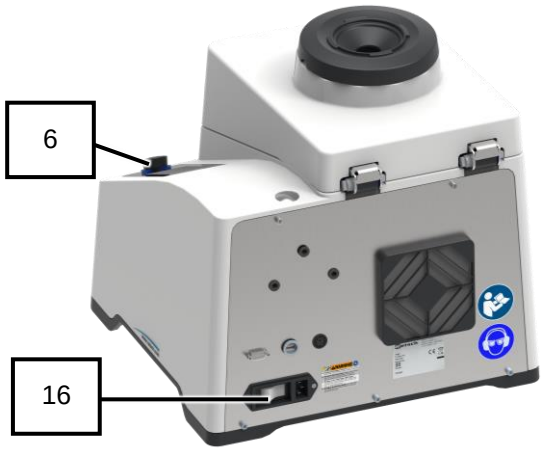


Fig. 11: Switching off the device

No.	Component
6	Touch display
16	Main switch

1. Switch off the device with the main switch (16) at the rear of the device.

➔ Touch display (6) goes out.

➔ Device is switched off.

6.3 Opening the device cover

	Release of the device hood and opening of the interior are only possible when the device is connected to the power supply and switched on. In situations such as a power failure, emergency release of the device hood is possible (chapter "Emergency release of the device hood").

Open the interior as follows:

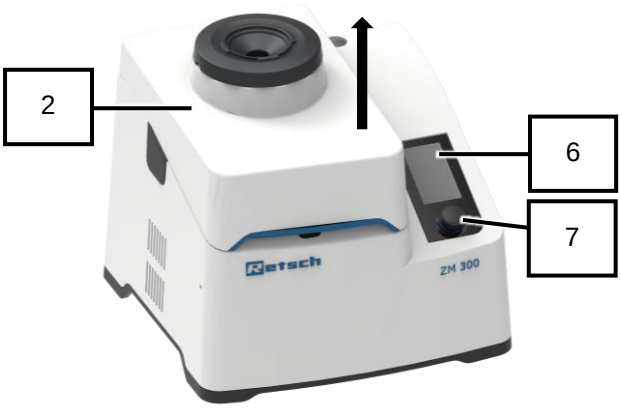


Fig. 12: Device with closed device hood

1. Switch on the device.

➔ The touch display (6) of the device is activated and the background of the control dial (7) briefly lights up in blue.

2. Press  on the touch display (6) to unlock the device hood (2) if it is locked.

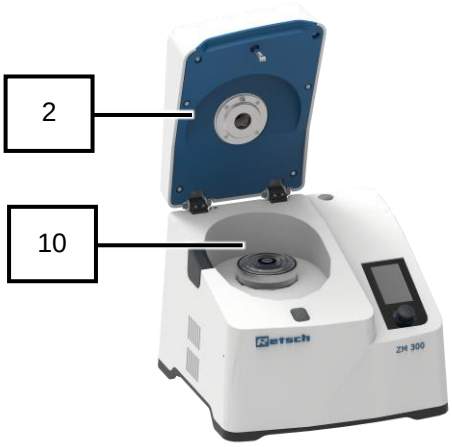


Fig. 13: Device with open device hood without inserted cassette

3. Open the device hood (2) by hand.

➔ The device hood (2) is open and the interior (10) can be accessed.

No.	Component
2	Device hood
6	Touch display
7	Control dial
10	Interior

6.4 Closing the device cover

	Closing and locking the device hood are only possible when the device is connected to the power supply and switched on.

Close the interior as follows:

Fig. 14: Device with open device hood

1. Close the device hood (2) by hand and hold it in closed position.

➔ The device emits an acoustic signal.

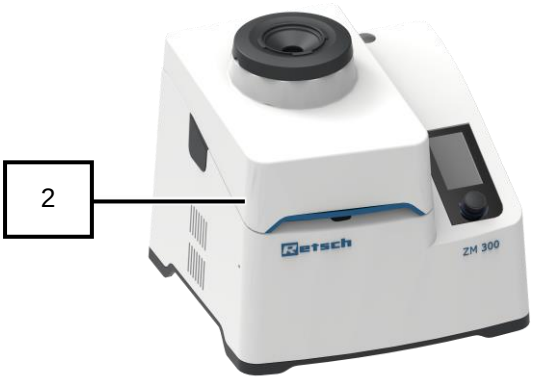


Fig. 15: Device with closed device hood

➔ The device hood (2) is automatically locked by the locking pin (8) and the interior (10) is closed (*Fig.* 15).

➔ The device again emits an acoustic signal.

NOTICE The device hood should only be fully locked when the device is being used. Permanent locking leads to increased wear of the lid seal.

No.	Component
2	Device hood
8	Locking pin
10	Interior

6.5 Emergency release of the device cover

⚠ CAUTION

C4.0009

Risk of injuries
Drive coasting

– In the event of a power failure, the drive on the device continues to coast for a long time, as does the drive on connected device parts. After activating the emergency release, items of clothing and parts of the body can get caught in moving components of the device. This can result in substantial injuries.

- **Disconnect the device from the power supply before activating the emergency release.**
- **Wait until all parts of the device have stopped moving.**

Situations such as a power failure may require emergency release of the device hood to access the interior of the device.

ⓘ	For emergency release of the device hood, a key is required. It is enclosed with the device.

For emergency release of the device hood, proceed as follows:

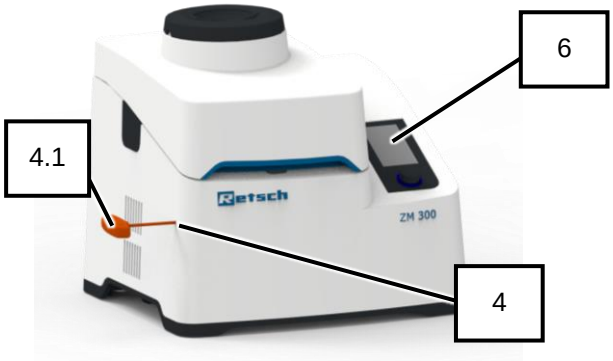


Fig. 16: Emergency release position

1. Switch off the device.
2. Disconnect the device from the power supply.
3. Wait (approx. 30 sec.) until the rotor shaft has come to an absolute standstill.
4. Insert the key (4.1) into the opening (4) on the left-hand side of the device and press in lightly to release the locking mechanism.

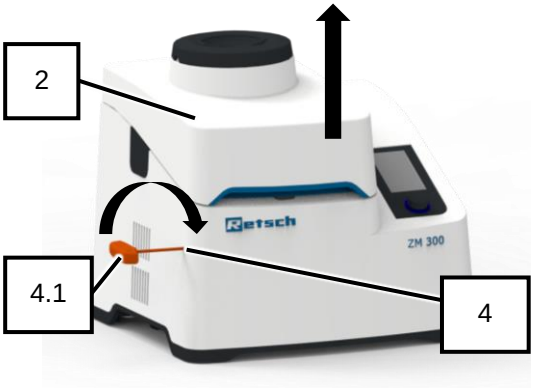


Fig. 17: Turning direction of the key for emergency release

No.	Component
2	Device hood
4	Opening for through cassette
4.1	Key for emergency release
6	Touch display

5. Turn the key (4.1) clockwise as far as it will go.

➔ Device hood (2) is unlocked and can be opened.

6. Open the device hood (2) by hand and remove the cassette from the interior (10).
7. Remove the key (4.1) from the opening (4).
8. Solve the situation that made the emergency release necessary.
9. Connect the device to the power supply.
10. Switch on the device.

➔ The touch display (6) of the device is activated and the background of the control dial (7) briefly lights up in blue.

➔ The device is ready for use.

6.6 Inserting the grinding tools und cassette

NOTICE

N9.0000

Damage to the device

Incorrect insertion of the grinding tools and the cassette

– If the grinding tools and the cassette are not inserted correctly into the interior of the device, the device will be damaged.

- **Insert the grinding tools and cassette as described in this manual.**
- **Do not start the device without the ring sieve in place.**

Before grinding of sample material, the required grinding tools and the cassette must be inserted into the interior of the device.

	No special tools are required to insert the grinding tools into the interior.

Insert the grinding tools and the cassette into the interior as follows:

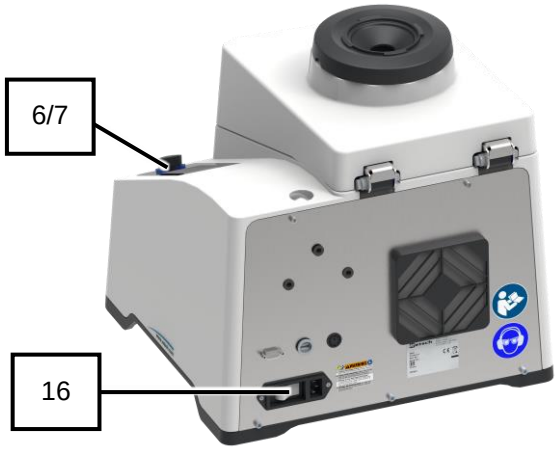


Fig. 18: Main switch at rear of device

1. Switch on the device.

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

2. Press on the touch display (6) to unlock the device hood (2) (*Fig.* 18).
3. Open the device hood (2).

➔ The device hood (2) is open and the interior (10) can be accessed (*Fig. 18*).

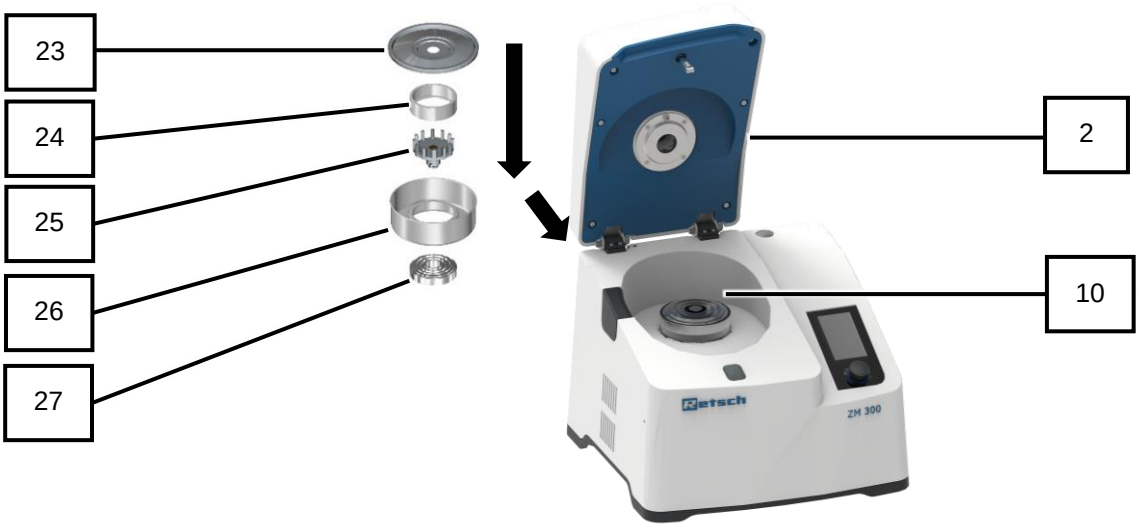


Fig. 19: Overview of grinding tools and cassette

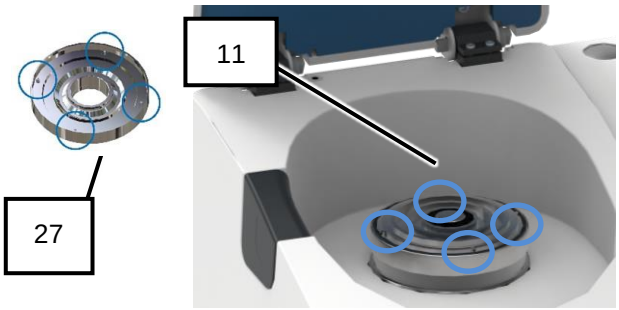


Fig. 20: Interior with rotor shaft

4. Place the labyrinth disc (27) around the rotor shaft (11) (*Fig.* 20).
5. Ensure that the anti-rotation device is correctly engaged (*Fig. 20*).
6. Place the cassette (26) (without lid) on the labyrinth disc (27).
7. Ensure that the anti-rotation device is correctly engaged.

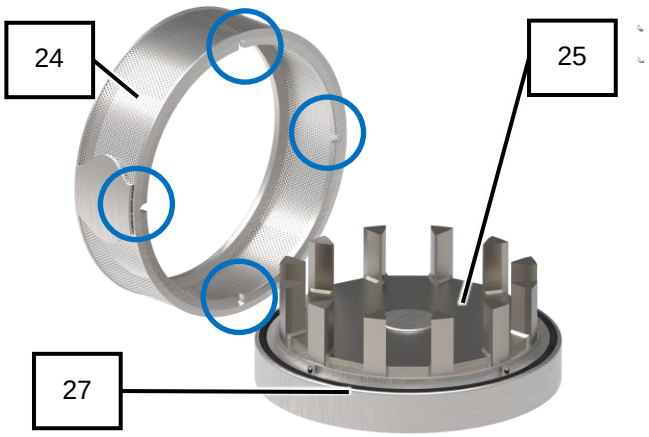


Fig. 21: Ring sieve and rotor

8. Place the rotor (25) around the rotor shaft (11) over the labyrinth disc (27).
9. Ensure that the driver is correctly engaged on the rotor shaft (11).
10. Place the ring sieve (24) in the cassette (26) with the rotor (25) in place (*Fig. 21).*
NOTICE: Do not start the device without the ring sieve in place. The lid tension could be too high, which would cause the rotor to drag on the lid!
11. Ensure that the anti-rotation device is correctly engaged (*Fig. 21*).

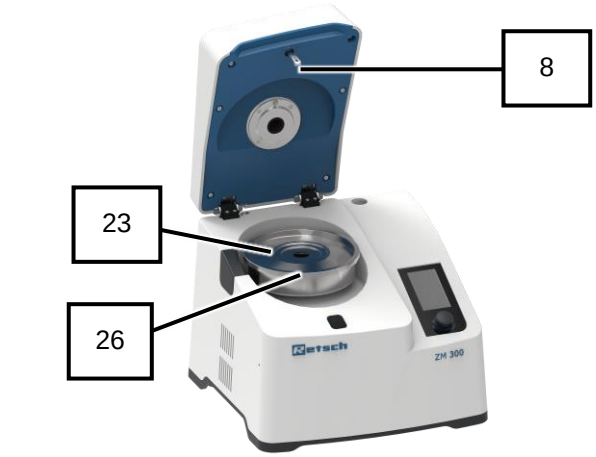


Fig. 22: Interior with open cassette

12. Close the cassette (24) with the cassette lid (23) (*Fig. 22*).

➔ The grinding tools and cassette are inserted.

13. Close the device hood (2) and hold it in closed position for approx. 2 seconds.

Fig. 23: Device with closed hood

➔ The device hood (2) is automatically locked by the locking pin (8) (*Fig. 23*).

No.	Component
2	Device hood
6	Touch display
7	Control dial
8	Locking pin
10	Interior
11	Rotor shaft
16	Main switch
23	Cassette lid
24	Ring sieve
25	Rotor
26	Cassette
27	Labyrinth disc

6.7 Feeding sample material

⚠ CAUTION C5.0010

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.**

⚠ CAUTION C6.0004

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 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

C8.0026

Danger! Risk of burns and injury due to explosion
Mixing of different sample materials

- Successive sample preparations of different materials may cause undesirable chemical reactions that can lead to fires or explosions causing injury.

- **Do not grind any sample materials in this device where the chemical reactivity may be increased by contact with a previously crushed substance.**
- **If in doubt, clean the device and all components used before grinding any other sample material.**
- **Observe the safety data sheets of the sample materials.**

NOTICE

N10.0003

Damage to mechanical components
Rotor blockage

- When feeding coarse, solid sample material, blockages can occur due to the high intake capacity of the rotor.

- **In case of blockage, switch off the appliance immediately and remove the blocking sample material.**
- **Reduce the feed of sample material to the feed hopper.**
- **Fill coarser and more solid sample material slowly and gradually into the feed hopper.**
- **Carry out a pre-crushing of the sample material.**

The sample material can be fed in manually by hand or automatically by using the DR 100 feed unit.

Fig. 24: Device with noise protection funnel

The feed hopper (1) is suitable for manual feed of the sample material by hand and for automatic feed of the sample material with the DR 100 feed unit (33) *(Fig. 24*).

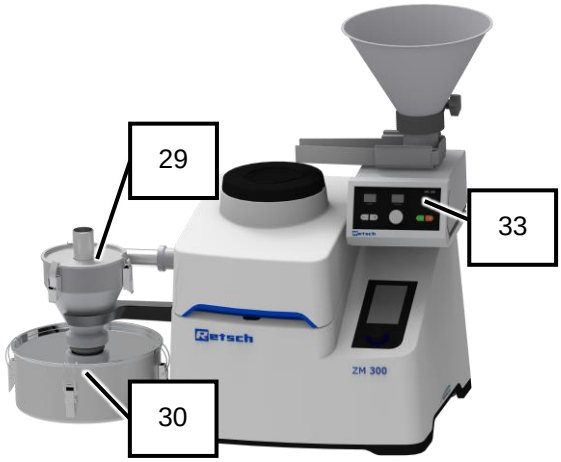


Fig. 25: Device with additional equipment

With the DR 100 feed unit (33) , larger quantities of sample material can be fed automatically. When feeding large quantities of sample material, operation in combination with the cyclone separator (29) and a collection receptacle (30) (*Fig. 25*) is recommended.

No.	Component
1	Noise protection funnel
29	Cyclone separator
30	Collection receptacle
33	DR 100 feed unit

6.7.1 Feeding sample material manually

Manually feed sample material as follows:

Fig. 26: Device with closed device hood

No.	Component
1	Noise protection funnel
6	Touch display
7	Control dial

1. Set the parameters for grinding on the touch display (6) and with the control dial (7).
2. Press ▶ on the touch display (6) to start the grinding process.
3. Slowly feed the sample material into the noise protection funnel (1) (arrow) (*Fig. 26*).

➔ The sample material is ground in the device.

6.7.2 Feeding sample material automatically using the DR 100 feed unit

Feed the sample material automatically using the DR 100 feed unit as follows:

Fig. 27: Device with additional equipment

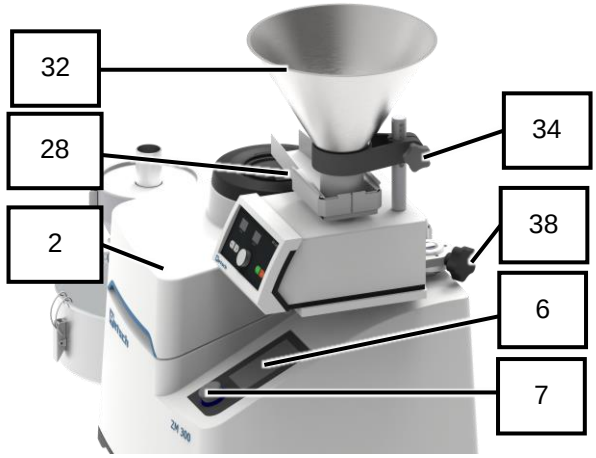


Fig. 28: Device with DR 100 feed unit

1. Install the DR 100 feed unit (33) and the cyclone separator (29) at the device (see "Installation of additional equipment").
2. Set the operating mode selector switch to "Standard".
3. Switch on both devices, the ZM 300 and DR 100 (33).
4. Wait for synchronisation between the device and the DR 100 feed unit (33).

➔ On the touch display (6), the functions "DR 100 conveying speed" and "Automatic stop" are activated.

➔ On the display (35) of the DR 100 feed unit (33), "pc" is displayed.

5. Loosen the toggle screw (38) of the base plate and swivel away the DR 100 feed unit (33).
6. Open the device hood (2).
7. Insert the grinding tools and cassette into the interior (10).
8. Close and lock the device hood (2).
9. Swivel back the DR 100 feed unit (33) and tighten the toggle screw (38) (*Fig. 28*).
10. Set the parameters for grinding on the touch display (6) with the control dial (7).
11. Loosen the toggle screw (34) on the hopper and lower the hopper (32) onto the chute (28). Fill in the sample material and afterwards, lift the hopper (32) off the chute (28) to operating height. The gap should be three times larger than the largest feed material to prevent blockage.

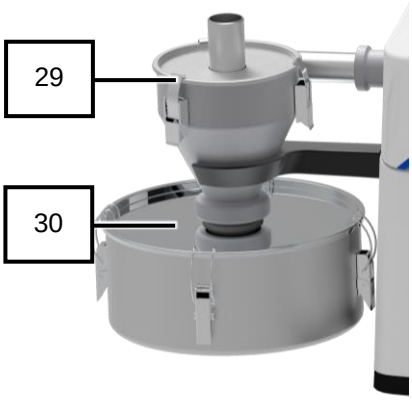


Fig. 29: Device with cyclone separator

12. Press ▶ on the touch display (6) to start the grinding process.
13. The sample material is automatically fed in via the chute (28) of the DR 100 feed unit (33) and ground.
14. Observe the performance indicator on the touch display (6) to assess the uniformity of the grinding process.

➔ The sample material is ground.

15. Press ■ on the touch display (6) to stop the grinding process.
16. Optional: Use the “Automatic stop” setting so that the process is stopped automatically by the device and the feed unit.
17. Remove the sample material from the collection receptacle (30) of the cyclone separator (29) (*Fig. 29)*.

➔ The sample material is ready for further processing.

No.	Component
2	Device hood
6	Touch display
7	Control dial
10	Interior
28	Chute of the DR 100 feed unit
29	Cyclone separator
30	Collection receptacle of cyclone separator
32	Hopper of the DR 100 feed unit
33	DR 100 feed unit
34	Toggle screw for unscrewing or screwing down the hopper
35	Display of the DR 100 feed unit
38	Toggle screw

NOTICE For explanation on manual operation of the DR 100, please refer to the DR 100 manual.

6.8 Sample material with recommended grinding gear

Below is a list of recommendations on which grinding tools to use according to the sample material in order to achieve the best result.

The following list does not take into account all possible materials, but serves for orientation. A detailed database and references can be found at:

- www.retsch.de
- myRetsch portal (see "Controlling the device with the touch display/ myRetsch")

For further assistance, please contact our application laboratory, our field service consultant or an authorised representative.

Sample material	Grinding tools
• Feed pellets • Drugs • Straw • Dog biscuits • Spices • Fabrics (e.g. cotton) • Paper cellulose	• 6-tooth rotor Adjust the ring sieve to the desired final fineness level. For preparation of bulk materials of up to 10 mm.
• Grain • Maize • Pills • Fibrous foods • Coated tablets • Confectionery	• 12-tooth rotor Adjust the ring sieve to the desired final fineness level. For preparation of bulk materials of up to 10 mm.
• Dolomite • Talc • Plaster • Activated carbon • Charcoal/lignite • Dry, non-hygroscopic chemicals • Ion exchanger • Beet/cane sugar	• 24-tooth rotor Adjust the ring sieve to the desired final fineness level. For preparation of fine-grained bulk materials < 2 mm.
• Minerals up to a degree of hardness of 4 according to Mohs • Compost • Waste mixtures • Fluorspar/feldspar	• Rotor with wear-resistant coating Adjust the ring sieve with wear-resistant coating to the desired final fineness level. This type of rotor should be used if any abrasion of the standard rotors interferes with the subsequent analysis.
• Organic products • Pharmaceutical products • Food of all kinds • Products from biological research	• Titanium rotor (heavy-metal-free) Adjust the titanium ring sieve to the desired final fineness level. These types of rotors are to be used when any contamination with heavy metal must be avoided. Titanium rotors and ring sieves cannot be used for hard, abrasive sample materials, but only for soft to medium-hard sample materials.
• Fatty samples • Humid samples • Temperature sensitive samples	• Spacer sieves

The listed grinding tools may not be included in the scope of delivery of your machine. If any conditions change, please contact our application laboratory, our field service consultant or an authorised representative.

6.9 Grinding methods

6.9.1 Grinding with ring sieves with reinforced rim

The selection of the mesh size of the ring sieves depends on the desired final fineness levels and the sample material. For brittle materials, final fineness levels of approx. 80 % smaller than half the mesh size of the used sieves are achieved.

6.9.2 Grinding with distance sieves

When grinding materials with a low melting point or grinding processes where any rise in temperature as a result of grinding must be kept as low as possible, the use of spacer sieves is recommended.
Due to the larger distance between the test sieve and the rotor, the temperature rise is lower. The grinding result may be slightly coarser than when using ring sieves.

6.9.3 Cold grinding

⚠ WARNING W6.0000

Risk of injury caused by liquid nitrogen
Use of liquid nitrogen during cryogenic grinding

– Liquid nitrogen has a boiling point of – 196 °C and causes burn-like injuries and frostbite if there is skin and eye contact.
- **Take note of the liquid nitrogen safety data sheets.**
- **Always wear goggles and protective gloves when using liquid nitrogen.**

⚠ CAUTION C9.0000

Risk of injury due to frozen CO_2 (dry ice)
Use of dry ice during cryogenic grinding

– Dry ice has a temperature of –78 °C and causes injuries similar to burns or frostbite if it comes into contact with skin and eyes.
- **Follow the safety data sheets.**
- **Always wear protective goggles and gloves when using dry ice.**

Materials that are difficult or impossible to grind at normal temperatures must be cold ground. By embrittlement with liquid nitrogen (-196 °C), for example, the fracture behaviour of e.g. thermoplastics, rubber products, fatty foods, pharmaceuticals, etc. can be improved.

ⓘ For cold grinding, Retsch GmbH offers a cryokit for cooling with liquid nitrogen or dry ice.

Carry out embrittlement of sample material as follows:

⇨ Embrittlement of sample material for grinding must be carried out in a suitable vessel. Fill in the liquid nitrogen and slowly add the sample material. After a suitable cooling time, remove the sample material and fill it into the ZM 300. It is recommended to use a vacuum cleaner connected to the pipe sockets of the cyclone separator lid.

ⓘ Do not fill the mill with liquid nitrogen under any circumstances. The resulting overpressure when the nitrogen is heated could blow the mill open.

Embrittlement with liquid nitrogen is often not necessary. Sample material that is difficult or impossible to grind at normal room temperatures (gummy bears, vegetables without additional water) must be ground cold. Good results are also achieved by mixing the material with dry ice or storing the sample material for approx. 24 hours at a minimum of -19 °C.

Embrittlement with dry ice (frozen CO_2) improves the fracture behaviour of such samples. For this purpose, the sample is mixed with dry ice in a ratio of 1:2 (V:V) and, after a few minutes of cooling, fed into the machine (dry ice may also be fed).

7 Controlling the device using the touchscreen display

The device is controlled using the touchscreen display in combination with the control dial.

7.1 Menu interface on the touchscreen display

The menu interface of the touch display is divided into the following areas:

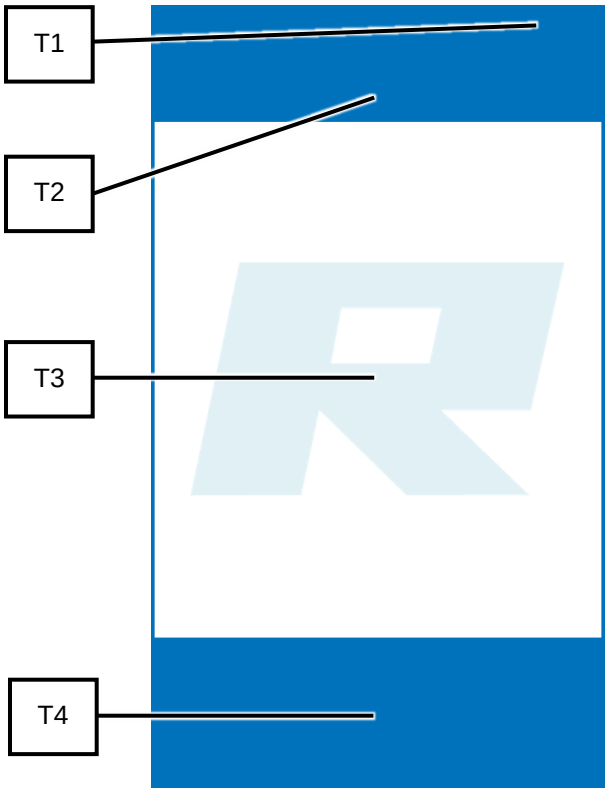


Fig. 30: Division of the touch display menu interface

Element	Description	Function
T1	Status display	Automatic hood opening on/off – Signalling device on/off.
T2	Navigation area	Selection of the operating modes "Manual" and "Program" as well as access to the "System settings" menu.
T3	Parameter settings and display area	Settings and display of grinding parameters the DR 100 feed unit. During grinding, the motor power is displayed over time.
T4	Device control area	Start, stop, open device hood.

Various control elements and functions can be selected via the menu interface of the touch display.

	Only those functions are displayed and active that can be selected for current operation.

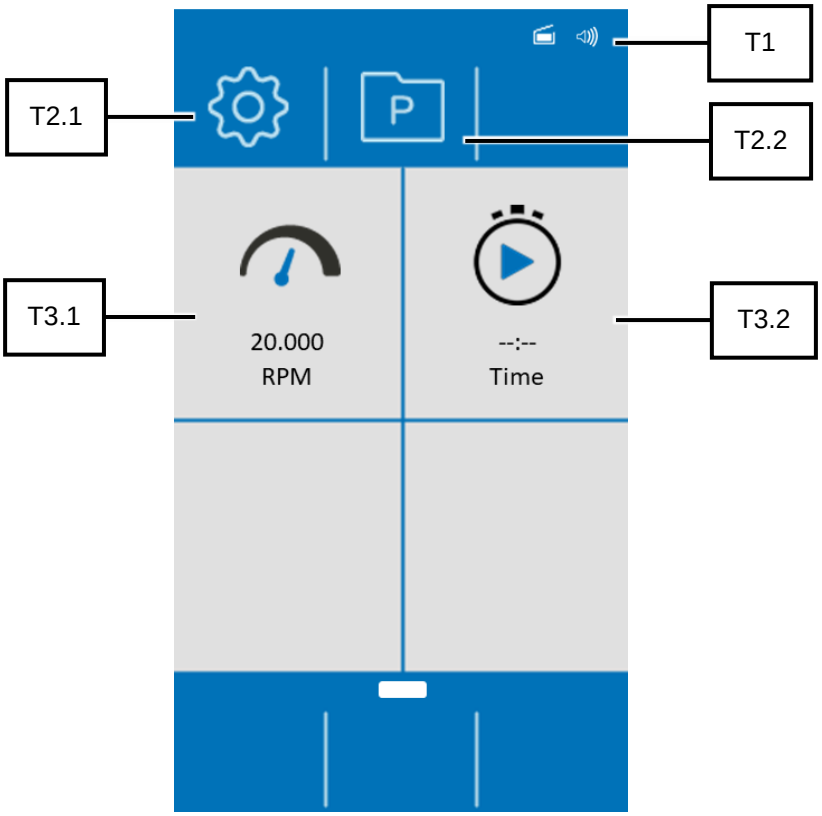


Fig. 31: Display after switching on the ZM 300

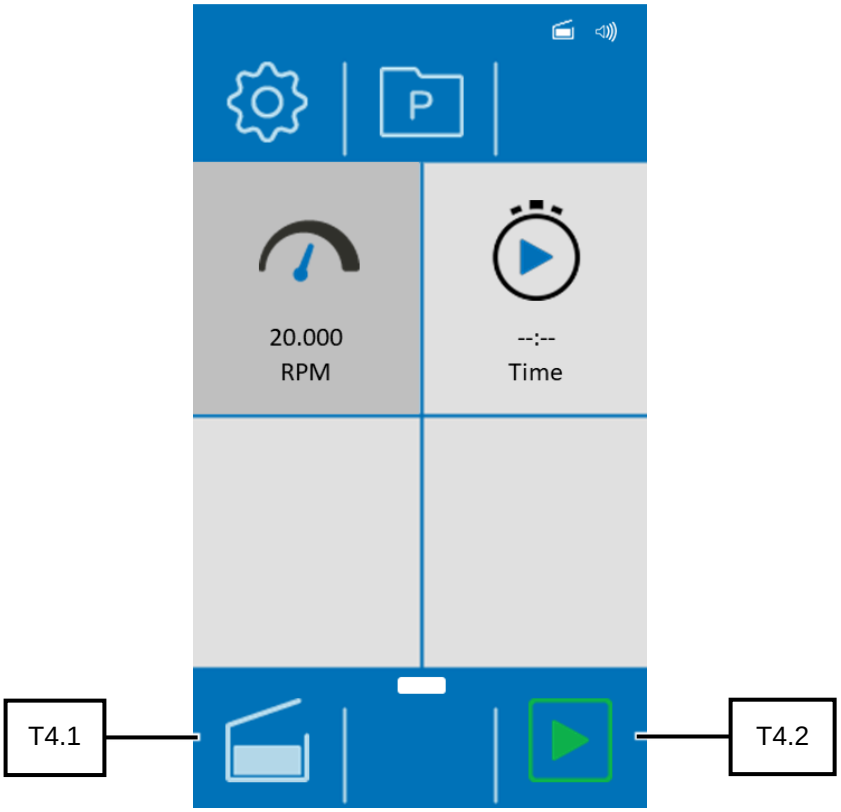


Fig. 32: Display after closing the lid

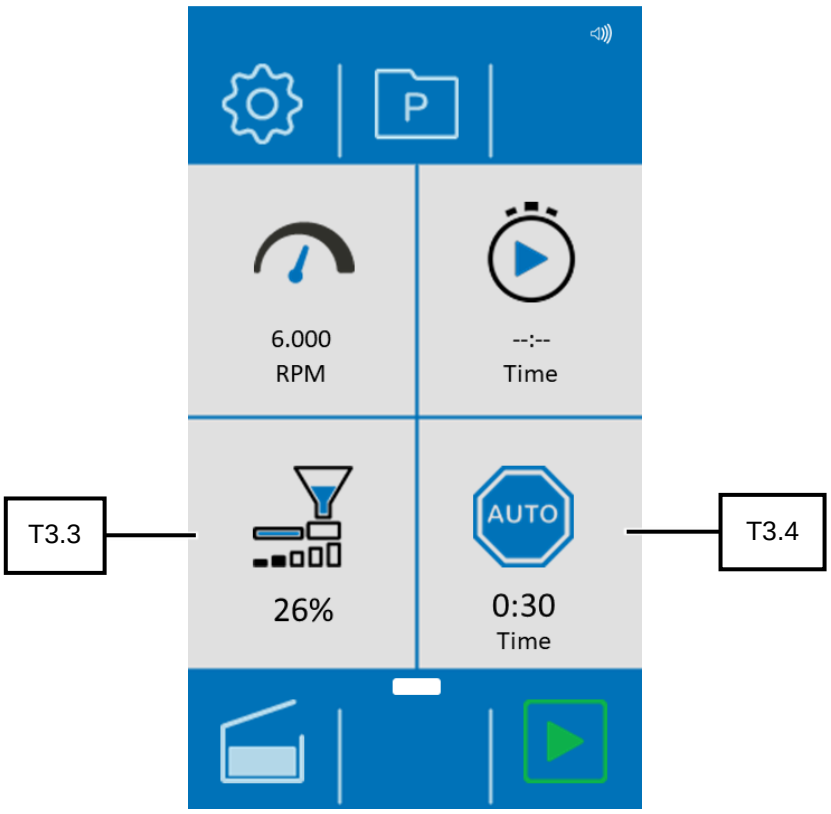


Fig. 33: Display with connected DR 100 after closing the lid

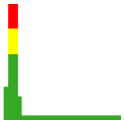
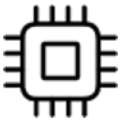
Element	Description	Function
T1	Status display	Automatic lid opening switched on – Acoustic signal on/off.
T2.1	System settings	Access to the system settings.
T2.2	Program settings	Access to program settings.
T3.1	Speed	Displays the set speed (6,000 - 23,000 rpm).
T3.2	Start delay	Device start in minutes/seconds (mm:ss).
T3.3	DR 100 conveying speed	Setting the conveying speed of the DR 100 feed unit. This function can only be selected when the DR 100 feed unit is connected and switched on. The conveying speed set manually on the feed unit is overwritten by the value set on the device when the grinding process is started at the device.
T3.4	Automatic stop	Automatic stop of the device after mm:ss. The device detects when there is no grinding load and automatically stops the grinding process and the sample material feed after the specified time. This function can only be selected when the DR 100 feed unit is connected and switched on. This function is only active when the grinding process is started via the device.
T4.1	Open	Opens the lock of the device hood.
T4.2	Start	Starts the grinding process.

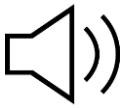
7.2 Function elements

Functional elements are selected on the touch display and configured with the dial.

ⓘ Only function elements that can currently be selected and configured are displayed or active.
The dial lights up in blue when an editable value is selected.

Element	Description	Function
	Main menu	Opens the main menu. In the main menu, the parameters for the grinding process can be configured and grinding be started.
	Opens the device hood	After switching on the device, the touch display shows a prompt to open and close the device hood.
	System settings	Opens the system settings.
	Program settings	Access to program settings.
	Gallery view	Opens the gallery view. The saved programs are displayed and can be selected directly.
	Revolutions per minute	Sets the revolutions per minute from 6,000 – 23,000 rpm.
	Delete program/cycle	Deletes a created program or cycle.
	Save program/cycle	Saves a created program or cycle.

Element	Description	Function
	Cancel	Cancel input / return to the previous menu.
	Start	Starts the grinding process.
	Stop	Stops the grinding process.
	Start delay	Time until the start of the grinding process.
	DR 100 conveying speed	Setting the conveying speed of the DR 100 feed unit. Function can only be selected when the DR 100 feed unit is connected and switched on.
	Automatic stop	Automatic stop of the device after mm:ss. The device detects when there is no more sample material and stops automatically after the specified time. This function can only be selected when the DR 100 feed unit is connected and switched on.
	Performance indicator	Shows the load on the drive during a grinding process.
	Brightness	Setting of the display brightness.
	Date and time	Setting of the date and time.
	Software version	Display of the installed software version.
	Operating hours	Display of operating hours.
	Serial number	Display of the device serial number.

	Software update	Software update of the device via USB medium
	Service environment	Access to service environment
	Signalling device (on/off)	Setting the signalling device (on/off).
	Auto-unlock	Switching on or off the automatic opening function. If the function is switched on, the hood is opened automatically at the end of grinding.
	myRetsch	Displays QR code on the display for access to the web portal.

7.3 Operating modes and navigation

The following operating modes can be selected via the navigation area (T2) of the touch display:

- System settings
- Program mode
- Manual mode

7.3.1 Navigation between Operating Modes

⇨ Enter the desired grinding parameters in the "Parameter settings and display"(T3) area to perform manual grinding.

⇨ Press the button to access the system settings.

⇨ Press the button to access the program settings.

7.4 Grinding Parameters

The parameters can be set and changed via the "Parameter settings and display" (T3) operating area.

7.4.1 Adjustable Parameters

The following parameters can be set by entering values with the control dial:

- Speed in rpm.
- Delayed start in mm:ss (minutes/seconds)
- When operating with DR 100 connected: Feed rate of the DR 100 feed unit in % (0 to max. speed in %)
- When operating with DR 100 connected: Automatic stop in mm:ss (minutes/seconds)

Fig. 34: Touch display with control dial

No.	Component	Function
6	Touch display	To control the device.
7	Control dial	For parameter setting.

	The background of the control dial lights up in blue when the touch display is used to select a section with values that are editable via the control dial.

7.5 Manual Mode

In manual mode, the following parameters can be edited directly:

Speed: Via the control dial, speeds of 6,000 to 23,000 rpm can be set.

Start delay: The control dial can be used to set a delayed start of the device. After pressing the  button, the device is started after a delay according to the preset minutes:seconds (mm:ss) value. The display counts down to zero in steps of one second.

DR 100 conveying speed: With the DR 100 feed unit connected, the control dial can be used to set the conveying speed of the optional accessory (0 to 100 % of the max. conveying speed).

Automatic stop: At the control dial an automatic stop of the device and the DR 100 feed unit can be set when the DR 100 feed unit is connected. The motor load is registered by the device. If no more motor load changes are detected by the device, the system is stopped after the set coasting time.

7.5.1 Start Process

	After switching on the device, the ▶ button is hidden until the device hood is closed and locked.

⇨ Press the ▶ button to start grinding.

	After the grinding gear has started, the start sign changes to the stop sign ■.

During a grinding process, a performance indicator is shown on the touch display.

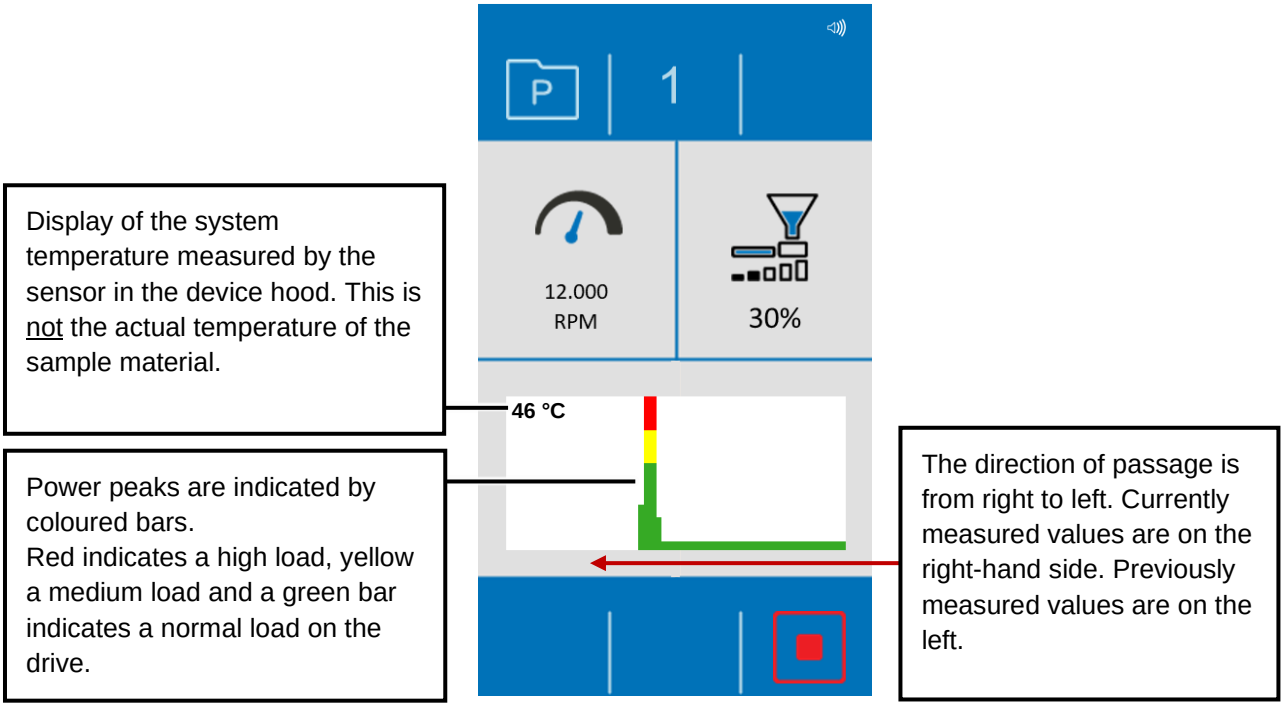


Fig. 35: Performance indicator

The performance indicator on the touch display shows the load on the drive.

	When grinding, observe the performance indicator on the touch display to prevent the sample material from being fed in too quickly.

7.5.2 Stop Process

Grinding is not stopped automatically (except when a DR 100 feed unit is connected and the auto stop function is selected) and must be actively stopped by pressing the stop button.

⇨ Press the button to stop grinding.

	The hood is unlocked automatically after grinding has stopped if the "Automatic opening" function (T8) is activated in the service menu.

7.6 Programme Mode

If sample materials are frequently ground with the same parameters, these parameters can be stored in the program preset and called as Standard Operating Procedures (SOP) when required.

Eight program presets are available.

The following parameters can be stored in individual programs:

- Speed in rpm.
- Delayed start in mm:ss
- Feed rate of the DR 100 feed unit in %
- Automatic stop in mm:ss

In programme mode, the parameters can only be changed if editing is activated by pressing .

⇨ Press the section of the parameter to be edited. The background of the control element is greyed out and the background of the control dial lights up in blue.
⇨ Turn the control dial until the desired value is displayed.

The set value is applied as soon as the section of the parameter is pressed again or another parameter is selected.

7.6.1 Select a Program

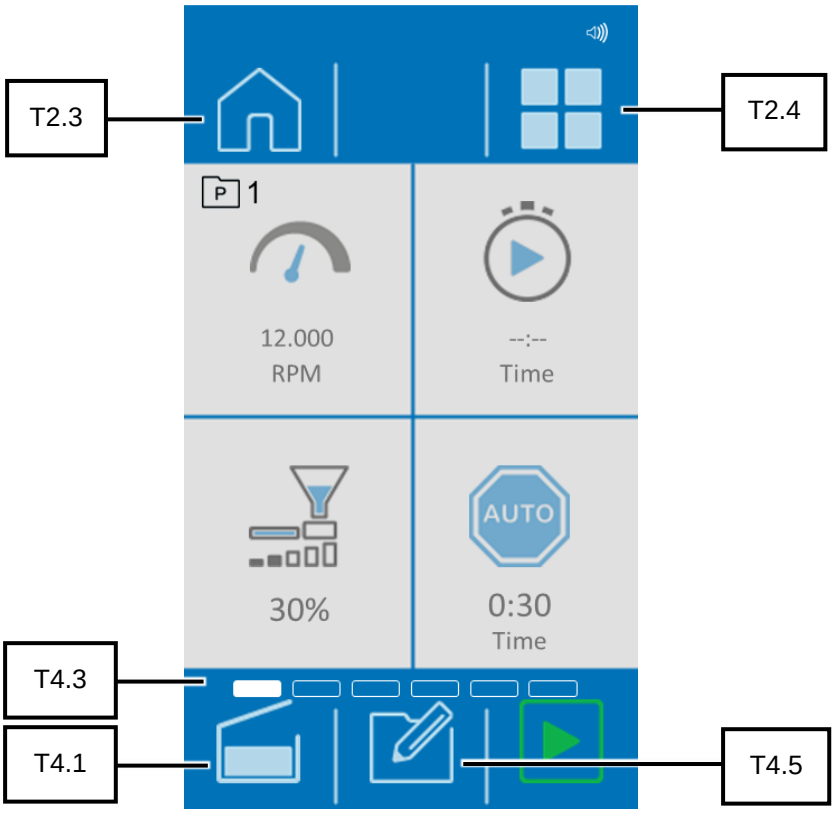


Fig. 36: Functions of the programme mode with DR 100 connected

Element	Description	Function
T2.3	Manual mode	Returns to manual mode.
T2.4	Program overview	Opens the program overview.
T4.1	Open	Opens the lock of the device hood.
T4.3	Scroll bar	Indicator for the position of the respective menu interface or program.
T4.5	Edit programs	Opens the "Edit program" function.

Press the P button to switch to program mode. The display switches to the current program. The program number is displayed next to the P symbol.

⇨ Swipe from right to left or from left to right on the touch display in the "Parameter settings and display" control element area to navigate through the programs. The position of the programme is shown in the scroll bar.

Alternatively, the programme overview can be accessed by pressing . Each program is presented in a section.

⇨ Swipe the display in the control element area "Parameter settings and display" to switch between program groups 1 to 4 and 5 to 8.
⇨ To activate a program, press the upper third of the desired program section.

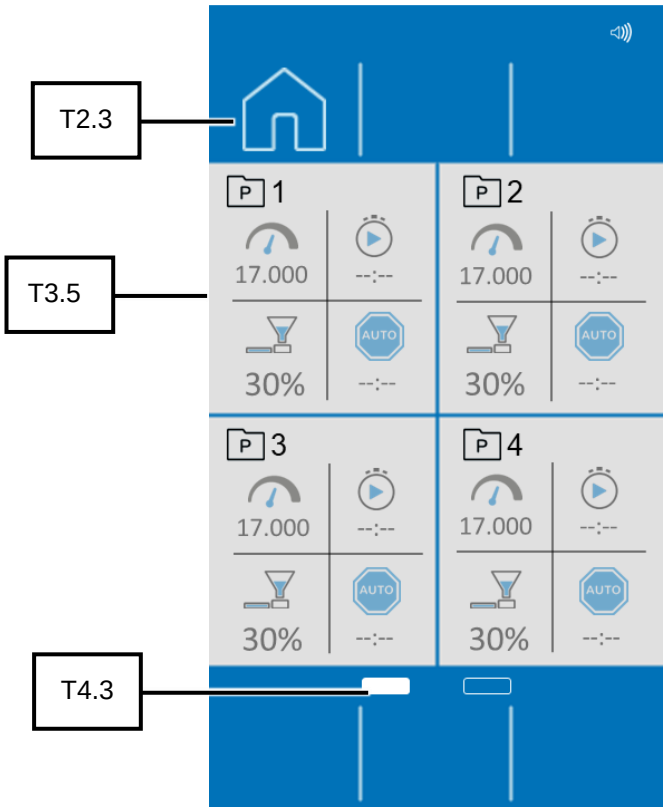


Fig. 37: Programs in the program overview with DR 100 connected

Element	Description	Function
T2.3	Manual mode	Manual mode or return to manual mode
T3.5	Program sections	Displays the current parameters of the programs.
T4.3	Scroll bar	Indicator for the position of the program overview.

⇨ Press ▶ to start the selected program and the grinding process.

⇨ To exit programme mode and return to manual mode, press ⌂.

7.6.2 Edit a Program

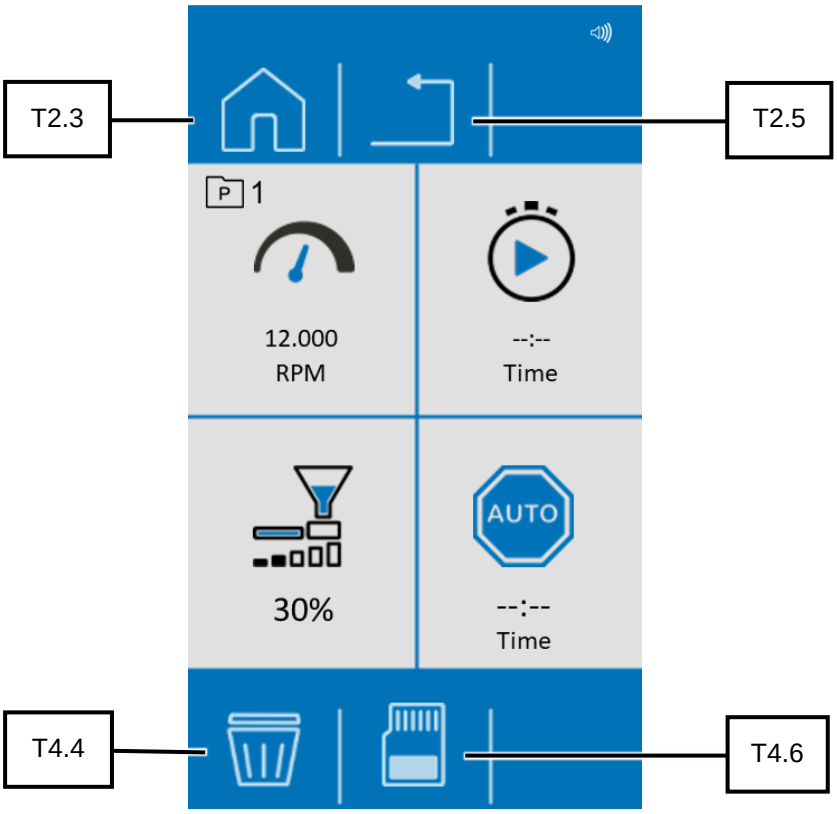


Fig. 38: Edit programs

Element	Description	Function
T2.3	Manual mode	Returns to manual mode.
T2.5	Cancel	Cancels editing of the program.
T4.4	Delete	Deletes the parameters of the program.
T4.6	Save	Saves the program.

⇨ Press the button to edit the program.
⇨ Enter the desired parameters.

The process can be cancelled by pressing . All settings are discarded.

7.6.3 Save a Programme

⇨ Press the button to save the set parameters in the selected program preset.

7.6.4 Delete a Programme

⇨ Tap the button (T4.4) in order to delete all parameters of a specific programme.
⇨ Confirm the deletion by tapping the button .
⇨ The process will be cancelled by pressing the button (T2.5).

7.7 System settings

The system settings can only be accessed in manual mode.

⇨ Press the button.

⇨ Swipe from right to left or from left to right to access the various windows of the system settings.

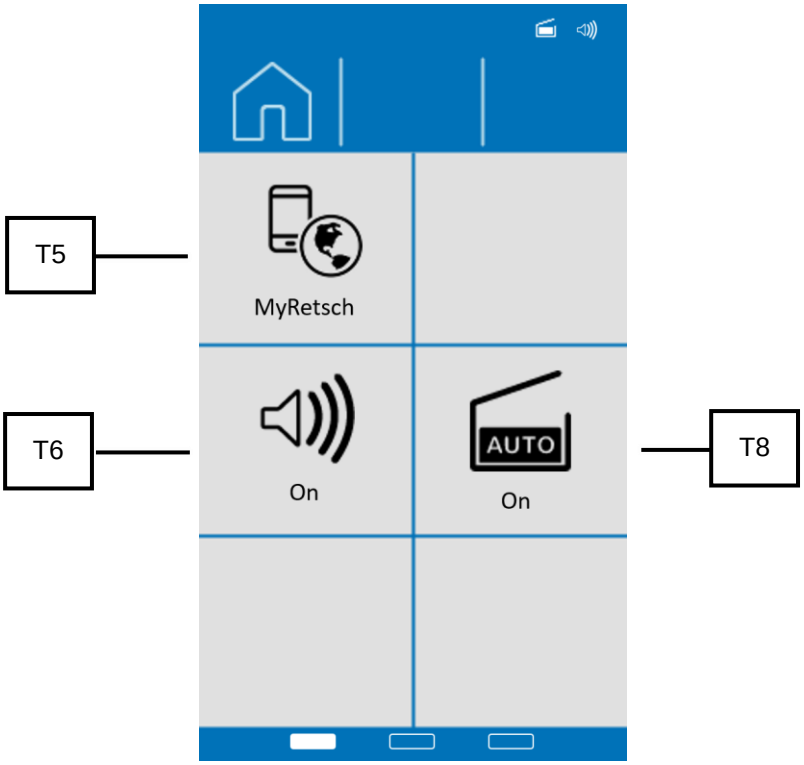


Fig. 39: Overview 1 System settings

Element	Description	Function
T5	"MyRetsch"	Displays a QR code in the display.
T6	Signalling device (on/off)	This can be used to switch the signal device on or off.
T8	Automatic opening (on/off)	Automatically unlocks the device hood at the end of a grinding process.

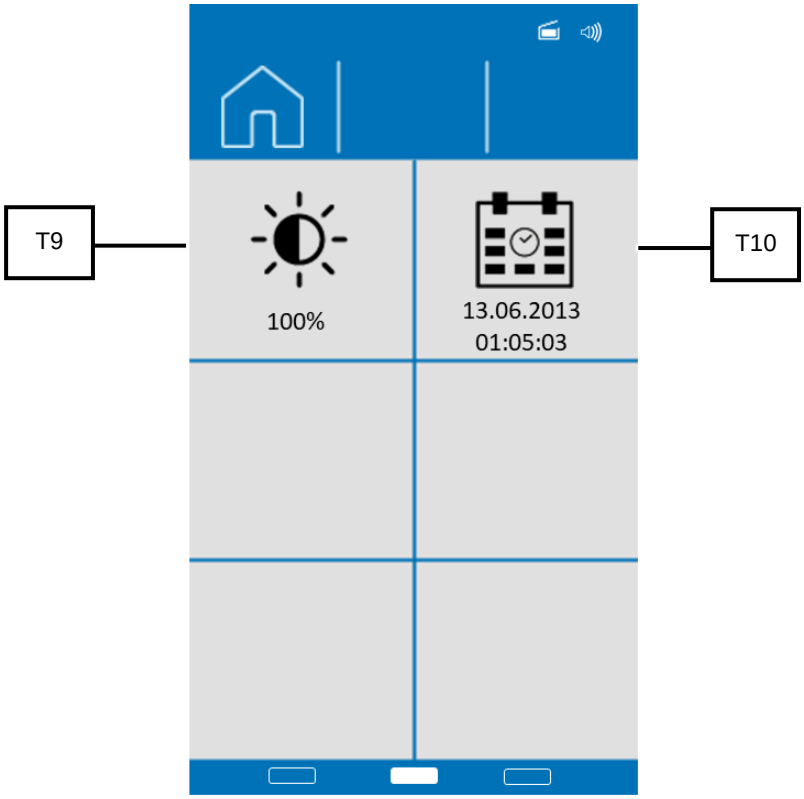


Fig. 40: Overview 2 System settings

Element	Description	Function
T9	Display brightness	Setting of the display brightness.
T10	Date and time	Setting of the date and time.

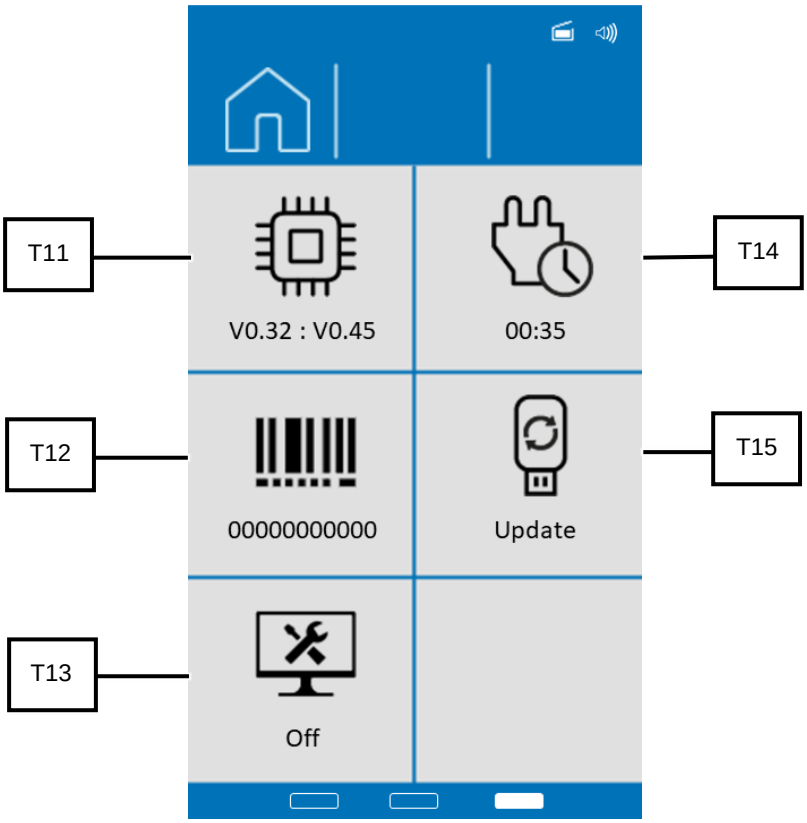


Fig. 41: Overview 3 System settings

Element	Description	Function
T11	Software version	Display of the installed firmware version.
T12	Serial number	The serial number of the device is displayed here.
T13	Service environment	Enables access to the service environment for service technicians.
T14	Operating hours	Display of operating hours
T15	Software update	Software update of the device via USB medium.

7.7.1 MyRetsch

The section (T5) allows access to the web portal of Retsch GmbH via QR code. This can be read in with a smartphone with the appropriate software and internet connection. Afterwards, the website of the device can be accessed directly, which provides additional information such as tips and tricks for the device as well as an application database.

⇨ Press the section (T5) to display the QR code.

Fig. 42: myRetsch QR code

7.7.2 Brightness

In the section (T9), the brightness of the display can be set between 6 % and 100 %.

⇨ Press the section (T9). The background of the section is greyed out and the background of the control dial lights up in blue.
⇨ Turn the control dial until the desired brightness of the display is reached.

The set value is applied as soon as the section (T9) or another section is pressed again or as soon as the system settings are exited.

7.7.3 Software Version

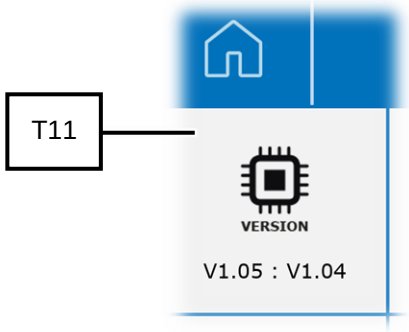


Fig. 43: Firmware version

In the section (T11), the installed firmware version of the device can be viewed.

7.7.4 Service Environment

In the section (T13), the service environment can be accessed. The service environment is only accessible to service technicians of the company Retsch GmbH .

	If the service environment is selected by pressing the section (T13), the USB interface is activated and "On" is displayed below the symbol. However, no other functions are carried out.

⇨ Deactivate the service environment by pressing the section (T13) or exit the "System settings" menu by pressing the button.

	As long as the service environment is activated, all other functions remain deactivated.

7.7.5 Operating Hours

In the section (T14), the operating hours of the device are displayed in hours and minutes (hh:mm). The process times are counted, i.e. the sum of the times between the start and stop of grinding. The time cannot be changed.

7.7.6 Software Update

Via the section (T15), the software can be updated.

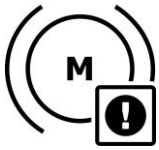
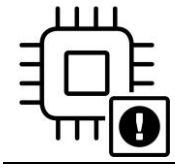
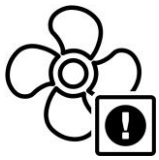
	A suitable USB medium must be connected to the USB interface. • The USB medium must be formatted in the FAT32 file system. • USB 3.0 mediums are not supported. The main directory may only contain the software to be installed. The software is then automatically detected by the device.

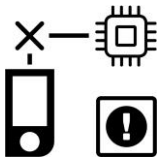
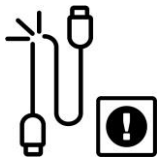
⇨ Press the (T15) icon to carry out the update.
⇨ Wait until the transfer and installation are complete. The background of the control dial flashes blue until the touch display is restarted. This may take a few seconds.

8 Error messages and remarks

8.1 Error messages

Error messages inform the user about detected device or program errors. An error message indicates that a fault is present which automatically interrupts operation of the device or the program. Faults of this type must be remedied before the device is next used.

Error code	Description	Measures
E10 	Overload	The drive can withstand short-term overloads. In the case of prolonged overload, self-protection becomes active. This can happen especially with high loads (feeding the sample material too quickly, hard sample). • Check whether there are any foreign bodies in the interior. • Check whether the rotor can be moved smoothly by hand. • Check whether the grinding process can be carried out with reduced speed. • Switch off the main switch and wait 30 seconds before switching the device on again.
E12 	Motor brake	Too many braking steps detected, causing excessive heating of the brake resistor. This can be caused by frequent and quick speed changes. • Check whether the grinding process can be carried out with fewer speed changes. • Leave the machine switched on until the cool down timer has expired. • Switch off the main switch and wait 30 seconds before switching the device on again.
E20 	Control error	• Switch off the main switch and wait 30 seconds before switching the device on again. • If the error persists, contact the Retsch GmbH technical service.
E23 	Fan error	The fan is blocked and does not start. • Check whether the fan is blocked by a foreign object. • Switch off the main switch of the ZM 300 and start the process again. • If none of the above causes can be identified, contact the Retsch GmbH technical service

Error code	Description	Measures
E25 	Display error	The connection to the display is interrupted. • Switch off the main switch and wait 30 seconds before switching the device on again. • If the error persists, contact the Retsch GmbH technical service.
E26 	Frequency converter error	Communication with the frequency converter is interrupted or faulty. • Switch off the main switch and wait 30 seconds before switching the device on again. • If the error persists, contact the Retsch GmbH technical service.
E41 	Speed sensor error	Target and actual speed of the drive deviate from each other. • Switch off the main switch and wait 30 seconds before switching the device on again. • If necessary, remove any foreign bodies from the interior of the device. • Check whether the cassette cover is correctly inserted. • If the error persists, contact the Retsch GmbH technical service.
E50 	Safety circuit error	A safety function has been interrupted. • Switch off the main switch and wait 30 seconds before switching the device on again. • If the error persists, contact the Retsch GmbH technical service.
E80 	USB interface error	An update was carried out via the settings menu. No USB stick is connected or the USB stick does not contain any information. • If the error persists, contact the Retsch GmbH technical service.

8.2 Remarks

Remarks inform the user about certain device or program processes. The operation of the device or program may be briefly interrupted but there is no fault. The remark must be acknowledged by the user to continue the process. Remarks offer the user additional information but do not represent any device or program faults.

Reference code	Description	Measures
H10 	Motor is overheated	The drive can withstand short-term overloads. In the case of prolonged overload, self-protection becomes active. This can happen especially with high loads (feeding the sample material too quickly, hard sample). • Leave the machine switched on until the cool down timer has expired.

9 Installing additional equipment

Thanks to Retsch additional equipment, the ZM 300 Ultra Centrifugal Mill can be flexibly adapted to different working conditions.

The following additional equipment is available for the Retsch ZM 300 Ultra Centrifugal Mill:

- Paper filter bag with support and through cassette
- Cyclone separator with collecting vessel and through cassette for dust extraction or a filter bag
- DR 100 feed unit with stand

	For installation of the additional equipment, this manual provides an adapted and suitable description which, however, does not include all details. For this reason, also observe the assembly instructions for installation of additional equipment.

9.1 Paper filter with support

The device can be fitted with a paper filter as collecting receptacle. With the paper filter, it is possible to collect a large quantity of sample material.

9.1.1 Installing the paper filter

	During installation, also follow the assembly instructions for the additional equipment.

Install the paper filter bag as follows:

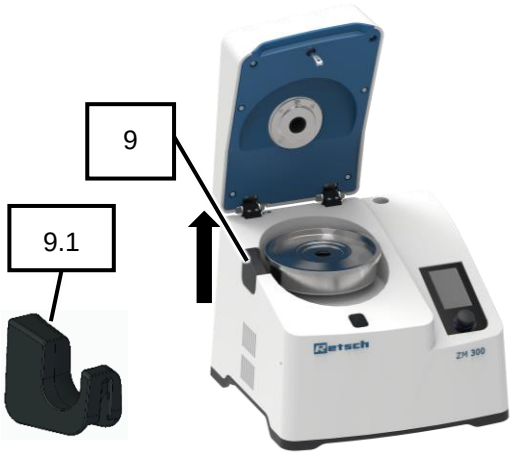


Fig. 44: Device with cassette and grinding tools

1. Switch on the device.
2. Open the device hood (2).
3. Switch off the device while the device hood (2) is open.

➔ The device is switched off and the device hood (2) is open.

4. If inserted, remove the grinding tools and cassette (26) from the interior (10) (Fig. 44).
5. Pull out the rubber sleeve (9) upwards (arrow) (Fig. 44).
6. Push in the through sleeve for the cyclone (9.1).
7. Place the through cassette (26.1) at the position of the standard cassette (26).
8. Insert the grinding tools and close with the lid.

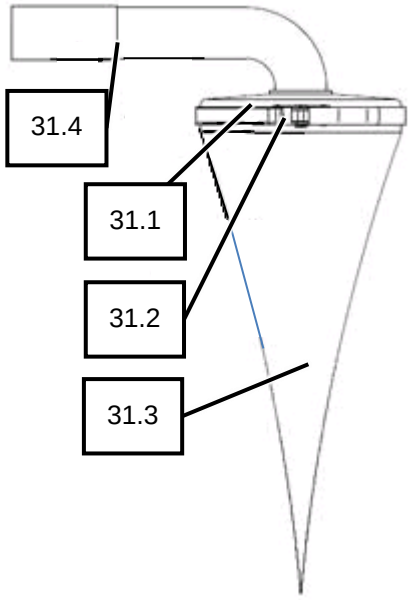


Fig. 45: Paper filter bag

No.	Component
2	Device hood
9	Rubber sleeve
9.1	Through sleeve
10	Interior
26	Cassette
26.1	Through cassette
31.1	Filter support
31.2	Clamps
31.3	Paper filter bag
31.4	Rubber seal

9. Switch on the device.
10. Close the device hood (2).
11. Secure the paper filter bag (31.3) with the clamps (31.2) in the filter support (31.1).
12. Fit the filter support (31.1) with the through cassette (26.1) and connect them with the rubber seal (31.4).

➔ The paper filter bag is installed and the device is ready for use (*Fig. 45*).

9.2 Cyclone separator with collecting receptacle

For larger quantities of sample material, the cyclone separator allows material discharge of up to 4500 ml in the collection receptacle.
During the grinding process, air throughput occurs. This transports the sample material into the collection receptacle of the cyclone separator. The air throughput depends on the mesh size of the ring sieve, the rotor speed and the air routing.

9.2.1 Installing the cyclone separator with collecting receptacle

	For installation, also observe the assembly instructions for additional equipment.

Install the cyclone separator with collection receptacle as follows:

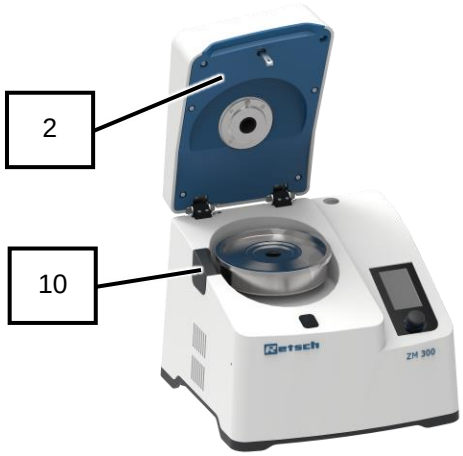


Fig. 46: Device with cassette and grinding tools

1. Switch on the device.
2. Open the device hood (2).
3. Switch off the device while the device hood (2) is open.

➔ The device is switched off and the device hood (2) is open (*Fig. 46*).

4. If inserted, remove the grinding tools and cassette (26) from the interior (10) (Fig. 46).
5. Pull out the rubber sleeve (9), which is the opening for the cyclone cassette (26), upwards (Fig. 46).

Fig. 47: Device with through cassette and support

6. Push in the through sleeve for the cyclone (9.1).
7. Set the support on the side of the device and secure it to the base plate of the device with the two screws provided (Fig. 47).

➔ The support is installed.

8. Place the through cassette (26.1) at the position of the standard cassette (26) (*Fig. 47*).
9. Insert the grinding tools (see "Inserting the grinding tools and cassette") (*Fig. 47*).
10. Close the through cassette (26.1) with the lid (*Fig. 47*).
11. Switch on the devices.
12. Close the device hood (2).

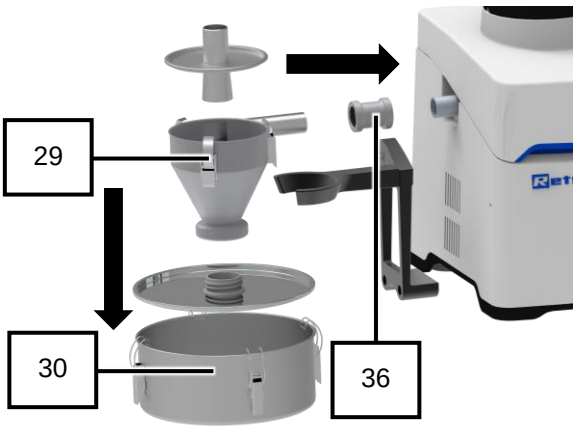


Fig. 48: Components of the cyclone separator

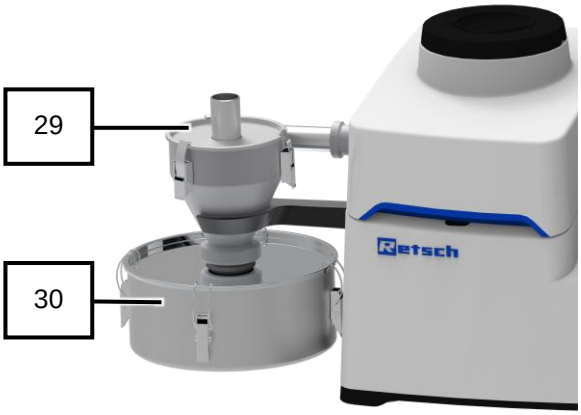


Fig. 49: The cyclone separator is installed

No.	Component
2	Device hood
9	Rubber sleeve
9.1	Through sleeve
10	Interior
26	Cassette
26.1	Through cassette
29	Cyclone separator
30	Collection receptacle
36	Coupling

13. Place the cyclone separator (29) in the fork of the support (31) (*Fig. 48*).
14. Connect the cyclone separator (29) and through cassette (26.1) with the coupling (33) (*Fig. 48*).
    NOTICE: First close the hood and then fasten the coupling (36). Otherwise the through cassette may be twisted.
15. If necessary, slightly loosen the screws on the support to adjust the height.

➔ The sockets of the cyclone separator (29) and the collection receptacle (30) are aligned.

16. Tighten the screws on the support after height adjustment.
17. Attach the collection receptacle (30) to the cyclone separator (29) (*Fig. 48*).
18. Connect the suction pipe of a vacuum cleaner to the pipe sockets of the cyclone separator lid or plug the connection with a filter bag onto the connection piece of the dedicated cyclone separator lid.

➔ The cyclone separator (29) with collection receptacle (30) is installed (*Fig. 49*).

9.3 DR 100 feed unit

With the DR 100 feed unit, larger quantities of sample material can be fed evenly through the noise protection funnel during the grinding process.

An additional interface cable is required to connect the unit to the DR 100 feed unit. The voltage and frequency must be checked against the nameplates of the device and the DR 100 feed unit.

	The best choice is a multiple socket to which the device and the DR 100 feed unit are connected, but no other devices.

9.3.1 Installing the DR 100 feed unit

	For installation and operation, also observe the assembly instructions for additional equipment.

Install the DR 100 feed unit as follows:

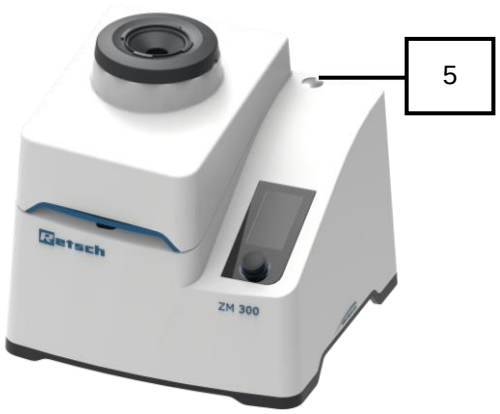


Fig. 50: Stand opening position

1. Switch off the device.
2. Remove the plastic plug from the stand opening (5) (e.g. with a slotted screwdriver) (*Fig. 50*).
3. Remove the transport lock at the bottom of the DR 100 feed unit (33).

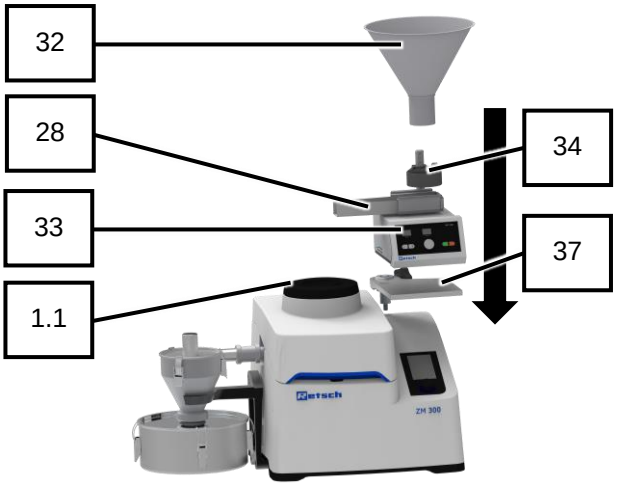


Fig. 51: Components of the DR 100 feed unit

4. Connect the base plate (37) and the bottom of the DR 100 feed unit (33) with washers and screws.
5. Screw the stand into the stand opening (5) using an open end wrench. Place the adapter ring on the stand and tighten the grub screw.
   NOTICE: The position of the grub screw determines the swivel radius of the base plate and is to be set individually.
6. Place the base plate with the DR 100 feed unit (33) installed on the stand and tighten it with the toggle screw.
7. Install the vibrating chute and hopper on the top of the DR 100.
8. Align the vibrating chute (28) over the noise protection funnel (1.1).
9. Lower the hopper (32) onto the chute (28), fill in the sample material. Afterwards, lift the hopper (32) off the chute (28) to operating height.
   The gap should be three times larger than the largest feed material to prevent blockage.

Fig. 52: DR 100 and ZM 300 interface cables

Fig. 53: Connection of the DR 100 feed unit

10. Connect the device and the DR 100 feed unit (33) to the DR 100 interface (17) using the interface cable supplied (*Fig. 53*).
11. Set the operating switch at the rear of the DR 100 feed unit (33) to "Standard".
12. Connect the DR 100 feed unit (33) to the power supply
13. Switch on both devices, the DR 100 feed unit (33) and the ZM 300, with the respective main switches (16) at the rear of the devices.

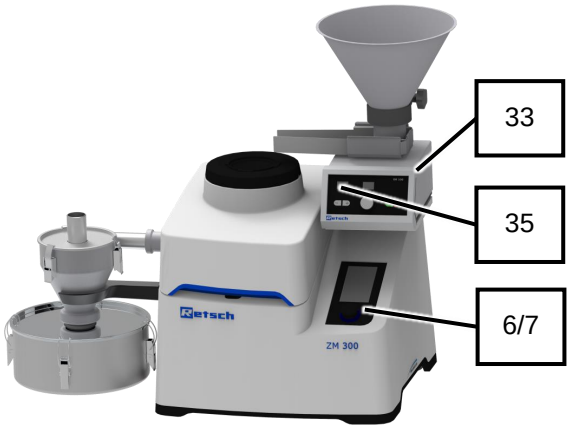


Fig. 54: Device with installed DR 100 feed unit

- ➔ The touch display (6) of the device is activated and the control dial (7) briefly lights up in blue.
- ➔ The display (35) of the DR 100 feed unit (33) is activated and shows "pc" during synchronisation (*Fig. 54*).
- ➔ On the touch display (6) of the device, the functions "DR 100 conveying speed" and "Automatic stop" are activated.
- ➔ The device and the DR 100 feed unit (33) are synchronised.
- ➔ The DR 100 feed unit (33) is installed and ready for use.

No.	Component
1.1	Hopper for noise reduction
5	Stand opening
6	Touch display
7	Control dial
16	Main switch
17	Interface for DR 100 feed unit
28	Chute of the DR 100 feed unit
32	Hopper of the DR 100 feed unit
33	DR 100 feed unit
34	Toggle screw
35	Display of the DR 100 feed unit

Synchronisation between the device and the DR 100 feed unit deactivates the automatic opening function of the device. This means that the device hood does not hit the chute (28) of the DR 100 feed unit due to the automatic unlocking at the end of a grinding process.

Loosen the toggle screw on the base plate and swivel away the DR 100 feed unit before opening the device hood.

10 Maintenance

CAUTION

C10.0013

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!**

This chapter contains descriptions on cleaning and servicing the device.

	This Manual does not contain repair instructions. All repairs must be conducted by Retsch GmbH, an authorised representative or by Retsch service technicians.

10.1 Cleaning

WARNING

W7.0003

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

C11.0031

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.**

To guarantee the reliability and operational safety of the device, it must be cleaned as necessary and at least once a month.

	Use a damp cloth and gentle cleaning agent to remove stubborn deposits.

10.1.1 Cleaning of the filling area

Clean the components as follows:

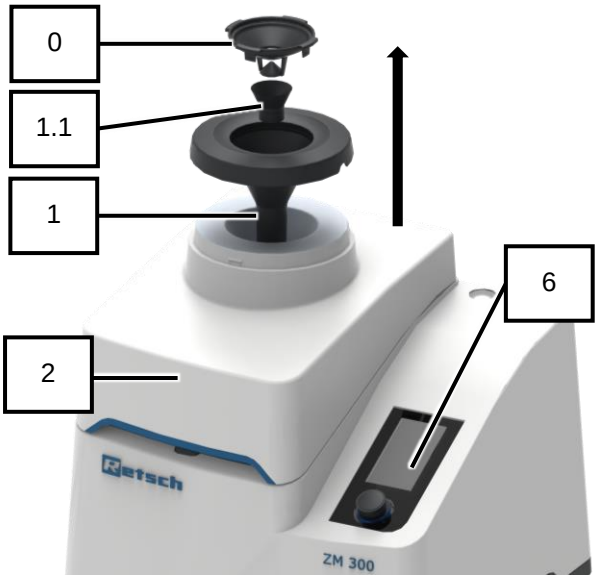


Fig. 55: Components of the filling area

1. Switch off the device with the main switch (16) at the rear of the device.

➔ Touch display (6) goes out.

➔ Device is switched off.

2. Disengage and remove the feed hopper (1) by turning it clockwise.
3. Pull the impact protection (0) out of the feed hopper (1).
4. Push out the funnel for noise protection (1.1).
5. Clean the feed hopper (1), impact protection (0) and funnel for noise protection (1.1) with a vacuum cleaner or brush.
6. If necessary, hold the feed hopper (1), impact protection (0) and funnel for noise protection (1.1) under running water.
7. Allow the feed hopper (1), impact protection (0) and funnel for noise protection (1.1) to dry.
8. Insert the feed hopper (1) into device hood (2).
9. Place the impact protection (0) in the opening of the noise protection funnel (1.1) and snap it in place by turning it counter-clockwise.
10. Place the noise protection funnel (1.1) on the device hood (2).

➔ The mentioned components are cleaned.

➔ Optional: The stainless steel funnel can be cleaned in the same way

No.	Component
0	Impact protection
1	Feed hopper
1.1	Hopper for noise reduction
2	Device hood

10.1.2 Cleaning the interior

Cleaning the interior includes cleaning the rotor shaft, the sensor areas and the locking pin under the device hood.

Clean the interior as follows:

Fig. 56: Device with open device hood

1. Switch on the device with the main switch (16) at the rear of the device.

➔ The touch display (6) of the device is activated and the background of the control dial (7) briefly lights up in blue.

2. Press  on the touch display (6) to unlock the device hood (2).
3. Open the device hood (2) by hand.
4. Switch off the device with the main switch (16) on the back while the device hood (2) is open.

➔ Touch display (6) goes out.

➔ The device is switched off and the device hood (2) is open (*Fig. 56*).

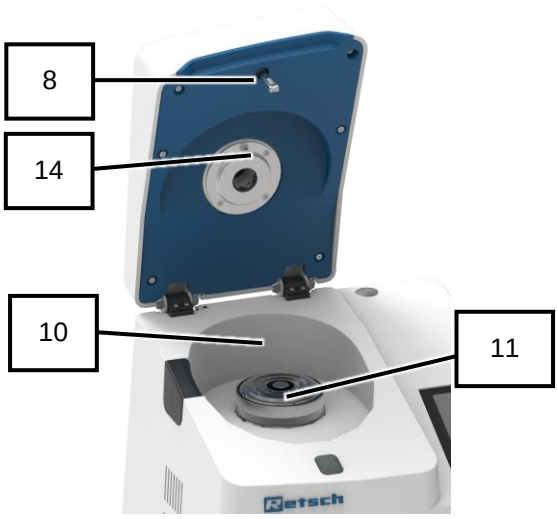


Fig. 57: Interior

5. If inserted, remove the grinding tools (cassette with lid, ring sieve, rotor and labyrinth disc) from the interior (10).
6. Clean the locking pin (8) under the device hood with a brush (*Fig. 57*).
7. Clean the temperature sensor (14) under the device hood (2) and next to the rotor shaft (10) with a brush *(Fig. 57*).
8. Clean the rotor shaft (11) with a vacuum cleaner (*Fig. 57*).
9. Clean the interior (10) and the underside of the device hood (2) with a vacuum cleaner (*Fig. 57*).
10. Clean stubborn deposits with a damp cloth and gentle detergent.

➔ The interior (10) is cleaned.

Fig. 58: Device with closed device hood

No.	Component
2	Device hood
6	Touch display
7	Control dial
8	Locking pin
9	Sensor areas
10	Interior
11	Rotor shaft

11. If required, insert the grinding tools (cassette with lid, ring sieve, rotor and labyrinth disc) (see "Inserting grinding tools").
12. Switch on the device with the main switch (16) at the rear of the device.

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

13. Close the device hood (2) by hand and hold it in closed position for approx. 2 sec.

➔ The device hood (2) is locked and held closed by the locking pin (8) (*Fig. 58*).

➔ The interior (10) is cleaned and the device is ready for use.

10.1.3 Cleaning the grinding tools and cassette

Cleaning the grinding tools and the cassette includes cleaning the labyrinth disc, the rotor, the ring sieve and the cassette with lid.

Clean the grinding tools as follows:

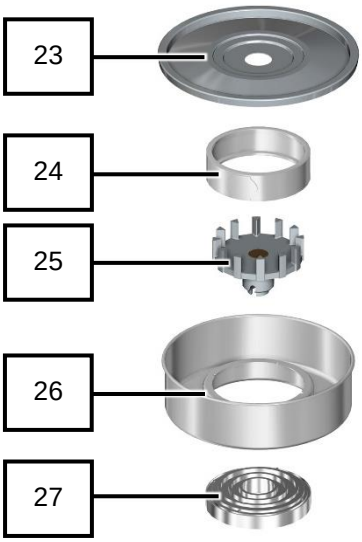


Fig. 59: Overview of grinding tools and cassette

No.	Component
23	Cassette lid
24	Ring sieve
25	Rotor
26	Cassette
27	Labyrinth disc

1. If used, remove the grinding tools:
- Cassette (26) with lid (23),
- Ring sieve (24),
- Rotor (25) and
- Labyrinth disc (27)
  from the interior (10).
2. Clean the grinding tools (24, 25, 27) and cassette (26) with lid (23), depending on the degree of soiling, individually with a brush, a vacuum cleaner, a damp cloth and/or a suitable cleaning agent. In case of heavy soiling, the individual parts can also be cleaned in the dishwasher.
3. If necessary, allow the grinding tools (24, 25, 27) and the cassette (26) with lid (23) to dry sufficiently before reinserting them.

➔ The grinding tools and the cassette are cleaned.

10.1.4 Cleaning the filter covers

Clean the filter cover as follows:

Fig. 60: Position of filter covers

1. Switch off the device with the main switch (16) at the rear of the device.

➔ Touch display (6) goes out.

➔ Device is switched off.

2. Remove the filter frame (22) on the back of the device by releasing it with a screwdriver.

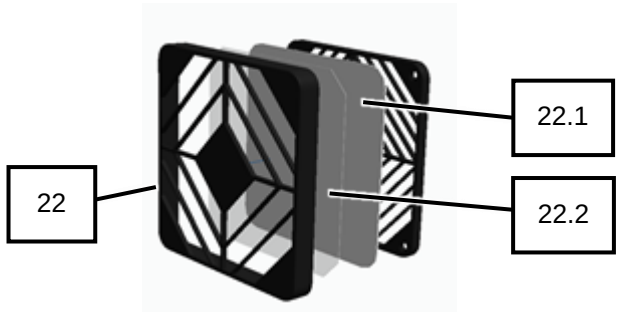


Fig. 61: Position of filter covers

3. Clean the filter frame, filter protection grid and filter mat (22/22.1/22.2) with a vacuum cleaner.
4. Fit the complete filter (22/22.1/22.2) again and snap it into place.

➔ The filter (22/22.1/22.2) is cleaned.

No.	Component
6	Touch display
16	Main switch
22	Filter frame (motor)
22.1	Filter protection grid
22.2	Filter mat

10.2 Servicing

To guarantee the reliability and operational safety of the device, the following servicing work must be carried out as necessary, and at least once a month.

10.2.1 Checking the roller on the closing pin for ease of movement and oiling where necessary

Check and oil the locking pin as follows:

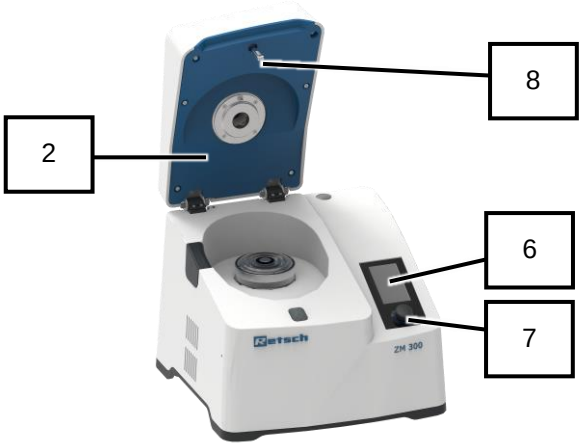


Fig. 62: Bottom of device hood

1. Switch on the device with the main switch (16) at the rear of the device.

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

2. Press on the touch display (6) to unlock the device hood (2).
3. Open the device hood (2) by hand.
4. Switch off the device with the main switch (16) on the back while the device hood (2) is open.

➔ Touch display (6) goes out.

➔ The device is switched off and the device hood (2) is open (*Fig. 62*).

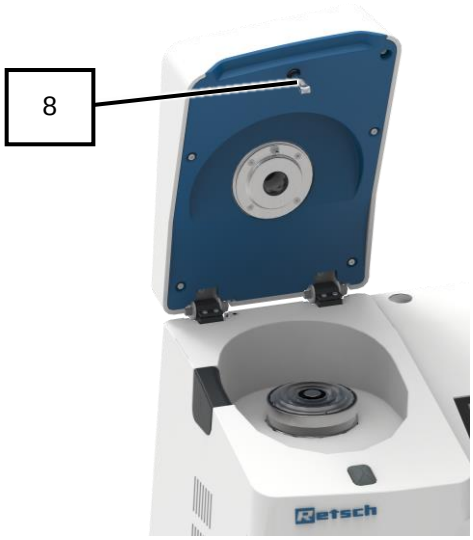


Fig. 63: Locking pin

5. Check the rollers of the locking pin (8) for smooth movement (*Fig. 63*).
6. If necessary, oil the rollers of the locking pin (8) with sewing machine oil.
7. Switch on the device with the main switch (16) at the rear of the device.

➔ The touch display (6) is activated and the background of the control dial (7) briefly lights up in blue.

8. Close the device hood (2) by hand and hold it in closed position for approx. 2 seconds. Pay attention to the acoustic signals.

➔ The device hood (2) is locked and held closed by the locking pin (8).

➔ Locking pin (8) is checked and oiled if necessary.

No.	Component
2	Device hood
6	Touch display
7	Control dial
8	Locking pin

10.2.2 Replacing the filter cover

If a filter cover is heavily soiled, it must be replaced.

Replace the filter cover as follows:

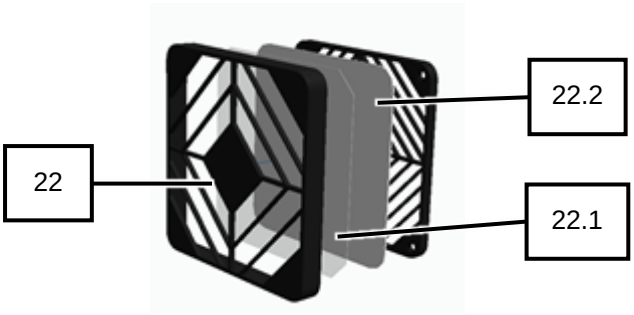


Fig. 64: Position of filter covers

No.	Component
22	Filter frame
22.1	Filter protection grid
22.2	Filter mat

1. Switch off the device with the main switch (16) at the rear of the device.

➔ Touch display (6) goes out.

➔ Device is switched off.

2. Remove the filter frame (22) as previously described.
3. Replace the heavily soiled filter mat (22.2) and clean the filter protection grid (22.1).
4. Fit the complete filter frame (22/22.1/22.2) again and snap it into place.

➔ The filter mat (22.2) is replaced.

10.3 Wear

⚠ CAUTION C12.0015

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!**

Grinding tools can wear to varying degrees depending on the frequency of grinding and the material being ground. Therefore, the rotors and sieves should be checked on a regular basis for wear and tear and should be replaced, if required.

All existing seals (if applicable for grinding tools and in the device) should also be regularly checked for wear and tear and replaced, if required.

10.3.1 Rotor wear

The teeth of the rotor wear through the grinding of samples. Wear and tear occurs at the tip of the tooth as well as on the tooth surface on which the sample impacts during the grinding process. Wear and tear on the rotor may lead to a reduction in the accuracy of the grinding results or may impact the duration of the grinding process. The more the teeth wear down, the greater the risk that a tooth may break off and cause damage to the inserted sieve and the cassette.
This process is gradual and may take several years. It is therefore recommended to check the rotor teeth on a regular basis and replace the rotor, if necessary, in order to ensure optimum performance.

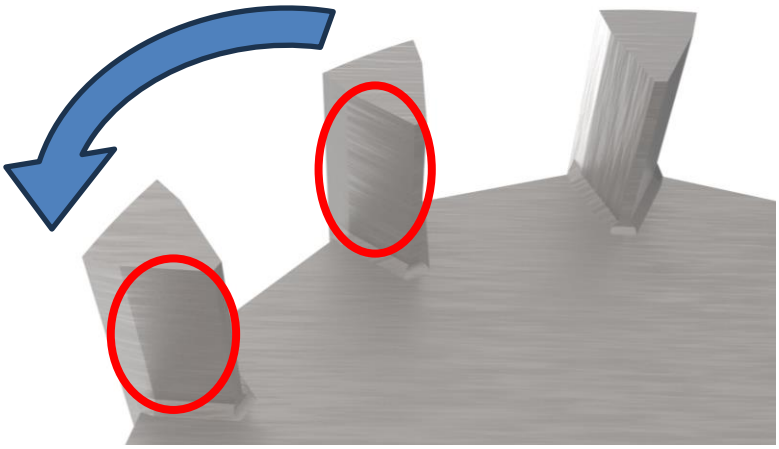


Fig. 65: Rotor wear and tear with anti-clockwise rotation

10.4 Returning for repair and servicing

Fig. 66: Returned goods consignment note

Devices and accessories from Retsch GmbH can only be accepted for repair, maintenance or calibration if the returned goods consignment note including the declaration of no objection is completed correctly and in full.

1. Download the returned goods consignment note from the download section "Miscellaneous" on the Retsch GmbH website (http://www.retsch.de/de/downloads/sonstiges/).
2. In the event of a return of the device, attach the returned goods consignment note to the outside of the packaging.

	To exclude any health risk to service technicians, Retsch GmbH reserves the right to refuse acceptance and to return the corresponding delivery at the expense of the sender.

11 Accessories

Information about available accessories and the corresponding manuals can be found directly on the website of Retsch GmbH (https://www.retsch.com) under the "Downloads" section for the device and on the myRetsch site (see “Controlling the device using the touchscreen display/myRetsch“).

Information about wearing parts and small accessories can be found in the complete catalogue of Retsch GmbH, that is likewise available on the homepage.

In the event of questions about spare parts , please contact the representative of Retsch GmbH in your country or contact Retsch GmbH directly.

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 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.

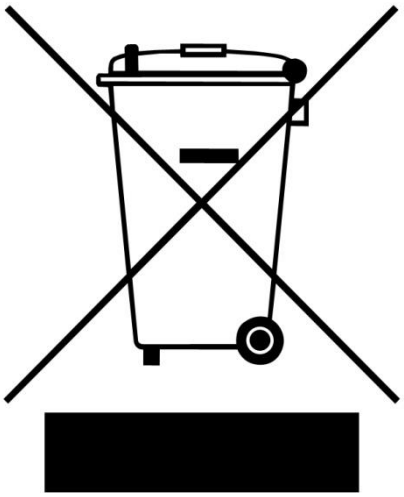


Fig. 67: Disposal label

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.

13 Index

EU Declaration of Conformity

Translation

ULTRA CENTRIFUGAL MILL

ZM 300 | 20.824.xxxx

EU DECLARATION OF CONFORMITY

We, represented by the undersigned, hereby declare that the above device complies with the following directives and harmonised standards:

Machinery Directive 2006/42/EC

Applied standards, in particular:

DIN EN ISO 12100	Machine Safety - General Design Principles
DIN EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems
DIN EN 61010-1	Safety Regulations for Electrical Measurement, Control, Regulation and Laboratory Devices

Electromagnetic compatibility 2014/30/EU (tested at 230 V, 50 Hz)

Applied standards, in particular:

EN 55011	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
DIN EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements

Restriction of hazardous substances (RoHS) 2011/65/EU

Authorised person for compilation of the technical documentation:

Julia Kürten (Technical Documentation)

Furthermore, we declare that the relevant technical documentation for the above device has been prepared in accordance with Annex VII Part A of the Machinery Directive and we undertake to submit the documentation to the market surveillance authorities on request.

In the event of a modification of the device not agreed on by Retsch GmbH, as well as the use of non-approved spare parts or accessories, this declaration loses its validity.

Retsch GmbH

Haan, 09/2023

Dr. Stefan Mähler, Technical Manager

CE