

**Manual**  
**Tap Sieve Shaker AS 200 tap**



**Translation**



**Copyright**

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## 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 <http://www.retsch.com> on the pages for the specific device concerned.

### **Amendment status:**

The document amendment 0002 of the "Tap Sieve Shaker AS 200 tap" manual has been prepared in accordance with the Machinery Directive 2006/42/EC.

### 1.1 Explanation of signs and symbols

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

①	Reference to a recommendation and/or an important information
→	Reference to a chapter, table or figure
⇒	Action instruction
Name	Software menu function
[Name]	Software button
<Name>	Software checkbox

### 1.2 Disclaimer

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

### 1.3 Copyright

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

## 2 Safety

### **Safety Officer**

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

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

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

### **Target group**

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

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

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

## 2.1 Explanations of the Safety Instructions

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

<b>⚠ DANGER</b>	<small>D1.0000</small>
<p><b>Risk of fatal injuries</b> Source of danger</p> <ul style="list-style-type: none"> <li>– Possible consequences if the danger is ignored.</li> <li>• <b>Instructions and information on how to avoid the risk.</b></li> </ul>	

**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.

<b>⚠ WARNING</b>	<small>W1.0000</small>
<p><b>Risk of life-threatening or serious injuries</b> Source of danger</p> <ul style="list-style-type: none"> <li>– Possible consequences if the danger is ignored.</li> <li>• <b>Instructions and information on how to avoid the risk.</b></li> </ul>	

**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.

<b>⚠ CAUTION</b>	<small>C1.0000</small>
<p><b>Risk of injuries</b> Source of danger</p> <ul style="list-style-type: none"> <li>– Possible consequences if the danger is ignored.</li> <li>• <b>Instructions and information on how to avoid the risk.</b></li> </ul>	

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

## NOTICE

N1.0000

### Type of damage to property

Source of the damage to property

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

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

## 2.2 General Safety Instructions

### CAUTION

C2.0002

#### Risk of injury

Lack of knowledge of the manual

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



### CAUTION

C3.0015

#### Risk of injury

Improper modifications to the device

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

## NOTICE

N2.0012

### Changes to the device

Improper modifications

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



## 2.3 Repairs

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

**In case of repair, please inform...**

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

**Service address:**

## 2.4 Confirmation Form for the Managing Operator

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

The user of the device herewith confirms to the managing operator (owner) that he has received sufficient instructions about the operation and maintenance of the system. The user has received the manual, has read and taken note of its contents and consequently has all the information required for safe operation and is sufficiently familiar with the device.

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

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

**User**

Surname, first name (block letters)

Position in the company

Place, date and signature

**Managing operator or service technician**

Surname, first name (block letters)

Position in the company

Place, date and signature

### 3 Technical Data

#### 3.1 Protective Equipment

- This device is equipped with an electronic hood monitoring. The hood monitoring prevents the device from being started when in an unsafe state.
- The device can only be started when the hood is closed.
- Opening the hood during operation leads to an immediate standstill of the device.

#### 3.2 Degree of Protection

- IP40

#### 3.3 Emissions

**⚠ CAUTION**

C4.0011

**Possibility of acoustic signals not being heard**

Loud sieving noises

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

**⚠ CAUTION**

C5.0025

**Hearing damage**

A high sound level may be generated depending on the type of material, the number of sieves, the sieving aid used and the duration of the sieving

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



**Sound parameters:**

The sound parameters are also influenced by the number of test sieves and the properties of the sample material.

Example1:

Number of test sieves:	5
Feed material:	Quartz sand (< 1 mm)
Soundproof hood:	closed

At these operating conditions, the workplace related equivalent continuous sound level  $L_{eq} = 80 \text{ dB(A)}$ .

#### 3.4 Electromagnetic Compatibility (EMC)

- EMC class according to DIN EN 55011: B

### 3.5 Rated Power

~ 315 VA

### 3.6 Dimensions and Weight

- Height: 670 mm
- Width: 700 mm
- Depth: 520 mm
- Weight without sieve stack: ~ 92 kg

### 3.7 Required Floor Space

- Width of the base: 800 mm
- Depth of the base: 550 mm
- No safety clearances required

**Location requirements:**

The device must be placed on a vibration-free, plane, stable and free surface to avoid transmission of vibrations. A level base ensures the uniform distribution of the sample over the sieve mesh fabric, as well as the stability of the device.

**NOTICE**

N3.0023

**Location requirements**

Unbalance and vibration during operation

- The AS 200 tap causes strong unbalance and vibrations during the operation, which can lead to a movement of the whole device.
- **The installation must be carried out on a stable, anti-slip, vibration-free base, which is suitable for both, the weight of the device and the resulting vibrations during operation.**
- **In order to ensure safe operation, the AS 200 tap has to be screwed firmly to the base by means of the transport angles.**

### 3.8 Receptacle Volume

The maximum receptacle volume (the maximum feed quantity) depends on various factors such as number and aperture size of the test sieves, maximum grain size and width of distribution of the sample material.

Examples for the maximum feed quantity according to DIN 66165 for test sieves of 200 mm in diameter are listed in the following table:

Mesh size	Max. feed quantity	Max. permitted oversize material according to DIN 66165
25 µm	14 cm <sup>3</sup>	7 cm <sup>3</sup>
45 µm	20 cm <sup>3</sup>	10 cm <sup>3</sup>
63 µm	26 cm <sup>3</sup>	13 cm <sup>3</sup>
125 µm	38 cm <sup>3</sup>	19 cm <sup>3</sup>
250 µm	58 cm <sup>3</sup>	29 cm <sup>3</sup>
500 µm	88 cm <sup>3</sup>	44 cm <sup>3</sup>
1 mm	126 cm <sup>3</sup>	63 cm <sup>3</sup>
2 mm	220 cm <sup>3</sup>	110 cm <sup>3</sup>
4 mm	346 cm <sup>3</sup>	173 cm <sup>3</sup>

8 mm	566 cm <sup>3</sup>	283 cm <sup>3</sup>
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### 3.9 Feed Grain Size

Traditional dry sieving is performed in the particle size range of 40 µm to 125 mm. By means of sieving aids or with wet sieving the measurement range can be extended to 20 µm. The maximum feed grain size depends on the sample material, the number and aperture size of the test sieves and the type of the sieving machine.

Examples for the maximum feed grain size according to DIN 66165 are listed in the following table:

Mesh size	Max. feed grain size according to DIN 66165	Mesh size	Max. feed grain size according to DIN 66165
22 µm	710 µm	4 mm	25 mm
45 µm	1 mm	8 mm	45 mm
63 µm	1.4 mm	16 mm	71 mm
125 µm	2.5 mm	22.4 mm	90 mm
250 µm	4 mm	45 mm	150 mm
500 µm	6 mm	63 mm	180 mm
1 mm	10 mm	90 mm	230 mm
2 mm	16 mm	125 mm	300 mm

The Tap Sieve Shaker AS 200 tap is designed for the measurement range of 20 µm to 25 mm.

### 3.10 Payload

- Maximum sample quantity: 3 kg
- Maximum sieve stack weight: 3 kg
- Maximum payload: 6 kg (sample material plus test sieves)
- Maximum sieve stack height: 380 mm
- Maximum number of fractions: 7 (height of test sieves and collecting pan: 50 mm (2")) / 13 (height of test sieves and collecting pan: 25 mm (1"))

### 3.11 Suitable Sieve Diameters

- Suitable sieve diameters: 200 mm / 203 mm (8")

### 3.12 Drive

- Horizontal circular motions: 280 rpm (+/- 2 rpm)
- Taps: 150 min

## 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

N4.0001

##### 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

N5.0017

##### Damage to components

Transport

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

#### NOTICE

N6.0014

##### 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

N7.0016

##### 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**

N8.0021

**Ambient temperature**

Temperatures outside the permitted range

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

N9.0015

**Humidity**

High relative humidity


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

## 4.5 Electrical Connection

**⚠ WARNING** 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).**



**NOTICE** N10.0022

**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.

## 4.6 Type Plate Description

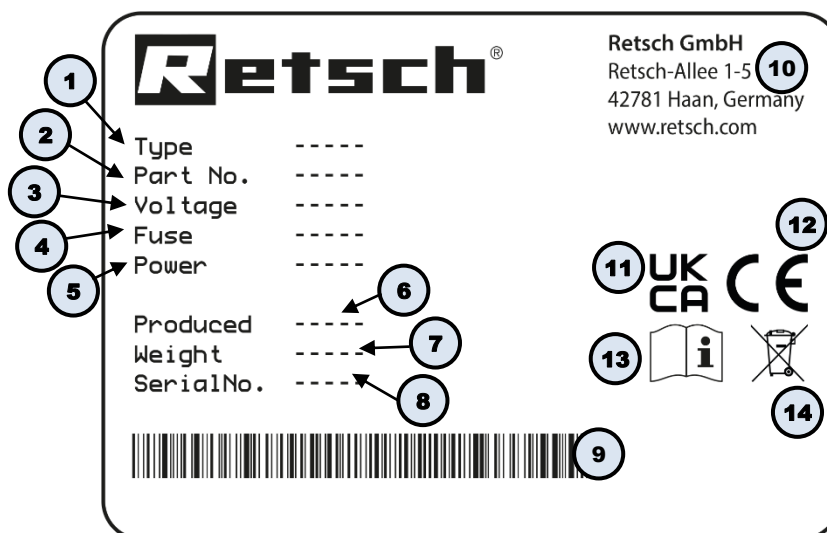


Fig. 1: Type plate

- 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

① 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.

#### 4.7 Removing the Transportation Lock

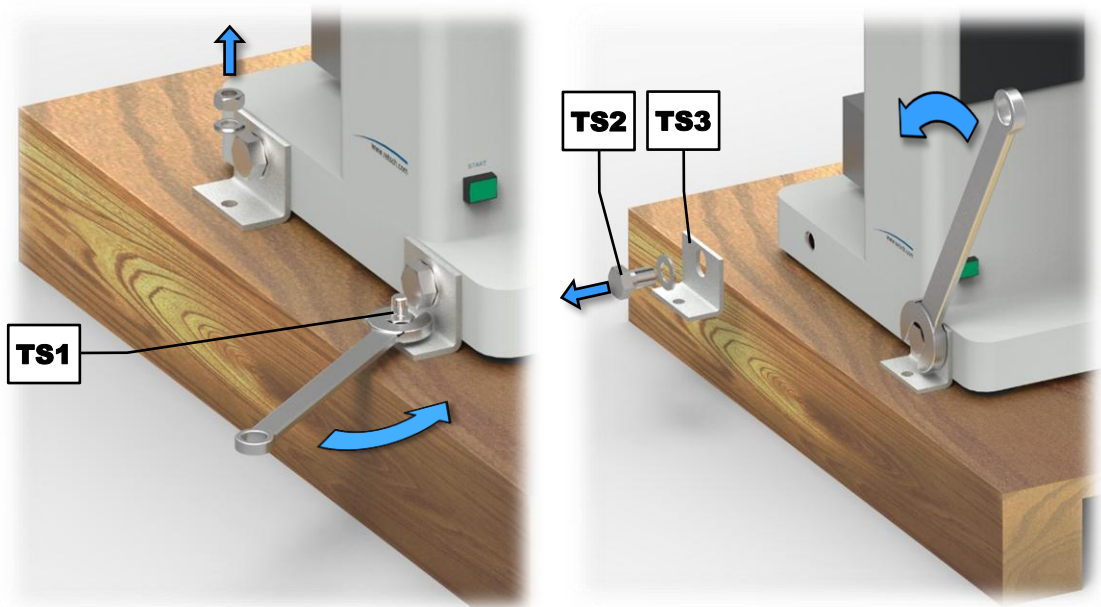


Fig. 1: Unscrewing the transportation lock

- ⇒ Loosen the four screws (TS1) securing the device to the pallet by means of an 18 mm open-end wrench and remove them.
- ⇒ Loosen the four screws (TS2) of the transport angles (TS3) on both sides of the device by means of a 30 mm open-end wrench and remove them.
- ⇒ Keep the transportation lock for later transport.

① The transport angles (TS3) can be used to securely screw the device to the base.

#### 4.8 Transportation Aid

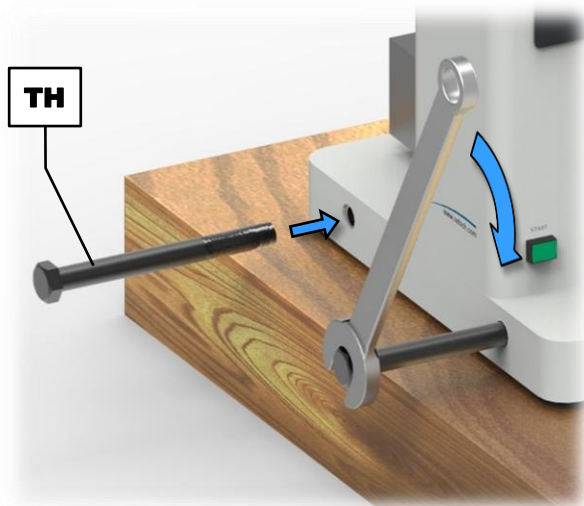
⚠

**WARNING**

W3.0005

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

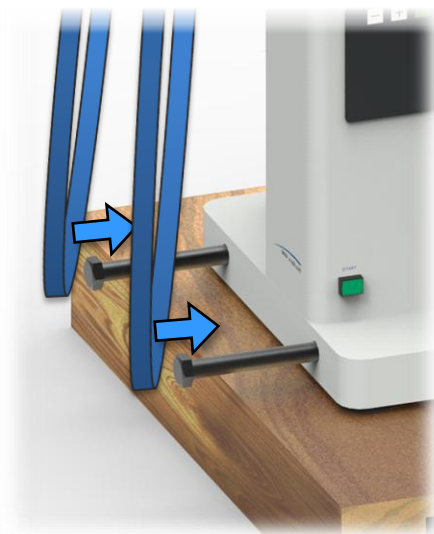
- The device can fall causing serious injuries when lifted above head height.
- **Never lift the device above head height!**



**Fig. 2:** Installing the transportation aid

⇒ Screw the four supplied transportation aids (**TH**) with a 30 mm open-end wrench into the existing threaded holes on both sides of the device.

**⚠ CAUTION** The weight without sieve stack amounts approx. 92 kg. The device may only be lifted by four people or with suitable hoist, that is designed for the weight.

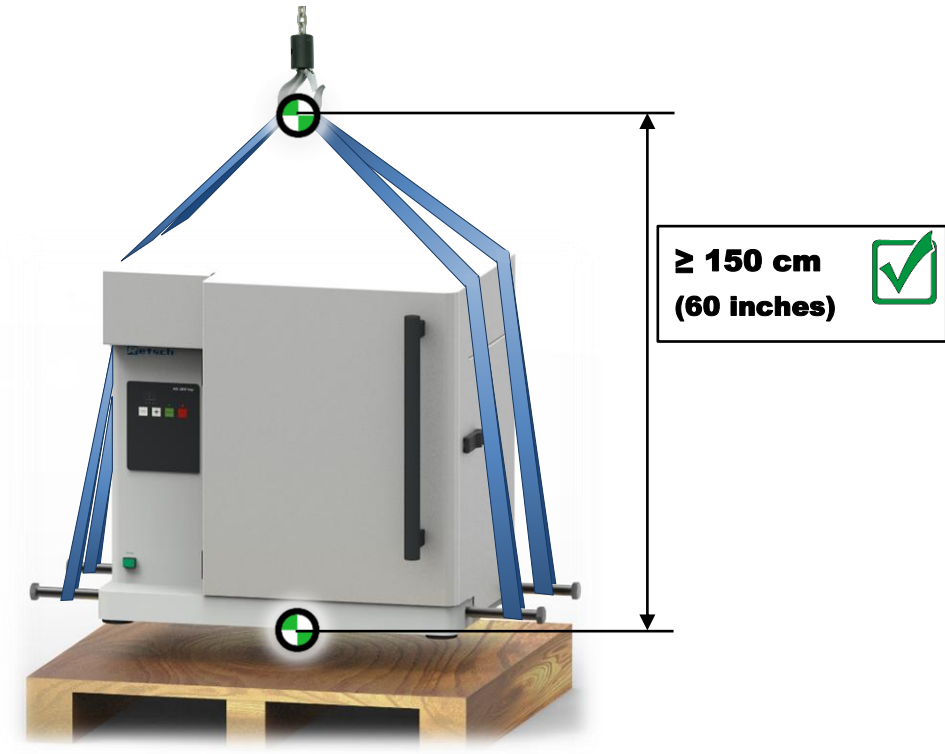


**Fig. 3:** Attaching lifting straps

Lifting straps should be used to lift the device with a suitable hoist.


⇒ Attach the lifting straps to the two transportation aids as shown in the figure.

**NOTICE** The housing can be damaged if the lifting straps are too short. The four lifting straps must be sufficiently long in order to observe a minimum distance of 150 cm between the device and the hoist.



**Fig. 4:** Minimum distance between housing and hoist


## 5 First Commissioning


**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!**



NOTICE

N11.0002

**Setting up the device**  
Disconnecting the device from the mains

- A separation of the device from the mains must be possible at any time.
- **Set up the device in such a way, that the connection for the power cable is always easily accessible.**

NOTICE

N12.0023


**Location requirements**  
Unbalance and vibration during operation

- The AS 200 tap causes strong unbalance and vibrations during the operation, which can lead to a movement of the whole device.
- **The installation must be carried out on a stable, anti-slip, vibration-free base, which is suitable for both, the weight of the device and the resulting vibrations during operation.**
- **In order to ensure safe operation, the AS 200 tap has to be screwed firmly to the base by means of the transport angles.**

The AS 200 tap is suitable for test sieves with an outer diameter of 200 mm and 203 mm (8"). Up to 13 fractions (12 test sieves plus collecting pan with a height of 25 mm), or 7 fractions (6 test sieves plus collecting pan with a height of 50 mm) can be clamped.

**NOTICE** A high number of test sieves can significantly increase the total weight of the load (sieve stack and sample material). Make sure not to exceed the maximum payload of 6 kg.

### 5.1 Inserting the Test Sieves


**CAUTION**

C6.0012

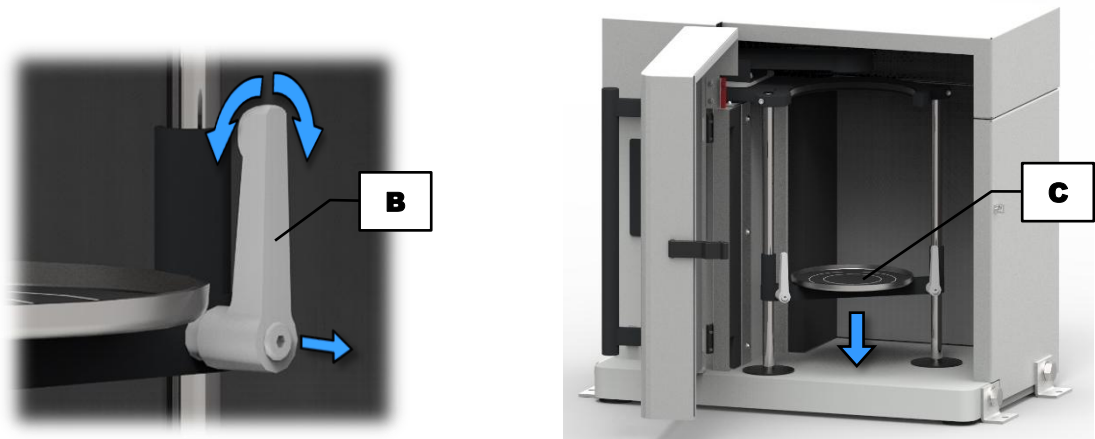
**Contusions and bruises**  
Overturning of the sieve stack

- The sieve stack can overturn and cause personal injury.
- **Only operate the device with securely clamped sieve stack.**

To make it easier to loosen the clamping screws, the position of the clamping levers (**B**) can be adjusted independently of the clamping screws.

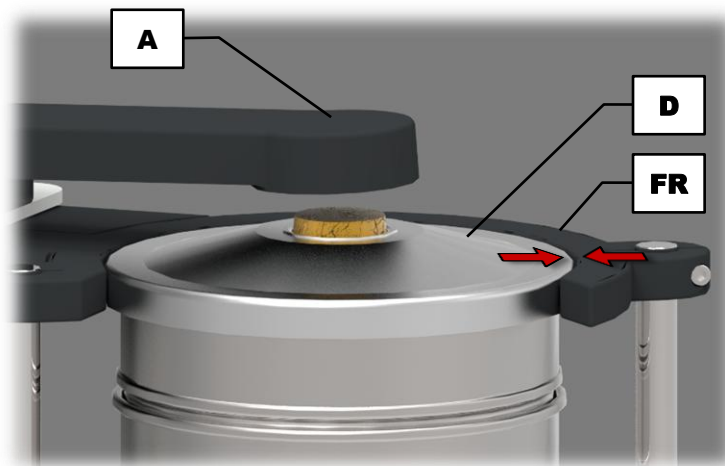
⇒ Pull the clamping levers (**B**) forward until they disengage audibly. The clamping levers can now be moved independently of the clamping screws.

- ⇒ Turn the clamping levers (**B**) to the desired position.
- ⇒ Press the clamping levers (**B**) backwards again until they engage audibly. The clamping levers are now again connected to the clamping screws.



**Fig. 5:** Position the clamping lever (left), adjust the height of the sieve plate (right)

- ⇒ Loosen both clamping screws and slide the sieve plate (**C**) downwards.
- ⇒ Tighten both clamping screws again.
- ⇒ Place the desired [sieve stack](#) including the sample material and sieve lid (**D**) centrally on the sieve plate (**C**).
- ⇒ Then again, loosen both clamping screws and slide up the sieve plate (**C**) together with the sieve stack until the upper edge of the sieve lid forms a plane with the guide ring (**FR**).
- ⇒ Tighten both clamping screws again.



**Fig. 6:** Insert the sieve stack

**Remove the sieve stack:**

- ⇒ To remove the sieve stack after the sieving process, slightly lift up the sieve stack together with the sieve lid and press the tapping arm upwards at the same time.
- ⇒ Pull the sieve stack out forwards.

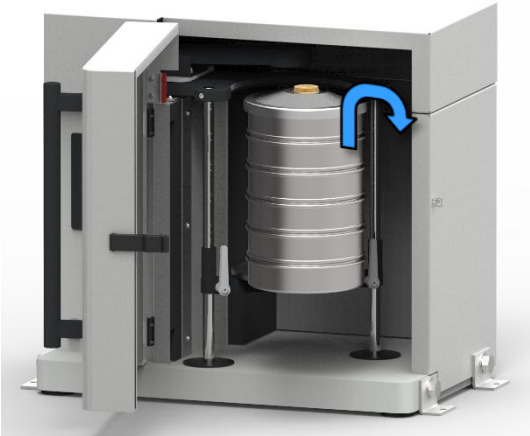


Fig. 7: Remove the sieve stack

## 6 Operating the Device

### 6.1 Use of the Device for the Intended Purpose

**⚠ CAUTION**

C7.0005

**Risk of injury**

Potentially explosive atmosphere

- The device is not suitable for use in potentially explosive atmospheres. Operating the device in a potentially explosive atmosphere can lead to injuries caused by an explosion or fire.
- **Never operate the device in a potentially explosive atmosphere!**

**⚠ CAUTION**

C8.0006

**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**

C9.0003

**Risk of explosion or fire**

Changing sample properties

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



This Tap Sieve Shaker of the Retsch GmbH is a laboratory device. It is suitable for dry sieving of free-flowing, disperse materials in the grain size range from 20 µm to 25 mm.

In relevant standards, the combination of a horizontal circular motion with tapping impulses is specified for the sieving of certain products, such as activated carbon, abrasives, metal powders, spices and diamonds.

In order to meet these standards, especially where there are high demands regarding easy operability, speed, precision and reproducibility, the Tap Sieve Shaker of the Retsch GmbH is successfully deployed in the areas of research and development, quality control of raw materials, intermediate and final products, as well as for production monitoring.

The AS 200 tap is specially designed for test sieves with an outer diameter from 200 mm and 203 mm (8"). For an optimum measurement result it is recommended to exclusively use test sieves from Retsch GmbH.

**⚠ WARNING**

W5.0010

**Handling of food, pharmaceutical and cosmetic products**

Analysed products

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



**NOTICE**

N13.0007

**Range of application of the device**

Long-term operation

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

**NOTICE**

N14.0005

**Device damage due to liquids**

Ingress of liquids into the interior of the device

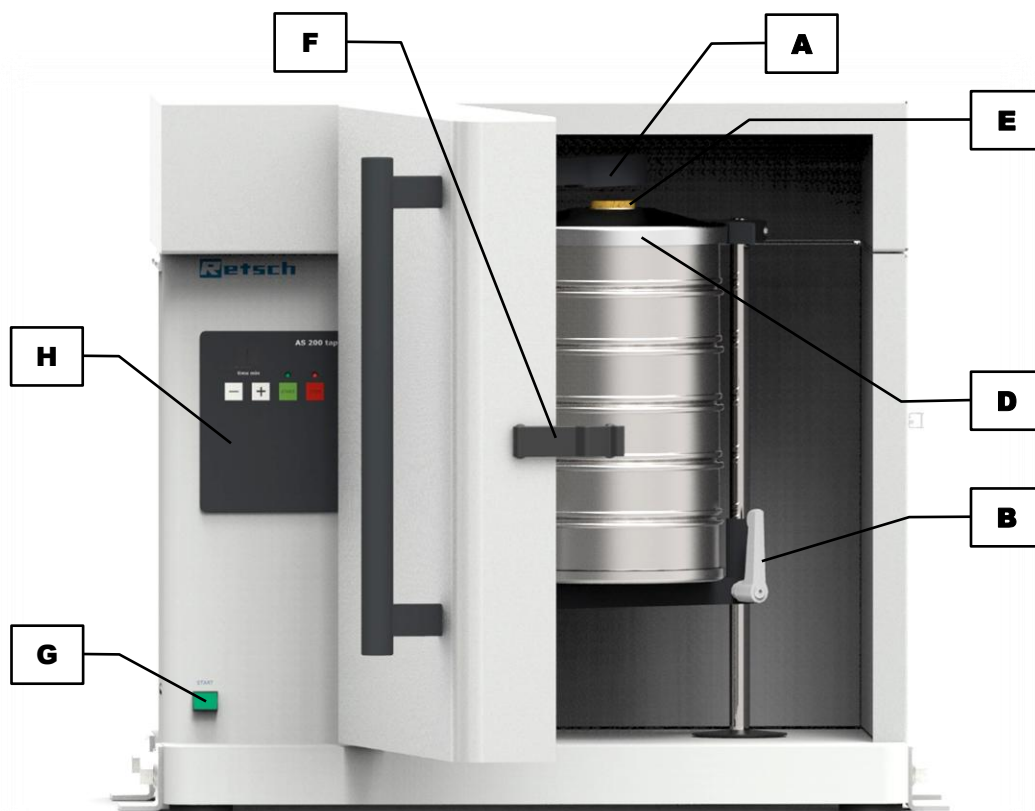
- Mechanical and electronic components are damaged, and the function of the device is no longer ensured.
- **No wet sieving may be carried out with this device!**

## 6.2 Principle of Operation

The AS 200 tap works with a horizontal circular motion of the sieve stack. At the same time, vertical tapping impulses are transferred to the sieve stack by means of a tapping arm. With the circular motion and tapping impulses independent of the mains voltage, the worldwide comparability of the sieving process is ensured. According to relevant standards, 280 revolutions and 150 impulses per minute are predefined in the Tap Sieve Shaker and cannot be modified. The sieving time is digitally adjustable.

### 6.3 Views of the device

#### 6.3.1 Front



**Fig. 8:** Front view of the device

Element	Description	Function
<b>A</b>	Tapping arm	Transmits the tapping impulses via the cork stopper (E) to the sample material
<b>B</b>	Clamping lever	Allows the adjustment to different sieve stack heights
<b>C</b>	Sieve plate	Retains the sieve stack
<b>D</b>	Sieve lid	Centres the sieve stack and retains the cork stopper (E)
<b>E</b>	Cork stopper	Transmits the tapping impulses via the sieve lid (D) to the sample material
<b>F</b>	Snap lock	Locks the soundproof hood
<b>G</b>	Push button START	Without function
<b>H</b>	Control unit	Operation of the device

### 6.3.2 Back

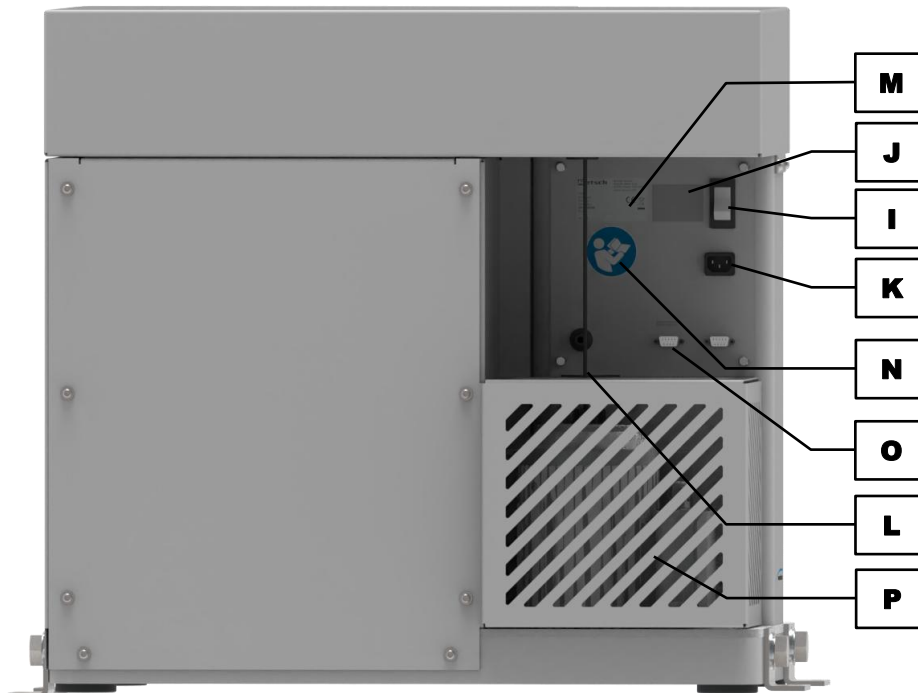


Fig. 9: Back view of the device

Element	Description	Function
I	Mains switch	Switches the device on and off, disconnects the device from the mains
J	Warning sign "Disconnect from the mains"	Warning of electric shock
K	Mains connection	Connection for the power cable
L	Safety plug	Monitors the contact of the protective guards
M	Type plate	Lists, among others, the voltage type, the serial number and the type of the device
N	Sticker "Manual"	Reminds to read the manual
O	RS232 interface	Data transfer between device and PC
P	Guard	Protective cover for the motor

## 6.4 Switching On / Off

⇒ Turn on the AS 200 tap with the mains switch (I) on the back side of the device.




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

After switching on, the control unit will display a message for opening and closing the housing door (message H4). The appliance is made ready for operation by opening and closing it once.

### Setting mode:

After switching on, the device is in the setting mode. The time display "time min" shows the last used value.

### Standby mode:

By pressing the  button (**H1**) after power on, the device can be put into standby mode. In this mode, only the LED of the  button (**H1**) is lit. Except for the  button (**H2**), all buttons are inoperable.

## 6.5 Opening and Closing of the Device

### 6.5.1 Opening

- ⇒ Open the snap lock (**F**) on the right side of the hood. The hood of the device can now be opened.

### 6.5.2 Closing

- ⇒ Close the hood.
- ⇒ Close the snap lock (**F**) on the right side of the hood. The hood is now locked.

## 6.6 Selection of the Test Sieves

The selection of the test sieves depends on the sample quantity as well as the particle size distribution. The gradation of mesh sizes and accordingly the measurement points should be selected in such a way that the complete particle size range of the sample is covered at regular intervals. The wider the particle size range, the more test sieves should be used.

## 6.7 Performing a Sieving

- ⇒ Determine the empty weights of the test sieves and the collecting pan.
- ⇒ Place the sieve stack with **increasing** mesh size on the collecting pan.
- ① Each test sieve is provided with an O-ring, which serves as a seal to minimise dust emission during the sieving.
- ⇒ Weigh the sample and put it on the uppermost test sieve (biggest mesh size). Make sure not to exceed the [maximum feed quantity](#).
- ⇒ Place the complete sieve stack centrally on the device and clamp the sieve stack (→ Chapter "[Inserting the Test Sieves](#)").
- ⇒ Set the sieving time (→ Chapter "[Controlling the Device](#)").
- ⇒ Start the sieving process.
- ⇒ After the end of the sieving process, weigh the individual test sieves and the collecting pan including the particle size fractions present therein.
- ⇒ Determine the mass of the particle size fractions (weight after the sieving less the respective empty weight).
- ① The evaluation software "[EasySieve®](#)" automatically records the weights and allows for a quick and simple evaluation of the sieve analysis. A detailed description can be found in the separate manual of the software.

## 7 Controlling the Device

### 7.1 Operating Controls, Displays and Functions

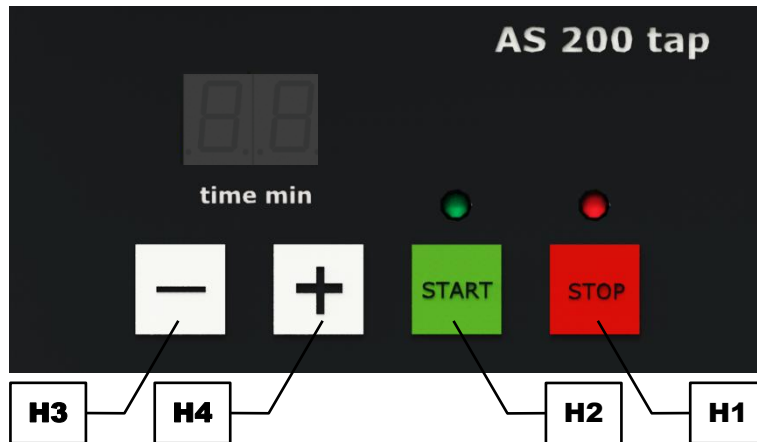




Fig. 10: Operating controls and functions

Element	Description	Function
<b>H1</b>	STOP	Stops the sieving process. In standby mode, the red LED is lit
<b>H2</b>	START	Starts the sieving process. During operation, the green LED is lit
<b>H3</b>	Minus button of the time setting	Reduces the sieving time in the range between 1 and 99 minutes
<b>H4</b>	Plus button of the time setting	Extends the sieving time in the range between 1 and 99 minutes

### 7.2 Start Process

- ⇒ To start the sieving process in the [setting mode](#), press the  button (**H2**).
- ⇒ If the device is in [standby mode](#), press the  button (**H2**) **twice** to start the sieving process.

The green LED lights up and the sieving process is started with the current settings.

### 7.3 Stop Process

The sieving process will stop automatically after the set process time has elapsed. However, the sieving process can be stopped manually at any time.

- ⇒ Press the  button (**H1**) **twice** to stop the sieving process.


### 7.4 Pause Process

The sieving process will stop automatically after the set process time has elapsed. However, the sieving process can be interrupted manually at any time.


- ⇒ Press the  button (**H1**) **once** to interrupt the sieving process.

The process time is stopped.

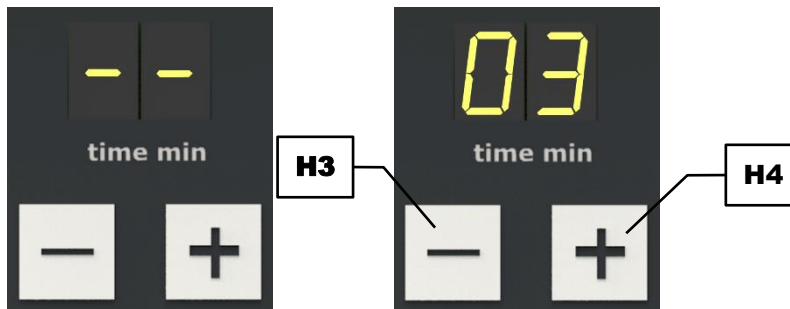
**Continue the process:**

⇒ Press the  button (H2) to continue with the sieving process.

**End the process:**







⇒ Press the  button (H1) to end the sieving process.



**7.5 Time**



**Fig. 11:** Time setting for continuous operation (left) or with a process time (right)

The AS 200 tap can be operated either in continuous operation or for a certain time between 1 and 99 minutes. When the device is switched on, the last used setting is displayed.

- ⇒ Press the  (H4) or  (H3) button of the time display to set the desired process time.
- ⇒ Press and hold the  or  button to extend or reduce the process time in fast steps.
- ⇒ To change to the continuous operation, fall below the duration of 1 min by pressing the  button, or exceed the duration of 99 min by pressing the  button. The time display now indicates "-- --".

The process time can also be changed during operation by pressing the  or  button.

## 8 EasySieve®

EasySieve® is a software for particle size analysis and simplifies the manual evaluation in many respects. The software is able to automatically perform the required measuring and weighing processes – from determining the weights of the test sieves to evaluating the data.

The software is structured in a self-explanatory way and follows the logical chain of events involved in a particle size analysis. Therefore, the training period will be very short. The abundance of evaluation options provides absolute flexibility in adapting to demanding, individual tasks.

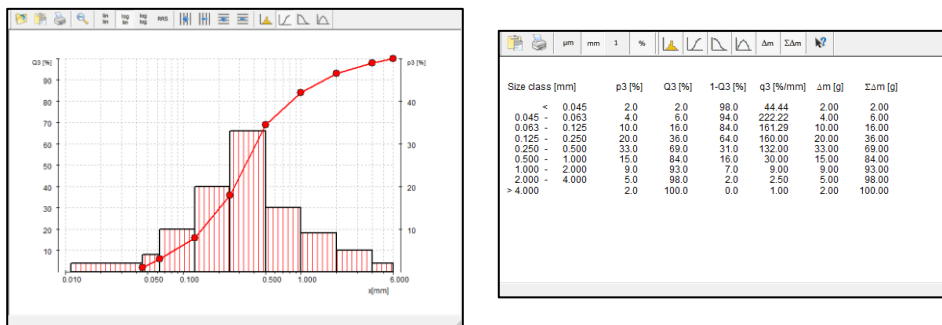


Fig. 12: Graphic and tabular presentation of the particle size analysis with EasySieve®

The software communicates with the scale and the AS 200 tap and guides the user through the respective steps. Available parameters, as well as the characteristics to be calculated can be entered in various edit boxes. Routine parameters can be edited, saved and recalled at any time.

If a scale is connected, the corresponding data (empty weights of test sieves, back weights of loaded test sieves) can be transferred directly to EasySieve®. If no scale is connected, the input can also be entered manually.

The software calculates all standard particle distributions, as well as the representative characteristics of the particle size, and allows for the tabular and graphical presentation of results in a measurement report conforming to standards. Furthermore, the data can be exported to other software products (e.g. Microsoft Excel).

EasySieve® is also available as AuditTrail enabled version in compliance with 21CFR Part 11.

① In case the sieve shaker is controlled via the software "EasySieve CFR", warning messages may appear in the Audit Trail stating that no serial number, no software version and no calibration date is received. Moreover, it may indicate, that no error number can be received. This is correct because the sieving machine does not support the provision of this data. Therefore, these warning messages in the Audit Trail do not constitute a reason for corrective measures.

① A detailed description can be found in the separate manual of the software.

## 9 Error Messages and Information Notes

### 9.1 Error Messages

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

Error code	Description	Measures
<b>E4</b>	Error safety switch (interlock)	<ul style="list-style-type: none"> <li>• Turn off the main switch and wait 30 seconds before turning the device on again.</li> <li>• If the error persists, contact the Retsch GmbH service department.</li> </ul>

### 9.2 Information Notes

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

Reference code	Description	Measures
<b>H4</b>	Open the appliance door	Opening and closing the door of the housing. <ul style="list-style-type: none"> <li>• If the error persists, contact the Retsch GmbH service department.</li> </ul>

## 10 Return for Service and Maintenance



**Fig. 13:** Return form

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

- ⇒ Download the return form located in the download section "Miscellaneous" on the Retsch GmbH homepage (<http://www.retsch.com/downloads/miscellaneous/>).
- ⇒ When returning a device, attach the return form to the outside of the packaging.

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

## 11 Cleaning, Wear and Maintenance

### 11.1 Cleaning

**WARNING**

W6.0003

**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!**

**NOTICE**

N15.0009

**Damage to the housing and device**  
Use of organic solvents

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

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

#### 11.1.1 Cleaning of Test Sieves

Test sieves are measuring instruments and should be treated with due care before, during and after the sieving process. It is recommended to clean new test sieves before the first use from possible preservative residues with ethanol or isopropanol and to store them in a dry, dust-free place when unused.

Before cleaning or drying the test sieves, the O-rings have to be removed. Before using and after the cleaning the test sieves should be visibly inspected for possible damages and impurities.

Near-mesh or clamped particles can be often removed dry after the sieving process by slightly tapping the test sieve upside down with the sieve frame on a table. For test sieves with mesh sizes > 500 µm a fine hair brush can be used to sweep over the outer side of the mesh fabric.

##### 11.1.1.1 Cleaning of Test Sieves with Mesh Sizes > 500 µm

Coarse mesh fabrics with mesh sizes > 500 µm can be cleaned dry or wet easily and effectively with a hand brush with plastic bristles (at not too high applied pressure).

##### 11.1.1.2 Cleaning of Test Sieves with Mesh Sizes < 500 µm

Test sieves with mesh sizes < 500 µm should generally only be cleaned in an ultrasonic cleaning-bath. As cleaning agent, water together with a standard surfactant is recommended. The cleaning in the ultrasonic bath usually takes two to three minutes. After that the test sieves

are thoroughly rinsed with water and dried. The cleaning with strong bases or acids is generally not recommended.

### 11.1.1.3 Drying of Test Sieves

Drying ovens of various sizes can be used for drying test sieves (drying temperature < 80 °C).

Additional information concerning ultrasonic cleaning-baths and drying ovens can be found on the Retsch GmbH homepage (<http://www.retsch.com>). Also ask for the free expert guide *Sieve Analysis – Taking a close look at quality*.

#### **NOTICE**

N16.0028

##### **Damage of the sieve mesh fabric**

Drying temperature > 80 °C

- At higher temperatures, especially fine metal wire meshes can become warped, leading to a reduced tension of the mesh fabric inside the sieve frame and hence, makes the test sieve less efficient during the sieving process.
- **The drying temperature for test sieves must not exceed 80 °C!**

## 11.2 Wear

#### **⚠ CAUTION**

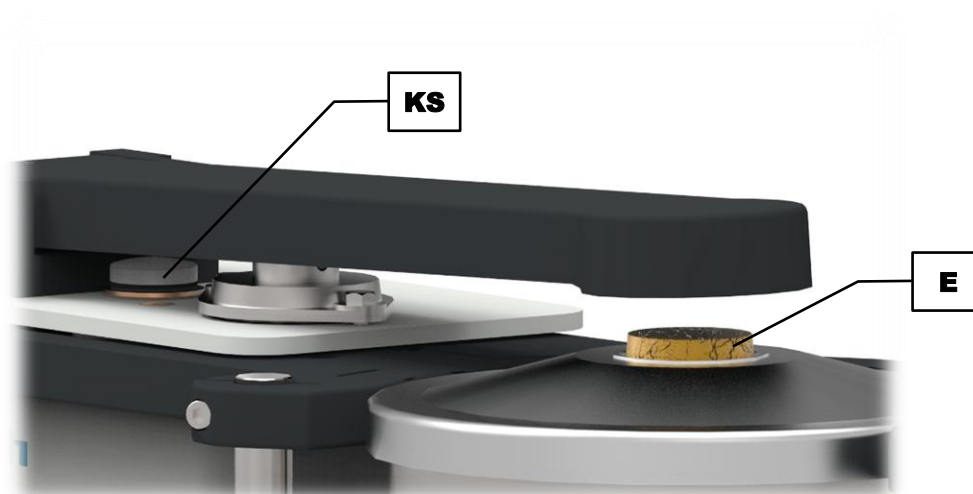
C10.0013

##### **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!**

⇒ Check the cork stopper (**E**) of the sieve lid, as well as the tapping ram (**KS**) and its O-ring for wear on a regular basis and replace them if necessary.



**Fig. 14:** Tapping ram and cork stopper

Even with the proper handling of the test sieves, a wearing of the sieve mesh fabric depending on the frequency of the sieving operation and on the sample material is unavoidable. The test sieves should be regularly checked for wear and damage and be replaced if necessary.

Likewise, all existing sealing gaskets should be checked for wear on a regular basis and replaced if necessary.

### **11.3 Maintenance**

The AS 200 tap is largely maintenance-free.

## 12 Accessories

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

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

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

### 12.1 Test Sieves

Decisive for the accuracy and reliability of the measurement result is, in addition to the reproducible operating Tap Sieve Shaker the quality of the test sieve. Test sieves of Retsch GmbH are high quality measuring instruments for which only mesh fabrics and perforated sheets of the corresponding standards are used. Each test sieve is tested five times and is given a serial number, as well as a quality certificate after the final check.



**Fig. 15:** Test sieves

The different versions of the test sieves of Retsch GmbH are supplied in accordance with all current national and international standards:

- available standards: DIN, ISO, ASTM, BS, NF, CGSB
- available diameters: 100 mm / 150 mm / 200 mm / 203 mm (8") / 305 mm (12") / 400 mm / 450 mm (18")
- available sieve surfaces: sieve mesh fabric (20 µm to 125 mm) and perforated screens (round, elongated or square holes) of stainless steel
- on request with an individual test certificate for the inspection of measuring and testing equipment monitoring according to ISO 9000 ff.

Among the various test sieves matching collecting pans, collecting pans with outlet, intermediate pans, intermediate rings, venting rings and sieve lids are available.

#### 12.1.1 Certificate

Before delivery, each test sieve is optically surveyed according to the standards DIN ISO 3310-1 and ASTM E 11, and provided a certificate of compliance with the order.

On request, an additional acceptance test certificate with a calibration protocol can be provided, documenting the measurement results in tabular and graphical form, hence representing a calibration certificate with more detailed statistics.

### 12.1.2 Calibration Service

As a special service Retsch GmbH offers the calibration of the test sieves. All relevant information are recorded during the standard measuring process of the test sieve and confirmed in the required certificate.

## 12.2 Sieving Aids

### NOTICE

N17.0027

#### Damage of the sieve mesh fabric

Use of mechanical sieving aids

- When using mechanical sieving aids, there is a danger that fine sieve mesh fabrics might be damaged.
- **Ensure that no overstretching of the sieve mesh fabric occurs due to overloading with sieving aids.**
- **If in doubt, please contact your local distributor or Retsch GmbH directly.**

By electrostatic and Van-der-Waals forces, as well as by fluid bridges, single particles can combine to form agglomerates. Since in this case not the individual primary particles, but particle collectives are measured, there is a distortion of the particle size distribution (a higher coarse fraction results). In order to prevent the formation of agglomerates or dissolve them, sieving aids can be used.

#### Mechanical sieving aids:

Mechanical sieving aids cause a destruction of agglomerates and dislodge wedged particles from the sieve meshes. Depending on the mesh size of the test sieve and the preselected amplitude, balls of agate, rubber, steatite or cubes of polyester urethane rubber, and nylon brushes or stainless steel chain rings can be used for this purpose.

**NOTICE** For very soft sample material, an undesired crushing of primary particles might occur.

#### Solid additives:

Solid additives, such as talcum or Aerosil<sup>®</sup> can be admixed to fatty, moist, sticky or oily sample materials. They attach themselves to the particle surface and counteract the formation of agglomerates. Their particle size is so small that they have no sustainable influence to the actual particle size analysis of the sample material. However, the measurement results will be distorted depending on the added amount of additive.

#### Liquid sieving aids:

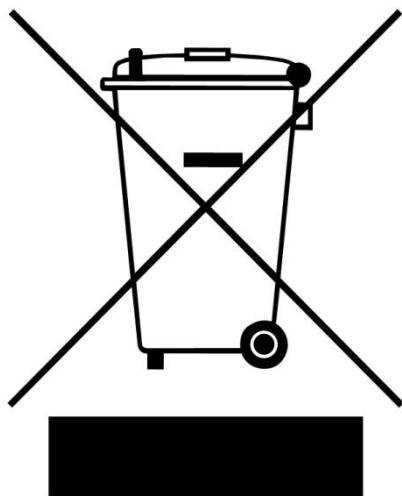
Antistatic spray, benzene, alcohol and surfactants can be used as liquid sieving aids, though benzene and alcohol are only to be used during sample preparation. They reduce the electrostatic charges, wash out fatty or oily components of the sample material, or diminish the surface tension in the wet sieving.

## 13 Disposal

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

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

Accordingly, all devices supplied after August 13<sup>th</sup> 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. 16:** 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 23<sup>rd</sup> 2006. From this date on, the manufacturer must provide an adequate possibility of returning all devices delivered since August 13<sup>th</sup> 2005. For all devices delivered before August 13<sup>th</sup> 2005 the end user is responsible for the proper disposal.

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# TAP SIEVE SHAKER

AS 200 tap | 30.025.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 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. Frank Janetta, Head of Development





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