Manual

Vibratory Sieve Shaker AS 300 control

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 0006 of the "Vibratory Sieve Shaker AS 300 control" manual has been prepared in accordance with the Machinery Directive 2006/42/EC.

1.1 Explanation of signs and symbols

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

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

1.2 Disclaimer

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

1.3 Copyright

2 Safety

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

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

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

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

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

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

2.1 Explanations of the Safety Instructions

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

DANGER D1.0000

Risk of fatal injuries
Source of danger

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

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

WARNING W1.0000

Risk of life-threatening or serious injuries
Source of danger

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

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

CAUTION C1.0000

Risk of injuries
Source of danger

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

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

NOTICE N1.0000

Type of damage to property
Source of the damage to property

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

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

2.2 General Safety Instructions

⚠ CAUTION C2.0002

Risk of injury
Lack of knowledge of the manual

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

⚠ CAUTION C3.0015

Risk of injury
Improper modifications to the device

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

NOTICE N2.0012

Changes to the device
Improper modifications

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

2.3 Repairs

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

In case of repair, please inform…

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

Service address:

3 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

4 Technical Data

4.1 Degree of Protection

– IP21

4.2 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 C5.0017

Hearing damage
A high sound level may be generated depending on the type of material, the number of sieves, the sieving aid used, the amplitude set 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 set amplitude, the number of test sieves and the properties of the sample material.

Example:

Number of test sieves:	5
Amplitude:	1.5 mm
Feed material:	Quartz sand (< 1 mm)
Sieve clamping unit:	"comfort"

At these operating conditions, the workplace related equivalent continuous sound level L_{eq} = 59.8 dB(A).

4.3 Electromagnetic Compatibility (EMC)

– EMC class according to DIN EN 55011: A

Strong electromagnetic interference fields, such as high-power radio transmitters, can have an adverse influence on the amplitude control of the AS 300 control. Once the source of the interference is eliminated, the AS 300 control will return to normal operation by itself.

4.4 Rated Power

~ 60 VA

4.5 Dimensions and Weight

- Height without sieve clamping unit: 222 mm
- Height with sieve clamping unit: 852 mm
- Width: 417 mm
- Width with "comfort" clamping unit: 566 mm
- Depth: 384 mm
- Weight without sieve stack, without clamping unit: ~ 42 kg

4.6 Required Floor Space

CAUTION C6.0047

Risk of injury caused by the device falling down
Incorrect installation of the device

- Due to its weight, the device can cause injuries if it falls down.
- **Only operate the device on a sufficiently large, strong and stable workstation.**
- **Ensure that all of the device feet are securely supported.**

- Width of the base: 450 mm
- Depth of the base: 450 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.

4.7 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 305 mm (12") in diameter are listed in the following table:

Mesh size	Max. feed quantity	Max. permitted oversize material according to DIN 66165
25 µm	29 cm^3	15 cm^3
45 µm	44 cm^3	22 cm^3
63 µm	58 cm^3	29 cm^3
125 µm	88 cm^3	44 cm^3
250 µm	132 cm^3	66 cm^3
500 µm	205 cm^3	102 cm^3
1 mm	292 cm^3	146 cm^3
2 mm	511 cm^3	256 cm^3
4 mm	804 cm^3	402 cm^3
8 mm	1315 cm^3	658 cm^3

4.8 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
22 µm	710 µm
45 µm	1 mm
63 µm	1.4 mm
125 µm	2.5 mm
250 µm	4 mm
500 µm	6 mm
1 mm	10 mm
2 mm	16 mm

Mesh size	Max. feed grain size according to DIN 66165
4 mm	25 mm
8 mm	45 mm
16 mm	71 mm
22.4 mm	90 mm
45 mm	150 mm
63 mm	180 mm
90 mm	230 mm
125 mm	300 mm

The Vibratory Sieve Shaker AS 300 control is designed for the measurement range of 20 µm to 40 mm.

4.9 Payload

	Voltage		
	100 V	200 V	230 V
Maximum sample quantity:	3 kg	4 kg	5 kg
Maximum sieve stack weight:	7 kg	9,5 kg	11 kg
Maximum payload:	10 kg	13,5 kg	16 kg

The maximum payload is calculated from the amount of sample quantity (sample material) and sieve stack mass (test sieves and clamping device) depending on the available nominal voltage. For the calculation, a "comfort" sieve tensioning unit was used, the weight of which is approx. 5 kg.

- Maximum sieve stack height: 510 mm
- Maximum number of fractions: 10 (height of test sieves and collecting pan: 40 mm) / 10 (height of test sieves and collecting pan: 50 mm (2")) / 19 (height of test sieves and collecting pan: 25 mm (1"))

4.10 Suitable Sieve Diameters

- Suitable sieve diameters: 100 mm / 150 mm / 200 mm / 203 mm (8") / 305 mm (12") / 315 mm

5 Packaging, Transport and Installation

5.1 Packaging

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

NOTICE N3.0001

Complaint or return
Keeping the packaging

- Inadequate packaging and insufficient securing of the device can jeopardise the warranty claim in the event of a complaint or return.
- **Keep the packaging for the duration of the warranty period.**

5.2 Transport

NOTICE N4.0017

Damage to components
Transport

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

NOTICE N5.0014

Complaints
Incomplete delivery or transport damage

- The forwarding agent and Retsch GmbH must be notified immediately in the event of transport damage. It is otherwise possible that subsequent complaints will not be recognised.
- **Please check the delivery on receipt of the device for its completeness and intactness.**
- **Notify your forwarding agent and Retsch GmbH within 24 hours.**

5.3 Temperature Fluctuations and Condensation

NOTICE N6.0016

Damaged components due to condensation
Temperature fluctuations

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

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

5.4 Conditions for the Installation Site

NOTICE N7.0021

Ambient temperature
Temperatures outside the permitted range

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

- 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 N8.0015

Humidity
High relative humidity

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

5.5 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 N9.0022

Electrical connection
Failure to observe the values on the type plate

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

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.

5.6 Type Plate Description

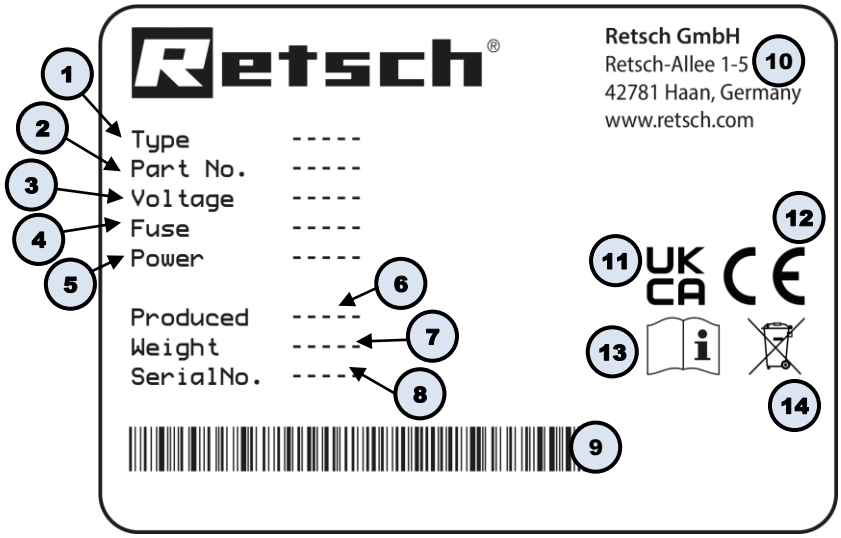


Fig. 1: Type plate

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

ⓘ 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.

5.7 Removing the Transportation Lock

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!**

NOTICE N10.0018

Transportation lock
Transport without transportation lock, or operation with transportation lock

– Mechanical components may be damaged.
- **Only transport the device with mounted transportation lock.**
- **Do not operate the device with built-in transportation lock.**

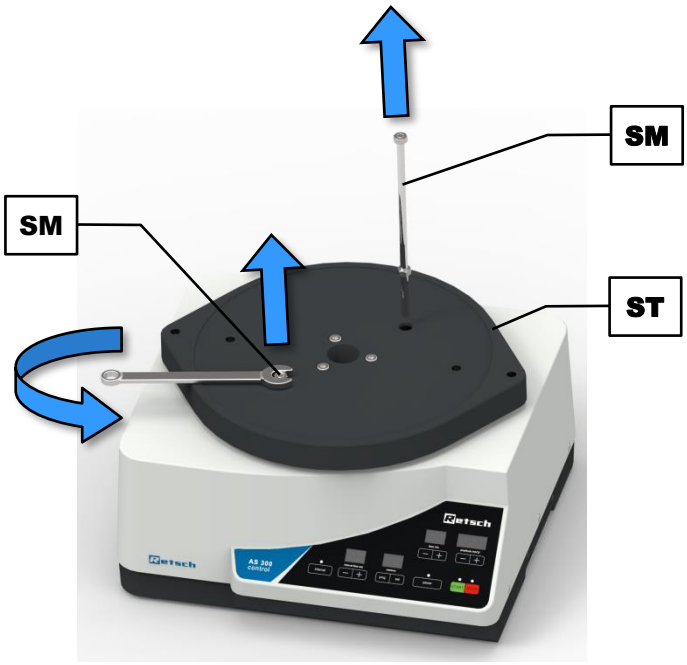


Fig. 1: Removing the transportation lock

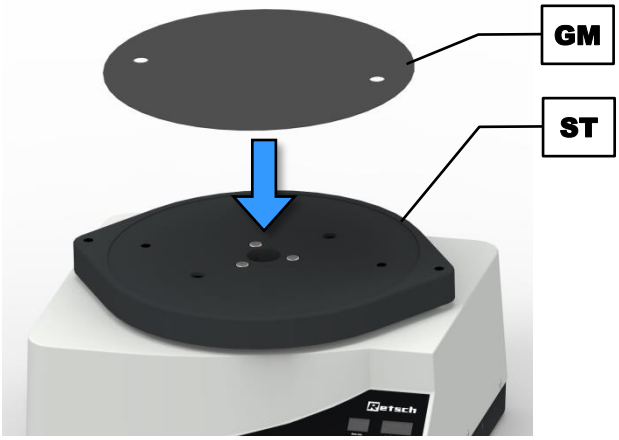


Fig. 2: Mounting the rubber disc

The transportation lock consists of two long hexagonal screws (**SM**) securing the drive through the sieve plate (**ST**).

- ⇨ Loosen the hexagonal screws (**SM**) on both sides of the sieve plate (**ST**) by means of a 13 mm open-end wrench and remove them.
- ⇨ Keep the transportation lock for later transport.
- ⇨ Remove the protective foil from the adhesive tape located on the underside of the rubber disc (**GM**).
- ⇨ Position the rubber disc (**GM**) centrally on the sieve plate (**ST**) and press it down firmly.

NOTICE The weight without sieve stack and sieve clamping unit amounts approx. 42 kg. The device must only be lifted by two people.

6 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 N12.0004

Setting up the device
Vibrations during operation

- Depending on the operating mode of the device, slight vibrations may occur.
- **Set up the device only on a vibration-free, plane and stable surface.**

Before first commissioning the sieve clamping unit must be installed.

The AS 300 control is suitable for test sieves of 100 mm to 305 mm outer diameter. For test sieves with diameters of 100 – 203 mm, the two inner threaded holes are used for the support or threaded rods. For test sieve with a diameter of 305 mm, the support or threaded rods are screwed into the two outer threaded holes.

Fig. 3: Positions of the support or threaded rods

Up to 19 fractions (18 test sieves plus collecting pan with a height of 25 mm), or 10 fractions (9 test sieves plus collecting pan with a height of 40 mm or 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 16 kg.

Different sieve clamping units and lids are available for the test sieves.

The following sieve clamping units are available for test sieves with an outer diameter of 305 mm (12"):

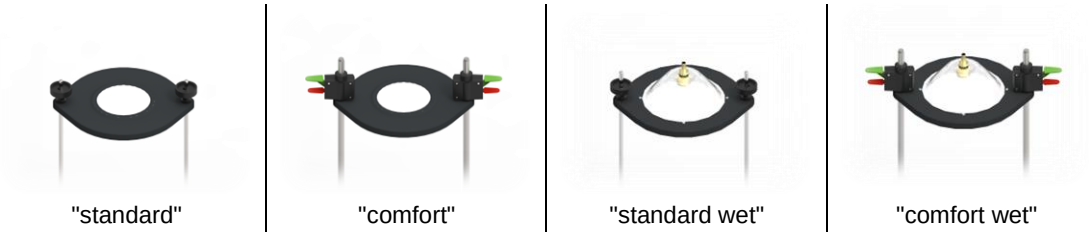


Fig. 4: Types of the sieve clamping unit

For test sieves with outer diameters of 100 – 203 mm smaller clamping lids must be used. For further information please contact your supplier or get in touch with Retsch GmbH directly.

6.1 Sieve Clamping Unit "standard"

- ⇨ Screw one hexagonal nut (**G**) on the lower end of each of the threaded rods (**A**).
- ⇨ Screw both threaded rods (**A**) into the designated threaded holes (**SB**) in the sieve plate (**ST**) and lock them with the hexagonal nuts (**G**).
- ⇨ Firmly tighten the hexagonal nuts (**G**) by means of a 19 mm open-end wrench.
- ⇨ Place the desired sieve stack including the sample material centrally on the sieve plate (**ST**).
- ⇨ Lay the clamping lid "standard" (**D**) over the threaded rods (**A**) onto the top test sieve. The clamping lid "standard" is orientated so that the peripheral edge surrounds the test sieves.
- ⇨ Slide the fixing nut (**B**) in an inclined position of 10° down the threaded rod (**A**) onto the clamping lid.
- ⇨ Align the fixing nuts (**B**) vertically so that the thread engages and tighten the fixing nuts hand-tight.

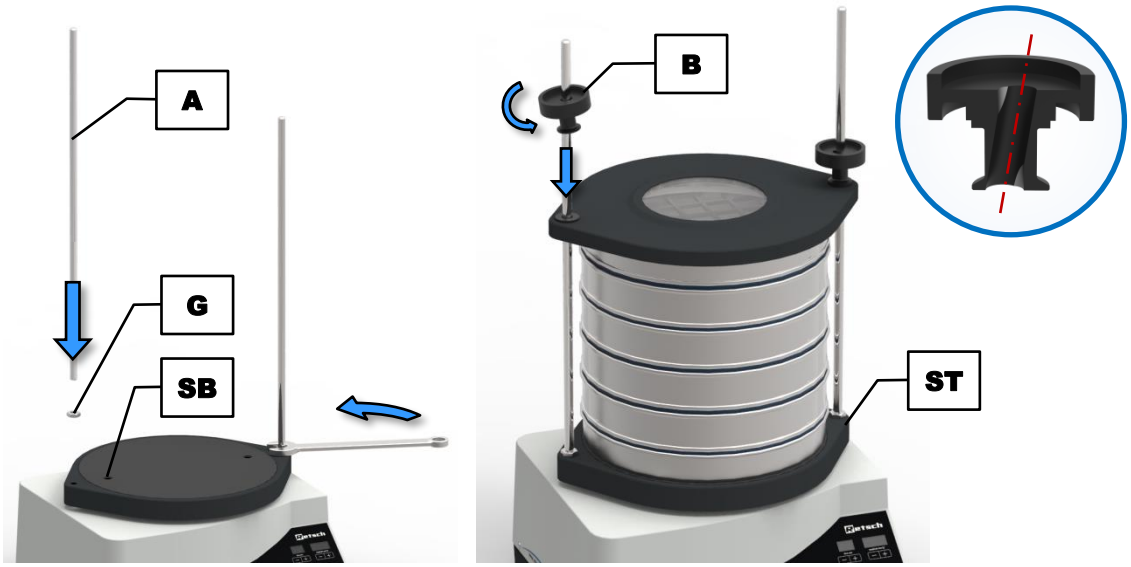


Fig. 5: Installation of the sieve clamping unit "standard"

NOTICE To clamp a maximum of five test sieves and a collecting pan, shorter threaded rods are available for the sieve clamping unit "standard". For sieving processes with only one to three test sieves, the shorter threaded rods should be used. Long, projecting threaded rods disturb the spreading of the sample material due to their natural vibration behaviour.

6.2 Sieve Clamping Unit "comfort"

- ⇨ Put both quick clamping units (**F**) on a flat surface with the green quick clamping lever (**F1**) facing down.
- ⇨ Place the clamping lid (**D**) with the top side (plane side) face down on the quick clamping units (**F**).
- ⇨ Place the O-ring (**OR**) on the cone shaped assembly aid (**MH2**) and slide it down into the designated groove.
- ⇨ Put the assembly aid (**MH2**) in the opening of the clamping lid (**D**) in such a way that the cone shaped tip is sticking out.
- ⇨ Place the assembly aid ring (**MH1**) on the assembly aid (**MH2**) and slide it down. This presses the O-ring on the quick clamping unit and fixes the clamping lid.
- ⇨ Repeat this procedure for the other side.

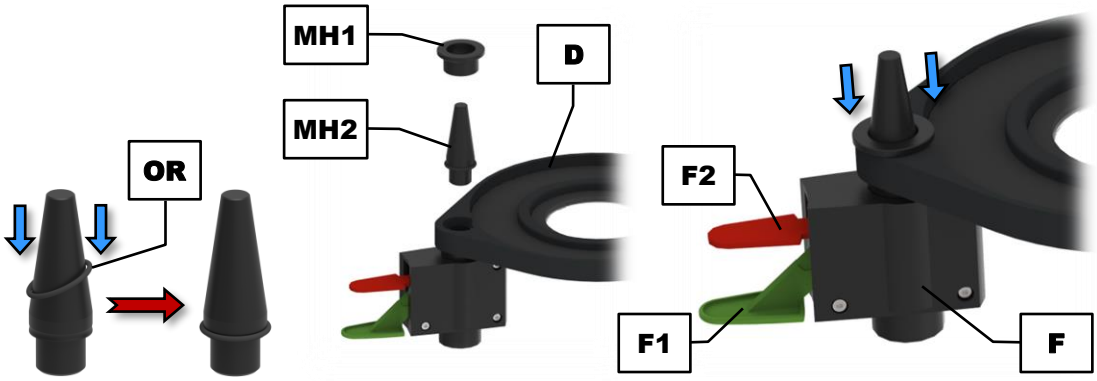


Fig. 6: Assembly of the clamping lid

- ⇨ Screw one hexagonal nut (**G**) on the thread of each of the support rods (**E**).
- ⇨ Screw both support rods (**E**) into the designated threaded holes (**SB**) in the sieve plate (**ST**) and lock them with the hexagonal nuts (**G**).
- ⇨ Firmly tighten the hexagonal nuts (**G**) by means of a 19 mm open-end wrench.

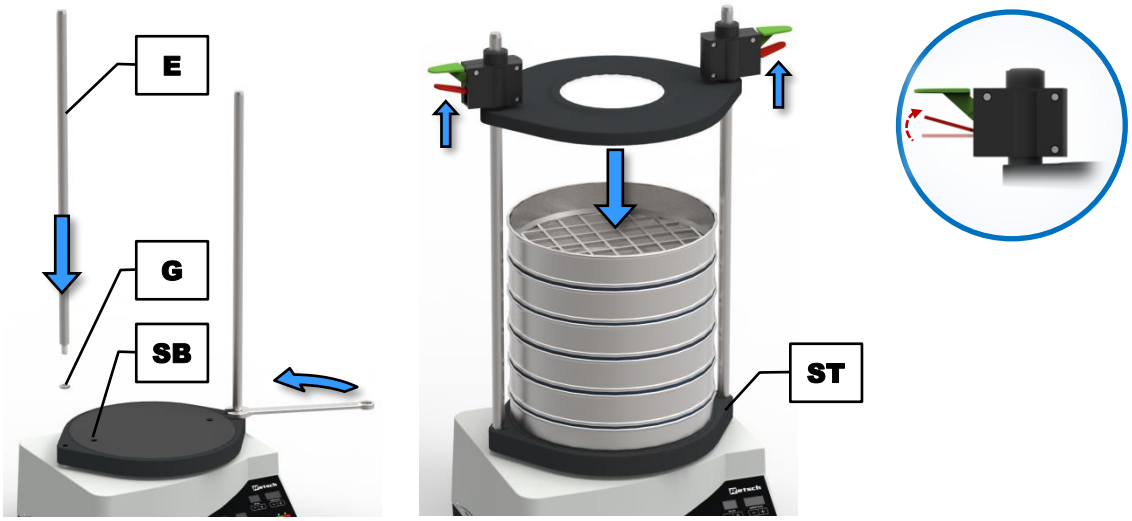


Fig. 7: Installation of the sieve clamping unit "comfort"

- ⇨ Place the desired sieve stack including the sample material centrally on the sieve plate (**ST**).
- ⇨ Place the assembled clamping lid on the support rods (**E**) with the quick clamping units facing upwards.
- ⇨ Lift the red quick clamping levers (**F2**) of both quick clamping units (**F**) for freely sliding the clamping lid up and down the support rods. Be sure not to push down the green quick clamping levers when doing so.
- ⇨ Slide the quick clamping units with the clamping lid down the support rods (**E**) onto the top test sieve.
- ⇨ When the clamping lid is correctly positioned on the sieve stack, press down the green quick clamping levers (**F1**) 1 – 2 times in order to fix the clamping lid tightly on the sieve stack.

NOTICE Always use both quick clamping units simultaneously! Do not activate both quick clamping levers (red and green) of one quick clamping unit at the same time.

- ⇨ To loosen the clamping lid after the sieving process, lift the red quick clamping levers (**F2**). Keep them lifted and slide the clamping lid upwards until the sieve stack can be removed. There is no need to take off the clamping lid completely from the support rods.

⚠ CAUTION *C7.0012*

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.**

7 Operating the Device

7.1 Use of the Device for the Intended Purpose

⚠ CAUTION C8.0005

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 C9.0006

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 C10.0003

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 Vibratory Sieve Shaker of the Retsch GmbH is a laboratory device. It is suitable for both, dry and wet sieving of free-flowing, disperse materials in the grain size range from 20 µm to 40 mm.

The particle size distribution of soils, building materials, chemicals, fertilizers, fillers, grains, coffee, plastics, flour, metal powders, minerals, nuts, seeds, sand, washing powder, cement clinker and many other substances can be easily and quickly analysed.

The Vibratory Sieve Shaker of the Retsch GmbH is successfully deployed in almost all areas of industry and research within the scope of quality control, especially where there are high demands regarding easy operability, speed, precision and reproducibility.

The AS 300 control is specially designed for test sieves with an outer diameter from 100 mm to 305 mm. 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.**

7.2 Principle of Operation

The AS 300 control performs a vibratory sieving, where the sample material is thrown upwards by the vibrations of the sieve bottom and subsequently falls back down onto the sieve mesh fabric due to gravitation forces. Thereby, the sample material is subjected to a three-dimensional movement, i.e. a horizontal circular motion superimposes the vertical throwing motion. Hence, the sample material is spread uniformly across the entire surface of the sieve bottom, whereas the particles are subjected to an acceleration in vertical direction. In this process, they perform free rotations and are compared with the mesh sizes when falling back down statistically orientated. In the Vibratory Sieve Shaker of the Retsch GmbH, an electromagnetic drive sets a spring-mass system in motion and transfers the oscillations to the sieve stack. The amplitude can be adjusted within a few millimetres.

7.3 Views of the device

7.3.1 Front

Fig. 8: Front view of the device with different sieve clamping units

Element	Description	Function
A	Threaded rod "standard"	Fixes the sieve stack together with the clamping lid (**D**) and the fixing nut (**B**)
B	Fixing nut "standard"	Fixes the sieve stack together with the clamping lid (**D**) and the threaded rod (**A**)
D	Clamping lid "standard"	Covers the top test sieve and fixes the sieve stack together with the fixing nut (**B**) in combination with the threaded rod (**A**), or the quick clamping unit (**F**) in combination with the support rod (**E**)

Element	Description	Function
E	Support rod "comfort"	Fixes the sieve stack together with the clamping lid (**D**) and the quick clamping unit (**F**)
F	Quick clamping unit "comfort"	Fixes the sieve stack together with the clamping lid (**D**) and the support rod (**E**)
F1	Quick clamping lever green	Moves the clamping lid (**D**) downwards when being pressed down and thus, fixes the sieve stack
F2	Quick clamping lever red	Releases the clamping lid (**D**) when being pressed up and thus, the sieve stack
G	Hexagonal nut	Serves as lock nut for the screwed threaded rod (**A**) or support rod (**E**)
H	Operating controls	Operation of the device

7.3.2 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	Fuse drawer	Contains the fuses protecting against overvoltage (fuse: 4 A delay-action at 100 – 240 V)
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

Element	Description	Function
o	USB interface	Data transfer between device and PC

7.4 Switching On / Off

⇨ Turn on the AS 300 control 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.

Setting mode:

After switching on, the device is in the setting mode and the LED of the STOP button (**H1**) is lit. The displays "time" (**H5**) and "amplitude" (**H4**) show the last used values. The display "memory" (**H8**) indicates "on".

Standby mode:

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

7.5 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.

7.6 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.

ⓘ Each test sieve is provided with an O-ring, which serves as a seal to prevent 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 "Sieve Clamping Unit "standard"" or "Sieve Clamping Unit "comfort"").
⇨ Set the optimum amplitude value and 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).

ⓘ The evaluation software "EasySieve®" automatically records the weights and allows for a quick and simple evaluation of the sieve analysis. When the device is controlled via EasySieve®, "ES" is indicated in the display "memory" (**H8**). A detailed description can be found in the separate manual of the software.

8 Controlling the Device

8.1 Operating Controls, Displays and Functions

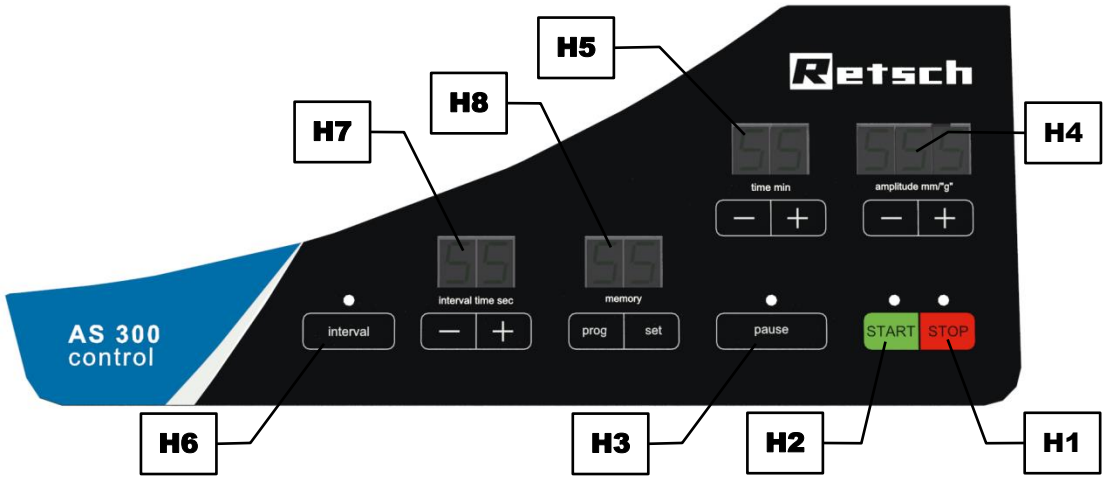


Fig. 10: Operating controls and functions

Element	Description	Function
H1	STOP	Stops the sieving process. In standby or setting mode, the red LED is lit
H2	START	Starts the sieving process. During operation, the green LED is lit
H3	Pause	Interrupts the sieving process. During the pause, the green LED flashes
H4	Amplitude setting	Decreases or increases the amplitude by pressing the "-" or "+" button, respectively in the range of 0.20 to 2.20 mm or 1 to 15.5 g
H5	Time setting	Reduces or extends the sieving time by pressing the "-" or "+" button, respectively in the range of 1 to 99 minutes
H6	Interval	Switches the device between interval and continuous operation. During the interval operation, the green LED is lit
H7	Interval setting	Reduces or extends the sieving time between the interval pauses by pressing the "-" or "+" button, respectively in the range of 1 to 99 seconds
H8	Programme setting	Allows for the saving, editing and selection of up to 99 programmes

8.1.1 Start Process

⇨ To start the sieving process in the setting mode, press the START button (**H2**).

⇨ If the device is in standby mode, press the START button (**H2**) **twice** to start the sieving process.

The green LED lights up and the sieving process is started. If a process time has been set beforehand, the time in the display "time" (**H5**) starts to count down on pressing the START button.

8.1.2 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 STOP button (**H1**) to stop the sieving process.

By pressing the STOP button, the sieving process stops, the red LED lights up and the green LED of the START button (**H2**) turns off.

⇨ Press the STOP button (**H1**) a second time to put the device into standby mode.

8.2 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 pause button (**H3**) to interrupt the sieving process.

The process time is stopped and the green LED of the pause button (**H3**) flashes.

Continue the process:

⇨ Press the START button (**H2**) to continue with the sieving process.

End the process:

⇨ Press the STOP button (**H1**) to end the sieving process.

8.3 Amplitude

The amplitude display (**H4**) shows the set amplitude value depending on the setting either in mm or g (acceleration of gravity). The amplitude value is adjustable between 0.20 mm (1 g) and 2.20 mm (15.5 g). When the device is switched on, the last used amplitude is preset.

⇨ Press the "+" or "-" button to set the desired amplitude.

⇨ Press and hold the "-" or "+" button to increased or decreased the amplitude in steps of 0.1 mm (1 g), respectively.

The amplitude can also be changed during operation by pressing the "+" or "-" button. An exceeding or falling below of 2.20 mm or 0.20 mm respectively is not possible.

The amplitude can either be displayed as the height of lift in mm or as a multiple of gravity g (9.81 m/s^2), the so called gravitational acceleration.

⇨ Simultaneously press the "+" and "-" button to toggle the display between "mm" and "g".

During the sieving process, the amplitude is kept constant within a predetermined tolerance of 0.1 mm.

NOTICE

N14.0008

Movement of the sieve stack at the beginning of the sieving process
Insufficient clamping of the sieve stack

- During the sieving process, the sieve stack can rotate and move over the sieve plate.
- The amplitude regulation cannot find a stable oscillating system, which leads to fluctuating amplitude values.

- **Observe the sieve stack at the beginning of the sieving process.**
- **If a movement of the sieve stack can be noticed, pause the sieving process and retighten the sieve stack again.**

8.3.1 Amplitudes in Dependence on the Load

The AS 300 control is a resonance sieving machine whose attainable amplitude is depending on the load. In this respect, the mass (sieve stack and sieve clamping unit) fixed to the sieve plate plays a primary role.

Only the amplitudes specified within the following load diagram can be achieved. The diagram is to be seen as a guideline for the voltage rated on the type plate. Mains voltage fluctuations or mains voltage deviations lead to increased tolerances.

Overview: Amplitude depending on the total weight

	Load [g]			max. Amplitude [mm]		
Description	Sieve stack	Sample material	Total	Voltage 100V	Voltage 200V	Voltage 230V
+ Collecting pan	6 000	1 000	7 000	2	2	2
+ 1 Sieve	6 700	2 000	8 700	2	2	2
+ 2 Sieves	7 600	3 000	10 600	2	2	2
+ 3 Sieves	8 600	4 000	12 600	1,8	2	2
+ 4 Sieves	9 500	5 000	14 500	1,5	1,8	2
+ 5 Sieves	10 700	6 000	16 700	1,4	1,6	1,9

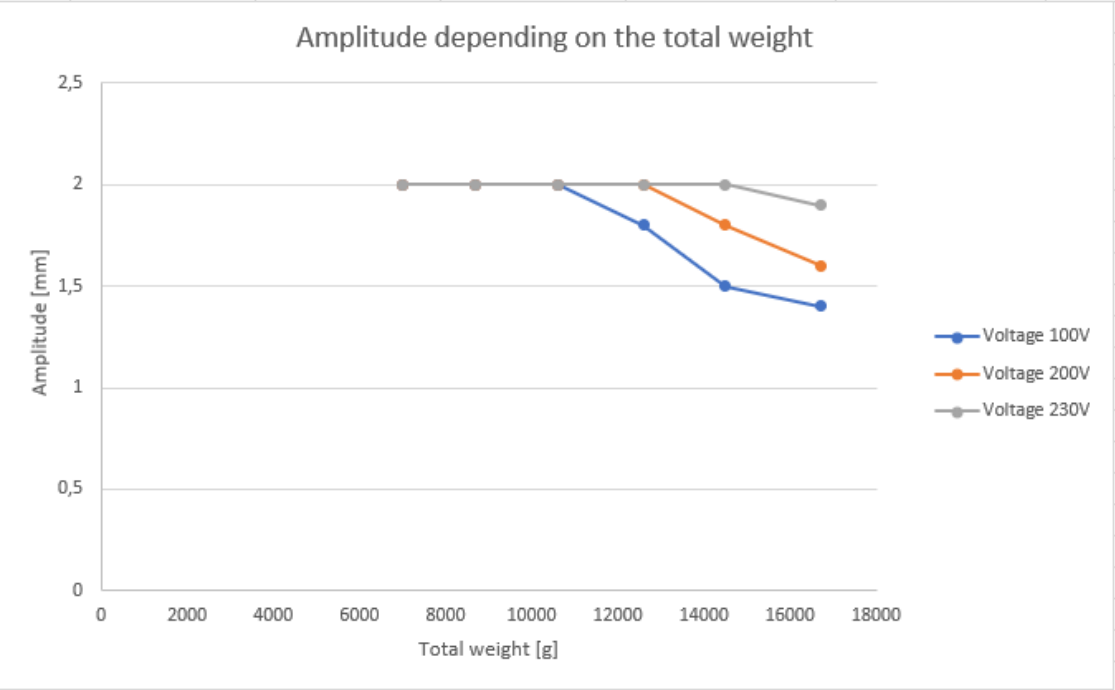


Abb. 2: Load diagram for the AS 300 control

The diagram illustrates the amplitude in millimetre in dependence of the load (sieve stack mass) in gramme. The tolerance of the sieve stack mass amounts ± 5 %. The best results are generally achieved with amplitudes from 1.0 to 1.5 mm.

Example 1:

Type:	230 V; 50 Hz
Sieve stack mass:	7 500 g
Sieve clamping unit:	"comfort"

Under these conditions the maximum attainable amplitude amounts 2 mm.

Example 2:

Type:	230 V; 50 Hz
Sieve stack mass:	16 000 g
Sieve clamping unit:	"comfort"

Under these conditions the maximum attainable amplitude amounts ~ 1.9 mm.

8.4 Time

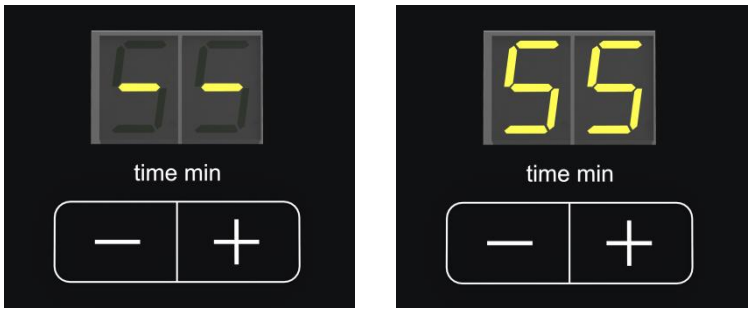


Fig. 11: Time setting for continuous operation (left) or with a process time (right)

The AS 300 control 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 "+" or "-" button of the time display (**H5**) to set the desired process time.
- ⇨ Press and hold the "+" or "-" button to extend or reduce the process time in steps of ten minutes, respectively.
- ⇨ 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 (**H5**) now indicates "– –".

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

8.5 Optimisation of Time and Amplitude

The settings of the optimum sieving time and amplitude depend on the sample material. These settings have a substantial influence on the measurement result. Generally, national and international standards, internal regulations and standards provide detailed information on product-specific sieve analyses and the associated sieving parameters. If such basic information cannot be obtained, the sieving time and amplitude must be determined experimentally.

With the AS 300 control the amplitude is defined as the total lifting height (**SH**) of the test sieve. For example, with a set amplitude of 1.2 mm, the test sieve is displaced in the range of -0.6 mm and +0.6 mm around the zero point (= stationary sieve plate (**ST**)).

An **optimum amplitude** has been found, when a state of statistical resonance is being reached during the sieving process. Then, the particles have the biggest probability of passing, as the throw time of a particle corresponds to the oscillation period of the test sieve. In this case, the particle (**PA1**) will be moved with a different orientation to a different mesh every time the test sieve (**SH**) lifts. At too low amplitudes, the particles (**PA2**) do not lift off high enough from the sieve mesh fabric, and are therefore not able to orientate freely and move freely over the sieve mesh fabric. At too high amplitudes, the particles (**PA3**) are thrown up very high, and thus have fewer opportunities to compare themselves with the sieve meshes. The best results are generally achieved with amplitudes from 1.0 to 1.5 mm.

The **optimum sieving time** is in accordance with DIN 66165 achieved, if less than 0.1 % of the feed quantity passes the test sieve after one minute of sieving duration. In practice, the individual test sieves are weighed after the sieving process including the respective particle size fraction. Then, the sieve stack is sieved again for one minute. The weights of the individual test sieves of the second weighing must not differ substantially from those of the first weighing.

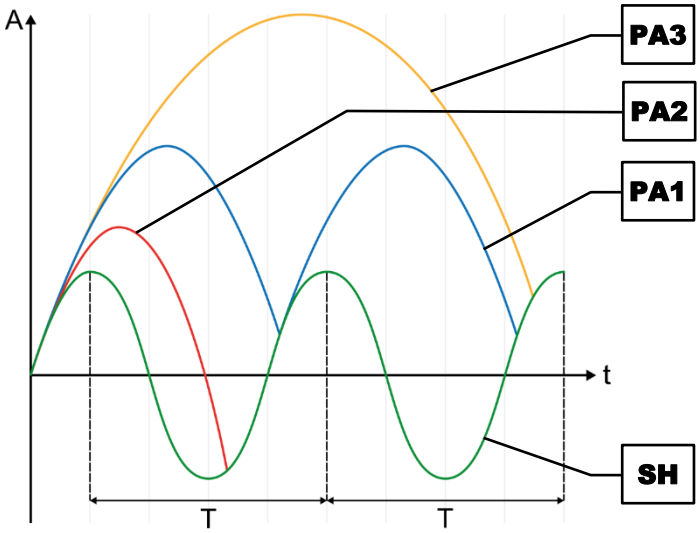


Fig. 12: Movement of the particles on the test sieve

8.6 Interval

⇨ Press the interval button (**H6**) to change to the interval operation. The green LED is lit.

⇨ Press the interval button (**H6**) again, to change back to the continuous operation. The green LED no longer lights up.

During the interval operation, the sieving process is periodically interrupted for one second. In interval operation, the interval times (pause times) are included in the displayed process time (**H5**). The interval operation can be switched on and off at any time during the sieving process.

8.6.1 Interval Time

With the interval time (**H7**) the time of the sieving process between the interval pauses can be freely selected between 1 and 99 seconds. The pause time of one second is not changeable. The display of the interval settings is only active with the interval function (**H6**) turned on.

⇨ Press the "+" or "-" button of the interval time (**H7**) to set the desired sieving time between the interval pauses.

⇨ Press and hold the "+" or "-" button to extend or reduce the interval time in steps of ten seconds, respectively.

On exceeding 99 seconds, the display changes back to 1 second. When going below 1 second, the display changes to 99 seconds. The interval time can also be changed during operation by pressing the "+" or "-" button.

8.7 Programme Mode

The AS 300 control allows for the saving and recalling of up to 99 parameter sets. The programme settings can only be edited in the setting mode.

The currently selected programme is displayed in the display "memory" (**H8**). If the display indicates "on", no programme is selected and the device is in the manual mode.

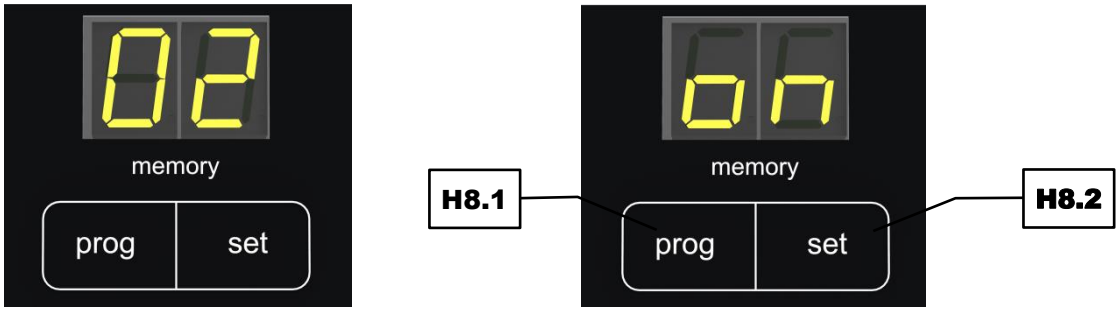


Fig. 13: Programme mode (left), manual mode (right)

8.7.1 Select a Program

- ⇨ Press the prog button (**H8.1**) to navigate through the programme memory slots in ascending order and to select the desired programme.
- ⇨ Press and hold the prog button to navigate through the programme memory slots in steps of 10.
- ⇨ Press the START button (**H2**) to start the sieving process in programme mode. All buttons, except for the STOP (**H1**) and the pause (**H3**) button are now locked.

Following the programme memory slot 99, "on" is again displayed in the display "memory" (**H8**) and the device is in manual mode. When a programme is selected, all buttons except for the prog (**H8.1**), set (**H8.2**), START (**H2**) and STOP (**H1**) button are locked.

8.7.2 Edit a Program

- ⇨ Press the prog button (**H8.1**) until the desired programme memory slot is displayed.
- ⇨ Press the set button (**H8.2**). All displays are now flashing.
- ⇨ Set the desired sieving parameters (amplitude, time, interval).

The programming can be cancelled by pressing the prog button. All settings are discarded.

8.7.3 Save a Programme

- ⇨ Press the set button (**H8.2**) to save the set sieving parameters in the selected programme memory slot. The displays stop flashing.

8.8 Signal Tone

The end of the sieving process is announced with an acoustic signal.

- ⇨ Simultaneously press the interval (**H6**) and STOP (**H1**) button to turn off the signal tone. The process is confirmed by one single signal tone.
- ⇨ Simultaneously press the interval (**H6**) and START (**H2**) button to turn on the signal tone. The process is confirmed by two single signal tones.

8.8.1 Operating Hours

- ⇨ Simultaneously press the pause button (**H3**) and the "-" button of the time display (**H5**).

The time display (**H5**) indicates "bS" (Betriebsstunden = operating hours) and the amplitude display (**H4**) displays the complete runtime (corresponds to the accumulated sieving duration) of the device in hhh format. All buttons, except for the STOP button (**H1**) are now locked.

⇨ Press the STOP button (**H1**) to exit the display of the operating hours.

8.8.2 Software Version

⇨ Simultaneously press the pause button (**H3**) and the "+" button of the time display (**H5**).

The time display (**H5**) indicates "S" (software) and the amplitude display (**H4**) displays the current number of the software version. All buttons, except for the STOP button (**H1**) are now locked.

⇨ Press the STOP button (**H1**) to exit the display of the software version.

8.9 Date

By default, the reminder date for the next calibration is set to the last calibration date plus one year. However, the reminder date can be changed arbitrarily by the user.

⇨ Hold the interval button (**H6**) for 5 seconds to display the current reminder date. The current reminder month is displayed in the time display (**H5**), whereas the current reminder year is displayed in the amplitude display (**H4**).
⇨ Press the "+" or "-" button of the time display (**H5**) to set the desired reminder month.
⇨ Press the "+" or "-" button of the amplitude display (**H6**) to set the desired reminder year.
⇨ Press the STOP button (**H1**) to save the settings and to exit the display.

Once the reminder date is reached, the information note "CAL" appears for approx. three seconds in the amplitude display (**H4**) each time the device is switched on.

A correctly set reminder date is important for the adherence of the calibration intervals. Especially, when the device is used in quality control and thus must be regularly calibrated in accordance with DIN EN ISO 9000 ff.

9 Wet Sieving

⚠ WARNING W6.0001

Danger to life through electric shock
Wet sieving

– An electric shock can cause burns, cardiac arrhythmia, respiratory arrest, as well as cardiac arrest.

- **Never operate the device in a water drain basin!**
- **Do not touch the device, if water has entered the interior!**
- **Always operate the device with a mains socket protected by a residual current circuit breaker (RCCB).**

⚠ WARNING W7.0008

Risk of death caused by an electric shock
Penetration of water if the mains plug is not fully plugged in

– If the IEC connector is not fully plugged in to the IEC appliance socket, water may enter the socket causing an electric shock.

- **Only operate the device with the IEC connector fully plugged in.**

NOTICE N15.0049

Damage to the sieve mesh fabric
Fluid retention during wet sieving

– Fluid retention can lead to overload and therefore to the damage or destruction of the sieve mesh fabric.

- **Observe the recommended flow rate.**
- **Always dose the quantity of liquid applied in such a way that no fluid retention can occur.**
- **Use venting rings, if necessary.**

9.1 Installing the Slash Protection

⚠ CAUTION Never carry out a wet sieving without mounted splash protection!

The splash protection (**SP**) is supplied together with the wet sieving lid.

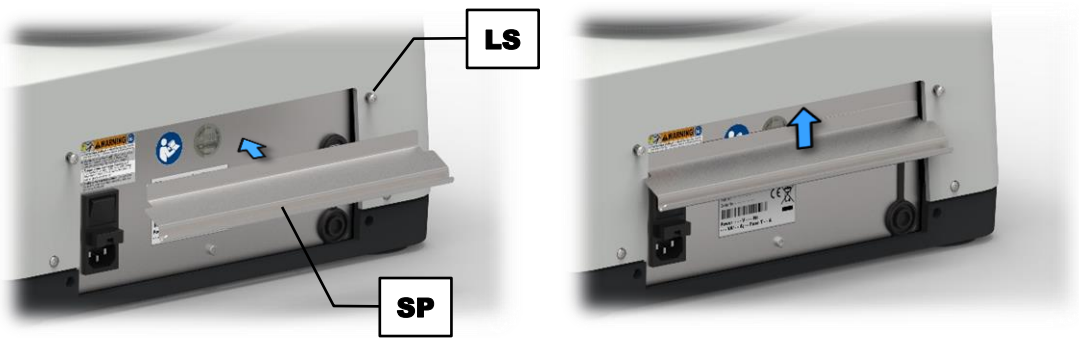


Fig. 14: Installing the splash protection

⇨ Loosen the two upper M4 oval-head screws (**LS**) on the backside of the AS 300 control.

⇨ Slide the splash protection from below up behind the top edge of the housing.
⇨ Retighten the two upper M4 oval-head screws (**LS**).

Fig. 15: AS 300 control with splash protection

9.2 Performing the Wet Sieving

Usually, sieving processes are carried out dry. However, when agglomerates, electrostatic charges or a high degree of fines impede the sieving process, either sieving aids can be used, or a wet sieving can be performed.

For wet sieving, a liquid, preferably water, is supplied to the sample material during the sieving process. A condition for wet sieving, however, is that the material to be sieved does not swell, dissolve or otherwise change in the liquid. Wet sieving is particularly suitable for materials which are already in suspension and may not be dried.

In addition to the test sieves, a collecting pan (**AB1**) with an outlet (**AB2**) and a wet sieving lid (**ND1**) with spray nozzle (**ND2**) are required for wet sieving. During the sieving process liquid is introduces via the spray nozzle (**ND2**) situated on top of the upper most test sieve into the sieve stack and, subsequently, leaving it again together with the last fraction via the outlet (**AB2**) of the collecting pan (**AB1**).

⇨ Position the device in the vicinity of the drain point (e.g. drain in the floor). The distance between the outlet (**AB2**) and the drain point should not be too large.
⇨ Connect the spray nozzle (**ND2**) of the wet sieving lid (**ND1**) with the liquid supply (e.g. water tap). The inner diameter of the hose must be 13 mm.
⇨ Connect the outlet (**AB2**) of the collecting pan (**AB1**) with the drain point or a corresponding receptacle. The inner diameter of the hose must be 20 mm. Make sure that the drain point or the receptacle are located **below** the collecting pan (**AB1**) and that the hose has a **continuous slope down**.

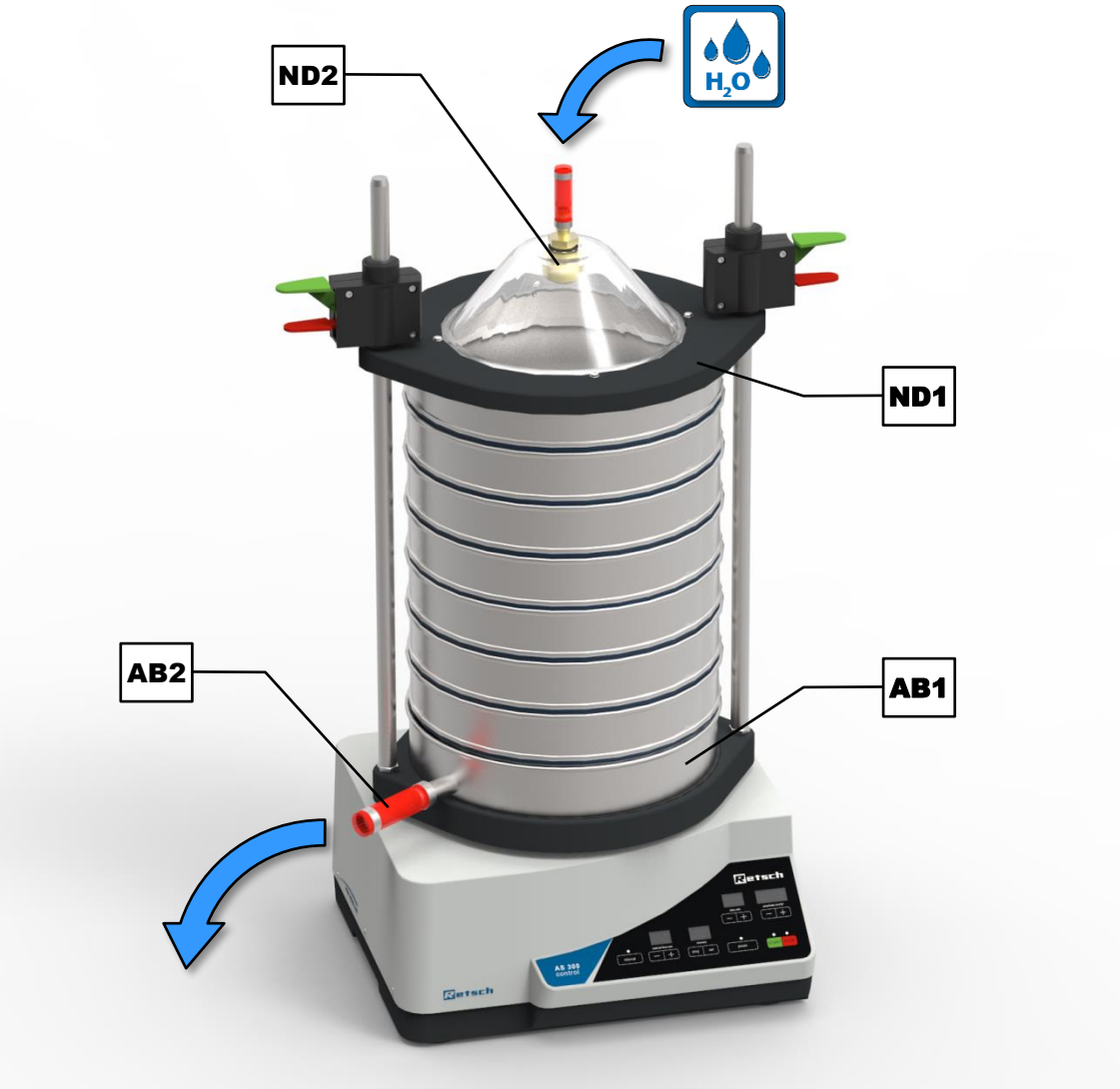


Fig. 16: Wet sieving

- ⇨ Suspend the sample material in a beaker containing the liquid intended for the wet sieving. To reduce the surface tension and to facilitate the screenings of the material later on, a few drops of surfactant may be added.
- ⇨ Moisten each test sieve with the liquid intended for wet sieving.
- ⇨ Place the sieve stack with **increasing** mesh size on the collecting pan with outlet.
- ⇨ Place venting rings (**ER**) between test sieves of mesh size < 100 µm to avoid air cushions.
- ⇨ Place the complete sieve stack centrally on the device.
- ⇨ Enter the sample suspension on the uppermost test sieve with the clamping lid open.
- ⇨ Clamp the sieve stack (→ Chapter "Sieve Clamping Unit "comfort"").
- ⇨ Set the optimum amplitude value and sieving time (→ recommended parameters).
- ⇨ Start the sieving process.
- ⇨ Turn on the liquid supply. The quantity of liquid applied should only be of such amount that the sieve mesh area is completely sprayed. A flow rate of 200 to 300 ml per sieve surface in dm^2 and minute is recommended (e.g. 1.5 to 2.2 litre per minute for sieve diameters of 305 mm).
- ⇨ The sieving process is considered as terminated when the exiting liquid shows no turbidity anymore.

Fig. 17: Venting ring

If the smallest fraction, that leaves the collecting pan should also be weighted, it must be appropriately collected. After the sieving process, the individual fractions are transferred on suitable tared filters (paper filter) and dried in an oven at 80 °C until the weight remains constant.

NOTICE Used test sieves must be cleaned immediately after the sieving process (→ Chapter "Cleaning of Test Sieves"). Depending on the sample material flash rust can form in the sieve mesh fabric.

ⓘ The load diagrams are invalid for the wet sieving. Due to the non-defined quantity of liquid in the sieve stack, binding statements are not possible for the wet sieving.

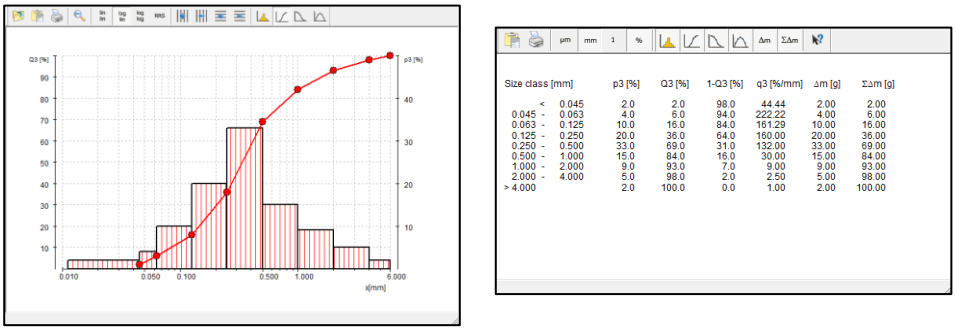
Recommended parameters for wet sieving:

- Amplitude: 1 mm to 1.2 mm
- Interval operation: yes
- Time: 5 min

10 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.



Size class [mm]			p3 [%]	Q3 [%]	1-Q3 [%]	q3 [%/mm]	Δm [g]	ΣΔm [g]
	<	0.045	2.0	2.0	98.0	44.44	2.00	2.00
0.045	-	0.063	4.0	6.0	94.0	222.22	4.00	6.00
0.063	-	0.125	10.0	16.0	84.0	161.29	10.00	16.00
0.125	-	0.250	20.0	36.0	64.0	160.00	20.00	36.00
0.250	-	0.500	33.0	69.0	31.0	132.00	33.00	69.00
0.500	-	1.000	15.0	84.0	16.0	30.00	15.00	84.00
1.000	-	2.000	9.0	93.0	7.0	9.00	9.00	93.00
2.000	-	4.000	5.0	98.0	2.0	2.50	5.00	98.00
> 4.000			2.0	100.0	0.0	1.00	2.00	100.00

Fig. 18: Graphic and tabular presentation of the particle size analysis with EasySieve®

The software communicates with the scale and the AS 300 control 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.

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

11 Error Messages and Information Notes

11.1 Error Messages

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

Error code	Description	Measures
E10	Drive overload	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E26	Failure frequency converter	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E45	Failure acceleration sensor	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.

11.2 Information Notes

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

Notice code	Description	Measures
bS	Display of the complete runtime in hhh	⇨ Press the STOP button to exit the display.
CAL	Calibration required	⇨ Press the STOP button to exit the display. ⇨ Contact the service to arrange an appointment for the calibration.
dA	Current date required	The device was not connected to the mains or off for more than 30 days, whereby the battery is discharged and the current date has been deleted. ⇨ Press the set button. The time display shows the month "01". The amplitude display shows the year "-00". ⇨ Use the respective "+" and "-" buttons to set the current month (e.g. "04" for April) and the current year (e.g. "-16" for 2016). ⇨ Press the STOP button to save the current date and to exit the display. ⇨ Leave the device connected to the mains and powered on for at least two hours, in order to fully charge the battery.

Notice code	Description	Measures
ES	External control by EasySieve®	The device is controlled by the EasySieve® software installed on a PC. ⇨ Close the software to restore the manual control.
S	Display of the software version	⇨ Press the STOP button to exit the display.

12 Return for Service and Maintenance

Fig. 3: 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.

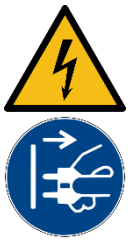
In order to eliminate any health risk to the service technicians, Retsch GmbH reserves the right to refuse the acceptance and to return the respective delivery at the expense of the sender.

13 Cleaning, Wear and Maintenance

13.1 Cleaning

WARNING W8.0003

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 N16.0009

Damage to the housing and device
Use of organic solvents

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

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

13.1.1 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.

13.1.1.1 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).

13.1.1.2 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.

13.1.1.3 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 (https://www.retsch.com). Also ask for the free expert guide *Sieve Analysis – Taking a close look at quality*.

NOTICE N17.0028

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!**

13.2 Wear

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.

⚠ CAUTION C11.0013

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!**

13.3 Maintenance

The AS 300 control is largely maintenance-free.

When using the sieve clamping unit "comfort" it is recommended to clean the support rods from time to time. Furthermore, after a certain time the sieve clamping unit "comfort" produces unavoidable, function-related clamping grooves on the support rods, which may impede secure clamping. Therefore, it is necessary to examine the support rods in regularly intervals for clamping grooves in the clamping area and, if required, to turn them by 90°.

⇨ Loosen the hexagonal nut (**G**) by means of a 19 mm open-end wrench.
⇨ Turn the support rod by 90°.
⇨ Then, tighten the hexagonal nut again.

If the rotation of the support rods does not expose a clamping groove free area, the support rods should be replaced.

If wet sieving is executed, a quarterly examination for tightness of the fluid hoses should be performed.

If the AS 300 control is used in quality control, it should be regularly calibrated in accordance with DIN EN ISO 9000 ff. For this purpose please contact your local distributor or get in touch with Retsch GmbH directly.

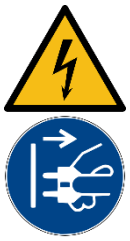
13.3.1 Replacing the Fuses

WARNING

W9.0014

Risk to life caused by an electric shock
Exposed contacts

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



Voltage	Fuse
100 – 240 V	4 A delay-action

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

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

14 Accessories

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

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

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

14.1 Test Sieves

Decisive for the accuracy and reliability of the measurement result is, in addition to the reproducible operating Vibratory 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. 19: 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.

14.1.1 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.

14.1.2 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.

14.2 Sieving Aids

NOTICE N18.0027

Damage of the sieve mesh fabric
Use of mechanical sieving aids

- When using mechanical sieving aids, there is a danger that fine sieve mesh farbrics 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® 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, benzine, alcohol and surfactants can be used as liquid sieving aids, though benzine 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.

14.3 Add-on Weight

If the mass of the sieve stack is too low, the necessary amplitude required for the sieve analysis cannot always be reached. To compensate for this, an additional mass of 2 100 g for test sieves with a diameter ≤ 203 mm can be placed underneath the sieve stack on the sieve plate and be clamped together with the sieve stack.

15 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.

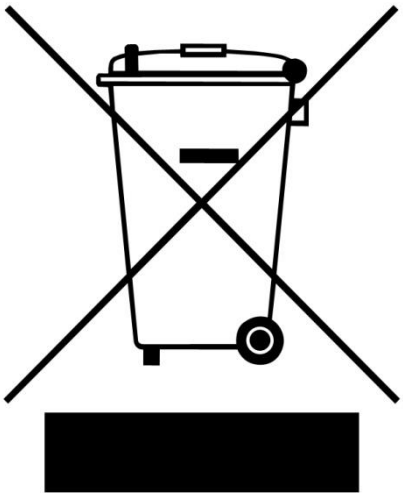


Fig. 20: Disposal label

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.

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EU Declaration of Conformity
Translation

VIBRATORY SIEVE SHAKER
AS 300 control | 30.033.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

CE