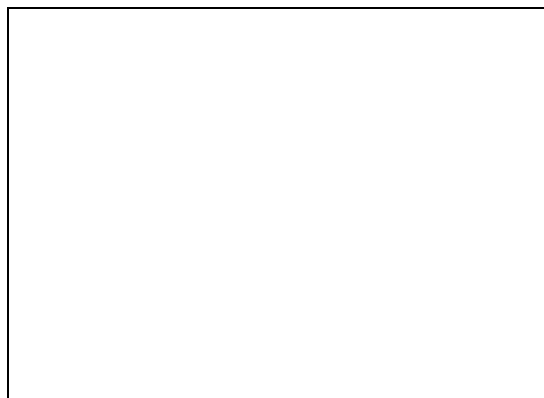


# Manual

## Vibratory Sieve Shaker AS450 basic



Translation

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## Table of Contents

<b>1</b>	<b>Notes on the manual .....</b>	<b>6</b>
1.1	Explanation of signs and symbols .....	6
1.2	Disclaimer .....	6
1.3	Copyright.....	6
1.4	Explanations of the Safety Instructions .....	7
1.5	General Safety Instructions .....	8
1.6	Repairs.....	11
<b>2</b>	<b>Confirmation .....</b>	<b>12</b>
<b>3</b>	<b>Technical Data .....</b>	<b>13</b>
3.1	Use of the Device for the Intended Purpose.....	13
3.2	Emissions.....	14
3.3	Maximum Load .....	15
3.4	Receptacle Volume.....	15
3.5	Feed Grain Size .....	16
3.6	Payload .....	16
3.7	Degree of Protection.....	16
3.8	Dimensions and Weight.....	16
3.9	Mains connection .....	16
3.10	Required Floor Space .....	17
3.11	Rated Power .....	17
<b>4</b>	<b>Packaging, Transport and Installation .....</b>	<b>18</b>
4.1	Packaging .....	18
4.2	Transport.....	18
4.3	Temperature fluctuations and condensed water .....	18
4.4	Conditions for the Installation Site .....	18
4.5	Installation of the Device.....	19
4.6	Removing the Transportation Lock.....	19
4.7	Insert tensioning rod .....	21
4.8	Connecting the Control Unit.....	22
4.9	Wall mounting and bench arrangement of the control unit .....	23
4.10	Electrical Connection .....	24
4.11	Type Plate Description.....	25
<b>5</b>	<b>Operating the Device .....</b>	<b>26</b>
5.1	Views of the device .....	26
5.2	Overview table of the parts of the device .....	27
5.3	Operating elements and displays .....	28
5.4	Overview Table of the Operating Elements and the Display.....	28
5.5	Inserting and Clamping the Test Sieves .....	29
5.6	Operating the Device .....	30
5.7	Switching On and Off .....	30
5.8	Starting and stopping .....	31
5.8.1	Starting.....	31
5.8.2	Stopping.....	31
5.9	Setting the sieve values .....	31
5.9.1	Timer .....	31
5.9.2	Amplitude .....	32
5.9.3	Interval .....	32
<b>6</b>	<b>Wet sieving.....</b>	<b>33</b>
6.1.1.1	.....	33
6.2	Required accessories .....	34
6.2.1	Preparation for wet sieving .....	34
6.2.2	Carrying out wet sieving .....	34
<b>7</b>	<b>Test Sieves.....</b>	<b>36</b>

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7.1	Certificate.....	36
7.2	Calibration Service.....	36
7.3	Sieving Aids .....	37
<b>8</b>	<b>Cleaning and service .....</b>	<b>38</b>
8.1	Cleaning.....	38
8.1.1	Cleaning of Test Sieves.....	38
8.1.1.1	Cleaning of Test Sieves with Mesh Sizes > 500 µm .....	38
8.1.1.2	Cleaning of Test Sieves with Mesh Sizes < 500 µm .....	39
8.1.1.3	Drying of Test Sieves.....	39
8.2	Replacing the machine fuses.....	39
8.3	Returning for repair and maintenance .....	40
<b>9</b>	<b>Disposal.....</b>	<b>41</b>
<b>10</b>	<b>Index .....</b>	<b>42</b>



## 1 Notes on the manual

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

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

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

### **Amendment status:**

The document amendment 0003 of the "Vibratory Sieve Shaker AS450 basic" manual has been prepared in accordance with the Directive of Machinery 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.

## 1.4 Explanations of the Safety Instructions

In this Operating Manual we give you the following safety warnings

**Serious injury** may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.



### WARNING

#### Type of danger / personal injury

Source of danger

- Possible consequences if the dangers are not observed.
- **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:



### WARNING

**Moderate or mild injury** may result from failing to heed these safety warnings. We give you the following warnings and corresponding content.



### CAUTION

#### Type of danger / personal injury

Source of danger

- Possible consequences if the dangers are not observed.
- **Instructions on how the dangers are to be avoided.**

We also use the following signal word box in the text or in the instructions on action to be taken:



### CAUTION

In the event of possible **property damage** we inform you with the word “Instructions” and the corresponding content.

### NOTICE

#### Nature of the property damage

Source of property damage

- Possible consequences if the instructions are not observed.
- **Instructions on how the dangers are to be avoided.**

We also use the following signal word in the text or in the instructions on action to be taken:

*NOTICE*

## 1.5 General Safety Instructions

This chapter describes the safety measures and safety devices of the machine. It serves for your orientation in safety questions around the use of the machine.

Safety instructions are intended for occupational safety and accident prevention. Follow all safety instructions described here to exclude residual risks.

It is essential that you read the following safety chapter and the safety notes contained therein carefully before commissioning and using the machine.



### CAUTION

#### Read the Operating Manual

Non-observance of these operating instructions

- The non-observance of these operating instructions can result in personal injuries.

- **Read the operating manual before using the device.**
- **We use the adjacent symbol to draw attention to the necessity of knowing the contents of this operating manual.**



### WARNING

W0018

#### Danger due to electric shock

- An electric shock can cause burns and cardiac arrhythmia or respiratory failure and cardiac arrest.
- **Do not touch the device if water has got inside it!**
- **Always operate the device with a mains socket protected by a circuit breaker.**



### WARNING

W0008

#### Risk of death through power surge

Mains plug not completely plugged in

- Water can enter the IEC socket if the IEC is not completely plugged in. An electric shock can lead to burns and arrhythmia or to respiratory arrest as well as cardiac arrest.
- **Only operate the device with the IEC fully plugged in.**



### WARNING

W00014

#### Mortal danger from electric shock

Exposed power contacts

- When replacing fuses on the cutout or fuse adapter you may come into contact with live contacts. An electric shock can lead to burns and to cardiac arrhythmias or to respiratory arrest and cardiac arrest.
- **Remove the mains cable before replacing fuses.**



**WARNING****Risk of a fatal electric shock**

- An electric shock can cause injuries in the form of burns and cardiac arrhythmia, respiratory arrest or cardiac arrest.
- **Do not clean the blender under running water. Use only a cloth dampened with water.**
- **Disconnect the power supply plug before cleaning the blender.**

**CAUTION****Risk of explosion or fire**

- On account of its design, the device is not suitable for use in hazardous (potentially explosive) atmospheres.
- **Do not operate the device in a hazardous atmosphere.**

**CAUTION****Risk of explosion or fire**

Changing sample characteristics

- Note that the characteristics and accordingly the danger presented by a sample can change during sieving.
- **Do not sieve any potentially explosive or combustible materials in this device.**

**CAUTION****Danger of personal injury**

Dangerous nature of the sample

- Depending on the dangerous nature of your sample, take the necessary measures to rule out any danger to persons.
- **Observe the safety guidelines and datasheets of your sample material.**

**CAUTION****Damage to hearing**

A greater sound level may occur depending on the type of material, the sieve column and the set oscillation amplitude or sieve base acceleration.

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



V0043


**CAUTION**
**Changes to the machine**

- Changes to the machine may lead to personal injury.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**


**CAUTION**

V0012

**Crushing and bruising**

Overturning of the sieve column

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

**Target group :** All persons concerned with the machine in any form

This machine is a modern, high performance product from Retsch GmbH and complies with the state of the art. Operational safety is given if the machine is handled for the intended purpose and attention is given to this technical documentation.

You, as the owner/managing operator of the machine, must ensure that the people entrusted with working on the machine:

- have noted and understood all the regulations regarding safety,
- are familiar before starting work with all the operating instructions and specifications for the target group relevant for them,
- have easy access always to the technical documentation for this machine,
- and that new personnel before starting work on the machine are familiarised with the safe handling of the machine and its use for its intended purpose, either by verbal instructions from a competent person and/or by means of this technical documentation.

Improper operation can result in personal injuries and material damage. You are responsible for your own safety and that of your employees.

Make sure that no unauthorised person has access to the machine.


**CAUTION**
**Changes to the machine**

- Changes to the machine may lead to personal injury.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

**NOTICE**
**Changes to the machine**

- The conformity declared by Retsch with the European Directives will lose its validity.
- You lose all warranty claims.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

## 1.6 Repairs

This operating manual does not contain any repair instructions. For your own safety, repairs may only be carried out by Retsch GmbH or an authorized representative or by Retsch service engineers.

**In that case please inform:**

The Retsch representative in your country
Your supplier
Retsch GmbH directly

**Your Service Address:**

--

## 2 Confirmation

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

As the owner/managing operator you should for your own protection have your employees confirm that they have received the instructions about the operation of the machine.

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

### User

Surname, first name (block letters)

Position in the company

Signature

### Service technician or operator

Surname, first name (block letters)

Position in the company

Place, date and signature

### 3 Technical Data

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



#### CAUTION

##### Risk of explosion or fire

- On account of its design, the device is not suitable for use in hazardous (potentially explosive) atmospheres.
- **Do not operate the device in a hazardous atmosphere.**



#### CAUTION

##### Risk of explosion or fire

Changing sample characteristics

- Note that the characteristics and accordingly the danger presented by a sample can change during sieving.
- **Do not sieve any potentially explosive or combustible materials in this device.**



#### CAUTION

##### Danger of personal injury

Dangerous nature of the sample

- Depending on the dangerous nature of your sample, take the necessary measures to rule out any danger to persons.
- **Observe the safety guidelines and datasheets of your sample material.**



**Target group:** Operating companies, operators

**Machine type designation:** AS450 basic

The AS450 basic is a vibratory sieve shaker for sieve tests in conjunction with sieve stacks to determine the particle size of different material samples. The AS 450 basic has been specially designed for test sieves with a diameter of between 400 mm and 450 mm. This offers four or five times the sieving area compared to sieves with a diameter of 200 mm. As a result, sieving times can be significantly shortened using the AS 450 basic.

The AS 450 basic is suitable for the dry and wet sieving of pourable, dispersible products with a feed size of up to 125 mm. A further advantage is the very high feed volume of up to 15 kg of material to be sieved, which depending on the particle size and sieve mesh size can be separated in a single operation. All sieving parameters are digitally set and displayed.

It has an electromagnetic drive with special springs arranged at a calculated angle. The horizontal rotating movement and the vertical movement enable sieve tests to be conducted efficiently.

The AS450 basic remote control contains a digital controller to adjust the vibration, process duration and interval operating mode. The interval time is part of the process duration, so that the vibration is switched on and off during the overall sieving duration. The process duration and amplitude are displayed on the same digital display. The process duration is shown in minutes and the maximum amplitude depends on the number of sieves and the weight of the sample.


**WARNING**

W0018

**Danger due to electric shock**

- An electric shock can cause burns and cardiac arrhythmia or respiratory failure and cardiac arrest.
- **Do not touch the device if water has got inside it!**
- **Always operate the device with a mains socket protected by a circuit breaker.**

**NOTICE**
**Area of use of the machine**

- This machine is a laboratory machine designed for 8-hour single-shift operation.
- **This machine may not be used as a production machine nor is it intended for continuous operation.**


**CAUTION**
**Changes to the machine**

- Changes to the machine may lead to personal injury.
- **Do not make any change to the machine and use spare parts and accessories that have been approved by Retsch exclusively.**

## 3.2 Emissions


**CAUTION**

V0043

**Damage to hearing**

A greater sound level may occur depending on the type of material, the sieve column and the set oscillation amplitude or sieve base acceleration.

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



**Noise levels:**

Noise measurement in accordance with DIN 45635-031-01-KL3

The noise levels depend on the set amplitude, the number of clamped sieves and the type of material to be sieved.

Operating conditions:

Material to be sieved = broken granite, particle size <2 mm, 5 sieves (Ø 450mm)

Measurement 1:

Vibration level = 5

Sound pressure level  $L_{pAeq} = 69.6$  dB

Measurement 2:

Vibration level = 9

Sound pressure level  $L_{pAeq} = 83.3$  dB

### 3.3 Maximum Load

Maximum volume of material to be sieved = up to 15 kg

### 3.4 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 450 mm (18") in diameter are listed in the following table:

Mesh size	Max. feed quantity	Max. permitted oversize material according to DIN 66165
25 µm	64 cm <sup>3</sup>	32 cm <sup>3</sup>
45 µm	95 cm <sup>3</sup>	48 cm <sup>3</sup>
63 µm	127 cm <sup>3</sup>	64 cm <sup>3</sup>
125 µm	191 cm <sup>3</sup>	95 cm <sup>3</sup>
250 µm	286 cm <sup>3</sup>	143 cm <sup>3</sup>
500 µm	445 cm <sup>3</sup>	223 cm <sup>3</sup>
1 mm	636 cm <sup>3</sup>	318 cm <sup>3</sup>
2 mm	1 113 cm <sup>3</sup>	557 cm <sup>3</sup>
4 mm	1 749 cm <sup>3</sup>	875 cm <sup>3</sup>
8 mm	2 863 cm <sup>3</sup>	1 431 cm <sup>3</sup>

### 3.5 Feed Grain Size

Traditional dry sieving is performed in the particle size range of 40 µm to 125 mm. 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

### 3.6 Payload

- Maximum sample quantity: 15 kg
- Maximum sieve stack weight: 50 kg
- Maximum payload: 65 kg (sample material plus test sieves)
- Maximum sieve stack height: 830 mm
- Maximum number of fractions: 8 (test sieves and collecting pan: 450 mm) / 12 (test sieves and collecting pan: 400 mm)

### 3.7 Degree of Protection

- IP31 Sieve shaker
- IP20 Control unit

### 3.8 Dimensions and Weight

Height: 242mm without sieve stacks; 1250mm with sieve stacks

Width: 605mm

Depth: 605mm

Weight: approx. 112 kg without sieve stack and without clamping mechanism

### 3.9 Mains connection

230 V, 50 Hz

230 V, 60 Hz

110 V, 60 Hz

Mains voltage fluctuations +/- 10%



---

### **3.10 Required Floor Space**

605 mm x 605 mm; no safety clearances necessary

### **3.11 Rated Power**

1000 VA

## 4 Packaging, Transport and Installation

### 4.1 Packaging

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

---

#### *NOTICE*

##### **Storage of packaging**

- In the event of a complaint or return, your warranty claims may be endangered if the packaging is inadequate or the machine has not been secured correctly.
  - **Please keep the packaging for the duration of the warranty period.**
- 

### 4.2 Transport

---

#### *NOTICE*

##### **Transport**

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

### 4.3 Temperature fluctuations and condensed water

---

#### *NOTICE*

##### **Temperature fluctuations**

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

- The resultant condensed water may damage electronic components.
  - **Protect the machine from condensed water.**
- 

### 4.4 Conditions for the Installation Site

Ambient temperature: 5°C to 40°C

---

#### *NOTICE*

##### **Ambient temperature**

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

Atmospheric humidity:

Maximum relative humidity 80% at temperatures up to 31°C, decreasing linearly up to 50% relative humidity at 40°C

---

## NOTICE

### Atmospheric humidity

- Electronic and mechanical components may be damaged and the performance data alter to an unknown extent.
  - **Do not exceed the admissible range for atmospheric humidity.**
- 

## 4.5 Installation of the Device

The device should be erected on a level, stable surface that does not buckle and which is suitable for operation.

A level surface ensures the even distribution of the sample across the sieves and the stability of the machine.

Installation height: maximum 2000 m above sea level

---


## NOTE

H0004

### Erection

- Vibrations can occur depending on the operating status of the device.
  - **Only erect the device on a level, flat and horizontal surface. The base must be stable and must not vibrate.**
- 

## 4.6 Removing the Transportation Lock


**WARNING**

**Risk of injury due to the device falling down**

Lifting the device above head height

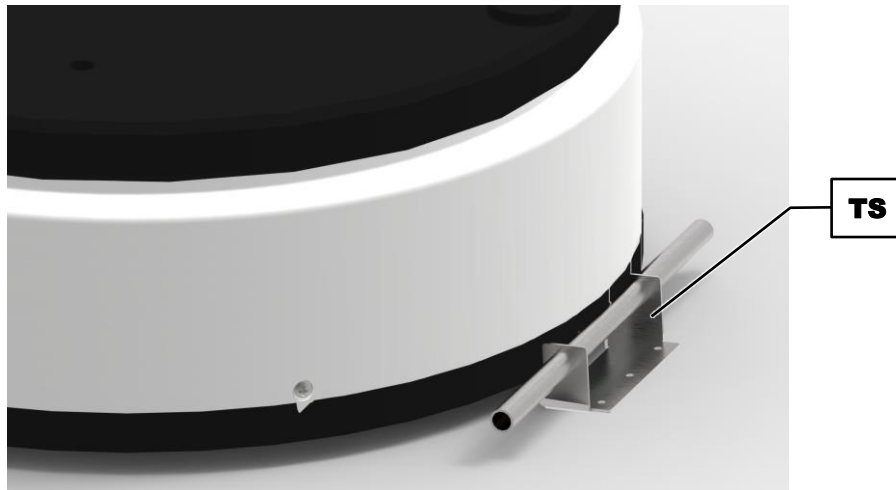
- The device can fall causing serious injuries when lifted above head height.
- **Never lift the device above head height!**

W1.0005



The device is secured in the packaging unit by the transport lock. In order to loosen the transport lock, please proceed as follows:

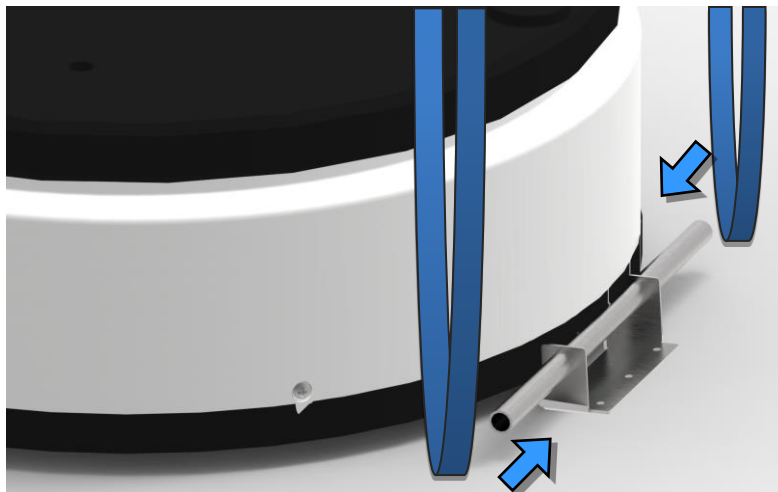
- ⇒ Loosen the screws of the transport lock (**TS**) on both sides of the device and remove them.
- ⇒ Keep the screws for any subsequent transport.



**Fig. 1:** Loosening the transport lock

**⚠ CAUTION** The weight without sieve tower and clamping unit is approx. 112 kg. The device may only be lifted by four persons.

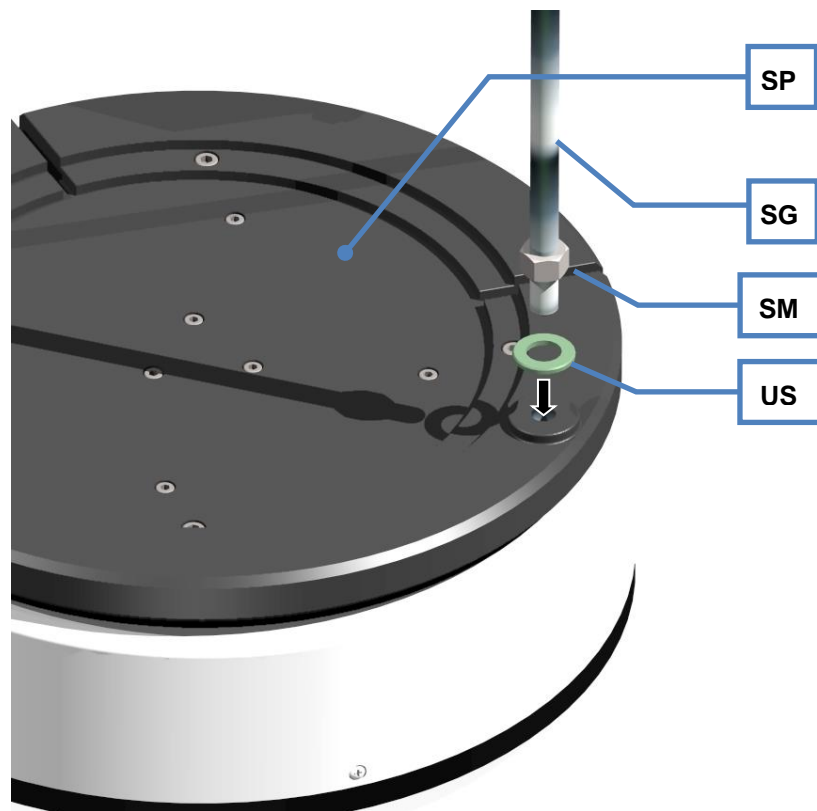
- ① The transport lock is also a transport aid.
- The transport aid can also be used in order to lift the device with a crane.
- ⇒ Attach the lifting straps to the two transport aids as shown.



**Fig. 2:** Attaching the lifting straps

**NOTICE** If the lifting straps are too short, the enclosure could become damaged. The four lifting straps must be long enough in order to ensure a minimum distance of 100 cm between the machine and the lifting device.

## 4.7 Insert tensioning rod



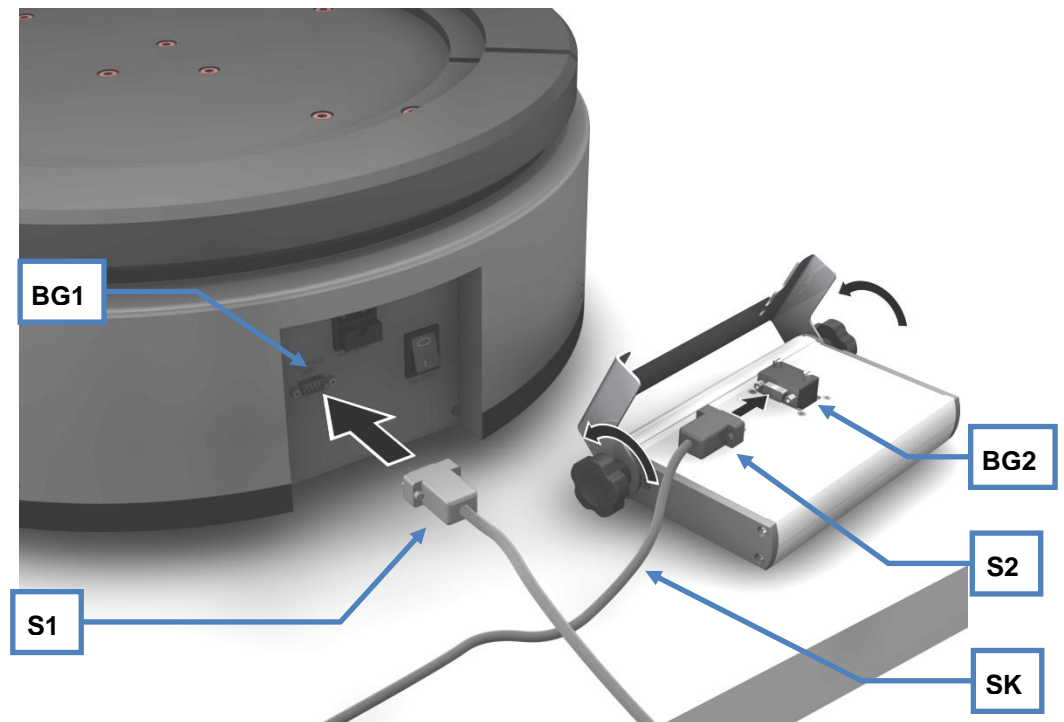
**Fig. 3:** Securing the tension rods

- Use an M20 washer (US) on the two tension rods (SG).
- Screw both tension rods (SG) into the designated threaded holes in the sieve plate (SP) and lock them with the hexagonal nuts (SM).
- Firmly tighten the hexagonal nuts (SM) by means of a 19 mm open-end wrench.

**NOTICE**

Screw the tension rods into the threaded holes at a maximum of 30 mm!

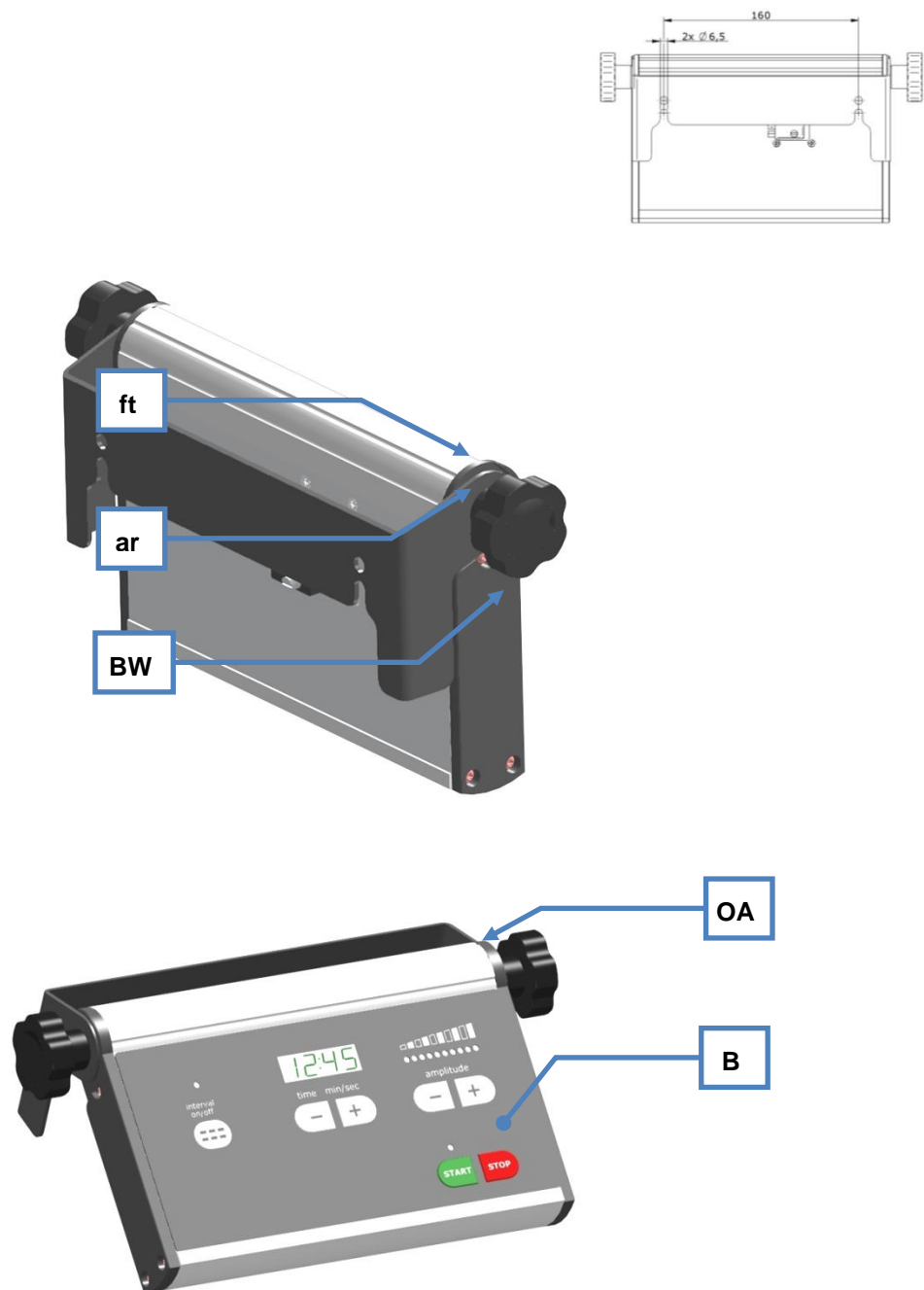
## 4.8 Connecting the Control Unit



**Fig. 4:** Connecting the control unit

- Plug the connector (**S1**) of the control cable (**SK**) into the socket (**BG1**) on the device.
- Screw the connector tight.
- Plug the 2<sup>nd</sup> connector (**S2**) of the control cable (**SK**) into the control unit socket (**BG2**).
- Screw the connector tight.

#### 4.9 Wall mounting and bench arrangement of the control unit



**Fig. 5:** Wall mounting or bench arrangement of the control panel

A bracket (**BW**) for wall installation or bench arrangement is provided on the control panel (**B**). Two screws (with maximum diameter of 6mm) and two corresponding dowels are required for wall installation. The control panel can be installed so it is fixed (**ft**) or removable (**ar**). For desk mounting, the bracket must be turned up to the top limit stop (**OA**).

## 4.10 Electrical Connection



### WARNING

W0008

#### **Risk of death through power surge**

Mains plug not completely plugged in

- Water can enter the IEC socket if the IEC is not completely plugged in. An electric shock can lead to burns and arrhythmia or to respiratory arrest as well as cardiac arrest.
- **Only operate the device with the IEC fully plugged in.**



### 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 .

- Please check the type plate for details on the necessary voltage and frequency for the device.
- Make sure the levels agree with the existing mains power supply.
- Use the supplied connection cable to connect the device to the mains power supply.

Refer to the type plate for information about fusing.



## 4.11 Type Plate Description

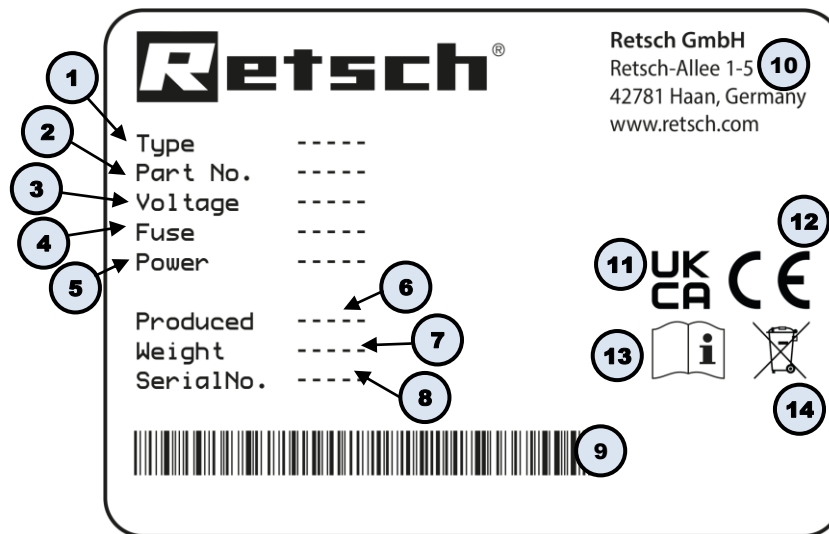


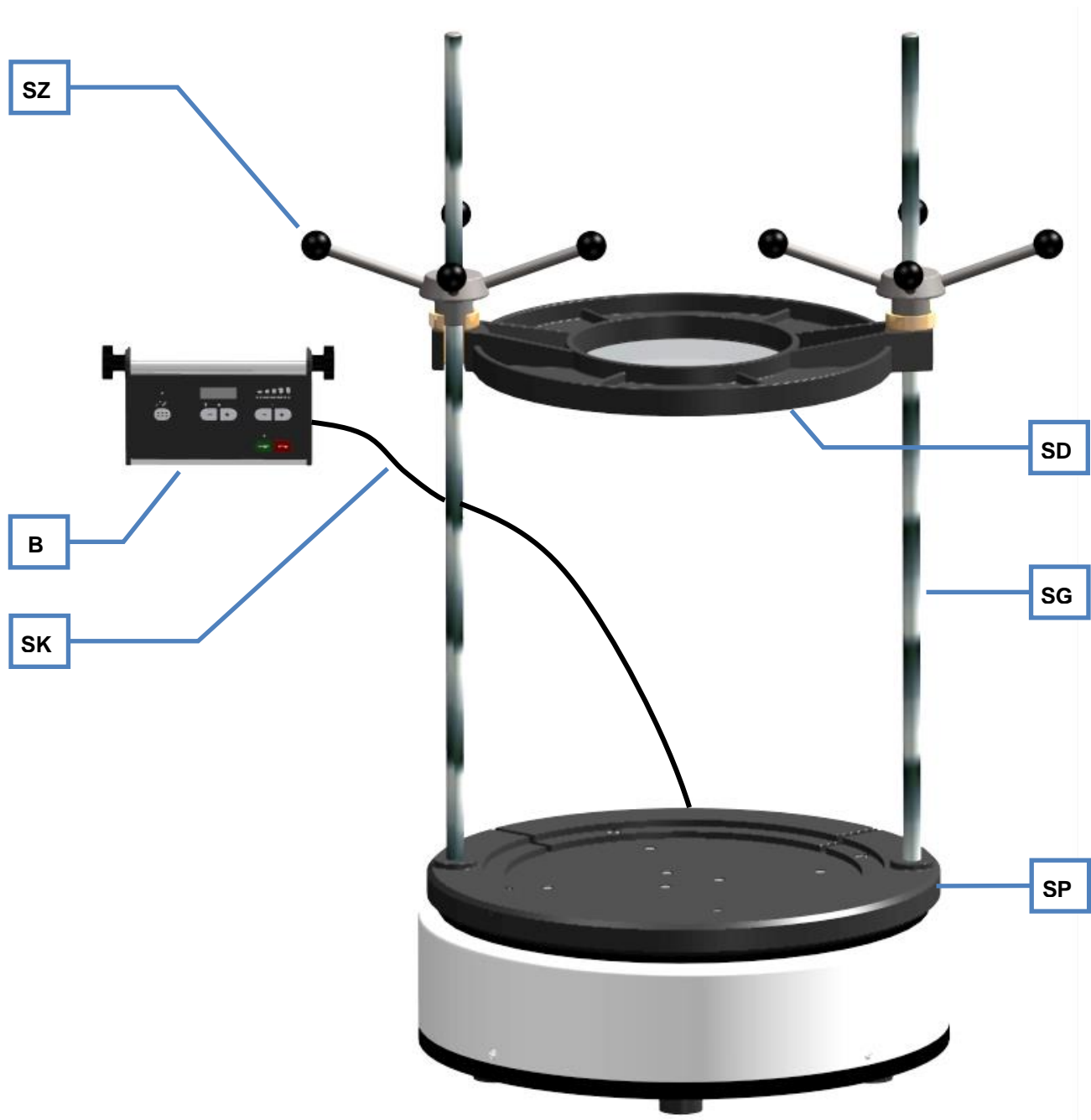
Fig. 6: Type plate

- 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.

## 5 Operating the Device

### 5.1 Views of the device



**Fig. 7:** Diagram showing device parts



**Fig. 8:** Detailed view of the back of the device

## 5.2 Overview table of the parts of the device

Element	Description	Function
<b>B</b>	Control unit	Contains the displays and control elements
<b>SK</b>	Control cable	Connects the control unit to the AS450 basic
<b>SZ</b>	Cross brace	Clamps the sieve cover to the sieve stack
<b>SD</b>	Sieve lid	Covers up the sieve stack
<b>SG</b>	Tension rod	Braces the sieve stack
<b>SP</b>	Sieve plate	Accommodates the sieve stack
<b>H</b>	Main switch	Disconnects the device from the mains
<b>A</b>	Holding fixture for fuse	Access to the device fuse
<b>K</b>	IEC appliance socket	Power supply for the mains lead
<b>T</b>	Type plate	Description of device parameters
<b>W</b>	Warning sign to pull out the plug	Warning of electric shock

### 5.3 Operating elements and displays

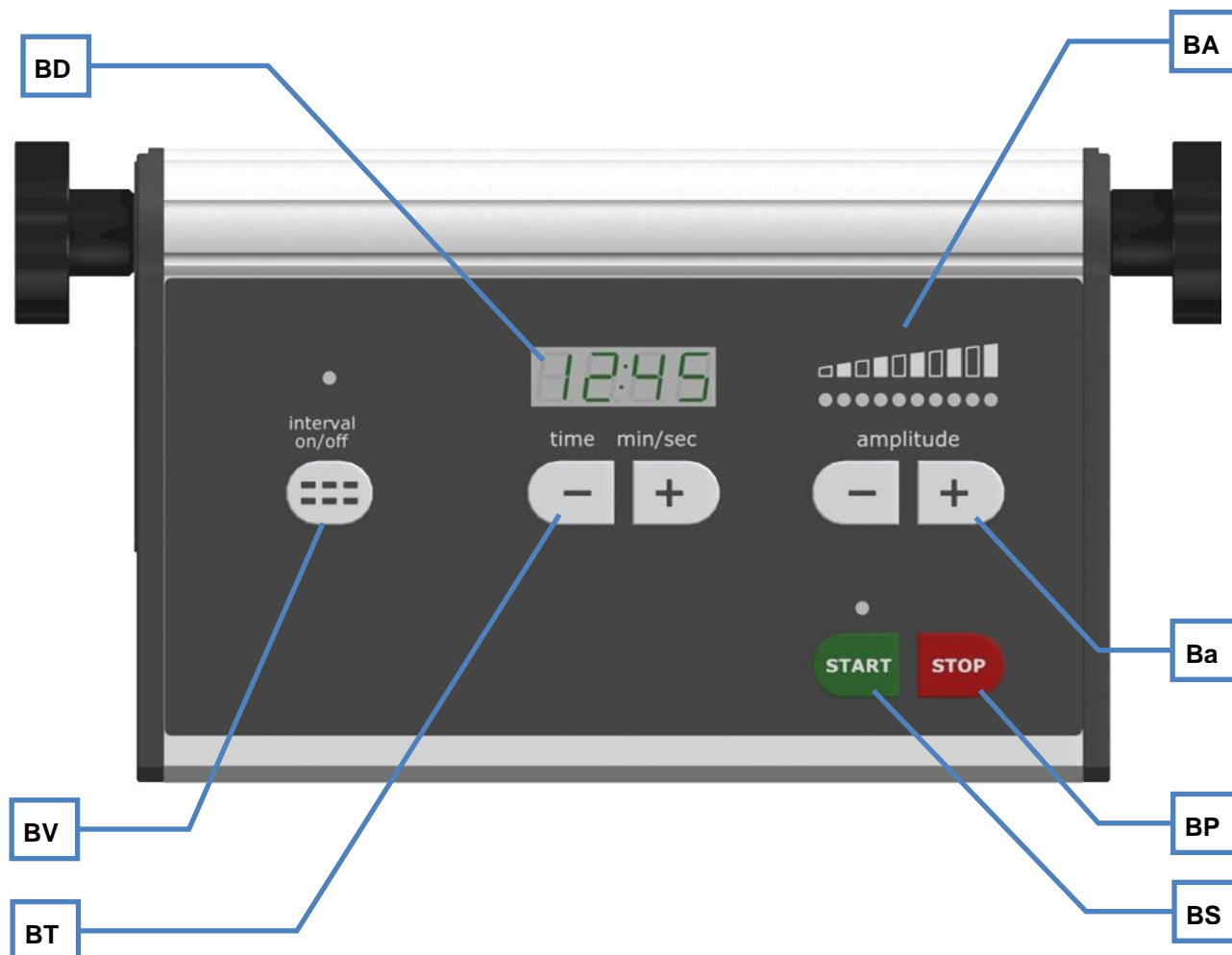


Fig. 9: Diagram showing the control and display elements

### 5.4 Overview Table of the Operating Elements and the Display

Element	Description	Function
<b>BV</b>	Interval (ON/OFF)	Switches the interval operating mode on / off
<b>BT</b>	Time min/sec	Adjusts the sieving time
<b>BD</b>	Display	Displays the sieving time (min/sec)
<b>BS</b>	START button	Starts sieving
<b>BP</b>	STOP button	Stops sieving
<b>BA</b>	Amplitude display	Displays the set amplitude
<b>Ba</b>	Amplitude	Adjusts the amplitude

## 5.5 Inserting and Clamping the Test Sieves



### CAUTION

V0012

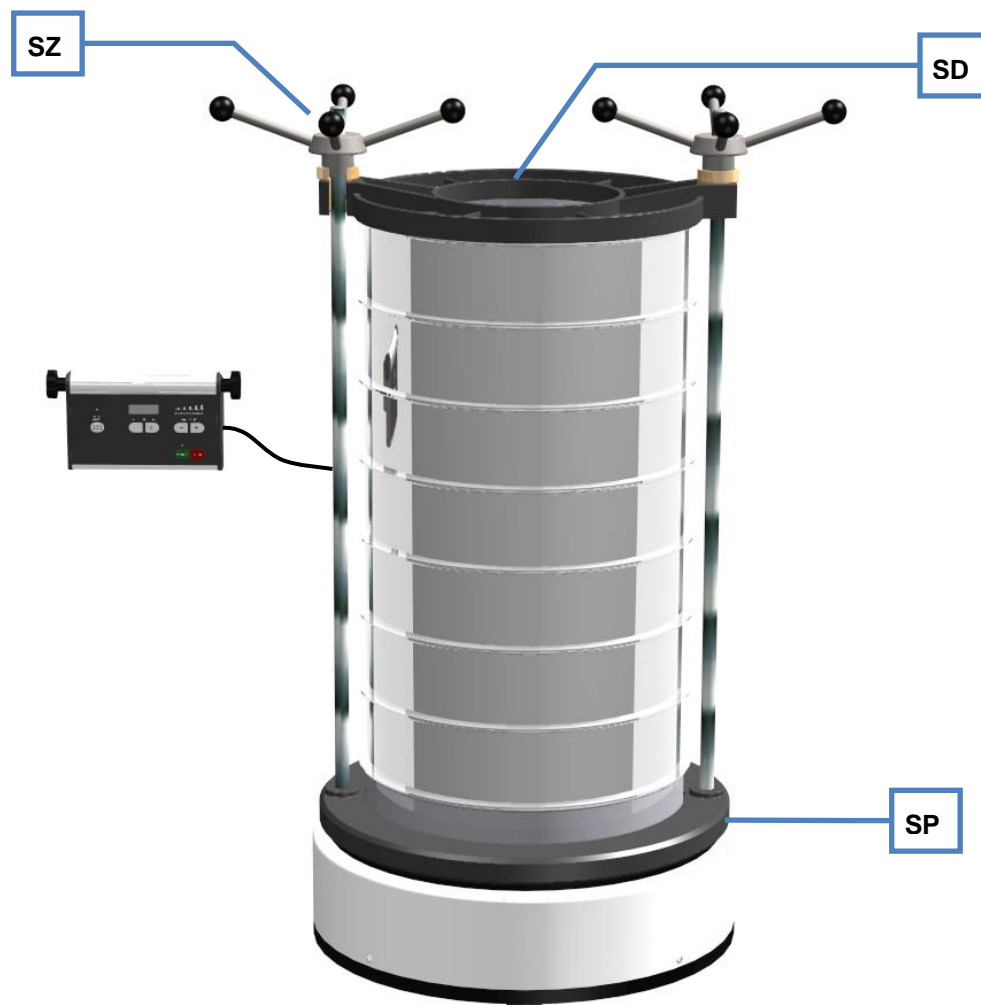
#### Crushing and bruising

Overturning of the sieve column

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

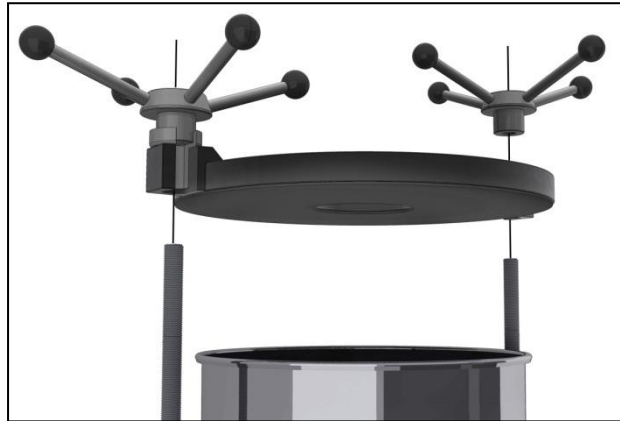
The AS450 basic is intended for use with test sieves with outer diameters between 400 and 450 mm. Depending on the sieve used, the following quantities can be used:

Sieve diameter (mm)	Quantity
400	11
450	7



**Fig. 10:** Inserting the sieve stack

- Place the sieve stack centrally on the sieve plate.
- Place the clamping cover (**SD**) over the threaded rods onto the upper sieve.



**Fig. 11:** Attaching the sieve cover

- Screw the two cross braces (**SZ**) onto the tripod thread up to the clamping cover.
- Tighten the cross braces using both hands at the same time.

If the collecting pan sticks to the smooth surface of the sieve plate (**SP**) when removing the sieve stack, we recommend using talcum powder .

## 5.6 Operating the Device



### CAUTION

#### **Danger of personal injury**

Dangerous nature of the sample

- Depending on the dangerous nature of your sample, take the necessary measures to rule out any danger to persons.
- **Observe the safety guidelines and datasheets of your sample material.**



## 5.7 Switching On and Off



**Abb. 12:** Switching on / off

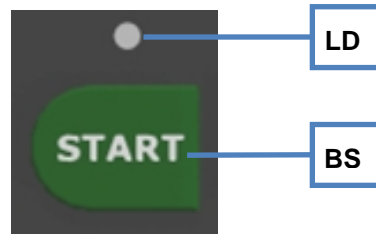
The main switch is on the back of the device.

- Switch the main switch (**H**) on.

When the switch is in the off position, the device is completely disconnected from the mains.

## 5.8 Starting and stopping

### 5.8.1 Starting



**Abb. 13:** Start button

- Press the **START** button (**BS**).

When the **START** button is pressed, the timer starts the countdown, the LED (**LD**) lights up green and sieving starts.

### 5.8.2 Stopping



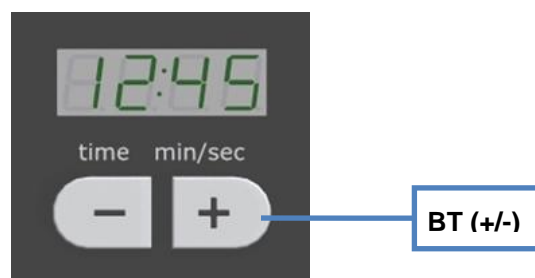
**Abb. 14:** Stop button

- Press the **STOP** button (**BP**).

When the **STOP** button is pressed, sieving stops and the green LED above the **START** button goes out.

## 5.9 Setting the sieve values

### 5.9.1 Timer



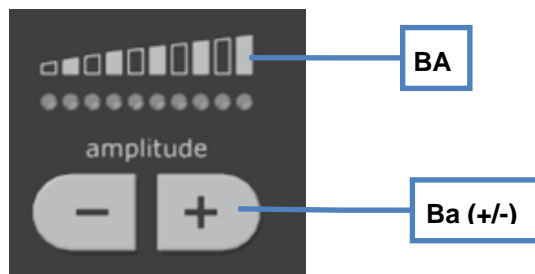
**Fig. 15:** Timer

The timer can be set in 10 second steps from 10 seconds to 99:50 minutes .

- Press the **+** or **-** button (**BT**) to set the sieving time.

- Pressing the buttons once increases/reduces the value. If the buttons are kept pressed, the value on the display is fast-scrolled to increase/decrease it.

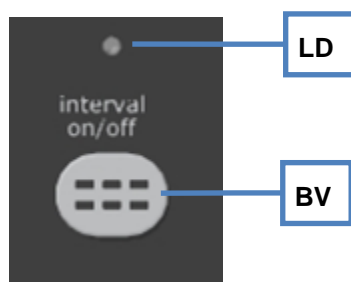
### 5.9.2 Amplitude



**Fig. 16:** Amplitude display / amplitude button

- The amplitude value is displayed in the amplitude display (**BA**).
- The amplitude value can be set to between 1 and 10.
- Press the buttons **+** or **-** (**Ba**) to set the amplitude.

### 5.9.3 Interval



**Fig. 17:** Interval button

- Press the button (**BV**) to start interval operating mode.
  - The interval time cannot be adjusted (10 seconds on / 2 seconds off).
  - Interval operating mode is switched on when the green LED (**LD**) is lit up.
  - Press the button (**BV**) again to end interval operating mode.

In interval operating mode, the pause cycle times are included in the sieving time and can be switched on or off during sieving. When the sieve shaker reaches zero, the sieve shaker stops the vibrating operation.



## 6 Wet sieving



### WARNING

W0001

#### Danger due to electric shock

- An electric shock can cause burns and cardiac arrhythmia or respiratory failure and cardiac arrest.
- **Never operate your sieve shaker in a water basin.**
- **Always operate the device with a mains socket protected by a circuit breaker.**



### WARNING

W0009

#### Danger to life from electric shock

- The control panel has safety class IP20.  
An electric shock can result in burns and arrhythmia or to respiratory arrest as well as cardiac arrest.
- **Ensure that the control panel does not come into contact with water.**

### NOTICE

H0048

#### Wet sieving

- Note the following information for successful wet sieving :
- The inner diameter of the hose for the water supply to the spray nozzle must be 13mm.
- A flow rate of 200 to 300 ml per sieve surface in dm<sup>2</sup> and minute is recommended (e.g. 2.5 to 4 litre per minute for sieve diameters of 400 mm)  
These figures apply depending on the sieve mesh size, sieve material and sieve tray load used.
- Use the venting rings between the sieves.  
The maximum number of the sieves that can be used can change according to the height of the aeration rings.
- The water outflow from the discharge hose must be below the water / sieve outflow (W1).
- The distance between the water outflow of the discharge hose and the water / sieve outflow should not be too great. (W2)
- The inner diameter of the water draining hose must be adequately dimensioned. (Hose inner diameter 20 mm).
- Used sieves must be cleaned directly after sieving. Depending on the sieved material, surface rust may develop in the sieve fabric.

#### 6.1.1.1

### NOTICE

H0049

#### Damage to the sieve mesh

- A build-up of water in the sieve column can lead to overloading and thus to damage or irreparable damage to the sieve mesh.
- **Always dose the volume of water applied in a way that ensures there is no build-up of water**

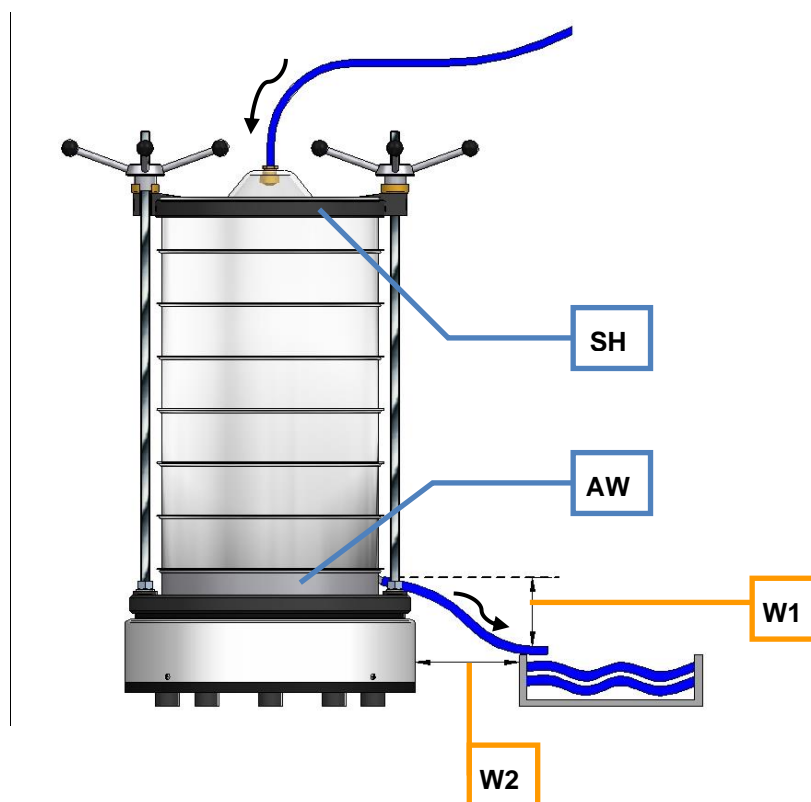
Dry sieve analyses are possible in most applications. However, there are materials for which the adhesive force between the individual particles causes difficulties. These problems can be eliminated by adding liquids, preferably water, during the sieving operation (if the additives specified in the chapter on sieving aids have not helped). However, wet sieving is only possible if the materials to be sieved do not swell, dissolve or change in any other way in the sieving liquid.

## 6.2 Required accessories

- Clamping cover with spray nozzle (**SH**) for the corresponding sieve diameter.
- Collecting pan with water drain (**AW**) for the corresponding sieve diameter.

### 6.2.1 Preparation for wet sieving

- Connect the spray nozzle of the clamping cover to a tap using a hose .
- Connect the drainage of the collecting pan to the water drain point or to a corresponding collecting vessel.



**Fig. 18:** Arrangement of the water circuit

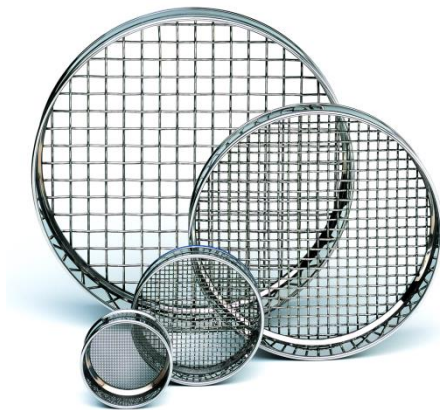
### 6.2.2 Carrying out wet sieving

- Add the solid material as a suspension.
  - The use of a dispersing agent is recommended. This reduces the surface tension of the sieve fluids .
  - In the case of goods that are difficult to separate or for precise separations, spray each of the individual fractions in turn.
  - After the sieving process, the fractions are transferred from the individual sieves to corresponding filters (e.g. paper filters) and dried in the drying cabinet at 80° C.

- 
- The sieves are then cleaned in the ultrasonic bath and likewise dried in the drying cabinet (without seal).
  - Do not exceed the maximum drying temperature of 80°C.

## 7 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.

### 7.1 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.

### 7.2 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.

## 7.3 Sieving Aids

### NOTICE

N1.0027

#### 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® 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.

## 8 Cleaning and service

### 8.1 Cleaning



#### **WARNING**

##### **Risk of a fatal electric shock**

- An electric shock can cause injuries in the form of burns and cardiac arrhythmia, respiratory arrest or cardiac arrest.
- **Do not clean the blender under running water. Use only a cloth dampened with water.**
- **Disconnect the power supply plug before cleaning the blender.**

#### *NOTICE*

##### **Damage to the machine through solvents**

- Solvents may damage plastic parts and the paint finish.
- **It is not allowed to use solvents.**

⇒ Clean the housing of the device with a damp cloth and, if necessary, a household cleaning agent. Make sure that no water or cleaning agent gets into the interior of the device.

⇒ Only use neutral cleaning agents. Do not use solvent-based cleaners! Acetone is not permitted!

Test cleaning products on an inconspicuous spot.

#### 8.1.1 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.

##### 8.1.1.1 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).

### 8.1.1.2 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.

### 8.1.1.3 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

N2.0028

##### **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!**

## 8.2 Replacing the machine fuses



Fig. 20: Replacing the fuses

The AS450 basic is protected by fuses .

- Refer to the type plate for information about fusing (T).
  - Switch the device off at the mains switch (H).
  - Disconnect the mains plug from the IEC appliance socket (K).
  - Pull out the fuse insert (A) and remove the faulty fuses.



A fuse must be replaced by one of the same type and with the same level of protection.

- Place the new fuse in the fuse insert.
- Press the fuse insert (A) in again.

**NOTICE**

If the fuse triggers again directly after replacing the fuse, the device has a fault. In this case please contact your supplier or Retsch GmbH directly.

There are two fuses: one in the current-carrying conductor and one in the neutral conductor of the power supply.

### 8.3 Returning for repair and maintenance



**Fig. 21:** 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.

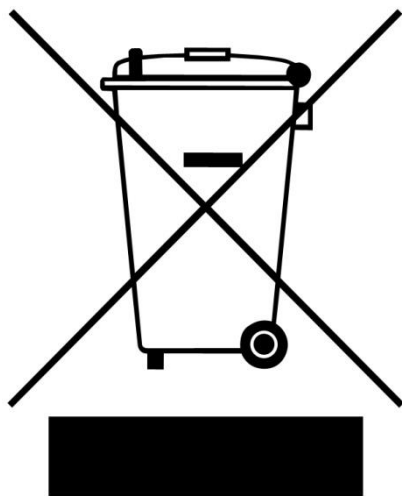


## 9 Disposal

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. 22:** 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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## 10 Index

### A

Ambient temperature .....	18
Amendment status .....	6
Amperage .....	25
Amplitude .....	32
Arrangement of the water circuit .....	34
Atmospheric humidity .....	18

### B

Bar code .....	25
----------------	----

### C

Calibration .....	40
Calibration service .....	36
Capacity .....	25
Carrying out wet sieving .....	34
CE marking .....	25
Certificate .....	36
Cleaning .....	38
Cleaning and service .....	38
Cleaning of test sieves .....	38
Collecting pan .....	34
Confirmation .....	12
Connecting the control unit .....	22
Connection cable .....	24
Control unit	
connect .....	22
Copyright .....	6

### D

Danger due to electric shock .....	33
Danger due to electric shock .....	8, 14
Degree of protection .....	16
Depth .....	16
Description .....	27, 28
Detailed view of the back of the device .....	27
Device designation .....	25
Diagram showing device parts .....	26
Diagram showing the control and display	
elements .....	28
Dimensions .....	16
DIN 45635-031-01-KL3 .....	15
Disclaimer .....	6
Dispersing agent .....	34
Disposal .....	41
label .....	41
regulations .....	41
Disposal label .....	25
Drying cabinet .....	34
Drying temperature .....	35

### E

Electrical connection .....	24
Emissions .....	14
Explanations of the safety instructions .....	7
External fuse .....	24

### F

Feed grain size .....	16
Feed quantity .....	15
Function .....	27, 28
Fuse insert .....	39
Fuse strength .....	25
Fuse type .....	25
Fuses .....	39

### G

General safety instructions .....	8
-----------------------------------	---

### H

Height .....	16
Hose .....	34

### I

Information for successful wet sieving .....	33
Insert tensioning rod .....	21
Inserting and Clamping the Test Sieves .....	29
Inserting the sieve stack .....	29
Installation .....	18
Installation height .....	19
Installation of the device .....	19
Installation site	
conditions .....	18
Interval .....	32
IP20 control unit .....	16
IP31 Sieve shaker .....	16

### L

Lifting the device .....	20
Loosening the transport lock .....	20
L <sub>pAeq</sub> .....	15

### M

Machine type designation .....	13
Mains connection .....	16
Mains frequency .....	25
Maintenance .....	40
Manual .....	6
Manufacturer's address .....	25
Maximum Load .....	15
Maximum relative humidity .....	18
Maximum volume of material to be sieved .....	15
Minutes .....	31
Moderate or mild injury .....	7

### N

Noise levels .....	15
Noise measurement .....	15
Notes on the manual .....	6
Number of fractions	
maximum .....	16

### O

Operating elements and displays .....	28
Operating the device .....	26

Operating the Device .....	30
Overview Table of the Operating Elements and the Display .....	28
Overview table of the parts of the device .....	27

## **P**

Packaging .....	18
Part number .....	25
Particle size range .....	16
Payload .....	16
Power version .....	25
Preparation for wet sieving .....	34
property damage.....	7

## **R**

Rated power .....	17
Receptacle volume .....	15
Regulations for the place of installation.....	24
Repair .....	11, 40
Replacing fuses .....	39
Replacing the machine fuses .....	39
Required accessories .....	34
Required floor space.....	17
Return device.....	41
Return form.....	40
Returning for repair and maintenance .....	40

## **S**

Safety clearances .....	17
Safety warnings .....	7
Sample quantity maximum.....	16
Securing the tension rods .....	21
Serial number .....	25
serious injury.....	7
Service Address.....	11
Setting the sieve values.....	31
Sieve fluid .....	34
Sieve stack maximum height.....	16
maximum weight .....	16
Sieving aids .....	37
Sieving area.....	13
Signs .....	6
Sound pressure level .....	15
Sound pressure level .....	15
Spray nozzle .....	34

Starting.....	31
Starting, interrupting, stopping.....	31
Stopping (Stand-by function) .....	31
Suspension .....	34
Switching on / off.....	30
Switching On and Off .....	30
Symbols .....	6

## **T**

Talcum powder .....	30
Target group .....	13
Target group .....	10
Technical data.....	13
Temperature fluctuation and condensed water .	18
Test sieve.....	36
cleaning .....	38
drying.....	39
maximum drying temperature .....	39
The transport lock .....	20
Timer .....	31
Timer .....	31
Transport.....	18
Transport aid .....	20
Transportation lock removing.....	19
Type plate .....	24, 25
description .....	25

## **U**

UKCA marking .....	25
Use of the device for the intended purpose .....	13

## **V**

Views of the device .....	26
---------------------------	----

## **W**

Wall mounting and bench arrangement of the control unit.....	23
Wall mounting or bench arrangement of the control panel.....	23
Water drain .....	34
Weight.....	16, 25
Wet sieving .....	33
Wet sieving .....	16
Width .....	16

## **Y**

Year of production.....	25
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# VIBRATORY SIEVE SHAKER

AS 450 basic | 30.029.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
DIN EN 60204-1	Safety of machinery – Electrical equipment of machines

### 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, 08/2024



Dr. Frank Janetta, Head of Development





### **Copyright**

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