Manual

Air Jet Sieving Machine Air Sizer 200

Original

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 Endecotts Limited directly if anything is unclear or you have questions about these guidelines or the device, or in the case of any faults or necessary repairs.

You can find further information about your device at **http://www.endecotts.com** on the pages for the specific device concerned.

Amendment status:
The document amendment 0001 of the "Air Jet Sieving Machine Air Sizer 200" manual has been prepared in accordance with the Directive of Machinery 2006/42/EC and the Supply of Machinery (Safety) Regulations 2008.

1.1 Disclaimer

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

1.2 Copyright

1.3 Explanation of signs and symbols

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

Signs and symbols	Meaning
ⓘ	Indicates a recommendation and/or important information.
Bold type	Indicates an important term.
(A), (B), (C) (1), (2), (3)	The relevant components are labelled with letters or numbers in the instructions for better orientation.
• • •	List of equivalent points.
- - -	List of equivalent points.
1. (…) 2. (…) 3. (…)	Actions in an instruction.
➔	Result of an action.

	The **Endecotts Air Sizer 200 air jet sieving machine** is usually described in the explanations in this Manual as **device**.

1.4 Explanations of the Safety Instructions

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

DANGER D1.0000

Risk of fatal injuries
Source of danger

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

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

WARNING W1.0000

Risk of life-threatening or serious injuries
Source of danger

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

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

CAUTION C1.0000

Risk of injuries
Source of danger

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

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

NOTICE N1.0000

Type of damage to property
Source of the damage to property

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

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

2 Safety

⚠ CAUTION

C2.0002

Risk of injury
Lack of knowledge of the manual

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

Target group:
The Air Jet Sieving Machine Air Sizer 200 is intended for use in the preparation of samples in a laboratory environment. This Manual is therefore directed at those working with this device in such an environment, who already have experience using similar equipment.

This device is a modern, efficient, cutting-edge product from Endecotts Limited. If used correctly and with knowledge of this technical documentation, it can be operated safely.

2.1 Use of the Device for the Intended Purpose

This Air Jet Sieving Machine of the Endecotts Limited is a laboratory device. It is suitable for dry sieving and particle size determination of powdered, dry, pourable and dispersed bulk materials in the particle size range from 20 µm to 4 mm.

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

As a laboratory device, the Air Jet Sieving Machine Air Sizer 200 may only be used to prepare samples. The Air Jet Sieving Machine Air Sizer 200 is not a production machine. The laboratory device has been designed for an 8-hour, single shift operation at 30 % duty cycle.

The operating company and operating staff must have read the Manual and be familiar with the entire functional scope of the device.

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

The sieving machines of Endecotts Limited are 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 Air Sizer 200 is specially designed for test sieves with an outer diameter of 200 mm or 8″. For an optimum measurement result it is recommended to exclusively use test sieves from Endecotts Limited.

2.2 Improper use

The device may only be used as intended.

Uses other than those described under intended use are deemed to be improper.

The Air Sizer 200 is **not** suitable for wet sieving.

The Air Sizer 200 is **not** suitable for sieving sample materials that can form explosive air mixtures.

Damage claims in any form for damage to property and personal injuries that result from improper use and/or the failure to follow the safety information shall be ruled out.

2.3 Obligations of the operating company

2.3.1 Provisions

The user bears responsibility for ensuring that people working with the device and the corresponding equipment have taken note of and understood all relevant safety regulations.

2.3.2 Personnel

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

2.3.3 Workstation and device

- Place the device on a vibration-free, plane, stable and clear surface
- All signs on the device must be maintained in a legible state.
- Ensure that all checks and maintenance work prescribed in this Manual are carried out.

2.3.4 Qualification of personnel

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

2.3.5 Personal protective equipment (PPE)

Work/operating phase	Personal protective equipment (PPE)
• Transport • Installation	• Safety shoes
• Putting into service • Installing additional equipment • Maintenance	• No PPE required
• Disposal	• Safety shoes
• Normal operation (operation and control)	• No PPE required

2.4 Structural modifications and repairs

⚠ CAUTION C3.0015

Risk of injury
Improper modifications to the device

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

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

In case of repair, please inform…
…the Endecotts Limited representative in your country,
…your supplier, or
…Endecotts Limited directly.

Service address:

Distributors affix alternative address/
contact details here

2.5 Safety equipment

Emergency stop switch

The device is not fitted with a pre-installed emergency stop switch. In an emergency, the device must be switched off by pressing the main switch or by disconnecting the device from the power supply.

2.6 Emergencies

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

2.6.1 Switching the device off in an emergency

Perform the following steps if there is a fault or unexpected interruption to operation:

1. Switch the device off by the main switch on the back of the device and disconnect it from the power supply.
2. Have the fault rectified.

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

➔ Fault has been rectified.

1. Connect the device to the power supply again
2. Switch the device on by the main switch on the back of the device.

2.7 Preventing risks during normal operation

Disregarding the following safety instructions constitutes improper and represents a risk to personnel and a risk to operational reliability.

Transport and installation

- Wear safety shoes when transporting and installing the device.
- Only connect the device to sockets with protective earth conductor (PE).
- When connecting the device, the values on the type plate must correspond to those for the power connection.

Operation

- Read the Manual before putting the device into service.
- Only operate the device where it can stand securely on a sufficiently large workstation.
- Check the mains lead for damage before operation.
- Never operate the device if damage is visible or suspected.
- Only operate the device in line with the technical application limits.
- Do not wear loose items of clothing and tie long hair back when operating the device.
- Prepare for limited communication while operating the device.
- Do not operate the device in potentially explosive atmospheres.
- Take note of the safety data sheets for samples and follow instructions by taking appropriate action in advance.
- Do not sieve any explosive and/or flammable materials.
- Do not sieve any materials which can become explosive and/or flammable during sieving.
- Be aware of surroundings during sieving because background noise makes it difficult to discern acoustic signals.

Maintenance and repair

- Switch the device off by the main switch before maintenance work.
- Do not clean the device with running water.
- Do not clean the device with compressed air.
- Have all repairs to the device carried out by the device manufacturer or an authorised representative.

2.8 Avoiding damage to property

- Increase or decrease the speed slowly to avoid damage to mechanical components.
- Observe the specifications for the maximum load of the machine.
- Handle test sieves with care.
- When filling the sieve, adhere to the specified maximum feed quantities and feed sizes. Too large a filling quantity or task size can damage the sieve and lead to a falsification of the result.
- Use a damp cloth for cleaning.
- Do not use any solvent or aggressive cleaning agent when cleaning.
- Only use original spare parts for servicing.
- Clean the sieves after each use to avoid corrosion of the sieve.

2.9 Confirmation Form for the Managing Operator

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

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

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

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

User
Surname, first name (block letters)
Position in the company
Place, date and signature

Managing operator or service technician
Surname, first name (block letters)
Position in the company
Place, date and signature

3 Air Jet Sieving Machine Air Sizer 200

The Air Sizer 200 from Endecotts Limited is a laboratory device used to sieve samples.

The device is suitable for dry sieving and particle size determination in the particle size range from 20 µm to 4 mm.

Due to the effective sieving process the Air Sizer 200 guarantees gentle sieving of samples for analysis in a very short time.

Fig. 1: The Air Jet Sieving Machine Air Sizer 200

3.1 Principle of Operation

With the Air Jet Sieving Machine Air Sizer 200 only one single test sieve is used per sieving process. The test sieve itself does not move during the sieving process. The movement of the sample material on the sieve mesh fabric is achieved by a rotating air jet.

An industrial vacuum cleaner connected to the Air Sizer 200 generates a negative pressure in the nozzle chamber by sucking ambient air through a silencer. The air jet generated this way exits the rotating slotted nozzle at high speed and disperses the resting sample material from below through the sieve mesh fabric. Above the sieve mesh fabric, the air jet is distributed over the entire surface of the test sieve and is drawn off through the sieve mesh fabric at low speed. The fine fraction of the sample material is transported through the sieve meshes and extracted with the industrial vacuum cleaner. A cyclone accessory is available for the Air Sizer 200 as an optional extra, to allow for recovery of undersized particles.

NOTICE

N2.0007

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.**

3.2 Technical data

General information	
Applications	For dry sieving
Area of application	Agriculture, biology, chemicals, plastics, building materials, engineering, electrical engineering, environment, foodstuffs, geology, metallurgy, glass, ceramics, medicine, pharmaceuticals
Feed material	Hard, medium-hard, soft, brittle, elastic, fibrous

Specifications	
Drive / sieving motion	Dispersion by air jet
Suitable for dry sieving	Yes
Suitable for wet sieving	No
Operation	Control panel
Interval operation	No
Range	20 µm to 4 mm
Max. sample quantity	100 g (depending on material and mesh)
Max. payload	1 sieve plus sample
Max. sieve stack height	1 sieve half height (25 mm) Or 1 sieve full height (50 mm)
Suitable sieve diameter	200 mm or 8″
Model	Bench top
Time setting	Digital, 0:10 – 99:50 min
Dimensions W x H x D	450 x 235 x 435 mm
Required floor space (W x D)	500 mm x 500 mm
Weight (without sieve stack and clamping device)	16 kg
Conformity	CE, UKCA

Electrical specifications	
Power connection	100-240 V, 50/60 Hz, 1-phase
Power consumption	~60 VA Connected with vacuum cleaner: ~1400 VA
Speed (nozzle speed)	5 – 55 rpm
Vacuum	0 – 99 mbar
Degree of protection	IP40
Electromagnetic compatibility (EMC)	EMC class B according to DIN EN 55011 and IEC CISPR 11. Strong electromagnetic interference fields, such as high-power radio transmitters, can have an adverse influence on the amplitude control of the Air Sizer 200. Once the source of the interference is eliminated, the Air Sizer 200 will return to normal operation by itself.

3.3 Receptacle Volume

The maximum volume of material depends on various factors such as number and aperture size of the test sieves, maximum particle size and width of distribution of the sample material.

Nominal width of aperture (200 mm diameter)	Recommended sample volume according to ISO 2591-1	Max. volume of sample residue after the completion of sieving according to ISO 2591-1
22.4 mm	1600 cm^3	800 cm^3
16 mm	1000 cm^3	500 cm^3
11.2 mm	800 cm^3	400 cm^3
8 mm	500 cm^3	250 cm^3
5.6 mm	400 cm^3	200 cm^3
4 mm	350 cm^3	175 cm^3
2.8 mm	240 cm^3	120 cm^3
2 mm	200 cm^3	100 cm^3
1.4 mm	160 cm^3	80 cm^3
1 mm	140 cm^3	70 cm^3
710 µm	120 cm^3	60 cm^3
500 µm	100 cm^3	50 cm^3
355 µm	80 cm^3	40 cm^3
250 µm	70 cm^3	35 cm^3
180 µm	60 cm^3	30 cm^3
125 µm	50 cm^3	25 cm^3
90 µm	42 cm^3	21 cm^3
63 µm	35 cm^3	17 cm^3
45 µm	30 cm^3	15 cm^3
32 µm	26 cm^3	13 cm^3
25 µm	22 cm^3	11 cm^3

3.4 Feed Particle 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 particle size depends on the sample material, the number and aperture size of the test sieves and the type of the sieving machine.

Nominal of aperture (200 mm diameter)	Approx. size of largest particle
25 mm	95 mm
4 mm	26 mm
1 mm	10 mm
250 µm	3.8 mm
45 µm	1.2 mm

3.5 Emissions

⚠ CAUTION C4.0050

Risk of injury from overhearing acoustic signals
Loud suction noises

- Loud suction noises may cause acoustic warning signals to be overheard and this could result in injuries to occur.
- **When designing acoustic signals in the work environment, it is necessary to take the volume of the intake noises into account.**
- **If necessary, please use additional visual signals.**

⚠ CAUTION C5.0046

Risk of hearing damage
High sound level

- High sound levels can occur due to suction noise at the suction opening. Excessive sound, in strength and duration, can cause impairment or permanent damage to hearing.
- **Provide suitable sound protection measures.**
- **Wear hearing protection in the event of any high or continuous sound levels.**

Sound parameters:
The Air Sizer 200 itself causes, due to its construction, almost no significant noise emission.

The sound parameters of the connected industrial vacuum cleaner depend on the set suction power.

Example	
Industrial vacuum cleaner:	Nilfisk GM80
Suction level:	2

At these operating conditions, the workplace related equivalent continuous sound level L_{eq} = 72 dB(A).

3.6 Views of the device

3.6.1 Front

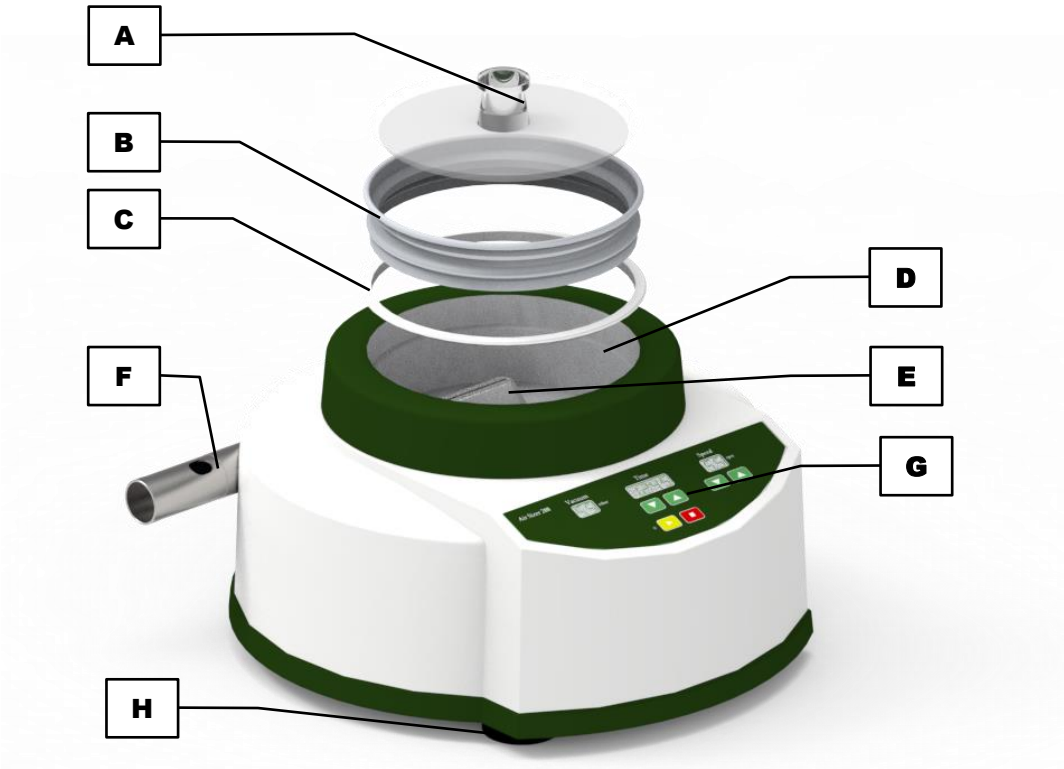


Fig. 2: Front view of the device with accessories

Element	Description	Function
A	Lid	Plexiglas lid for air jet sieving.
B	Sieve	For the dispersion of the sample through the sieve mesh.
C	Adapter ring	For the correct positioning of the sieve.
D	Nozzle chamber	Directs the fine fraction to the air outlet duct.
E	Nozzle	Directs the air jet below through the test sieve.
F	Air outlet channel	Connection for the external industrial vacuum cleaner, allows for the manual regulation of the negative pressure.
G	Control panel	Setting sieving parameters.
H	Anti-vibration feet	To dampen vibrations (oscillations), shocks and contributes to noise reduction.

3.6.2 Back

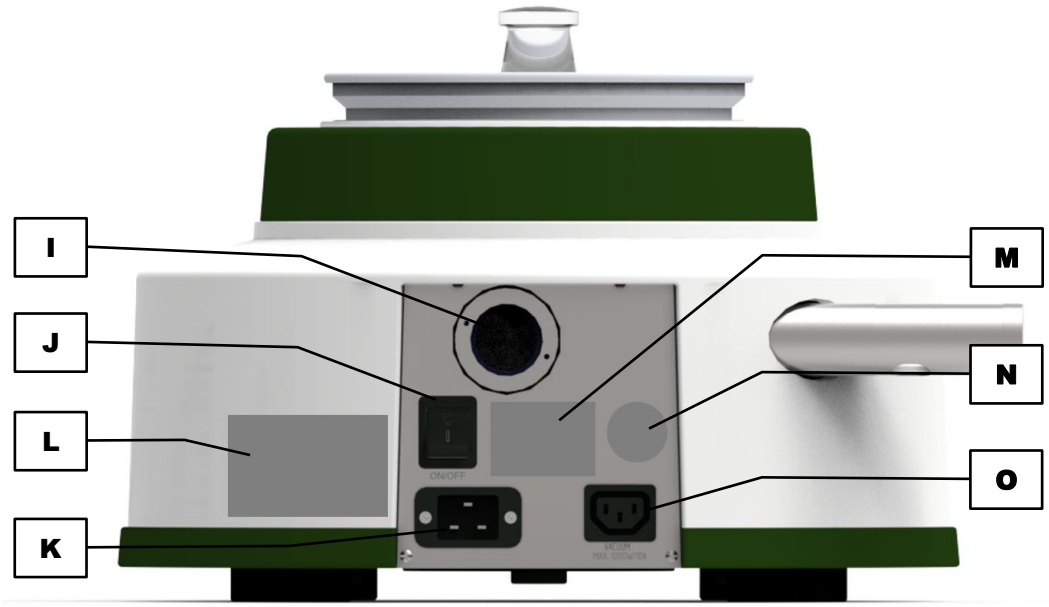


Fig. 3: Back view of the device

Element	Description	Function
I	Air inlet channel	Opening for air inlet. Include a silencer for noise reduction.
J	Mains switch	Switches the device on and off, disconnects the device from the mains
K	Mains connection	Connection for the power cable
L	Type plate	Lists, among others, the voltage type, the serial number and the type of the device
M	Power warning	Caution – Beware of electric shock! The housing of the device may only be opened by trained personnel. Pull the power plug before opening.
N	Read operating manual carefully	Safety notice: The operating manual of the device must be read carefully before commissioning and operation.
O	IEC power connection	Connection for the external industrial vacuum cleaner.

3.7 Operating Controls, Displays and Functions

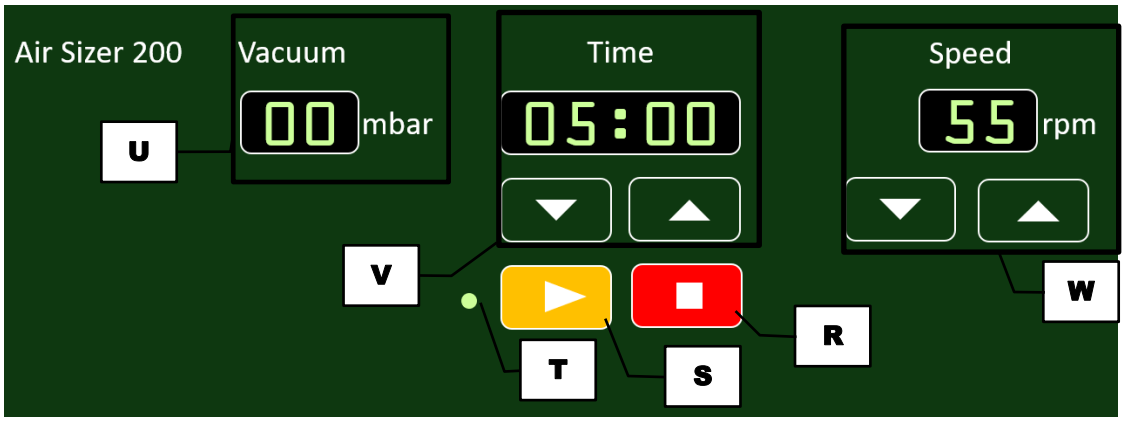


Fig. 4: Operating controls and functions

Element	Description	Function
R	Stop	Stops the sieving process.
S	Start	Starts the sieving process.
T	L.E.D.	Indicates Start button is on.
U	Vacuum pressure	The display shows the negative pressure in the range from 0 to 99 mbar.
V	Time setting	Reduces or extends the sieving time by pressing the "▲" or "▼" button, respectively in the range of 0:10 – 99:50 min
W	Speed setting	Reduces or extends the speed by pressing the "▲" or "▼" button, respectively in the range of 5 – 55 rpm.

3.8 Description of the type plate

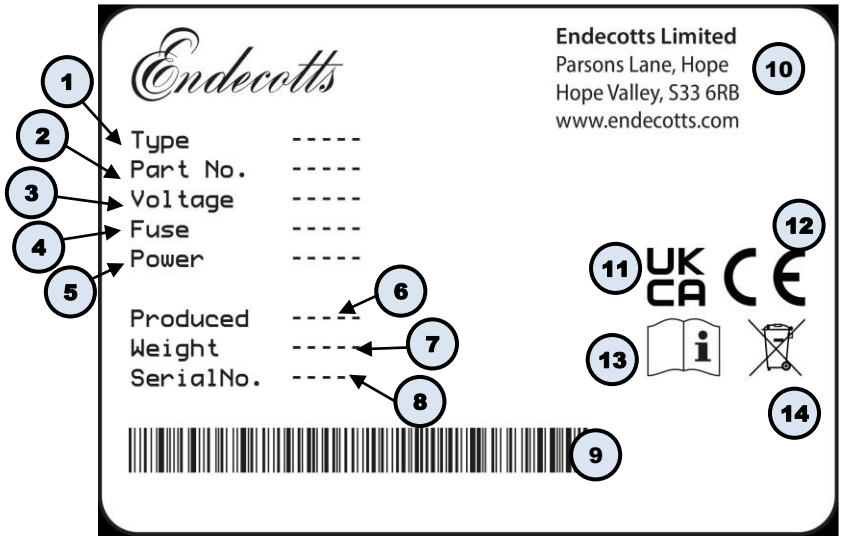


Fig. 5: Type plate

1 Device designation
2 Part number
3 Power version, Mains frequency
4 Fuse type and fuse strength
5 Capacity, Amperage
6 Year of production
7 Weight
8 Serial number
9 Bar code
10 Manufacturer's address
11 UKCA marking
12 CE marking
13 Safety warning: Read the manual
14 Disposal label

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

4 Packaging, Transport and Installation

4.1 Accessories included with delivery

Air Sizer 200 (item number dependent on voltage selected)
Item No: AS200/100-240

Adaptor ring 200mm
Item No: ZMAIR-RIN1

Plexiglas lid 200mm
Item No: ZMAIR-LID2

Plexiglas lid 8”
Item No: ZMAIR-LID5

Soft-faced mallet
Item No: ZMAIR-MAL1

4.2 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.**

4.3 Transport

CAUTION C6.0000

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

- Due to its weight, the device can cause injuries if it falls down.
- **Do not transport the device by yourself.**

CAUTION C7.0000

Risk of injury caused by the device falling
Incorrect transport of the device

- Due to its weight, the device can cause injuries if it falls.
- **Wear safety shoes during 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 Endecotts Limited 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 Endecotts Limited within 24 hours.**

4.4 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:
In case of an interim storage the device must be stored dry and within the specified ambient temperature range.

4.5 Conditions for the Installation Site

CAUTION C8.0047

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

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

NOTICE N7.0021

Ambient temperature
Temperatures outside the permitted range

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

NOTICE N8.0004

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.**

- Installation height: max. 2 000 m above sea level
- Ambient temperature: 5 °C – 40 °C
- Width of the base: 500 mm
- Depth of the base: 500 mm
- No safety clearances required

Location requirements:
The device must be placed on a vibration-free, plane, stable and clear 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.

- Maximum relative humidity < 80 % (at ambient temperatures ≤ 31 °C)

For ambient temperatures U_T between 31 °C and 40 °C, the maximum relative humidity value L_F linearly decreases according to $L_F = -(U_T - 55) / 0.3$:

Ambient temperature	Max. rel. humidity
≤ 31 °C	80 %
33 °C	73.3 %
35 °C	66.7 %
37 °C	60 %
39 °C	53.3 %
40 °C	50 %

NOTICE

N9.0015

Humidity
High relative humidity

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

4.6 Installation of the Device

⚠ WARNING W2.0005

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 N10.0051

Suction of objects
Suction opening of the silencer

- Smaller objects can be sucked into the interior of the device.

• **Make sure that no objects are placed near the suction opening.**

To generate the necessary negative pressure in the nozzle chamber, the Air Sizer 200 sucks the required air through the air inlet channel (**I**) during operation.
Make sure that the suction opening of the air inlet channel is always kept clear and that the air can be sucked in unhindered!

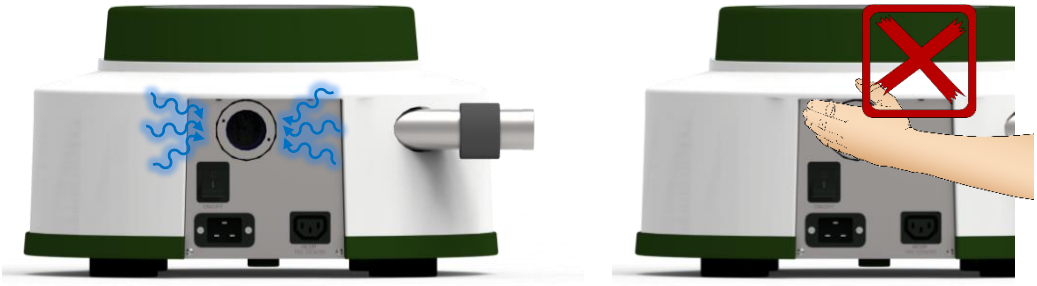


Fig. 6: Installation of the device: keep the suction opening clear!

5 First Commissioning

Before first commissioning an industrial vacuum cleaner must be connected and the slider of the air outlet channel must be adjusted. Subsequently, the adapter ring and the desired test sieve with the appropriate lid can be inserted

The Air Sizer 200 is suitable for test sieves of 200 mm and 203 mm (8″) outer diameter.

NOTICE Only one half height (25 mm) or one full height (50 mm) test sieve must be inserted. More sieves prevent the device from working correctly. A large amount of sample can significantly increase the load on the sieve mesh fabric.

5.1 Electrical Connection

⚠ WARNING W3.0015

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

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

⚠ WARNING 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 a damaged power cable or plug!**

NOTICE N11.0022

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.

The Air Sizer 200 must be connected to the power supply on site for initial commissioning.

Ensure the following before connecting the device to the power supply:

- The application site complies with the installation requirements.
- The device is securely and firmly in place.
- The power values for the device (type plate) correspond to the values of the power supply at the site.

5.2 Connecting the device to the power supply

Connect the device to the power supply as described below:

1. Compare the voltage and frequency on the type plate (**L**) of the device to the values on site.
2. Plug the supplied mains lead into the mains connection (**K**).
3. Plug the other end of the mains lead into a socket at the installation site.
4. Provide external fusing according to the regulations at the installation site.

Fig. 7: Connecting to the power supply

Element	Description
K	Mains connection
L	Type plate

5.3 Manual Vacuum Regulation

The air outlet channel (**F**) has an opening (**FB**) through which air is sucked in. The size of the opening can be varied by means of a slider (**FA**). This allows to adjust the desired negative pressure in the nozzle chamber (**D**).

When the opening is closed (**1**), the airflow from the nozzle (**E**) and thus also the negative pressure in the nozzle chamber is at maximum. With the opening at maximum (**3**), the airflow from the nozzle and thus the negative pressure in the nozzle chamber is at a minimum.

In between, the negative pressure can be infinitely adjusted by means of the slider (**G1**).

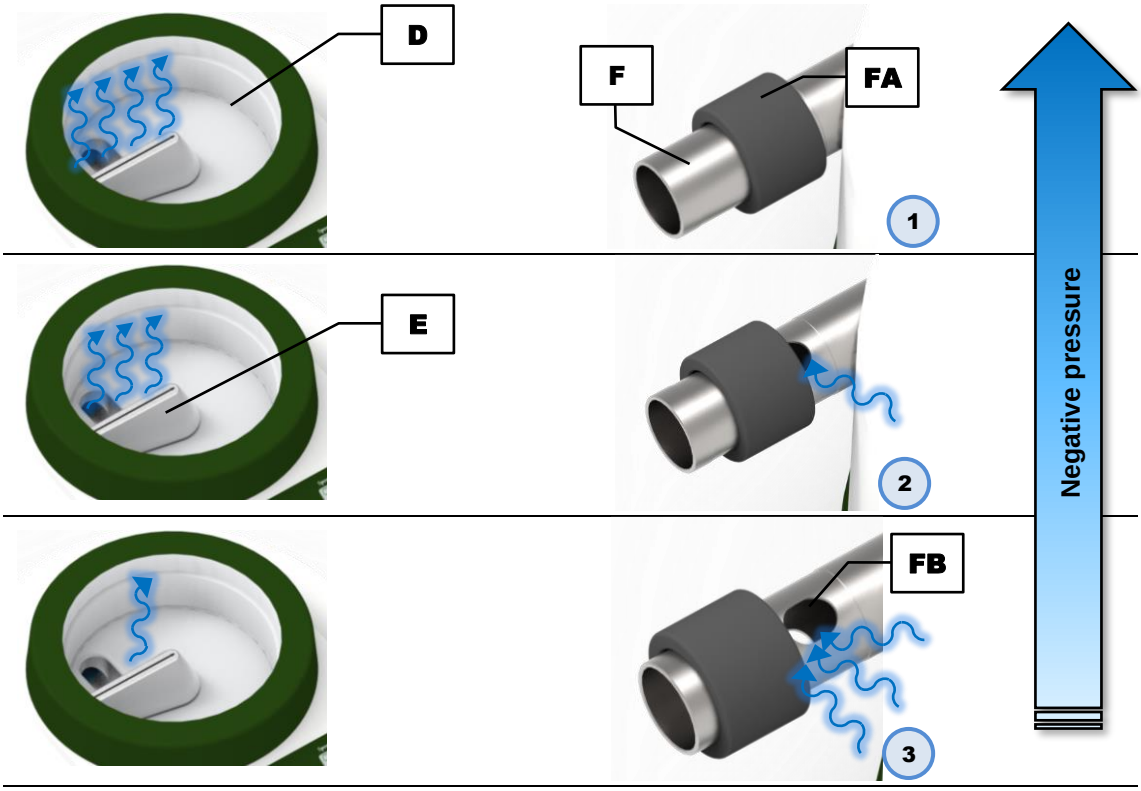


Fig. 8: Setting the manual vacuum regulation

The current negative pressure, i.e. the differential pressure between the air inlet and the air outlet is displayed in the operating control (**H**).

Element	Description
D	Nozzle chamber
E	Nozzle
F	Air outlet channel
FA	Slider
FB	Air outlet channel opening

5.4 Connecting an Industrial Vacuum Cleaner

WARNING W5.0017

Danger to life through electric shock
IEC power connection for external industrial vacuum cleaner

- When the device is switched on, there is a risk of an electric shock when touching the IEC power connection for the external industrial vacuum cleaner.
- An electric shock can cause burns, cardiac arrhythmia, respiratory arrest, as well as cardiac arrest.

- **Switch off the device before connecting the external industrial vacuum cleaner.**

CAUTION C9.0049

Risk of injury caused by the ejection of liquid or particles
Sieve stack has not been tightly clamped or sieve lid is missing or damaged

- If the device is operated with a sieve stack that has not been tightly clamped or with a faulty sieve lid or a missing or faulty inspection glass, liquids or particles may be ejected and cause injuries.

- **Only start the device with a sieve stack that has been tightly and securely clamped.**
- **Never use a sieve lid with faulty or missing inspection glass.**
- **Always use undamaged Retsch sieves with seals that are intact.**

CAUTION C10.0026

Risk of explosion or fire
Mixing different sample materials

- Unwanted chemical reactions can occur when analysing different sample materials one after the other, and these reactions can lead to fire or explosions and thus to injuries.

- **Do not analyse any sample materials in this device whose chemical reactivity can be increased through contact with a previously analysed substance.**
- **If in doubt clean the device and the industrial vacuum cleaner (also changing the vacuum cleaner bag and filter) before analysing another sample material.**
- **Take note of the safety data sheets for the sample materials.**

The Air Sizer 200 can only be operated with a suction device such as an industrial vacuum cleaner. A suitable industrial vacuum cleaner is available as an optional accessory from Endecotts Limited.

CAUTION Before commissioning the industrial vacuum cleaner, read the corresponding separate manual.

The industrial vacuum cleaner must be connected to the air outlet channel (**E**), described as follows.

1. Connect the suction pipe (**FC**) of the industrial vacuum cleaner to the air outlet channel (**F**).
2. Insert the mains plug (IEC C14) of the industrial vacuum cleaner into the IEC power connection (**O**) on the backside of the device.
3. Switch on the industrial vacuum cleaner.

ⓘ The industrial vacuum cleaner is supplied with power by the device and switched on automatically via software control at the beginning of the sieving process.

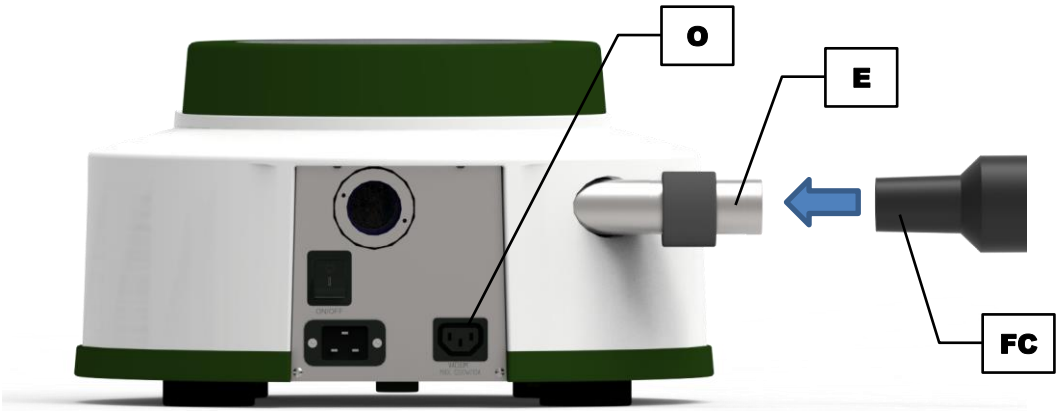


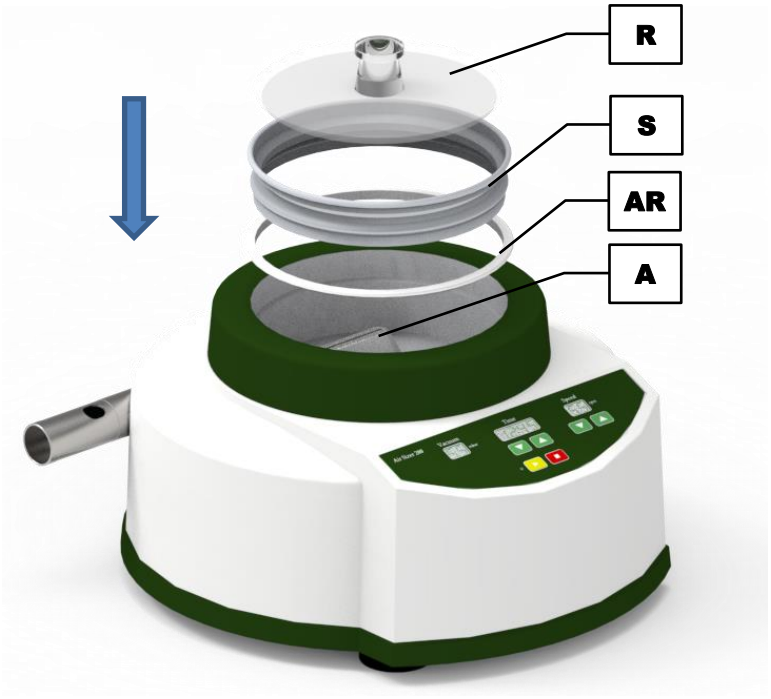
Fig. 9: Connecting the industrial vacuum cleaner to the air outlet channel

ⓘ The industrial vacuum cleaner connected to the IEC power connection (**O**) can also be used to clean the device. For that purpose, the industrial vacuum cleaner can be switched on manually via the control unit.

Element	Description
E	Air outlet channel
FC	Suction pipe
O	Power connection

5.5 Inserting the Test Sieve

The Air Sizer 200 is designed for test sieves with an outer diameter of 200 mm or 8" (203 mm) and a height of 50 mm (2") or 25 mm (1"). Test sieves (200 mm) must be used in combination with an adapter ring (**AR**).



⇨ Place the adapter ring (**AR**) and the desired test sieve (**S**) on the nozzle chamber (**A**).
⇨ Place the sample material on the test sieve.
⇨ Close the test sieve with the sieve lid (**R**).

NOTICE Only with a suitable combination of adapter ring, test sieve and sieve lid, the required negative pressure can be built up in the nozzle chamber and thus the sieving process can be started.

5.5.1 Sieve Lids

For the test sieves two different types of the sieve lid are available. These differ in their diameter and must be chosen to match the test sieve used.

⇨ Pay attention to the appropriate labelling on the sieve lids:

Label	Outer diameter	Sieve height	Adapter ring for sieve
8 inch x 2 inch (50 mm)	203 mm (8")	25 mm (1") 50 mm (2")	Not needed
200 mm x 50 mm	200 mm	25 mm (1") 50 mm (2")	Yes

6 Operating the Device

⚠ WARNING W6.0002

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 a damaged power cable or plug!**

⚠ CAUTION C11.0005

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 C12.0006

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 C13.0003

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.**

NOTICE N12.0000

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 of these substances in accordance with the applicable regulations.**

6.1 Switching On / Off

Switch the device on as described below:

1. Make sure the device is connected to the mains power.
2. Turn on the device with the mains switch (**J**) on the back side of the device.

➔ The device is then ready for use.

Switch the device off as described below:

1. Switch the device off by the mains switch (**J**) on the back of the device.

➔ The device is switched off.

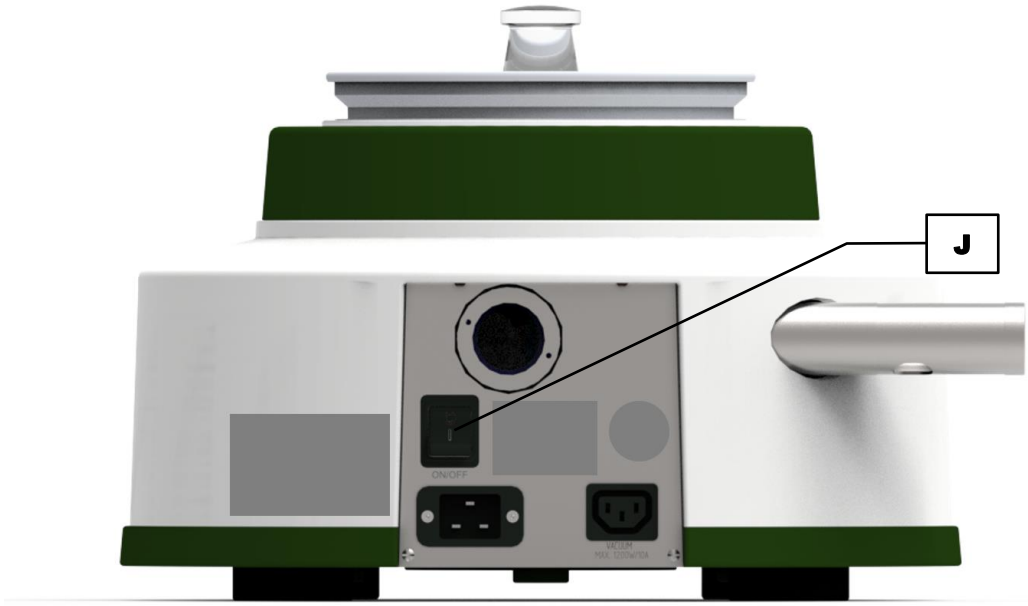


Fig. 10: mains switch

Element	Description
J	Mains switch

6.2 Selection of the Test Sieves

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

6.3 Performing a Test Sieving Operation

Performing of a Test Sieving Operation as described below:

1. Determine the empty weights of the test sieve.
2. Put the sample on the test sieve and weigh it. Make sure not to exceed the maximum feed quantity.
3. Place the sieve lid on the test sieve and weigh it (determine the empty weight of the sieve lid).
4. Place the sieve with sample and lid on the device.

	Each 200 mm / 8" stainless steel test sieve is provided with an O-ring, which serves as a seal to build up the required negative pressure during the sieving.

5. Connect the industrial vacuum cleaner with the device.
6. Set the sieving parameters.
7. Start the sieving process.
8. After the end of the sieving process, weigh the test sieve including sieve lid and the particle size fraction present therein.
9. Determine the mass of the particle size fraction (weight after the sieving minus the empty weight of the test sieve and sieve lid).

6.3.1 Soft-faced Mallet

To remove deposits of sample material from the bottom side of the sieve lid during the sieving process, the soft-faced mallet included in the delivery can be used.
Lightly tap on the sieve lid (**A**) with the soft-faced mallet (**AA**).

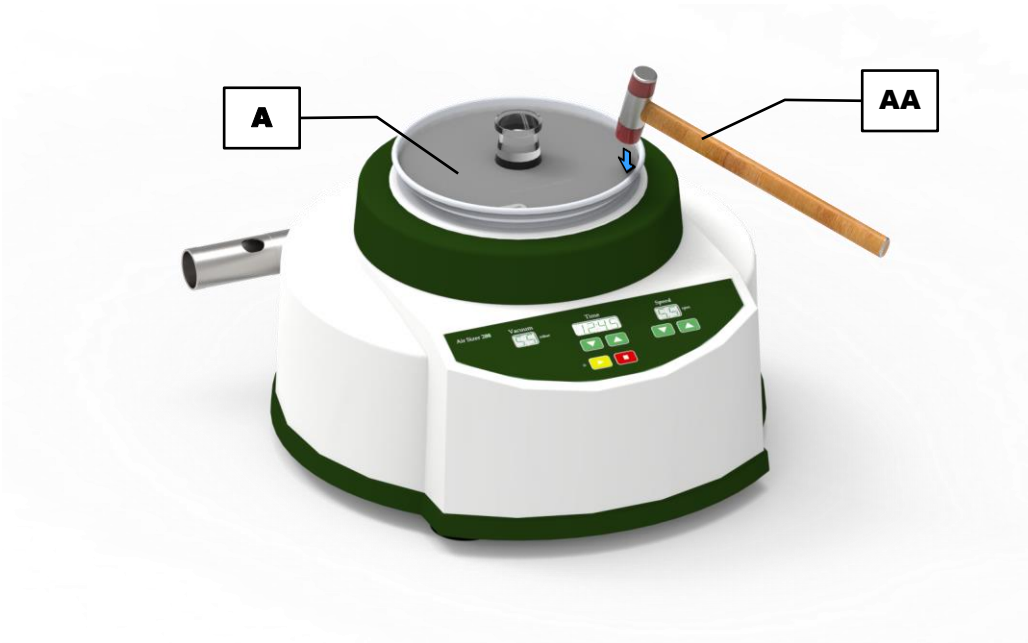


Fig. 11: Using the soft-faced mallet

7 Controlling the Device

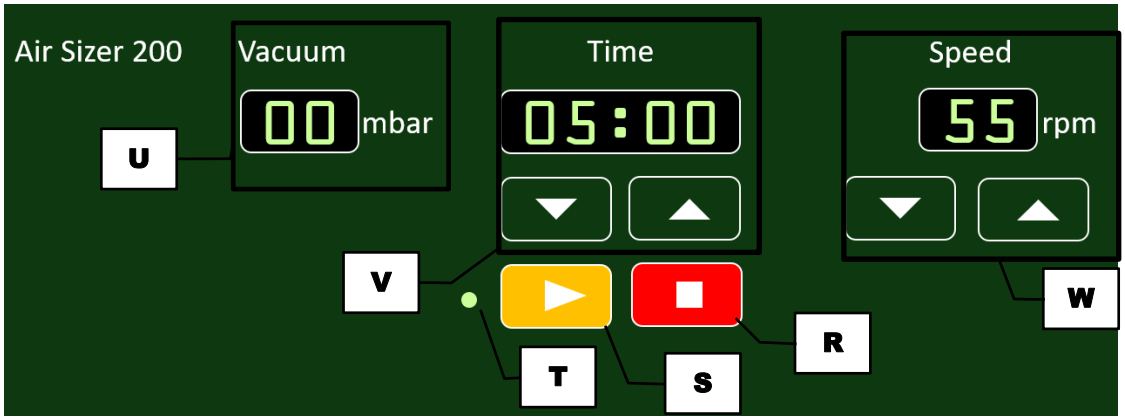


Fig. 12: Operating controls and functions

Element	Description
R	Stop
S	Start
T	L.E.D.
U	Vacuum pressure
V	Time setting
W	Speed setting

7.1.1 Start Process

Start the sieving process as described below:

1. Make sure the device is connected to mains power and the industrial vacuum cleaner.
2. Set the sieving time and speed.
3. Press the ▶ button (**S**).
4. The sieving process ends when the timer is up.

➔ The green L.E.D. (**T**) lights up and the sieving process is started. If a process time has been set beforehand, the time in the display "time" (**V**) starts to count down by pressing the ▶ button.

During the manual sieving process, the sieving time and/or the speed can be modified. If a manual vacuum regulation is used, the negative pressure can also be changed during operation.

NOTICE Without the sieve lid (**A**) on, no negative pressure can be built up and thus no sieving process can be carried out.

7.1.2 Stop Process

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

1. Press the  button (**R**) to stop the sieving process.

➔ The sieving process stops and the green L.E.D. (**T**) of the  button (**S**) turns off.

7.1.3 Speed

The device can be operated with speed setting between 5 and 55 rpm. When the device is switched on, the last used setting is displayed.

Set the speed as described below:

1. Press the "▲" or "▼" button of the speed display (**W**) to set the desired speed.
2. Hold the "▲" or "▼" button (**W**) to extend or reduce the speed setting in steps of 5 rpm, respectively.

The speed setting can also be changed during operation by pressing the "▲" or "▼" button.

7.2 Time

The device can be operated for a certain time between 0:10 and 99:50 minutes. When the device is switched on, the last used setting is displayed.

Set the time as described below:

1. Press the "▲" or "▼" button of the time display (**V**) to set the desired process time.
2. Hold the "▲" or "▼" button (**V**) to extend or reduce the process time in steps of 0:10 minutes, respectively.

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

8 Error Messages and Information Notes

8.1 Error Messages

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

Error code	Description	Measures
E11	Failure drive / motor	⇨ Switch off the main switch and wait for 30 s before switching on again. ⇨ If the error persists, contact service.
E83	Negative pressure too low	⇨ Confirm the message on the control panel. ⇨ Check whether the industrial vacuum cleaner is correctly connected and generates sufficient negative pressure. ⇨ Check if the vacuum cleaner bag is full. ⇨ Check that the sieve lid is correctly positioned on the test sieve. ⇨ If the error persists, contact service.
E84	Negative pressure drop	⇨ Confirm the message on the control panel. ⇨ Check whether the industrial vacuum cleaner is correctly connected and generates sufficient negative pressure. ⇨ Check if the vacuum cleaner bag is full. ⇨ Check that the sieve lid is correctly positioned on the test sieve. ⇨ If the error persists, contact service.

9 Cleaning, Wear and Maintenance

This chapter contains descriptions on cleaning and servicing the device.

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

CAUTION C14.0013

Risk of injury
Improper repairs

- Unauthorised and improper repairs can cause injuries.
- **Repairs to the device may only be carried out by Endecotts Limited , an authorised representative or by qualified service technicians.**
- **Do not carry out any unauthorised or improper repairs to the device!**

CAUTION C15.0015

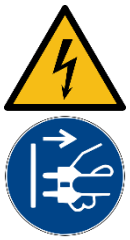
Risk of injury
Improper modifications to the device

- 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 Endecotts Limited!**

9.1 Cleaning

WARNING W7.0003

Risk to life caused by an electric shock
Cleaning live parts with water



- Cleaning the device with water can lead to life-threatening injuries caused by an electric shock if the device has not been disconnected from the power supply.
- **Only carry out cleaning work on the device when it has been disconnected from the power supply.**
- **Use a cloth moistened with water for cleaning.**
- **Do not clean the device under running water!**

CAUTION C16.0031

Risk of injury
Cleaning with compressed air

- When using compressed air for cleaning purposes dust and remnant of the sample material can be flung around and injure eyes.
- **Always wear safety glasses when cleaning with compressed air.**
- **Observe the material safety data sheets of the sample material.**

NOTICE

N13.0009

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.**

9.1.1 Cleaning the outside of the device

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

Clean the nozzle chamber and the air outlet channel with a paint brush and vacuum the loosened material residues with the industrial vacuum cleaner. Alternatively, the nozzle chamber can also be cleaned with compressed air.

If necessary, exchange the vacuum cleaner bag or empty the collecting container of the industrial vacuum cleaner. Check the degree of contamination of the vacuum cleaner filters at regular intervals and replace them if necessary.

9.1.2 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 trapped particles can often be 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.

9.1.2.1 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).

9.1.2.2 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 a cleaning agent, water together with a standard surfactant is recommended. Cleaning in the ultrasonic bath usually takes two to three minutes. After that, the test sieves should be thoroughly rinsed with water and dried. Cleaning with strong bases or acids is generally not recommended.

9.1.2.3 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 can be found on the Endecotts Limited homepage (http://www.endecotts.com) as can the free expert guide - *Test Sieving Manual – A guidance to the terminology and general information for test sieves and equipment for particle analysis*.

NOTICE N14.0028

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!**

9.2 Wear

CAUTION C17.0013

Risk of injury
Improper repairs

- Unauthorised and improper repairs can cause injuries.
- **Repairs to the device may only be carried out by Endecotts Limited , an authorised representative or by qualified service technicians.**
- **Do not carry out any unauthorised or improper repairs to the device!**

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.

9.3 Maintenance

The device is maintenance-free if cleaned regularly.

9.4 Returning for repair and maintenance

Fig. 13: Return form

The acceptance of devices and accessories of Endecotts Limited for repair, maintenance or calibration can only be effected, if the return form and the decontamination declaration service has been correctly and fully completed.
Download the return form located in the download section "Miscellaneous" on the Endecotts Limited homepage (https://www.endecotts.com/downloads/miscellaneous/).
When returning a device, attach the return form and the decontamination declaration form to the outside of the packaging.

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

10 Accessories

Information on available accessories as well as the respective manuals are accessible directly on the Endecotts Limited homepage (http://www.endecotts.com) under the heading "Downloads" of the device.

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

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

10.1 Test Sieves

Critical for the accuracy and reliability of the measurement result is, in addition to the reproducible operating sieving machine the quality of the test sieve. Test sieves of Endecotts Limited are high quality measuring instruments for which only mesh fabrics and perforated sheets of the corresponding standards are used. Each test sieve is given a serial number, as well as a quality certificate after the final check.

Fig. 14: Test sieves

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

- available standards: DIN, ISO, ASTM, BS, NF
- available diameters: 3" / 100 mm / 200 mm / 8" (203 mm) / 300 mm / 12" (305 mm) / 400 mm / 450 mm / 18"
- available sieve surfaces: sieve mesh fabric (20 µm to 125 mm) and perforated screens (round 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 series.

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

10.1.1 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.

10.1.2 Calibration and Inspection Service

As a special service Endecotts Limited offers the calibration and inspection of test sieves, documenting the measurement results in tabular and graphical form, hence representing a certificate with more detailed statistics. All relevant information is recorded during the standard measuring process of the test sieve and confirmed in the required certificate.

10.2 Sieving Aids

NOTICE N15.0027

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 Endecotts Limited 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 on 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 during the wet sieving operation.

11 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 United Kingdom and European Community are given.

Within the United Kingdom the disposal of electronic equipment is legislated by The Waste Electrical and Electronic Equipment Regulations 2013.

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, in both United Kingdom and the European Community, 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.

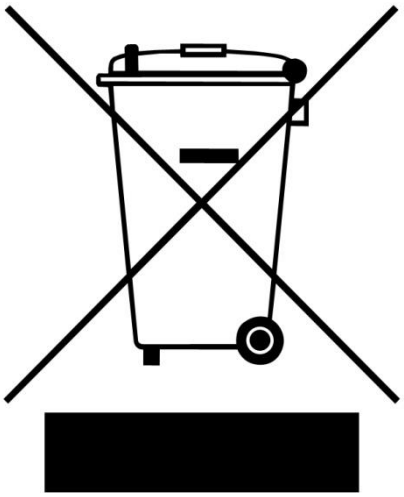


Fig. 15: Disposal label

Since the disposal regulations worldwide and within the EU may differ from country to country, the supplier of the device should be consulted directly in case of need.

As per the above United Kingdom and European Community regulations, 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 solely responsible for the proper disposal.

12 Index

Y

EU Declaration of Conformity

Original

AIR JET SIEVING MACHINE

Air Sizer 200 | AirS200/***

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), Haan (Germany)

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 Endecotts Ltd, as well as the use of non-approved spare parts or accessories, this declaration loses its validity.

Endecotts Ltd

Hope, 12/2023

Adriaan Stander, Managing Director

CE

UKCA Declaration of Conformity

Original

AIR JET SIEVING MACHINE

Air Sizer 200 | AirS200/***

UKCA DECLARATION OF CONFORMITY

Herewith we declare, represented by the signatory, that the above mentioned device complies with the following directives and UK designated standards:

Supply of Machinery (Safety) Regulations 2008

Applied standards, in particular:

BS EN ISO 12100	Safety of machinery - General principles for design
BS EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use.

Electromagnectic Compatibility Regulations 2016

Applied standards, in particular:

CISPR 11	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
BS EN IEC 61326-1	Electrical equipment for measurement, control and laboratory use. EMC requirements

The Restriction of The Use of Certain Hazardous Substances in Electrical Electronic Equipment Regulations 2012

Authorised person for compilation of the technical documentation:

Hayley Davies (Production & Design Engineer)

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

Endecotts Ltd

Hope, 12/2023

Adriaan Stander, Managing Director

© Endecotts Ltd · Parsons Lane, Hope · Hope Valley, S33 6RB · United Kingdom
www.endecotts.com · e-mail: sales@endecotts.com · phone: +44 208 542 8121