CleanControlling®

PARTICLE SUCTION EXTRACTION SYSTEM

INSTRUCTION MANUAL

C|PS3 apeX

ENGLISH VERSION

FOCUS ON PARTICLES

You must read these operating instructions and all relevant documents before using the system.

Document	Particle suction extraction system C|PS³ Item no.: 6006955/6006100 Operating instructions – English translation
Version	V 1 / Date 07.03.2024

Other documents relevant for this product:

EC Declaration of Conformity for C|PS³ particle suction extraction system

EC Declaration of Conformity for FESTOOL mobile dust extractors

Original operating instructions – FESTOOL mobile dust extractor CTL MINI I, CTL MIDI I, CTL MINI, CTL MIDI

CleanControlling GmbH
Gehrenstrasse 11 a
D-78576 Emmingen-Liptingen

Tel.: +49 (0)7465 929678-0
Fax: +49 (0)7465/929678-10
Website: www.cleancontrolling.com/en/
Email: info@cleancontrolling.de

Table of contents

1. Basic safety instructions

These operating instructions contain important information on the safe and proper use of the device. Observance of these instructions helps to

- avoid hazards,
- reduce repair costs,
- minimize downtimes, and
- increase the reliability and service life of the device.

CleanControlling GmbH accepts no liability if errors, damage, operational breakdowns and resulting production downtimes occur due to non-observance of these operating instructions. The operating instructions comply with the European Machinery Directive 2006/42/EC and DIN EN ISO 12100 Parts 1 and 2. The operating instructions are part of the device and are included in the scope of delivery of the device documentation. At the time of handover, the documentation corresponds to the latest device version at the time of delivery.

The contents of the operating instructions must be read, understood, and observed in every respect by every person responsible. This applies in particular to safety instructions that are specially marked in the operating instructions.

In addition to the operating instructions and the local obligatory regulations for accident prevention at the place of use, the generally recognized technical rules for safety-conscious and professional work must also be observed. CleanControlling GmbH reserves the right to make technical modifications that are necessary to improve the device. Therefore, deviations from the contents or the illustrations in the operating instructions are possible.

1.1. Obligation to instruct

All persons who work on and with the device and are responsible for the device must read and understand these operating instructions and must comply with all points in the instructions.

CleanControlling GmbH does not accept any liability or warranty for any damage caused by staff who have received inadequate instructions or who have not received any instructions, as well as in case of changes to the system that do not comply with the specified requirements.

1.2. Conformity, guidelines and directives

The device and its components, modules and assembly groups comply individually and as a whole with the current applicable safety standards as specified in European Union CE Directives (see the EC Declaration of Conformity).

1.3. Safety symbols and representations used

The symbols used, if standardized, comply with the accident prevention regulation BGV A8 and DIN 4844-2.

1.3.1. Warnings and warning signs

Warnings refer to an immediate danger and appear before an action at the beginning of each chapter. In addition, warning signs are placed at various places on the device. They have the following meanings:

Possible imminent danger to the life and health of persons. Non-observance of these instructions may result in severe adverse health effects, including life-threatening injuries.

1.3.2. Signal words

Signal words are used in conjunction with safety warning symbols to highlight warnings. The three signal words WARNING, CAUTION and NOTICE used in these instructions indicate possible injury or damage to equipment. The defined signal words indicate the risk level of the hazard. It is absolutely necessary to observe the measures described to avoid the hazards. The signal words may also precede the main text and have the following meanings:

⚠ WARNING A WARNING refers to a potential danger which can cause serious injuries or even death if not avoided.

⚠ CAUTION CAUTION refers to a potential danger which can cause slight injuries if not avoided.

NOTE The word NOTICE indicates a potential danger which can cause damage to the device.

1.3.3. Other symbols

The following symbols are also used:

The text next to this symbol provides additional important information.

⇒ This symbol requires you to take action.

- This symbol is a bullet point for lists.

1.3.4. Mandatory symbols

Mandatory instructions and symbols are used within warning symbols or precede highly important points in the main text. They have the following meanings:

Obligation to behave in a certain way or to perform an activity for the safe handling of the device in order to avoid material damage.

"Observe instructions"

1.4. Operating instructions

Information on the operation of the system consists of an info pictogram and a verbal instruction

Only trained staff may operate the *particle suction extraction system*. The manufacturer or persons authorized by the manufacturer to provide training will give training on the device's use.

Persons whose ability to react is affected by drugs, alcohol, medication or similar must not operate the *particle suction extraction system*. Region-specific age regulations must be observed.

1.5. Designated use

The device is used to suction and extract particles in line with the requirements for particle suction extraction.

Any other use other than the one described above is forbidden since improper use could cause a threat to life and physical well-being.

⚠ WARNING The suction unit or its suction hose may only be used in combination with the particle suction extraction system. To ensure the operational safety of the system, it may only be operated in accordance with its intended use and in a perfectly safe condition. Dangers may occur if the device is not used as intended.

The components of the current system configuration are listed in Appendix IV Data sheets of the installed components. The operating conditions and operating parameters defined in the appendix must be strictly observed.

Intended use also includes:

- Observance of all information in these operating instructions and in the manufacturer's documentation for the components
- Regular cleaning of the system
- Compliance with inspection & maintenance cycles Use of original parts only

1.5.1. Obligation and liability

This *particle suction extraction system* has been built to state-of-the-art standards and in line with established safety regulations. However, using the device may possibly pose a threat to life and physical well-being for the user or third parties or adversely affect the device or other assets.

The device must be used for its designated purpose only. Any faults which could jeopardize safety must be rectified immediately.

Our General Terms and Conditions of Sale and Delivery apply to the warranty and liability. Warranty and liability claims for personal injuries and material damage are excluded if they are caused by one or more of the following:

- Use of the device not in accordance with its intended use.
- Improper installation, initial operation, operation, and maintenance of the device.
- Operation of the device with defective safety devices or improperly installed or non-functioning safety and protective devices.
- Non-observance of the instructions in the operating instructions regarding transport, installation, initial operation, operation, maintenance, and setup of the device.

- Unauthorized structural changes to the device.
- Unauthorized modification of the operating parameters.
- Insufficient monitoring of device parts that are subject to wear.
- Improperly performed repairs and force majeure.

1.5.2. Foreseeable misuse

Any use other than that specified under “Intended use” or which goes beyond this is considered improper use and is prohibited.

The operator bears sole responsibility for damage resulting from improper use. The manufacturer assumes no liability whatsoever. The risk is borne solely by the operator.

Non-intended uses include:

- Work with modified operating parameters
- Unauthorized retrofits or modifications
- Use of spare and wear parts or auxiliary materials not approved by the manufacturer
- Violations of wastewater and environmental regulations at the operating site of the system
- Use of media and water qualities other than those defined
- Processing explosive materials
- Operating the system in an explosive atmosphere

1.6. Risks involved in handling the system

The C|PS³ has been built according to the current state-of-the-art standards and in line with established safety regulations. Nevertheless, risks and impairments to life and limb of the operators or third parties, to the system itself or to other material assets may occur during the use of the system.

The prerequisite for safe handling and trouble-free operation is knowledge of the safety instructions and safety regulations.

Wear the prescribed protective equipment, consisting of safety shoes, at all times when working on the system.

1.6.1. Electrical hazards

When working on the electrical equipment, danger to life exists due to electrical voltage.

Caution – ESD-protected area: Observe preventive measures when handling components susceptible to damage from electrostatic discharge.

Risk of damage to ESDS. Do not place any electronic components or assembly groups on this surface! This warning symbol warns against damage to ESDS if they are placed on labeled surfaces.

Work on the electrical equipment may only be carried out by qualified electricians.

The qualified electricians working on the system must be informed about the power supply to the system, its disconnection options and about the procedural instructions in accordance with the DGUV Regulation 3.

The integrity of the system's electrical equipment must be checked regularly; if necessary, damaged parts must be replaced immediately and professionally. Switch cabinets and control units must always be locked. Access is only allowed to authorized personnel with a key or tool.

1.6.2. Mechanical hazards

The sharp edges of the sheets pose a risk of injury.

Cut-resistant protective gloves must be worn during cleaning work.

1.6.3. Hazard due to noise

Depending on local conditions, a higher sound pressure level may occur, causing noise-induced hearing loss. For these areas, the operator must provide the operating personnel with appropriate protective equipment and take protective measures in accordance with the Worker Noise Protection Directive 2003/10/EC.

1.6.4. Remaining hazards

“Warning of obstacles in the head area”

1.6.5. Fire fighting, preventive fire protection

Risk of fire if motors and valves overheat.

The operator of the system must ensure that the applicable fire protection regulations are complied with. He must regularly instruct the personnel on how to behave in the case of fire and document the instructions that have been given.

Escape routes, emergency exits, and safety equipment must be marked in accordance with ASR A1.3.

1.6.6. How to behave in case of danger and accidents

The operator of the system must regularly instruct the personnel on how to behave in case of danger and accidents. General procedure in case of danger:

- Shut down the machine or trigger an emergency stop, secure the danger area
- Dial emergency number
- Inform first-aiders and supervisor
- Provide first aid

1.6.7. Organizational measures

The operator must provide the required personal protective equipment. All safety systems must be checked on a regular basis.

The operator is obliged to appoint a person in charge who is responsible for safe operation of the device and for coordination of all work on the device.

1.6.8. Informal safety measure

The operating instructions must be kept on the device at all times. In addition to the operating instructions, general regulations and other binding regulations on accident prevention and environmental protection must be observed.

You must keep all safety instructions and hazard warnings in a legible condition and replace if necessary.

1.6.9. Training of staff

Only trained and briefed staff are permitted to work with and on the device. The staff's different responsibilities are specified in the following table:

Task	Briefed technical staff	Specialist
Operation ➔ Parameterization ➔ Extraction	x	
Fault finding	x	
Fault repair		Authorized service technician
Maintenance	x	
Repair		Authorized service technician

1.6.10. Maintenance, servicing and fault repair

Do not perform work on the device until the device has been disconnected from the mains power supply. Before putting it back into operation, check that all covers, screw connections and safety systems have been fitted as per regulations and check that they work correctly. Perform all setting, servicing and inspection work correctly within the required periods.

1.6.11. Structural changes to the device

Authorization from the manufacturer is required for any modifications or retrofits.

1.6.12. Cleaning the device

Correct functioning of the device can only be guaranteed for a longer period of time if the device is kept spotless and is cleaned on a regular basis using customary methods. Clean with mild, non-scouring, non-scratching products only. Never use aggressive cleaning agents such as solvents. Properly handle materials and substances used, such as solvents and lubricants, and dispose of them in an environmentally friendly way.

1.6.13. Noise from the device

Suction: A-weighted noise pressure level Lp	70,00 dB(A)
Suction: EN series of standards	60335-2-69
Suction: Unsafe (noise) K	3,00 dB

1.6.14. Decommissioning and disposing of the device

This device is labeled in accordance with the European Directive on waste electrical and electronic equipment – WEEE.

You must comply with applicable local regulations on health, safety and the environment at all times when decommissioning the device or disposing of parts of the device.

- You must dispose of the device as electronic waste once its service life has come to an end. Ask your local waste management company or CleanControlling where your particular collection point is.
- Sort different materials such as plastic, metal and electronic components and dispose of them separately.
- Dispose of used liquids safely and correctly, so that they do not cause damage to health or the environment.
- Dispose of all components safely and correctly as per applicable local regulations on health, safety and the environment.

1.6.15. Change of owner

Ensure that all components, including spare parts and accessories, are also given to the new owner if you sell the device. These components include all operating instructions, manuals, maintenance instructions, other instructions, modifications and additions that you have received as an owner.

1.6.16. Guidelines for a safe work area

Ensure that work areas and surrounding areas are clean and very tidy and do not contain any potential hazards. The work area must comply with local and national safety regulations.

There must be enough room around the device to work with the system safely and comfortably and perform adjustment and maintenance work.

Ensure that cables and hoses are not deformed and cannot be damaged.

Ensure that the ambient conditions are within the indicated ranges.

Ensure that no cables or hoses pose a tripping hazard.

1.7. Defective device

A defective device poses a serious risk of injury for operators and other persons. If the device is not free from defects when in operation and cannot be repaired immediately, the person in charge must switch off the device and put it out of service. The device can be defective if:

- The device shows signs of damage
- Electrical components and wires are damaged
- The device does not perform its required function correctly, even after it has been adjusted
- The device has been stored or not operated for a long time under unfavorable conditions, such as high humidity or excessively high or low temperatures.

1.8. Further use of components after suction extraction

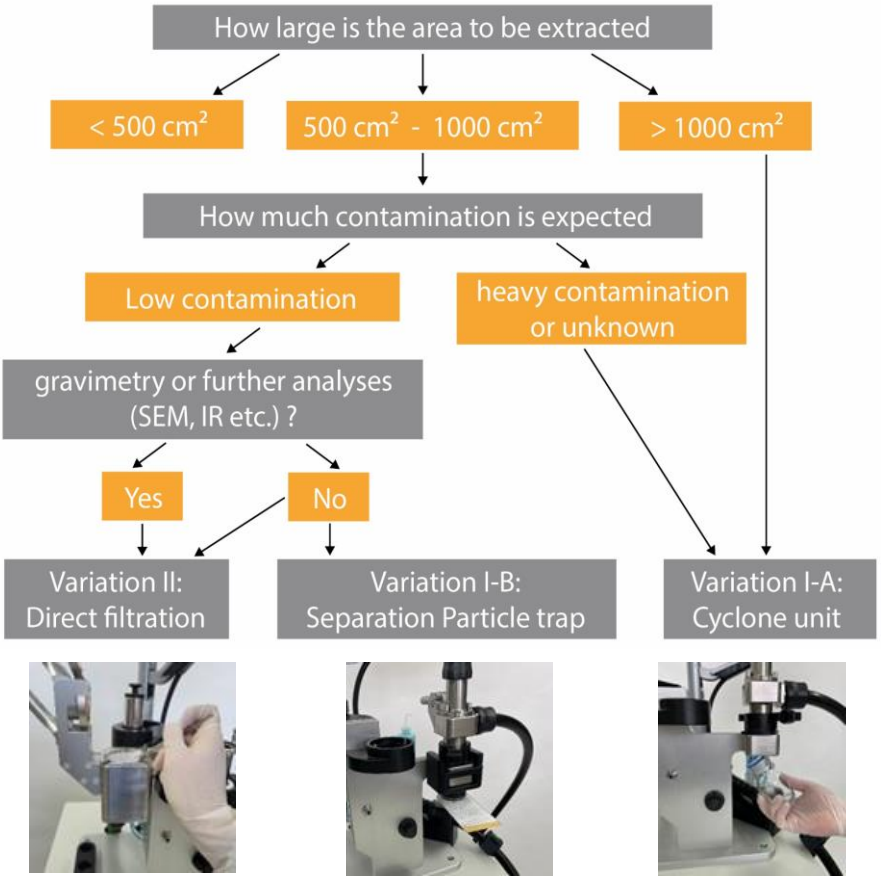
If the components sampled by the particle suction extraction system are reused, the operator is responsible for carrying out subsequent tests to ensure their integrity.

2. Description of the extraction principle

The mobile particle suction extraction system is used to extract dry, adherent particles from large surfaces and from specific control areas on workpiece carriers and in process environments. The particles are released from the surface by suction using nozzles and brush and then sucked in by means of a mobile extractor. The mobile trolley provides easy, safe set-up and transportation of the particle suction extraction system and its associated equipment. The extraction by means of the mobile extractor can be carried out with the help of the integrated control system in accordance with VDA 19.1.

Particle suction extraction system – front view

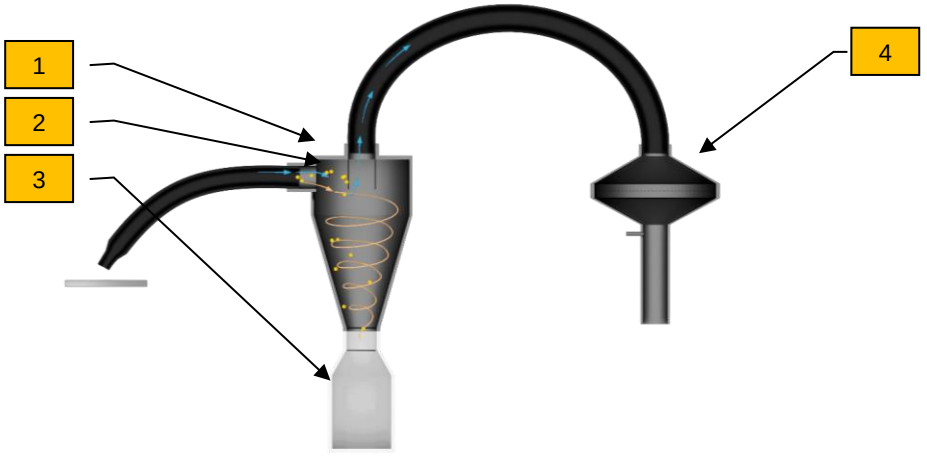
Particle suction extraction is possible **with or without the cyclone unit**. The most suitable process depends on different factors, primarily the specific application and the degree of contamination.



Selecting the appropriate method according to the degree of contamination

2.1. Particle suction extraction with cyclone and filter unit (variant I)

Variant I-A: The extracted particles (2) are separated in a clean laboratory bottle (3) via the cyclone unit (1). The filter unit (4) provides overload protection using a special analysis filter (> 5 µm) to protect against an excessively high particle load. The particles collected in the particle collection jar are transferred to analysis filters for the subsequent microscopic analysis using secondary extraction (with an aqueous medium) and then analyzed under a microscope.



Variant I-A operating principle: Particle suction extraction with cyclone unit and laboratory bottle

Suction extraction via the cyclone unit is particularly suitable for large component surfaces with greater particle loads. This dry particle extraction system is very economical compared to wet extraction due to the absence of liquid extraction media, the reduced logistics workload and the easily delimited control areas.

Variant I-B: Via the cyclone unit, the extracted particles can also be deposited directly onto a particle trap instead of the laboratory bottle. The filter unit provides overload protection using a special analysis filter (> 5 µm) to protect against an excessively high particle load. For subsequent microscopic analysis, the particles collected in the particle trap are analyzed under a microscope.

2.2. Particle suction extraction without cyclone unit, directly onto the filter unit (variant II)

The particles are extracted directly via the filter unit and separated from the air stream using a special analysis filter (> 5µm). The analysis filter can be analyzed using a microscope directly after suction extraction and any downstream flushing. The flushing unit can be used to prepare particulates on the filter for microscopic analysis (see chapter 6.4)

Variant II operating principle: Particle suction extraction without cyclone unit

Direct suction extraction via the filter unit is suitable for small surfaces with a light particle load, such as on workpiece carriers or printed circuit boards in the process environment. Particles are quickly collected, meaning interruptions to processes are kept to a minimum.

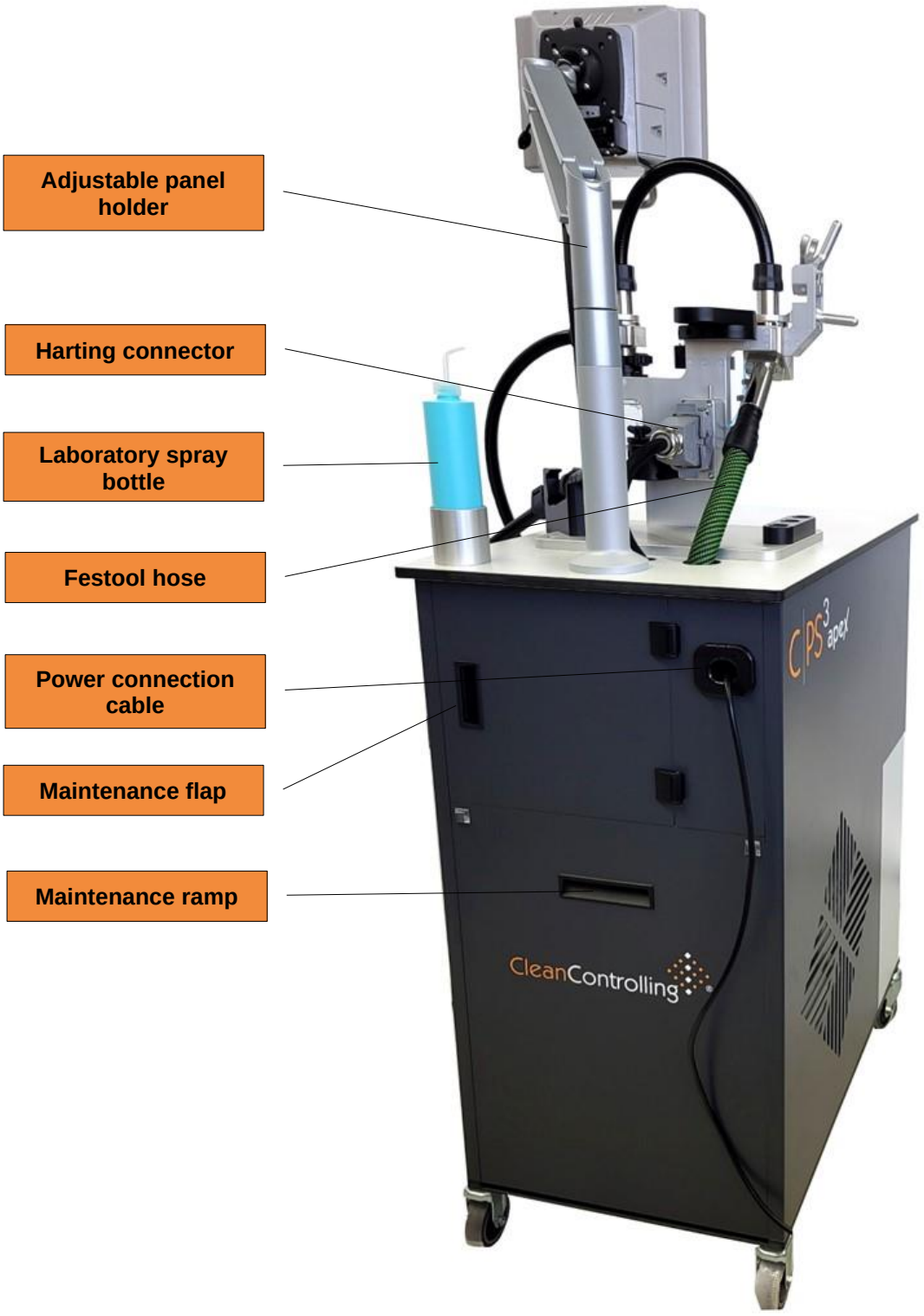
The specially developed flushing unit allows homogeneous filter loading to be optimized. Manual flushing (see chapter 6.4) is performed with an aqueous medium after suction extraction. The analysis filter can be taken for microscopic analysis immediately after drying.

The flushing can also be used as a filter cascade (e.g. 5 µm/60 µm) if a higher particle volume is extracted.

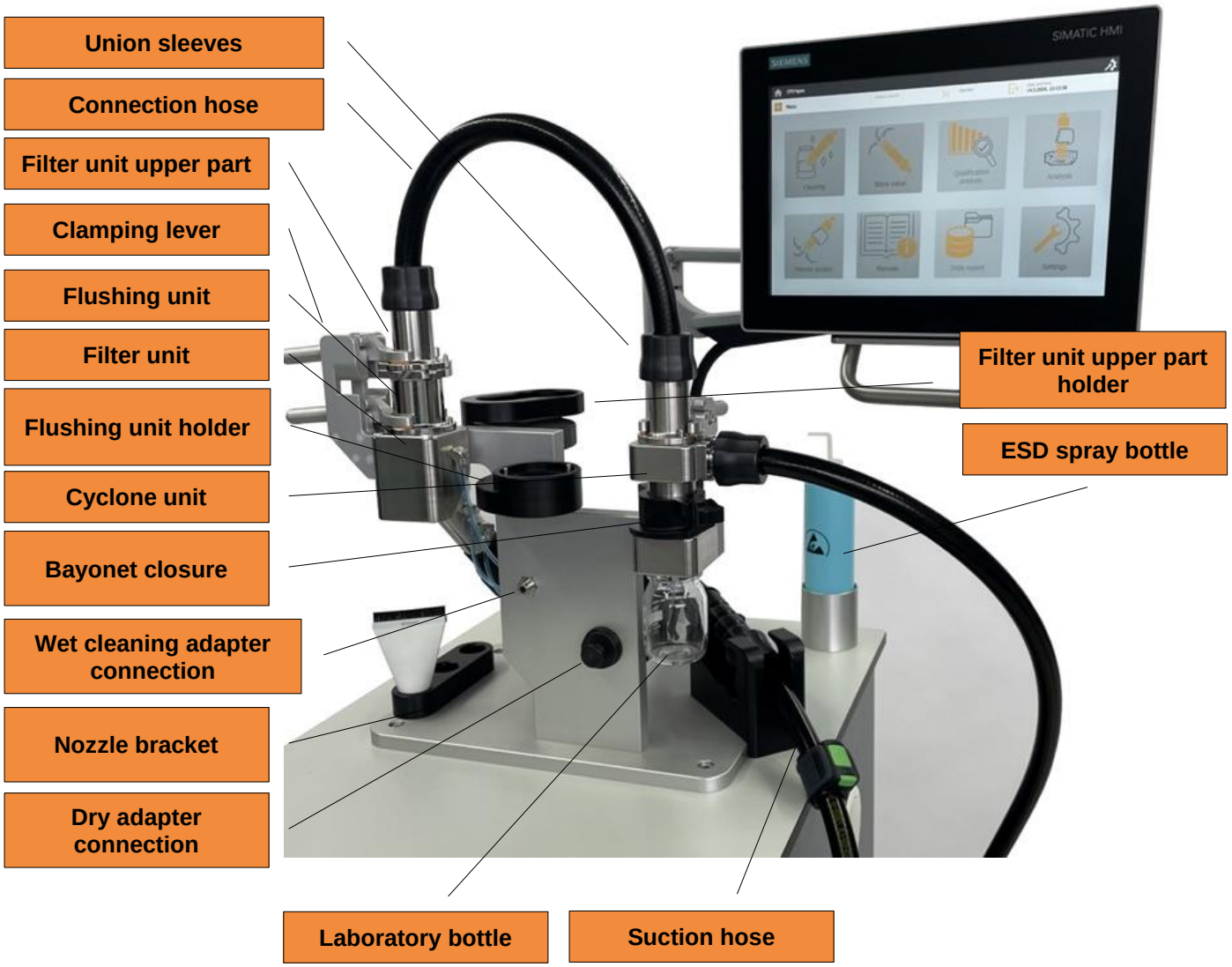
3. Structure

3.1. C|PS³apex – front view

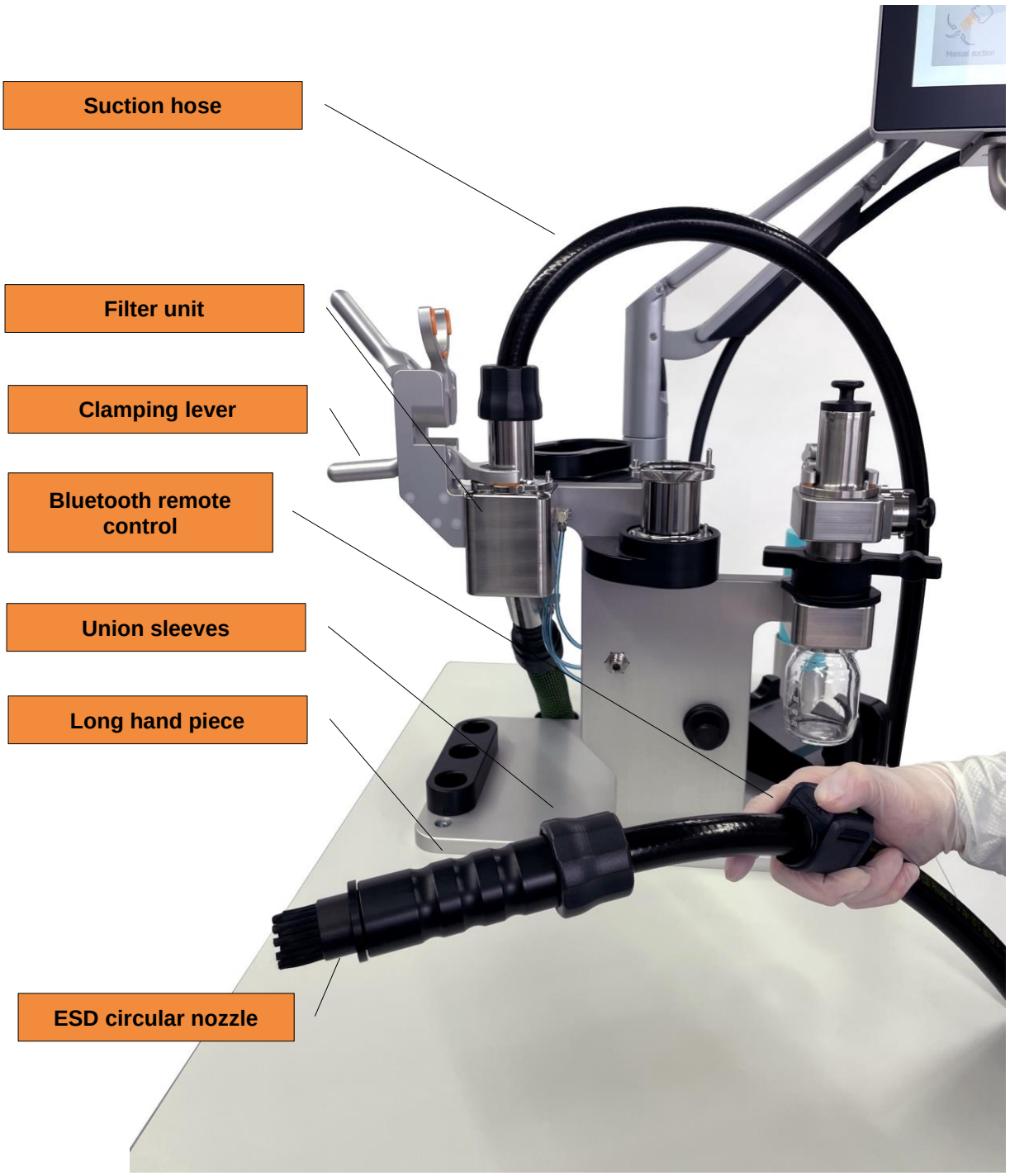
3.2. C|PS³apex – back view



3.3. Particle suction extraction system with cyclone unit



3.4. Particle suction extraction system without cyclone unit



4. Device transport

When transporting the device, the following must be observed. To protect the device from contamination by external particles, the protective hood should be pulled over it. During transport of the system, it may only be moved at walking speed.

⚠ CAUTION Ensure that the clamping levers and union nuts are correctly closed, otherwise, machine components may unexpectedly come loose and fall down.

⚠ CAUTION If the tipping point is exceeded or the speed is too high, the C|PS³ may tip and cause damage to the system or injury to the user.

⚠ CAUTION When the parking brakes are released, keep a safety distance of 30 cm from the rollers, otherwise, it may cause injuries.

⚠ CAUTION On steep paths, at least two people must move the device, otherwise, control of the device may be lost.

5. Initial operation

NOTE

Wrap the components to be tested in ESD-protected packaging while carrying out work on the C|PS³ system or remove the C|PS³ system from the EPA environment to prevent any damage to the components to be tested.

5.1. Mobile trolley

To put the C|PS³ particle suction extraction system into operation, follow the steps below

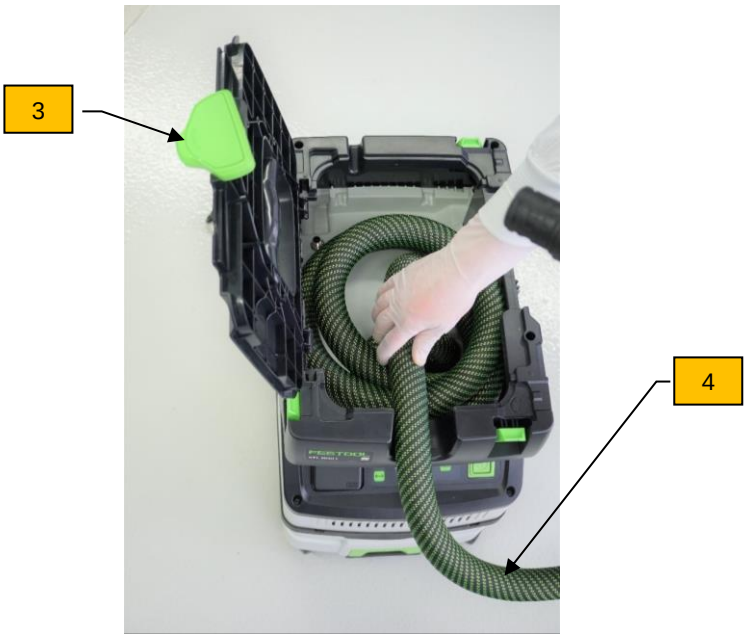
Opening the maintenance ramp

⚠ CAUTION

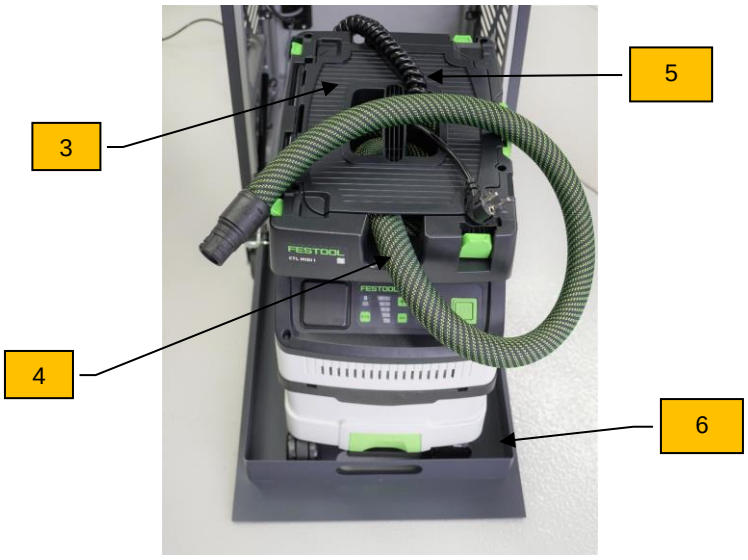
Risk of injury

Always hold the maintenance ramp at the handle opening when opening and closing it, otherwise, your fingers may be crushed if the maintenance ramp slams down.

5.2. Suction unit



Preparing suction unit 1

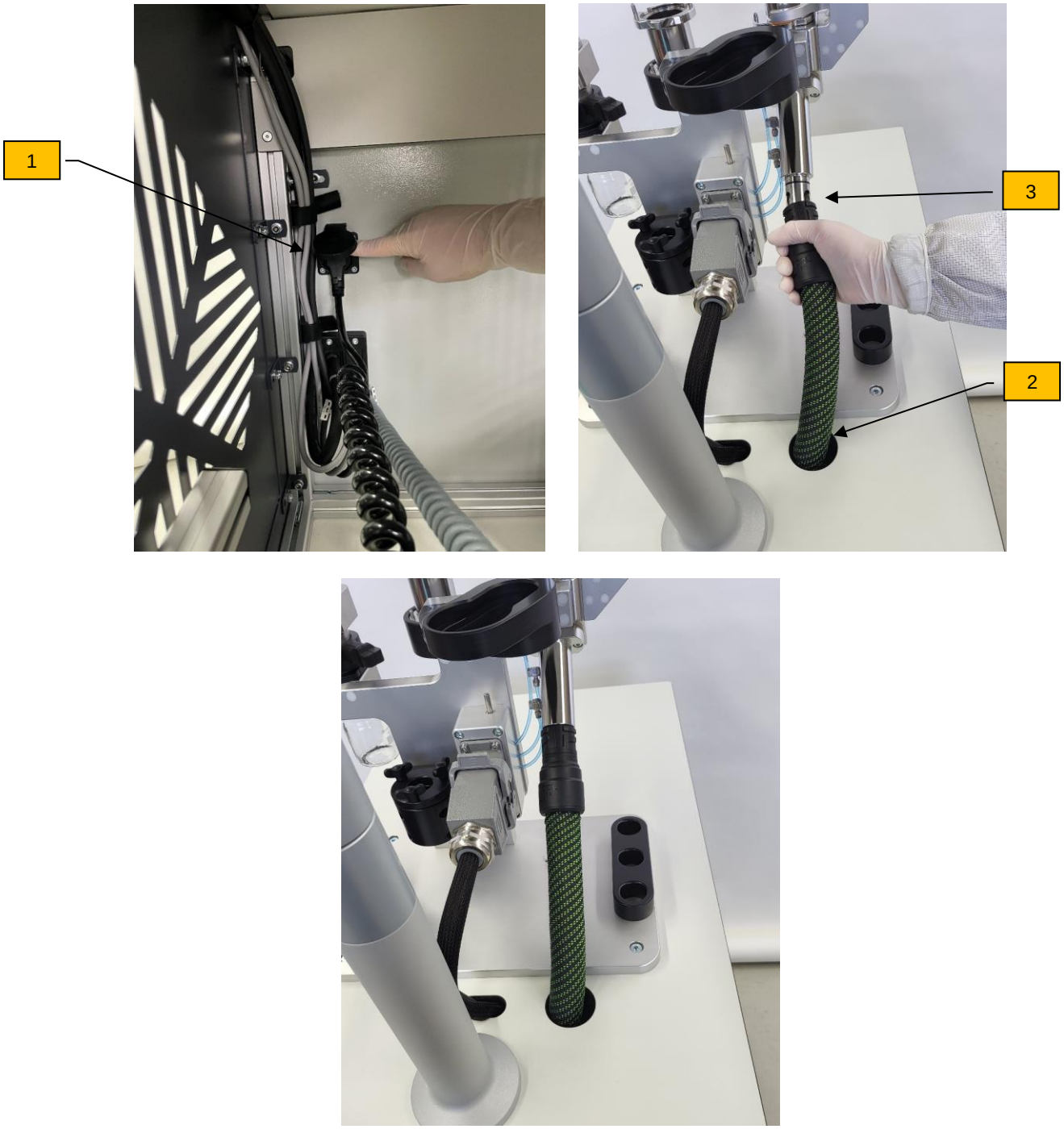


Preparing suction unit 2

⇒ Open the flap (3) of the suction unit and remove the power cable. Then guide approx. 1.5 m of the Festool hose (4) out through the recess provided for this purpose and close and lock the flap (3) again.

⇒ Place the power cable (5) and Festool hose (4) on the closed flap.

⇒ Place the suction unit on the device (6) of the trolley.

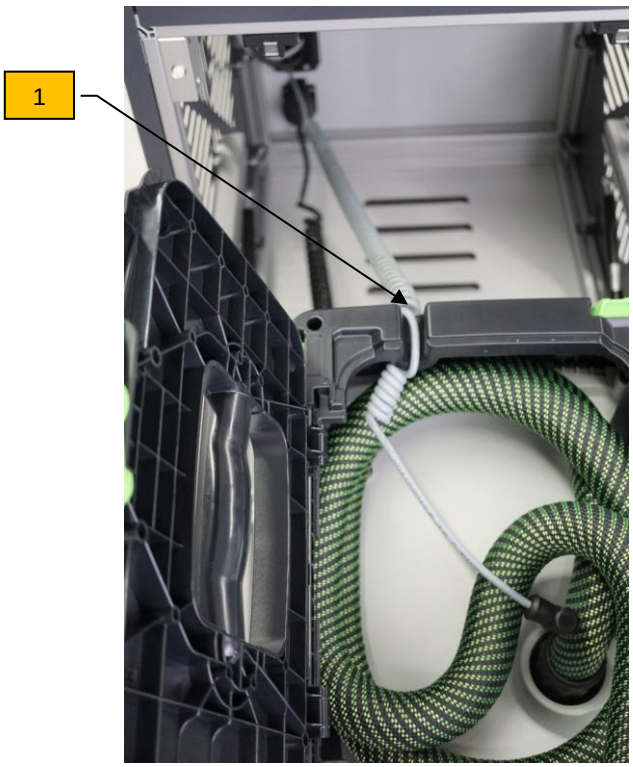


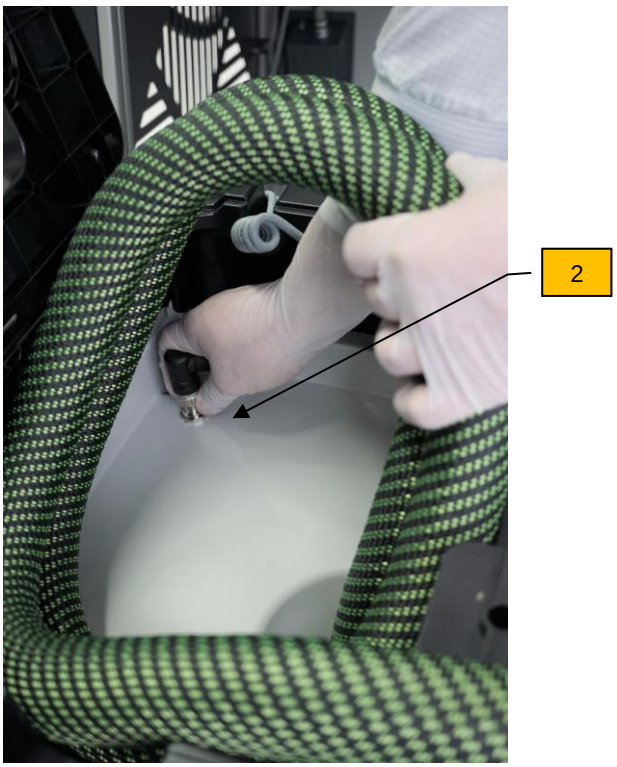
⇒ Connect the power cable to the socket (1).

⇒ Guide the Festool hose through the opening (2) of the trolley and connect it to the connection (3) provided for this purpose.

⚠ WARNING

Make sure that the main switch of the device is in the “OFF” position, otherwise, electric shocks may occur.

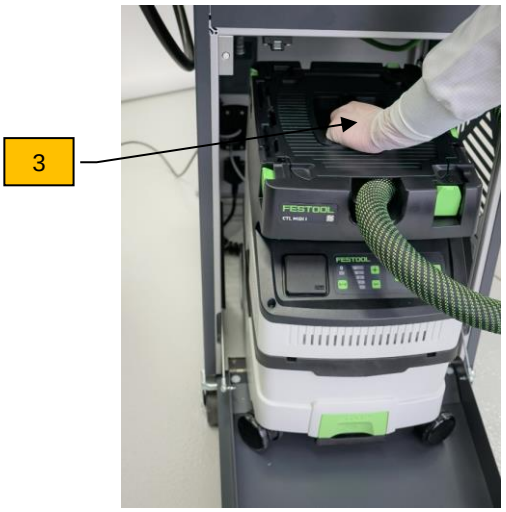




⇒ Open the flap of the suction unit again and insert the control cable (1) into the device.

⇒ Slightly lift the Festool hose and connect the connector (2) of the control cable to the suction unit.

⇒ Place the Festool hose back into the suction unit and close the suction flap.



⇒ Grip the suction unit at the handle (3) and roll it into the trolley.

⇒ Push the protruding Festool hose into the suction unit and then close the flap of the trolley.

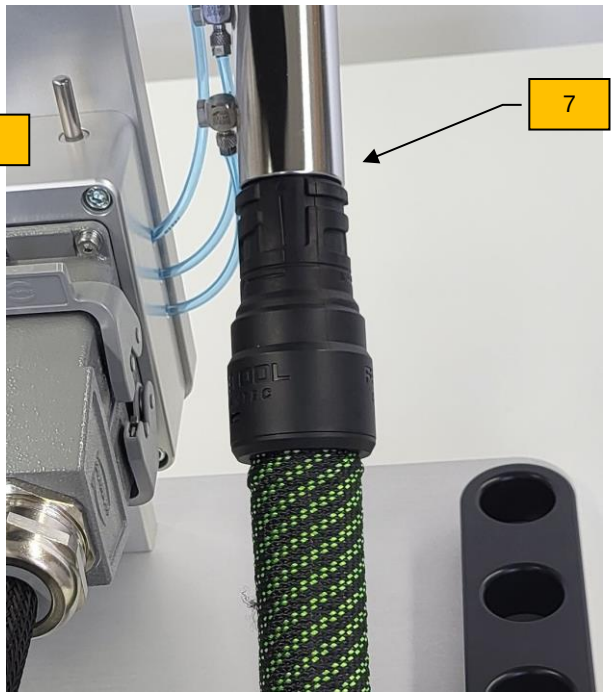
⇒ If the Harting connector (4) should not be connected to the suction system, connect it to the plug-in unit.

⇒ Tighten the brackets (5) at the top and bottom to fix the connector on the device.

NOTE

The brackets must be closed firmly, otherwise, measurement errors may occur.

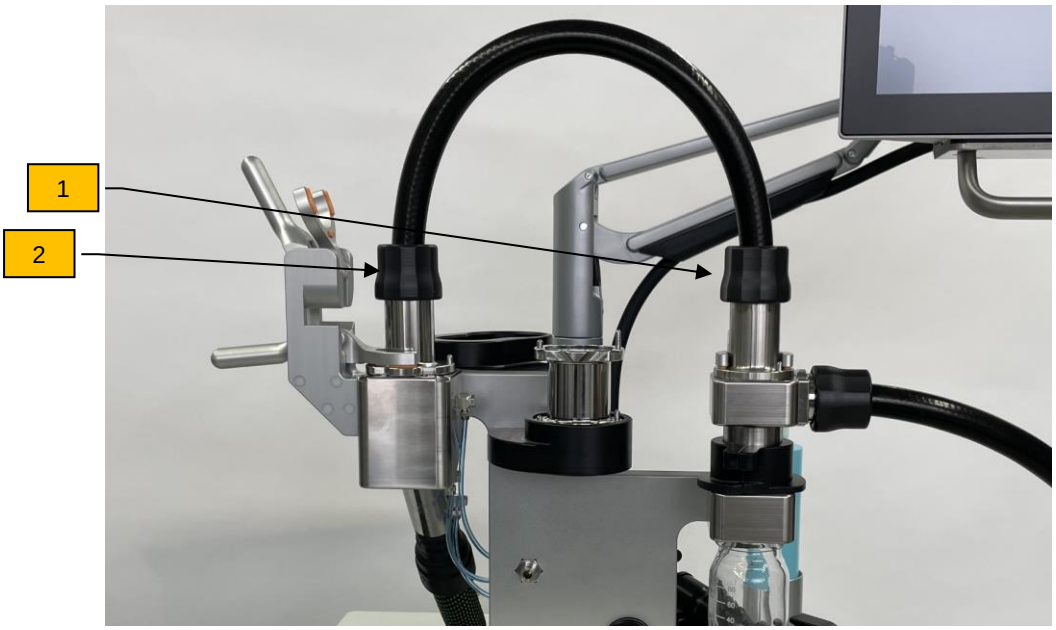
5.3. Extraction system



Connecting Festool hose to suction unit

⇒ Attach the Festool hose to the suction unit on the C|PS³ (6). When you do so, the arrow on the connection hose must face the hose connection slot (7).

5.3.1. Initial operation <u>with</u> cyclone unit



Interconnecting cyclone unit and filter unit

⇒ Remove the protection plug and interconnect the cyclone unit (1) and the filter unit (2) with the 0.5 m connection hose.

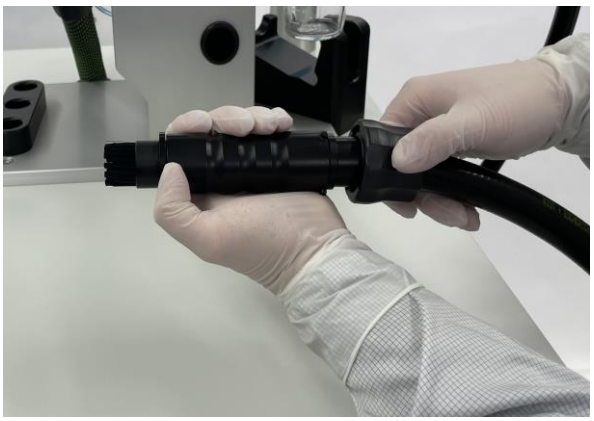
⇒ Insert the connecting hose until it stops and turn the union sleeve tightly.

NOTE

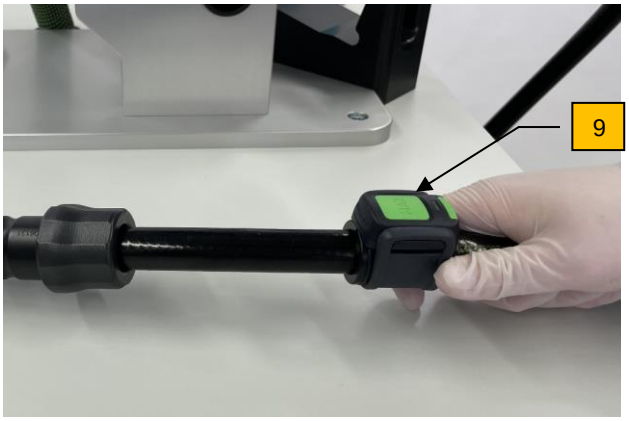
If the union sleeves are not tightly tightened, this may cause particle loss or malfunction of the device.

Attaching the suction hose (1 or 2 m)

⇒ After removing the protection plug, connect the suction hose to the cyclone unit and tighten the union sleeve (3).



Attaching the suction nozzle



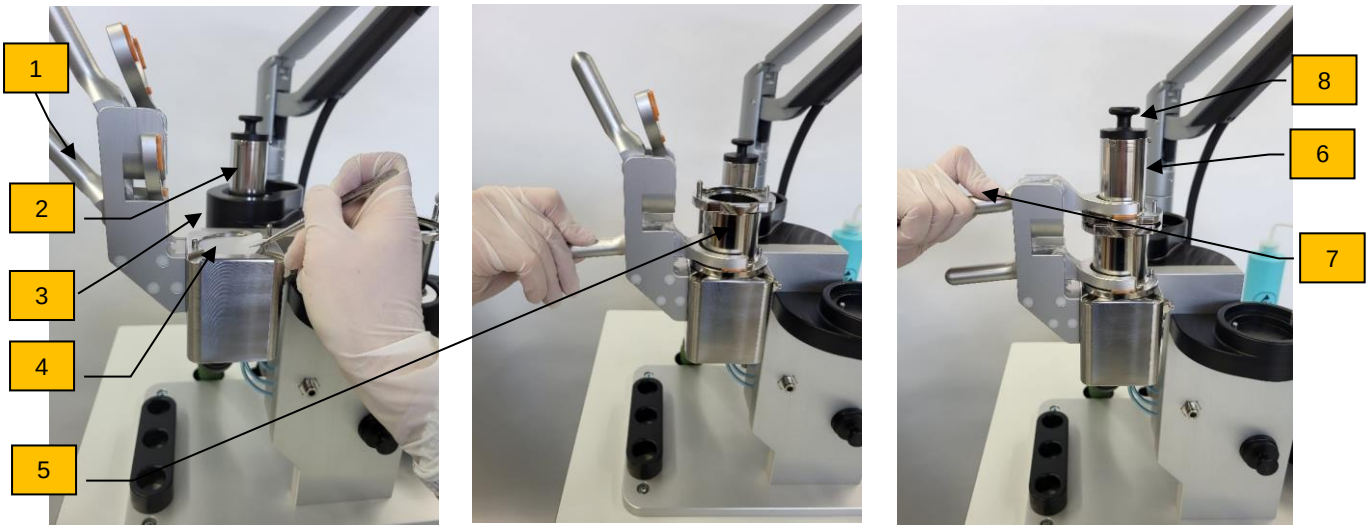
Attaching the Bluetooth remote control

⇒ Attach the required suction nozzle suitable for the intended particle suction extraction process.

⇒ Insert the suction hose and suction nozzles until they stop and tighten the union sleeve.

⇒ Attach the Bluetooth remote control (9) to the hose.

5.3.2. Initial operation <u>without</u> cyclone unit



Attaching the suction hose and suction nozzle

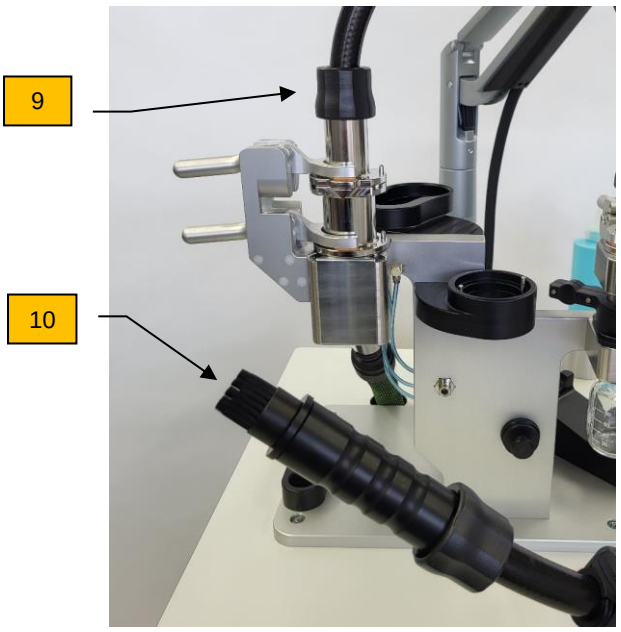
⇒ Open the lower clamping lever (1) and place the upper part of the filter unit (2) in the holder (3).

⇒ Insert the filter (4).

⇒ Place the flushing unit (5) and actuate the lower clamping lever.

⇒ Place the upper part of the filter unit (6) on the flushing unit and actuate the upper clamping lever (7) and remove the protection plug (8).

⚠ CAUTION Machine components can cause injuries if they fall down.



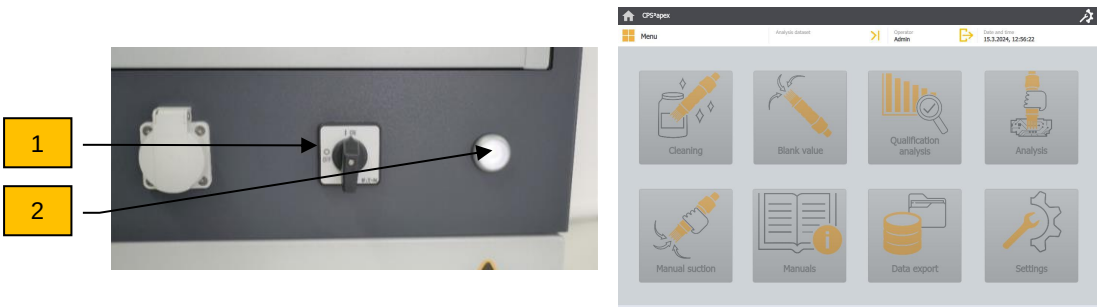
⇒ Push the suction hose on until it stops and tighten the union sleeves (9).

⇒ Attach the required suction nozzle (10) suitable for the intended particle suction extraction process.

Suction extraction can also be performed without the flushing unit shown in the picture above.

NOTE If the union sleeves and clamping levers are not tightly tightened, this may cause particle loss or malfunction of the device.

5.4. Switching on the device



Main switch and screen

⇒ Turn the main switch (1) to “ON”.

⇒ Then press the button (2).

The device is ready for operation as soon as the button is lit, the screen is on and the main menu is visible on the screen.

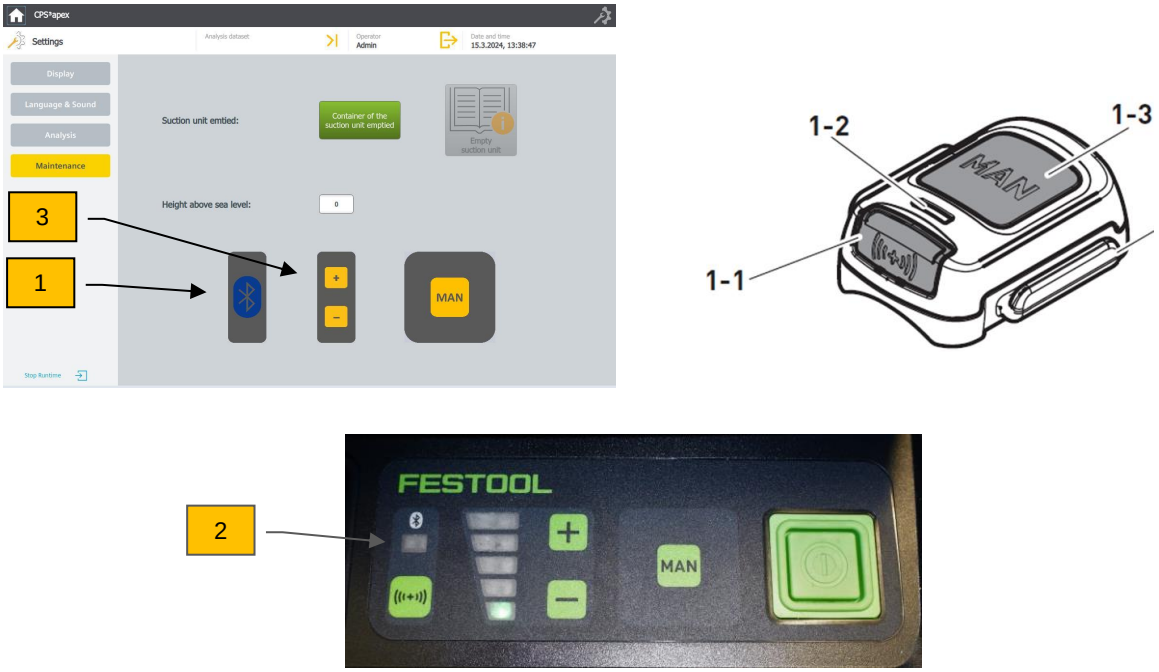
5.4.1. Connecting the remote control to the suction unit

To connect a remote control to a suction unit, it may be necessary to reset the remote control (see chapter 5.5 Resetting the remote control or Festool original operating instructions – Mobile dust extractor).

Remote controls that have **not been connected** so far can be connected **directly**.

An established connection between remote controls and the suction unit remains even after manual switching off or disconnecting the suction unit from the mains.

The suction unit can be connected to up to five remote controls simultaneously. However, a remote control can only be connected to one suction unit.



Function keys and indicators of the operating panel and remote control

Follow the steps below to connect a remote control that is not yet connected (or after a reset) to the suction unit:

⇒ In stand-by mode, press and hold the connection key (1) of the suction unit for 3 seconds.

⇒ Open the flap of the suction unit.

⇒ The connection indicator on the suction unit (2) flashes quickly. The suction unit is ready to be connected for 60 seconds.

⇒ Press the MAN key **[1-3]** on the remote control.

⇒ The remote control is permanently stored in the suction unit.

⇒ Once the remote control is connected to the suction unit, the suction unit can be switched on and off using the remote control.

⇒ Press the MAN key **[1-3]** on the remote control for switching on or off.

5.5. Reset on the remote control

Reset deletes the connection between the remote control and the suction unit.

⇒ Press and hold the connection key **[1-1]** and the MAN key **[1-3]** for 10 seconds.

⇒ The LED indicator **[1-2]** lights up in magenta when the reset has been performed.

5.6. Deleting all saved Bluetooth connections of the suction unit

If required, all saved device connections can be deleted by following the steps below:

⇒ Press and hold the connection key (1) for at least 3 seconds.

⇒ Connection indicator (2) flashes quickly.

⇒ Release the connection key (1).

⇒ Within 3 seconds, press and hold the plus and minus keys (3) simultaneously for at least 3 seconds.

⇒ The suction unit confirms the command by three rapid flashes of the connection key (2).

Before a remote control can be reconnected to the suction unit that was previously connected to this or another suction unit, the remote control should be reset.

6. Particle suction extraction process

The extraction process shown here is performed **with the cyclone unit** and is also valid for an extraction process without a cyclone unit.

If necessary, the device must be cleaned and a blank value determined before particle suction extraction – see chapter 7.

6.1. Screwing on or replacing the particle collection jar

Replacing the particle collection jar

⇒ Screw on a new, clean particle collection jar (4) into the cyclone unit from beneath.

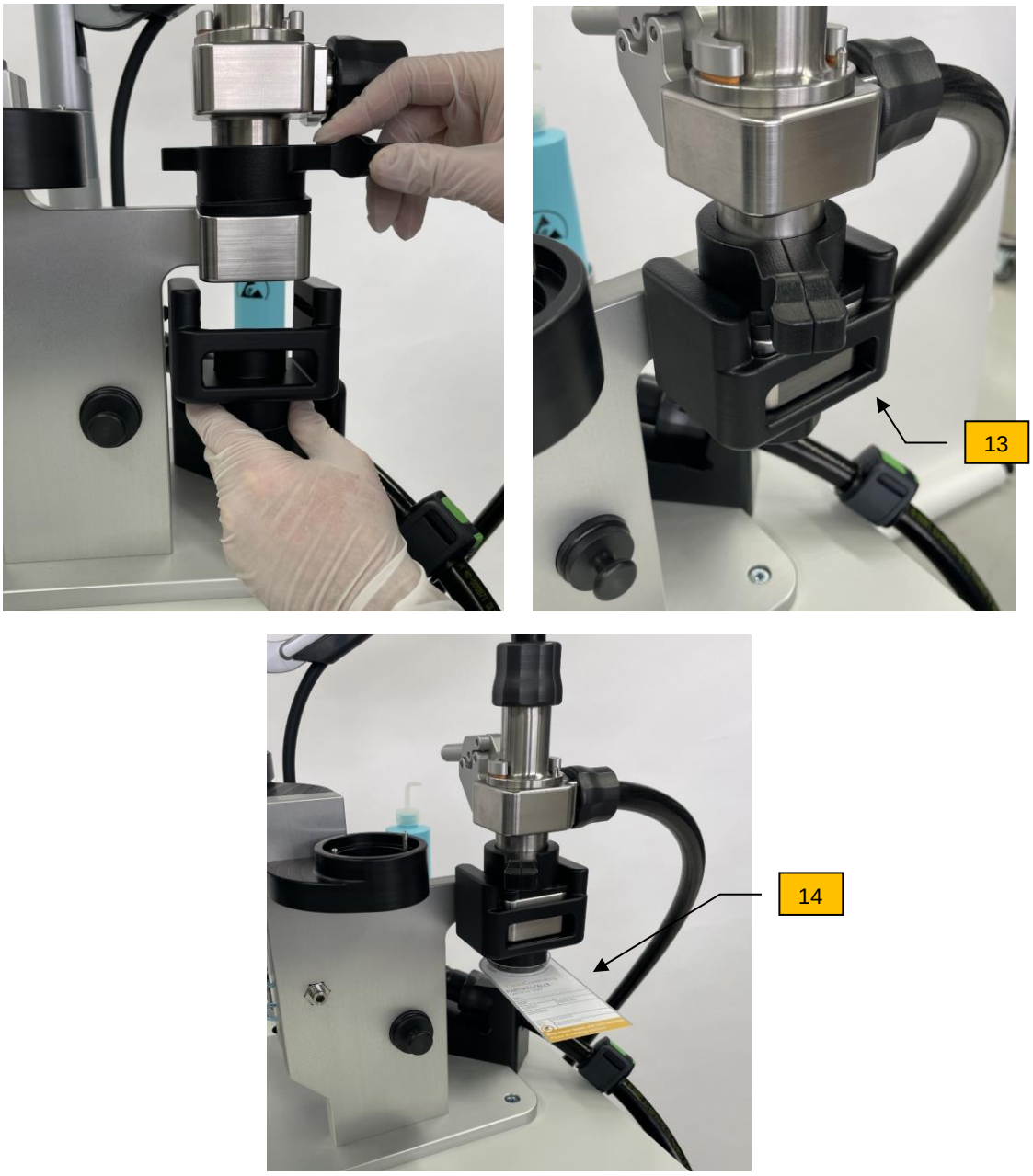
⇒ Once particle suction extraction is complete, unscrew the particle collection jar to be analyzed, close it with the lid and label with the relevant sample details.

⇒ Use secondary extraction (with an aqueous medium) to transfer the particles collected in the particle collection jar onto the analysis filter for the subsequent microscopic analysis and then analyze under a microscope.

⚠ CAUTION The laboratory bottle may fall and splinters may cause injuries.

6.2. Attaching or replacing the particle trap

In case of less severe contamination, it is also possible to extract particles from the cyclone unit directly onto the particle trap.



Attaching the particle trap

⇒ If necessary, unscrew particle collection jar and attach the adapter (13) for the particle trap to the cyclone unit and secure it with the locking lever.

⇒ Attach particle trap (14) to the adapter (13).

⇒ After extraction, detach particle trap (14) by pulling downwards, close with the lid, and label with the relevant sample details.

⇒ Then analyze the particle trap under a microscope.

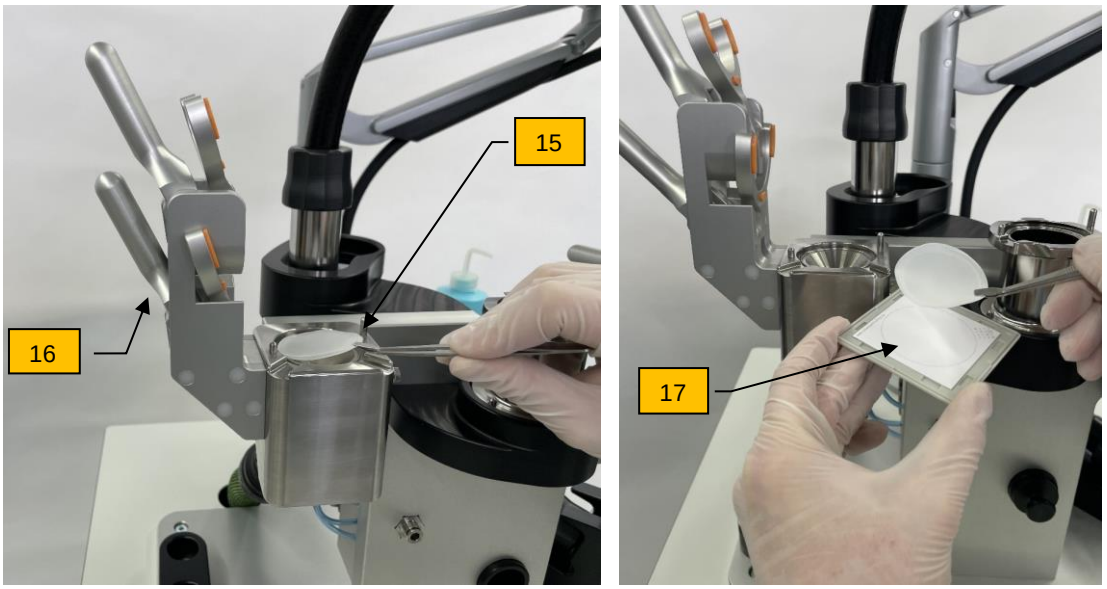
6.3. Replacing or inserting the mesh filter

A filter unit is provided as a safeguard and overload protection in case any particles not separated in the cyclone unit are still forwarded. The cyclone unit overload protection is necessary if there are very large, fitful extraction volumes of particles.

⇒ Open the filter unit by loosening the clamping lever (16).

⇒ Use the tweezers to remove the mesh filter (15). To do so, attach the tweezers in the designated hole (circled) in the filter unit and remove the mesh filter.

⇒ Archive the mesh filter in a filter frame with an archiving card (17) and label with the relevant sample details on the rear.



Removing and archiving the mesh filter

⇒ Then analyze the mesh filter with a microscope (as per ISO 16232). The particles on the mesh filter removed from the filter unit complement the microscopic analysis.

⇒ Insert the new mesh filter (15) into the filter clamping point.

⇒ Remount the filter unit, ensuring that the mesh filter (15) is positioned correctly, and fasten it by means of the clamping lever (16).

If particle suction extraction is performed without a cyclone unit, analysis is carried out based on the mesh filter evaluation only.

⚠ CAUTION If the archiving frame falls down, glass splinters may occur and cause injuries.

⚠ CAUTION Machine components can cause injuries if they fall down.

6.4. Flushing the mesh filter

The specially developed flushing unit allows homogeneous filter loading to be optimized. Manual flushing is performed with an aqueous medium after suction extraction. The analysis filter can be taken for microscopic analysis immediately after drying. The flushing can also be used as a filter cascade (e.g. 5 µm/60 µm) if a higher particle volume is extracted.

Flushing to optimize particle distribution

Left before flushing and right after flushing

⇒ Press the ***Flush*** button.

⇒ Loosen the upper clamping lever (1) and remove the upper part.

⇒ Fill the liquid to a height of approx. 2 cm using a spray bottle (2).

⇒ Move the bottle in a circular motion to ensure that the particles are better distributed.

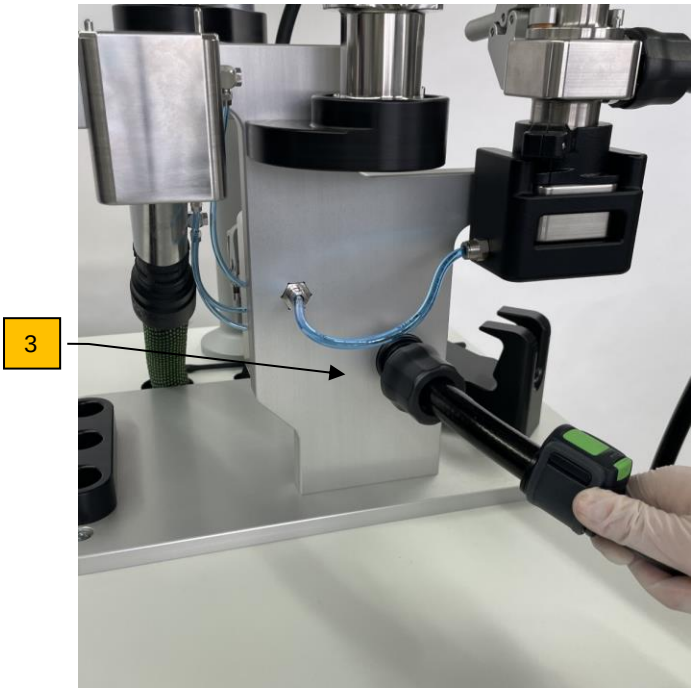
⇒ Press the ***Yes*** button.

⇒ Press the ***Start*** button to start the suction unit and simultaneously flush the edge surfaces of the flushing unit.

⇒ Press the ***Next*** button.

⇒ Assemble the filter unit and close it with the upper clamping lever.

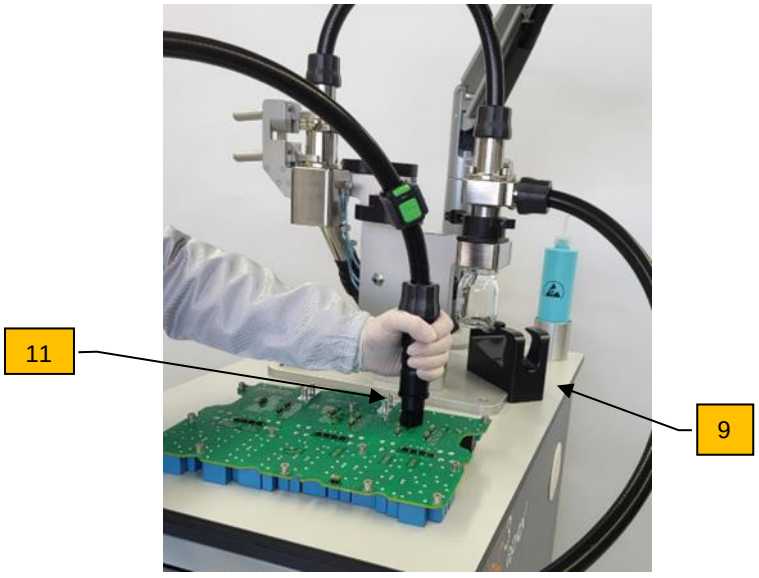
⚠ CAUTION Machine components can cause injuries if they fall down.



⇒ Connect the suction hose to the drying adapter (3) and then start dry suction by pressing the ***Subsequence suction*** button.

⇒ Remove the filter accordingly and place it on the labeled filter frame.

6.5. Carrying out the particle suction extraction procedure



Extracting particles

⇒ Remove the nozzle from the bracket (9).

⇒ Extract the particles with the selected suction nozzle – e.g. with brush nozzle (11) as in the photo.

⇒ Place the suction nozzle back in the nozzle bracket after use.

NOTE The filter load affects the suction power significantly. The mesh filter becomes blocked if the suction power is inadequate. This is indicated by a falling volume flow which can be monitored on the display.

NOTE Failure to re-suction correctly may result in particle loss.

NOTE Only use the mesh filter specified in the scope of delivery! Other types of filters can cause malfunctions.

During suction extraction, ensure that you take samples from components or surfaces from the outside to the inside and from top to bottom.

Re-suction must be carried out for approx. 30 sec. after suction extraction and before each change of a nozzle variant (including removing the particles from the brush attachments) to ensure that all particles extracted from the component can be found in the analysis. You can do this by holding the suction hose with the respective nozzle attachment in the atmosphere while the suction unit is active.

With small nozzle cross-sections (operating point 2), the nozzle must be removed as soon as the message appears on the device.

6.6. Selecting the correct suction level

The power level of the suction unit can be set either by the system or by the user (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**). If this is done by the user, the power level for each area is set using qualification test or analysis.

As a rule, power level 2 is selected for nozzles with a small outlet area (lower volume flow) and power level 4 for nozzles with a larger outlet area (higher volume flow). The selection depends, however, on further factors such as weather influences, influence of the mains voltage, etc. and, depending on the conditions, can make it necessary to switch up to power level 5, for example.

6.7. Instructions on using the suction and brush nozzles

Suction nozzle

Correct distance and angle to hold the suction nozzle

Incorrect distance and angle to hold the suction nozzle

When using the suction nozzle or flat nozzle, ensure that you don't block the nozzle by closing the suction nozzle head. Sufficient suction power is achieved by inclining the nozzle (optimum angle position is approx. 35° – 40°).

If you apply the nozzle with strong contact pressure, it may leave marks or generate particles on the surface undergoing extraction.

NOTE Incorrect nozzle guide may result in particle loss.

Brush nozzle

Applying the brush nozzle correctly

Applying the brush nozzle incorrectly

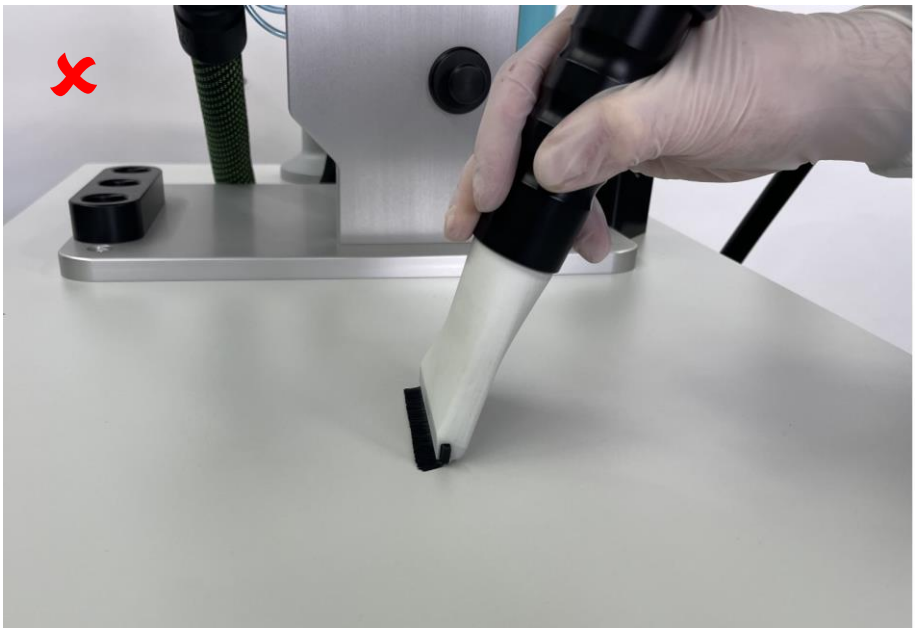
When using the brush nozzle, ensure that the brush nozzle is not applied at an angle.

The contact pressure should not cause the brush hairs to bend. You should aim to apply the brush nozzle at a right angle.

NOTE Incorrect nozzle guide may result in particle loss.

Flat nozzle

Applying the flat nozzle correctly



Applying the flat nozzle incorrectly

When using the flat nozzle, ensure that the contact pressure does not cause the brush hairs to bend.

You should aim to guide the flat nozzle with your hand parallel to the component surface.

NOTE Incorrect nozzle guide may result in particle loss.

6.8. Operating parameters

The volume flow of the particle suction extraction system is measured and calculated using the differential pressure measurement method below the mesh filter. The volume flow is an indicator of the reproducibility of the selected process parameters.

The following guide values are given when using the suction unit, 5 µm mesh filter and the marked operating point:

Volume flow when using the 5 µm mesh filter	
Usage	**CYCLONE UNIT**
Suction nozzle	21 m³/h +/- 2 m³/h
Brush nozzle	22 m³/h +/- 2 m³/h
Flat nozzle	22 m³/h +/- 2 m³/h
	FILTER UNIT
Suction nozzle	25 m³/h +/- 3 m³/h
Brush nozzle	27 m³/h +/- 3 m³/h
Flat nozzle	27 m³/h +/- 3 m³/h

7. Cleaning

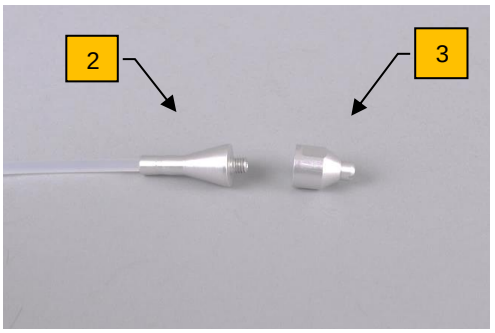
Clean the particle suction extraction system thoroughly before initial operation and between individual measurements. Particles from previous tests or contaminants may distort the analysis results. For this reason, it is important to remove all remaining particles from the system as far as possible.

It is recommended to use a number of fresh, alcohol-soaked cleaning cloths per cleaning process, depending on how contaminated the appliance is, to clean the device thoroughly to an optimum extent.

7.1. Cleaning with cleaning wire – dry cleaning

7.1.1. Preparing cleaning equipment and cleaning

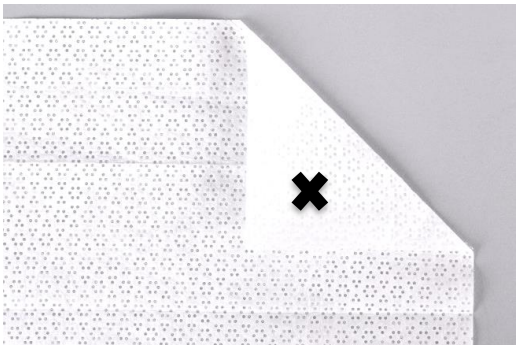
Cleaning wire assembled



Cleaning wire disassembled

⇒ Clean the suction hose (Pos.1) or the connection hose (Pos. 2) with the cleaning wire (1). The cleaning wire head piece comprises the cleaning wire lower section (2) and the cone (3).

Damp, alcohol-soaked cleaning cloths prevent the wire from sticking. Do not use dried-out cleaning cloths. The folded corner of the alcohol-soaked cleaning cloth will tear off if you press or pull on the cleaning wire strongly.



Attachment point for the alcohol-soaked cleaning cloth

Inserting through the attachment point

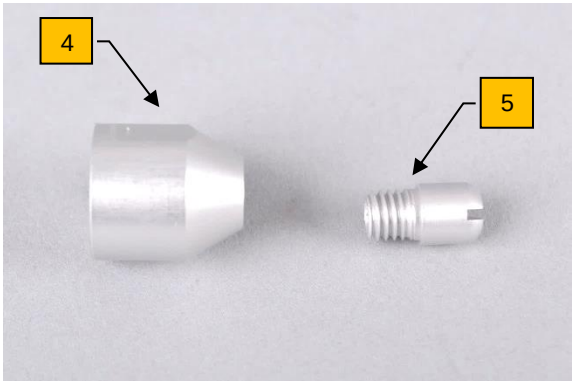
⇒ Unscrew the cone (3) of the cleaning wire (1) and wrap or fold over the alcohol-soaked cleaning cloth about 6.5 cm at one corner (see photo). Punch a hole in the folded corner with the thread of the cleaning wire lower section (2) (see the **x** in the photo).

⇒ Do not make the hole too large (as large as the diameter of the thread as a maximum); otherwise, you won't be able to fasten it with the cone (3).

⚠ CAUTION When punching the cleaning cloth, there is a risk of injury caused by the sharp edge of the cleaning wire cone.

Cleaning wire with attached alcohol-soaked cleaning cloth

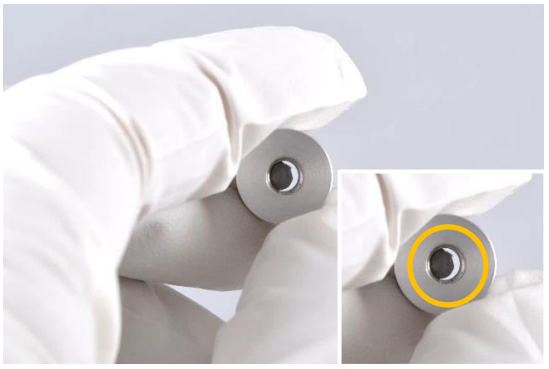
⇒ Screw on the cone (3) to fix the double-folded, alcohol-soaked cleaning cloth.



Cleaning wire cone with screw

Thread to be cleaned

⇒ You can disassemble the cone (4) by hand, using a screwdriver and open-end spanner if necessary.



Blocked cone thread

Removing cleaning cloth remains

⇒ The cleaning wire cone features a small screw (5). You can remove the screw (5) to clean the cone thread with a pointed object. Bits of alcohol-soaked cleaning cloths will stick in the thread and occasionally need to be removed.

7.1.2. Cleaning hoses

Inserting the alcohol-soaked cleaning cloth

Alcohol-soaked cleaning cloth pushed through

Alcohol-soaked cleaning cloth inverted by 180°

Feeding back the alcohol-soaked cleaning cloth

⇒ Carefully feed the alcohol-soaked cleaning cloth through the hose using the cleaning wire (1). Do not compress the cleaning cloth at a single point; otherwise, there is a risk of it getting stuck. You can prevent this by carefully feeding and turning the cleaning cloth into the hose being cleaned. After feeding it through the entire hose, turn the alcohol-soaked cleaning cloth by 180° and carefully pull the cleaning wire back with the alcohol-soaked cleaning cloth.

Cleaning the connectors on the end of the hose

⇒ Also clean the ends of hoses with their connectors with the alcohol-soaked cleaning cloth.

Clean all hoses in the way described.

If the cleaning cloth gets stuck in the hose, flush the hose with demineralized water to remove the cloth. Then clean the hose again.

Covering hose ends with plugs

Hose ends with plugs

⇒ Once the hoses have been cleaned, insert the hose ends into their designated positions on the particle suction extraction system. If you no longer intend to use the hose after thorough cleaning, close it with a plug to prevent it from becoming contaminated with particles.

7.1.3. Cleaning the nozzles

Pre-cleaning the brush suction nozzle mechanically

⇒ Loosen and suction particles from the bristles on the brush suction nozzle and the flat nozzle by wiping while the suction unit is switched on.

⇒ Use an ultrasonic bath with water and commercial dishwashing detergent to clean the brush. Then rinse the brush and leave to dry.

Brush nozzle hand piece

Cleaning the suction nozzle

⇒ Clean the suction nozzle or the brush nozzle hand piece with a cleaning tab and an alcohol-soaked cleaning cloth.

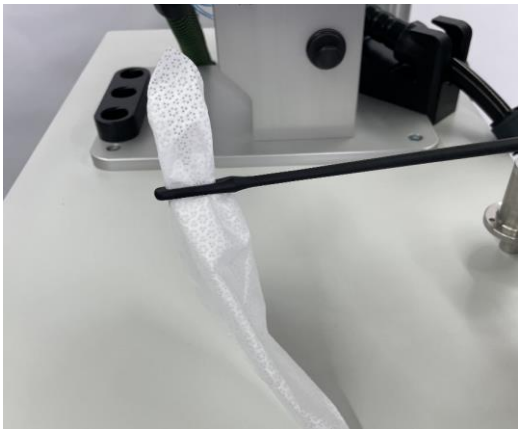
Cleaning the flat nozzle on the inside

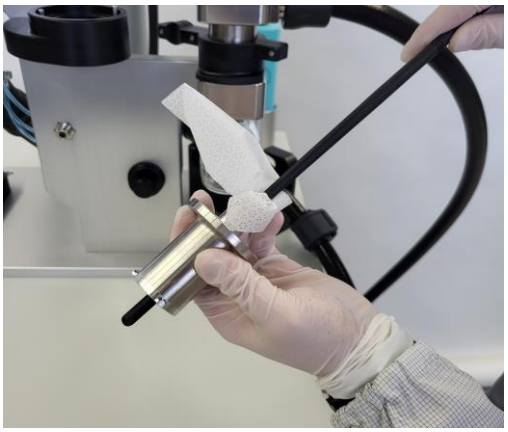
… and outside

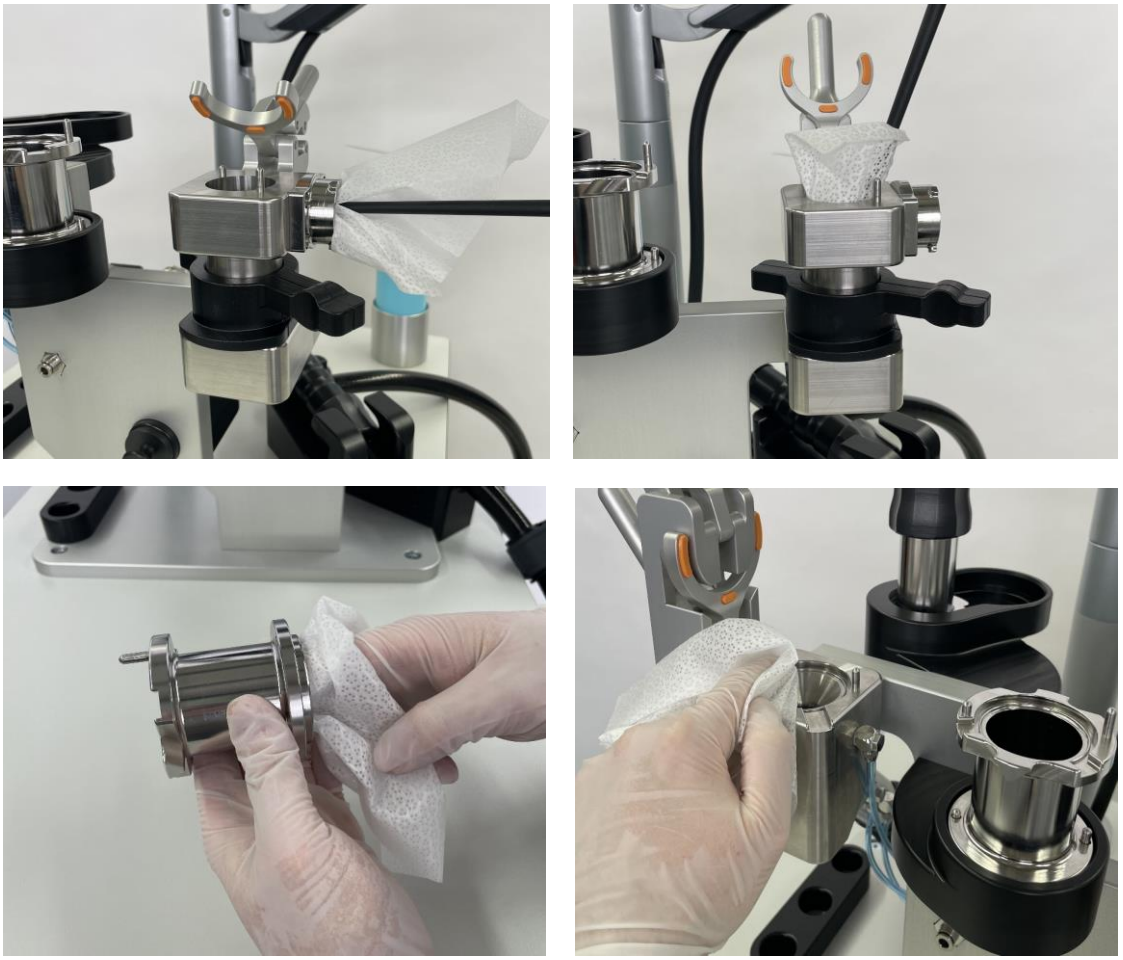
⇒ Clean the brush and flat nozzles and their bristles on the inside and outside with an alcohol-soaked cleaning cloth.

7.1.4. Cleaning the system

⇒ Clean all parts using an alcohol-soaked cleaning cloth and the cleaning tab.







Cleaning cyclone unit and filter unit on the inside and outside

⚠ CAUTION

Risk of injury due to sharp edges. Take care while cleaning the cyclone unit, filter unit and flushing unit. There are sharp edges at connection points and transitions, some of which are required for the device to function. These sharp edges may only be cleaned with a cleaning cloth folded over several times to eliminate the risk of injury.

Cleaning the laboratory bottle

⇒ Clean the laboratory bottle with an industrial dishwasher or an alcohol-soaked cleaning cloth.

If you do not intend to use the particle suction extraction system after thorough cleaning, close the cyclone unit and the filter unit (on top and at sides) with the plugs to prevent them from becoming contaminated with particles.

Closed and protected particle suction extraction system, cyclone unit, and filter unit

⇒ Cover the system with the supplied protective hood to provide optimum protection against contamination from the surrounding environment.

NOTE The system may become contaminated if the plugs are not fitted correctly.

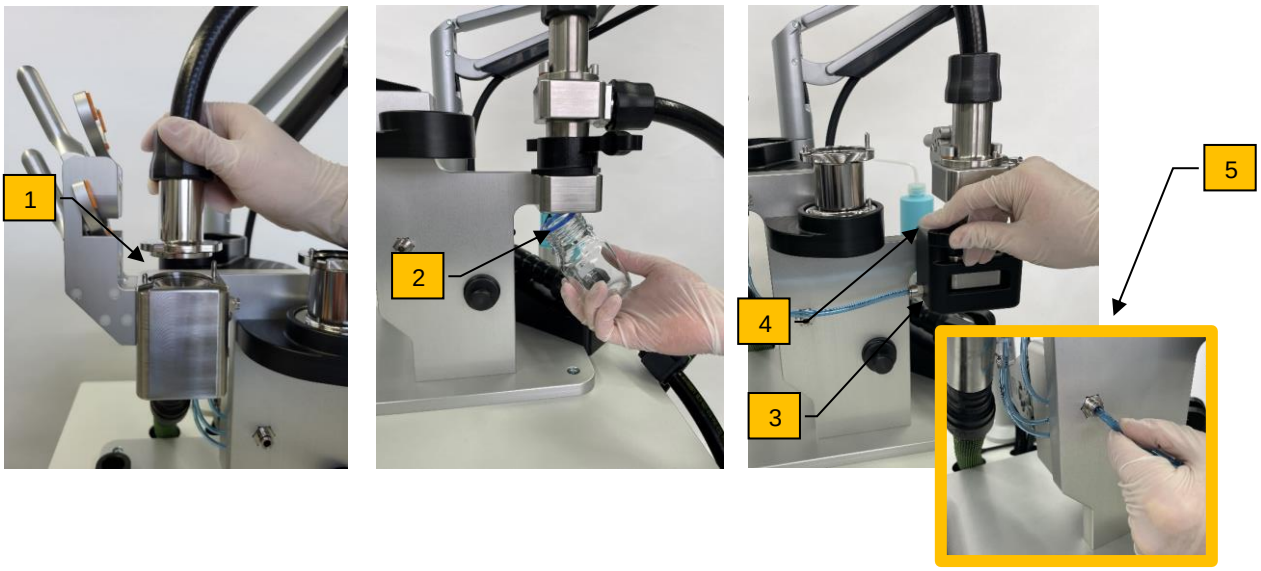
Particle suction extraction system with covering hood

7.2. Wet cleaning

⇒ Check the filter in the drying adapter (1). The filter must be replaced in case of heavier contamination.

⇒ Unscrew the drying adapter and remove the old filter (2).

⇒ Insert a new filter and screw down the drying adapter again (3).



⇒ Press ***Cleaning*** in the control system.

⇒ Check to make sure that there is no filter in the filter unit (1).

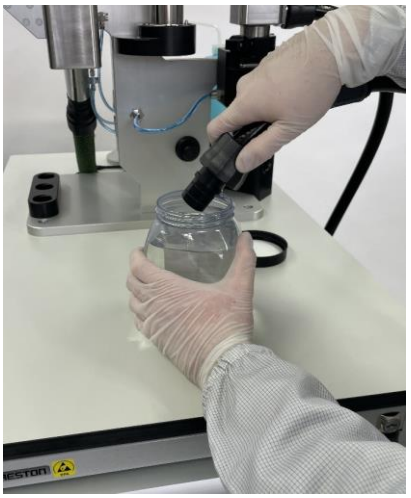
⇒ Remove the nozzle (cleaning the nozzle in chapter 7.1.3).

⇒ Unscrew the bottle (2).

⇒ Connect the wet cleaning adapter (3) and fix it with lever (4).

⇒ Connect the hose (5).

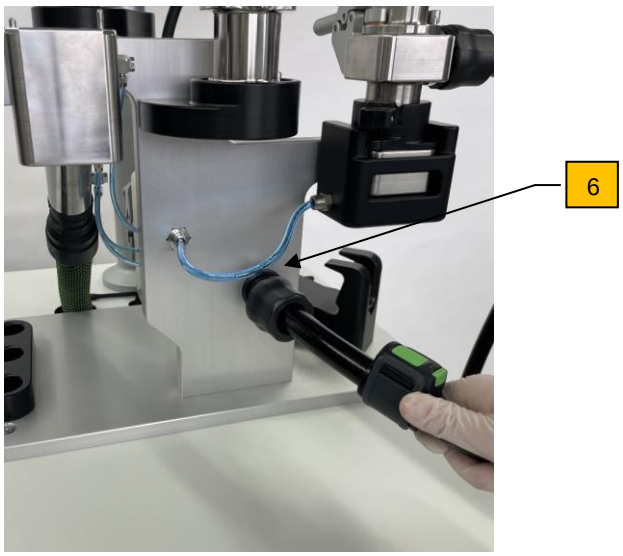
⇒ Start with the ***Start/Stop*** button or by pressing the button on the Bluetooth remote control.



⇒ Hold the suction hose in the liquid and completely empty the container. Then press the ***Start/Stop*** button or use the remote control to end the process.

NOTE

Please use only the cleaning medium intended for this purpose. Otherwise, the cleaning result may be insufficient or the cleaning system may even be contaminated.



⇒ Remove the cap from the drying attachment and connect the suction hose to the drying attachment (6).

⇒ Press the ***Finish step*** button to go to the next step.

⇒ Press ***Start drying process***. (Duration: 300 seconds)

⇒ Once you hear the voice message “Drying process completed” and the screen message appear, acknowledge with ***OK***.

⇒ Pull the nozzle out of the drying adapter, insert it into the intended device and place the plug back on the drying adapter.

7.3. Determining the blank value after cleaning

Cleanliness testing on components using extraction entails a risk of not only particles from the test component but also foreign particles not originating from the component affecting the analysis results. If the proportion of foreign particles ("blank value") is too high, this can result in an incorrect evaluation of component cleanliness. The blank value represents the total value for impurities not originating from the component. (see: VDA 19.1, chapter Determining the blank value)

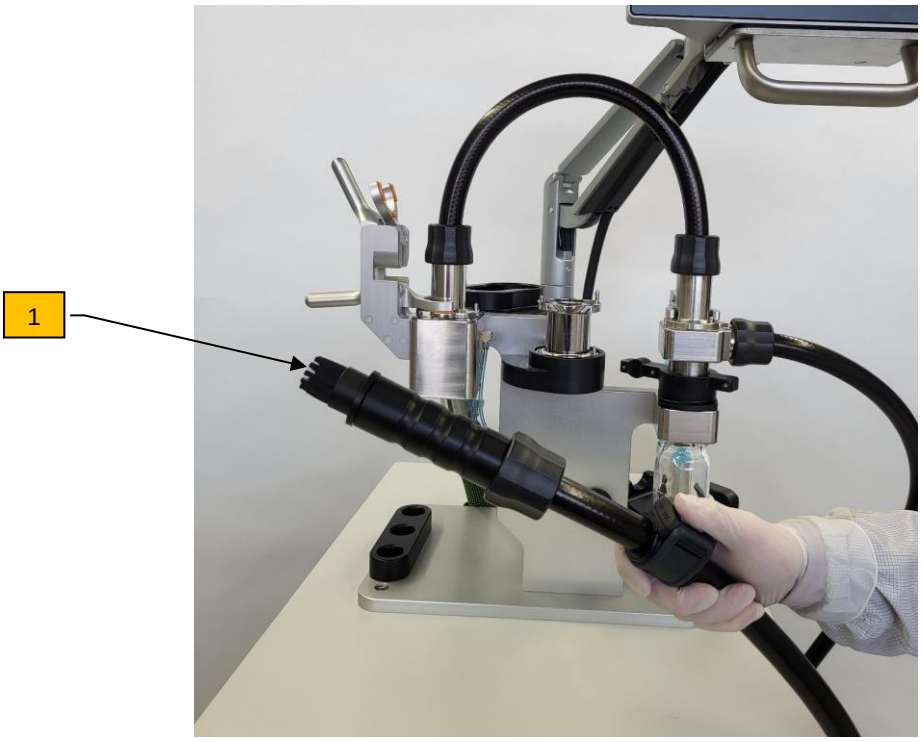
The user determines the required blank value on an individual basis. Once the blank value specifications have been met, the system is ready for particle suction extraction.

7.3.1. Determining the blank value with or without the prefilter

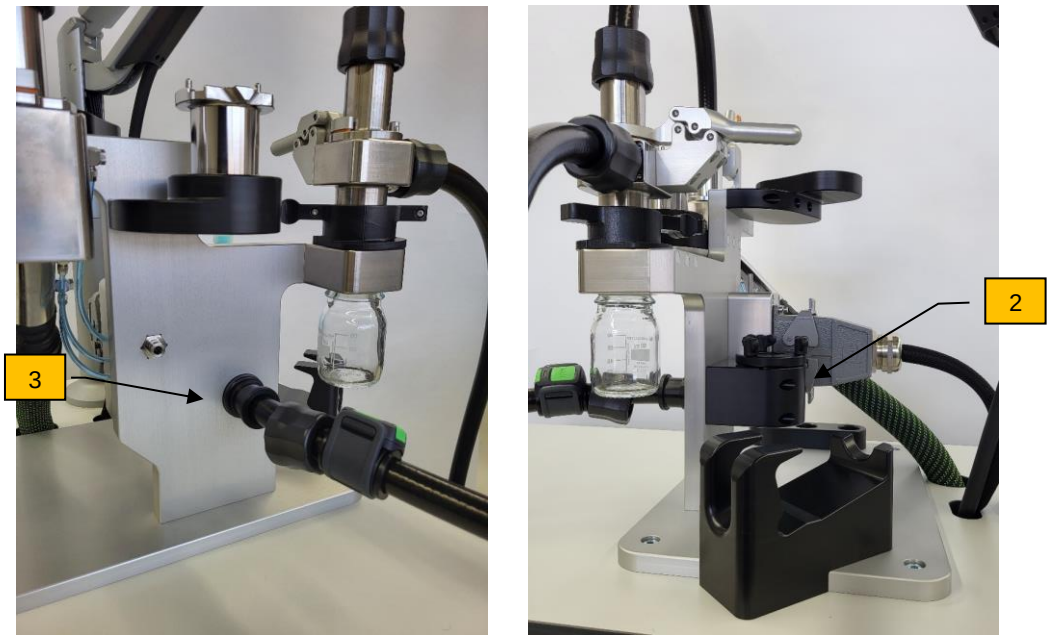
There are different options for determining the blank value: Determining the blank value with ambient air from the test environment.

Determining the blank value without ambient air from the test environment (blank value from the particle suction extraction system only) using a prefilter.

Blank value, including the test mat or test surface. The relevant surfaces are actively suctioned while the blank value is determined.



Determining the blank value, suction from the atmosphere



Determining the blank value, suction with prefilter via drying adapter

7.3.2. Determining the blank value

⇒ Insert a new mesh filter (as described in chapter 6.3).
If you are working with the cyclone unit, screw on a clean, empty particle collection jar as described in Section 6.

⇒ Do not perform particle suction extraction to determine the blank value.

⇒ When determining the blank value against the atmosphere, hold the suction nozzle or brush nozzle with or without a prefilter, pointing it upwards into the atmosphere (1).

⇒ When determining the blank value with prefilter (2), insert the suction nozzle into the drying adapter (3).

⇒ Select the ***Blank value*** function in the menu and switch on the suction unit for 2 minutes as described in chapter 8.4.

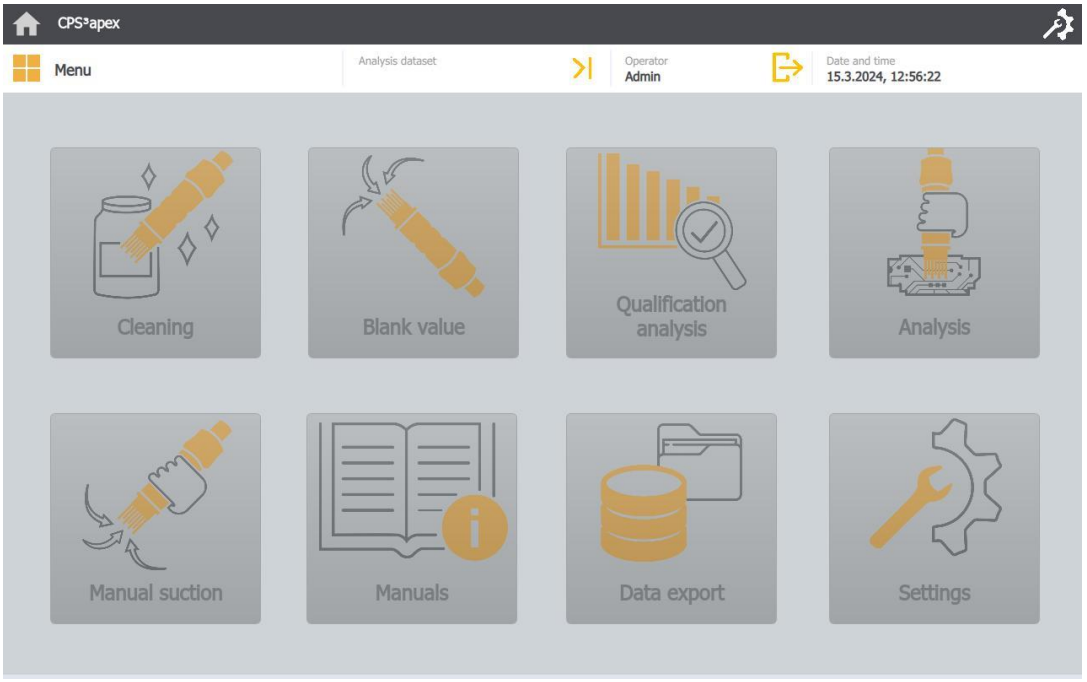
⇒ Perform a visual inspection of the filter unit and laboratory bottle.
If necessary, rinse or extract the laboratory bottle contents and analyze the mesh filters.

8. Operation with control system

The CPS[3] particle suction extraction system and thus the connected suction unit can only be operated with the help of the panel. Manual operation via or with the suction unit is not possible.

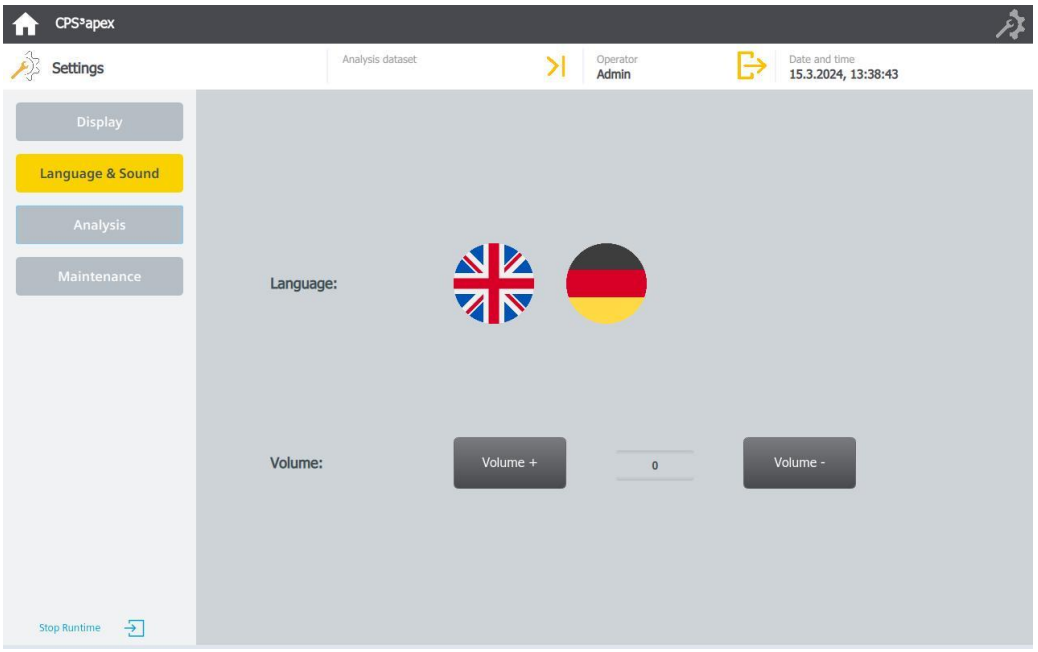
8.1. Function keys

The following function keys can be selected via the touch panel. For more information on the function keys, refer to the following chapters.

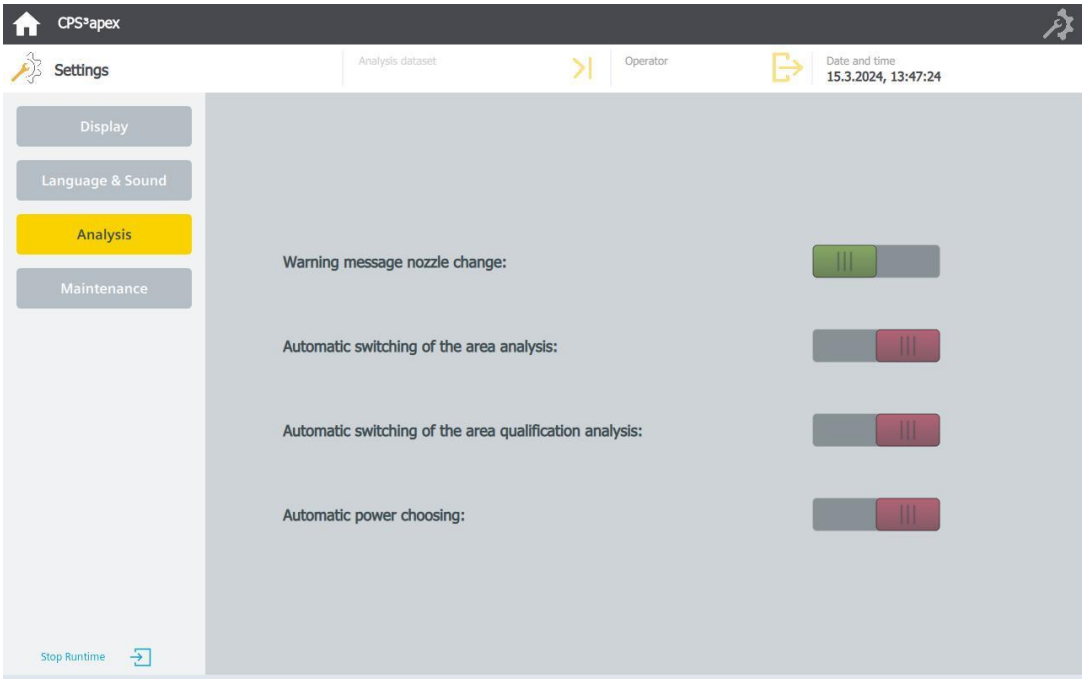


8.2. Settings

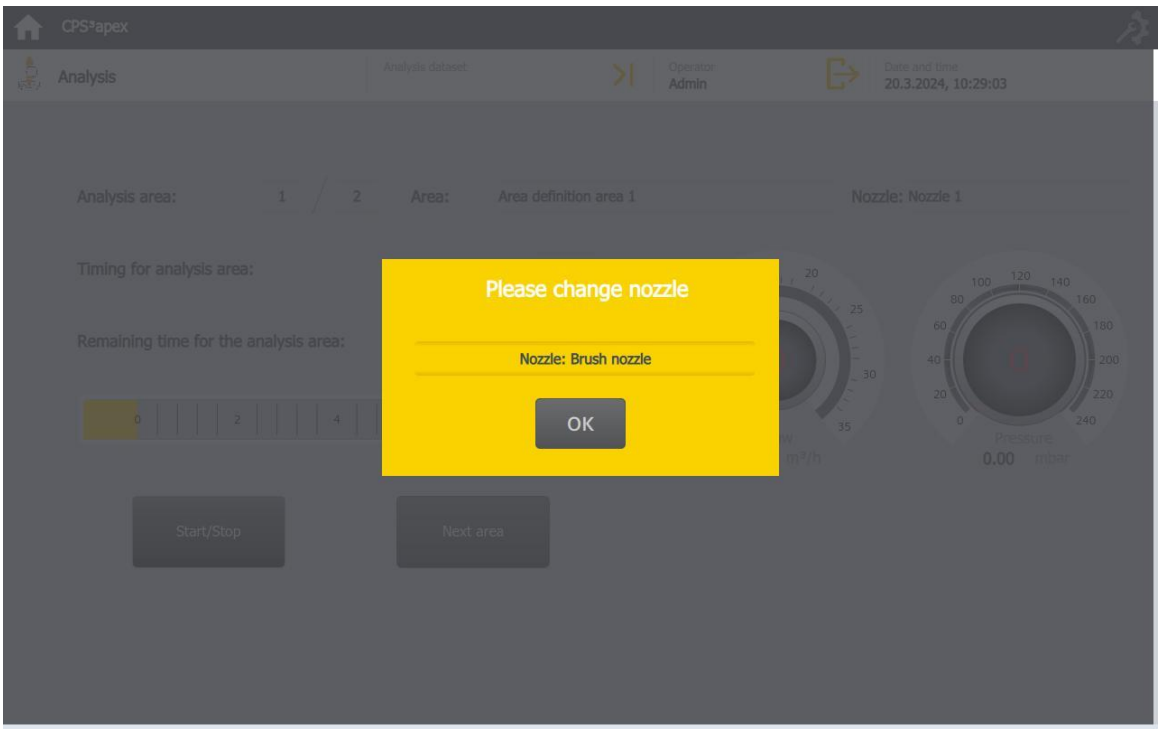
The language of the entire menu navigation can be changed in two languages via the buttons ***German*** to German and ***English*** to English. The ***Volume +*** and ***Volume -*** buttons can be used to adjust the volume of the system's voice messages and acoustic feedback.



The slide switch (On-Off switch) ***Nozzle change warning message*** can be used to activate or deactivate the warning messages before a nozzle change.



If activated, both an acoustic and a visual warning message in the form of a pop-up will be output. The nozzle description does not appear in step 1 of the qualification test because the system does not know the nozzle yet.



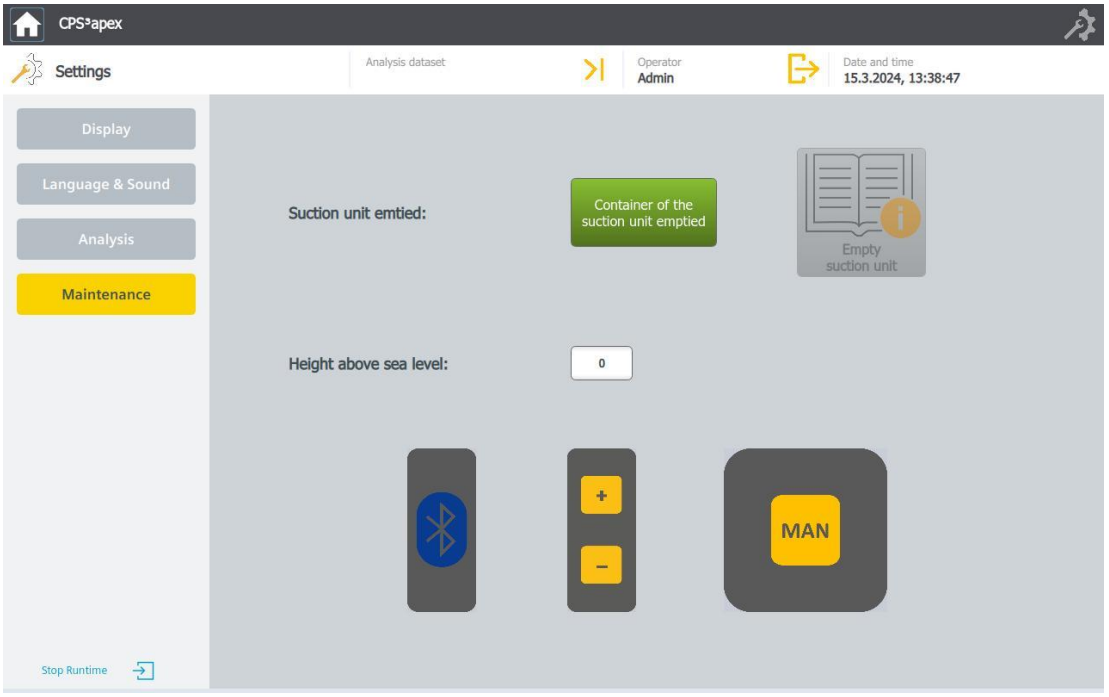
NOTE

The nozzle change warning message should only be deactivated by experienced personnel, otherwise, there is a risk of forgetting to change the nozzle.

The ***Automatic switching*** slide switch can be used in the system to activate or deactivate automatic switching between the individual extraction areas during extraction.

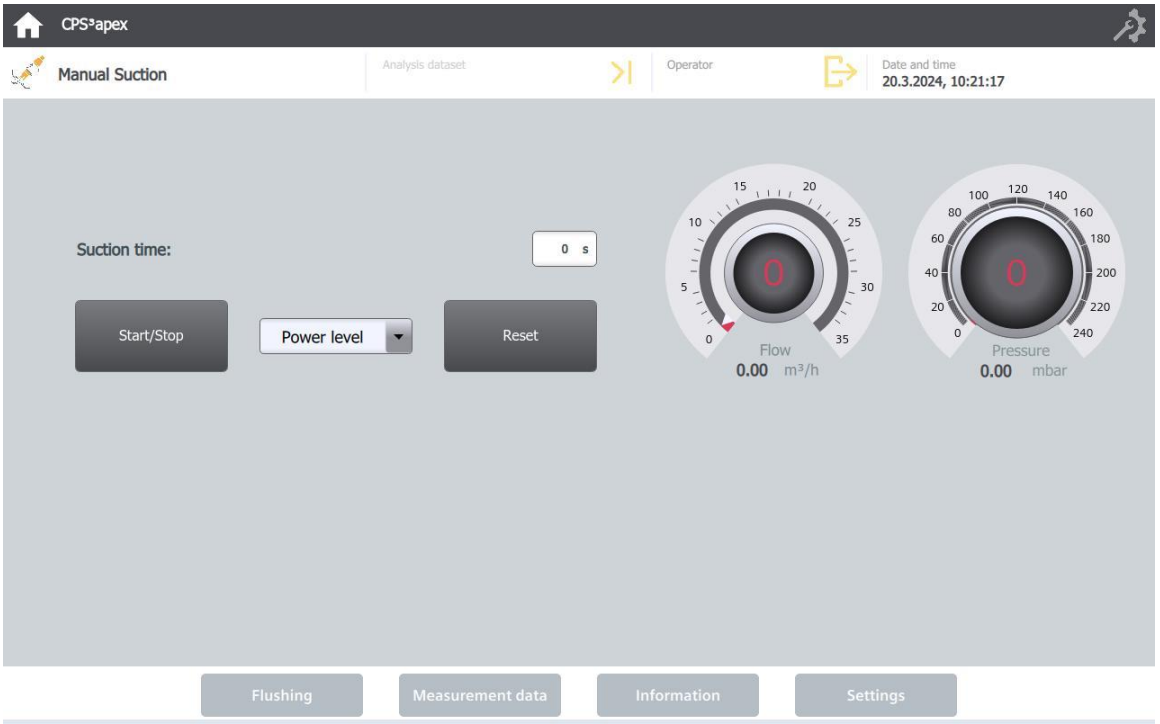
If the ***Automatic power choosing*** is switched on, the system automatically selects the power level. In addition, in case of automatic nozzle detection, the user must additionally select the power level for larger or smaller nozzles in the settings menu. (See chapter 6.6)

In the ***Altitude above sea level*** input field, the altitude above sea level of the current system location is stored. This is done only once during the installation of the system or after software updates.



If the C|PS³ system is relocated, for example, within a company site, no adjustment is necessary, since minimal changes in height of up to 50 m have no effect on the calculation of the volume flow.

8.3. Suction unit control panel



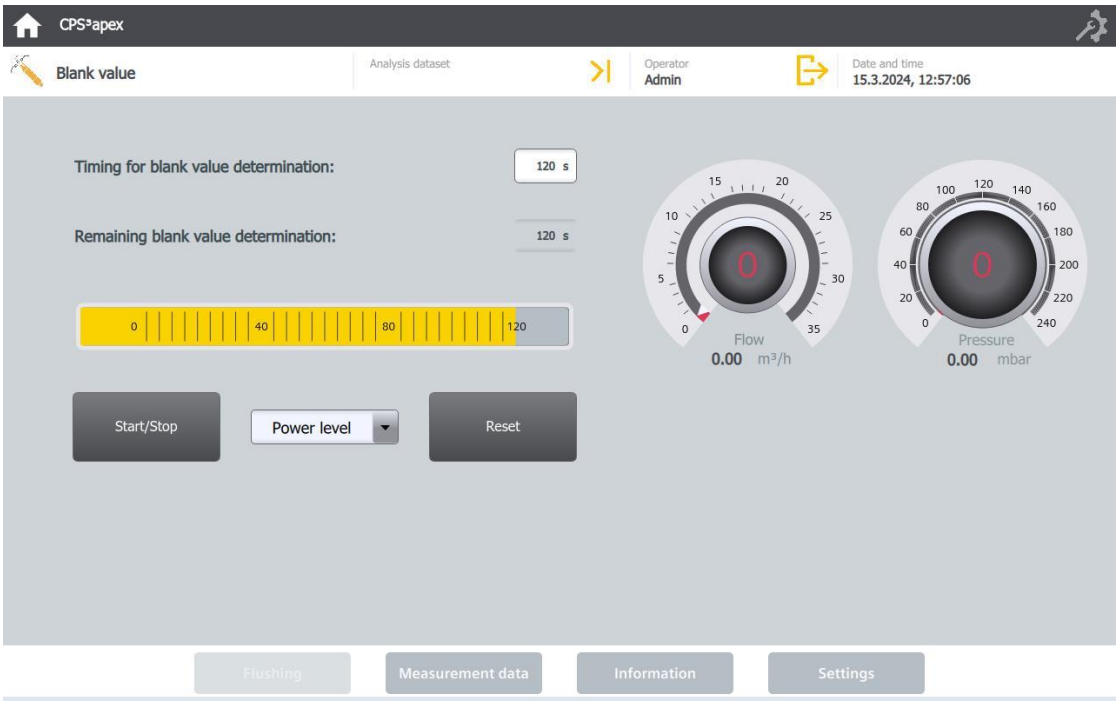
The suction unit can be switched on and off via the Bluetooth remote control (see chapter 5.4.1) or the power level can be regulated via the control panel of the control system. Manual operation directly via the control panel of the suction unit is not possible.

The suction unit can be switched on and off manually in the ***Manual suction*** function using the ***Start/Stop*** button. The suction level can be selected using the ***Power level*** button. As long as the system is operating within the operating parameters, the suction time is recorded. The suction time can be reset using the Reset button.

NOTE

Operation above the operating point (OP) may result in a reduction of the available suction time (due to thermal shutdown of the suction unit). Operation below OP results in impairment of the separation rate when separating via cyclone unit.

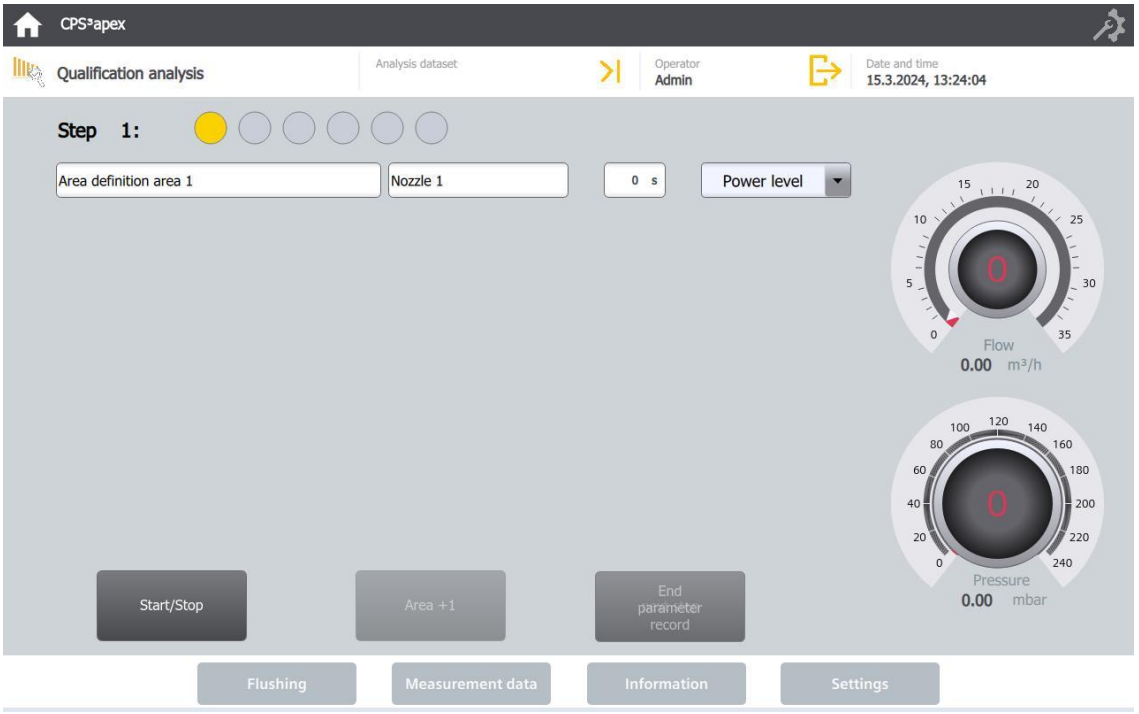
8.4. Blank value



More detailed information on how to perform the blank value test can be found in chapter 7.3. The blank value determination can be started and stopped via the ***Start/Stop*** button or via the Bluetooth remote control of the suction unit if it is connected. If the automatic nozzle detection is activated, the power level is selected by the system. If automatic nozzle detection is deactivated, the user must manually select the correct power level before starting the blank value determination. It is selected via the ***Power level*** selection field.

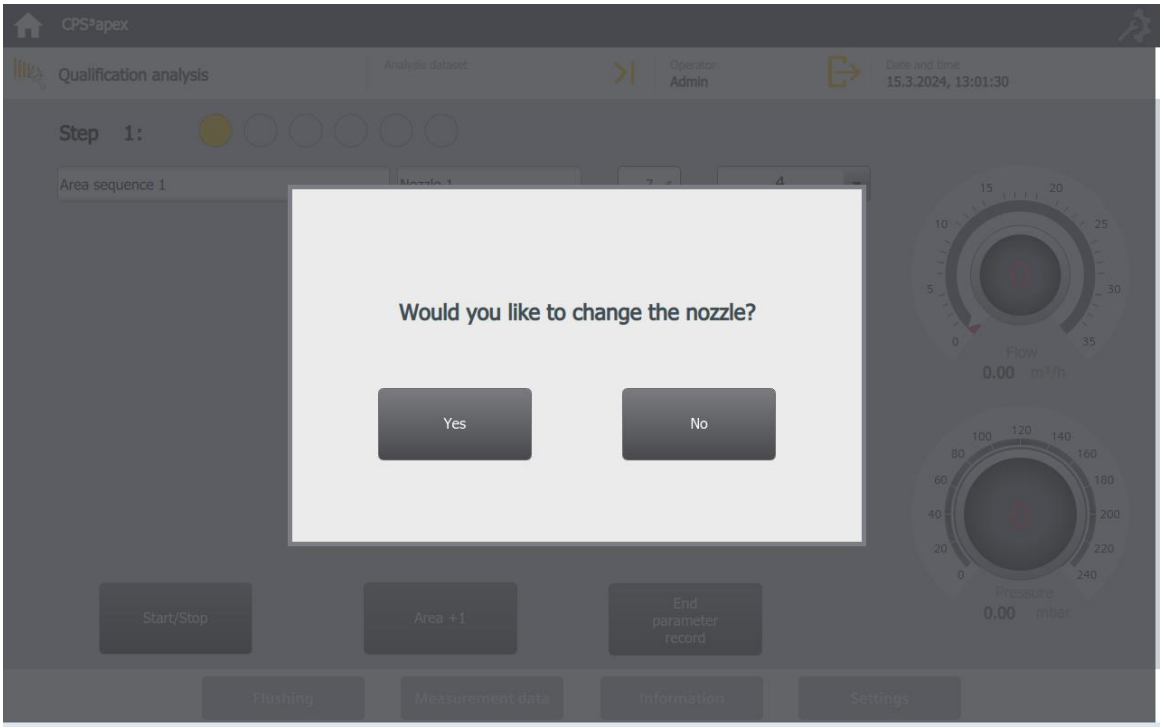
The volumetric flow and differential pressure are visually shown in the blank value display by two indicators and a numerical value. The user should use this display and values to independently check whether the extraction system has been properly assembled and the operating point is properly maintained. If an error is displayed or the operating point is not maintained, the blank value determination should be stopped by pressing the ***Start/Stop*** button. For information on the further procedure and determining the error source, see chapter 8.7.

8.5. Qualification analysis

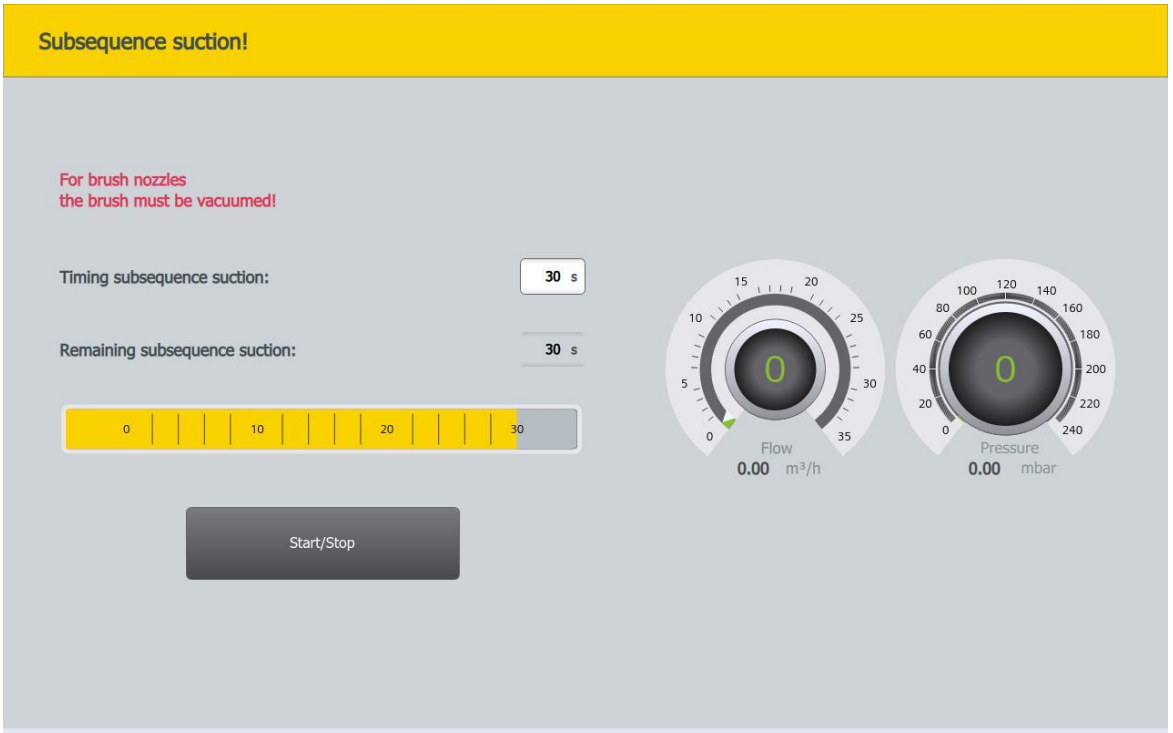


If the ***Automatic power choosing*** is switched off, the suction level must be selected first using the selection field. Then the area to be vacuumed next can be renamed and defined via the ***Area definition + Nozzle*** input field. The suction unit can be switched on and off by pressing the ***Start/Stop*** button. Alternatively, the suction unit can also be switched on and off via the Bluetooth remote control if it is connected.

After an area has been completely vacuumed, another area can be added via the ***Area +1*** button or the parameter input can be terminated via the ***End parameter record*** button. A ***Nozzle change*** pop-up appears.

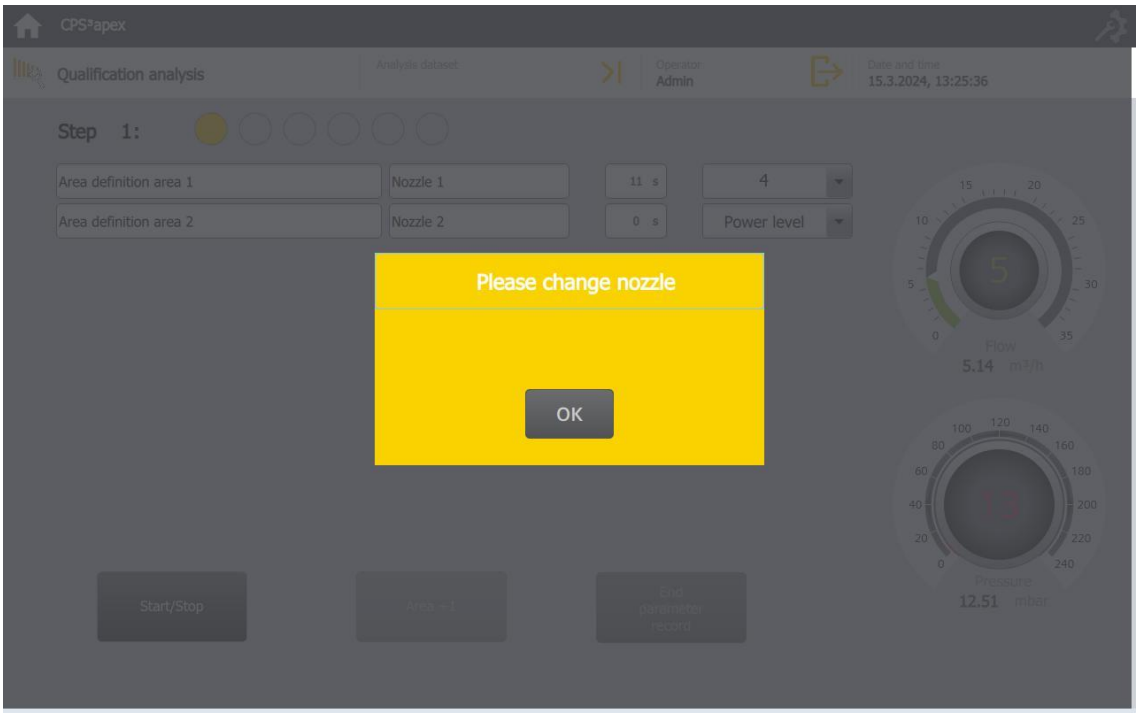


If the next area is to be vacuumed with the same nozzle, press ***No***. If you want to use a different nozzle for the next area, press ***Yes*** and another “Subsequence suction” pop-up will open.

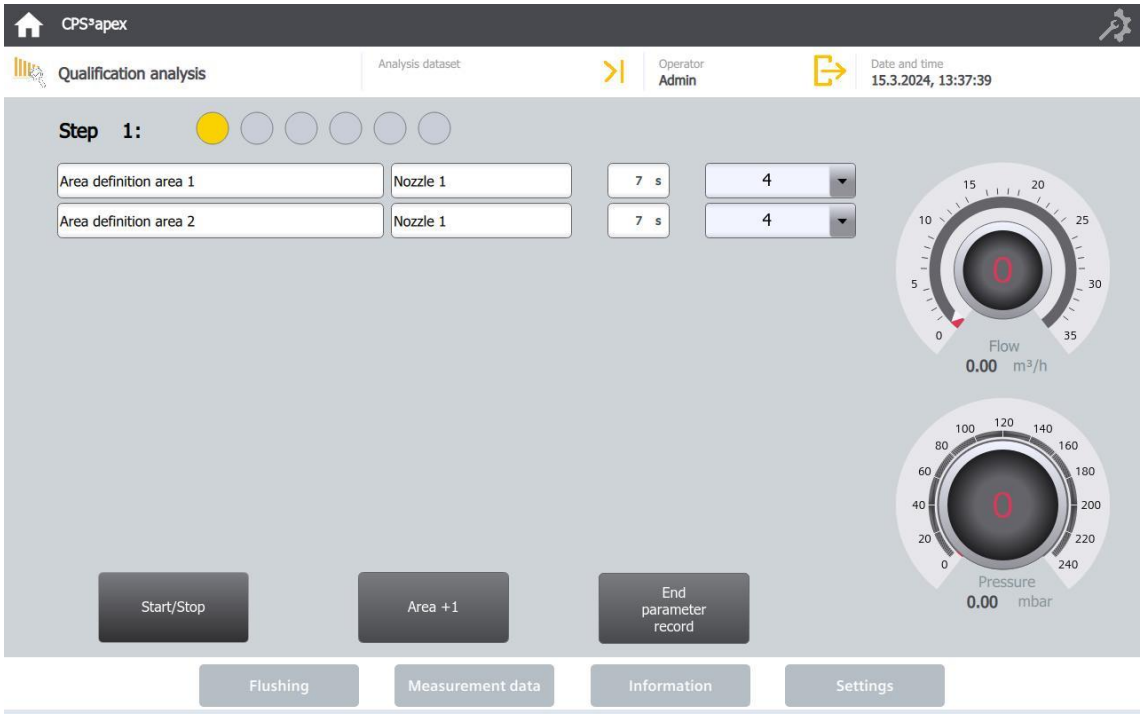


When performing a subsequence for a nozzle change, the subsequence suction time can be adjusted using the white input field. The subsequence suction time should not be less than 15 seconds. If a step of the qualification analysis has been completed, a minimum of 30 seconds should be added to the suction time so that as many particles as possible end up in the collection glass or on the filter.

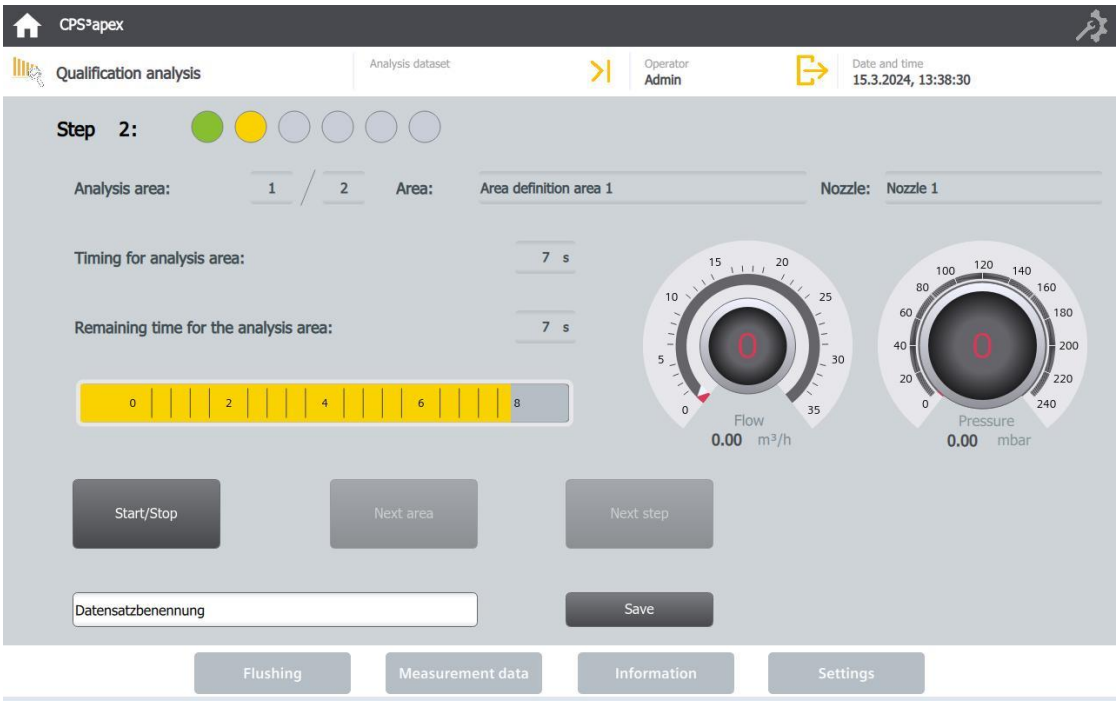
Before changing the nozzle or you have finished a step of the qualification test or an analysis, you must re-suction. Once the suction has been finished, a ***Re-suction completed*** pop-up will open again.



After pressing the ***OK*** button, you will return to the qualification test program. A new line appears for the next area to be vacuumed. This area can be renamed and defined as already described for area 1.



After the next area has been renamed and vacuumed, press the ***End parameter record*** button to proceed to the next step of the qualification test and after finishing the subsequence suction by pressing the button ***Next step*** to the next step of the qualification test.



 The LED display at the top of the screen indicates in green the areas already vacuumed and completed, and in orange the area to be vacuumed now. To the left of the LED display, the current step is also indicated with text.

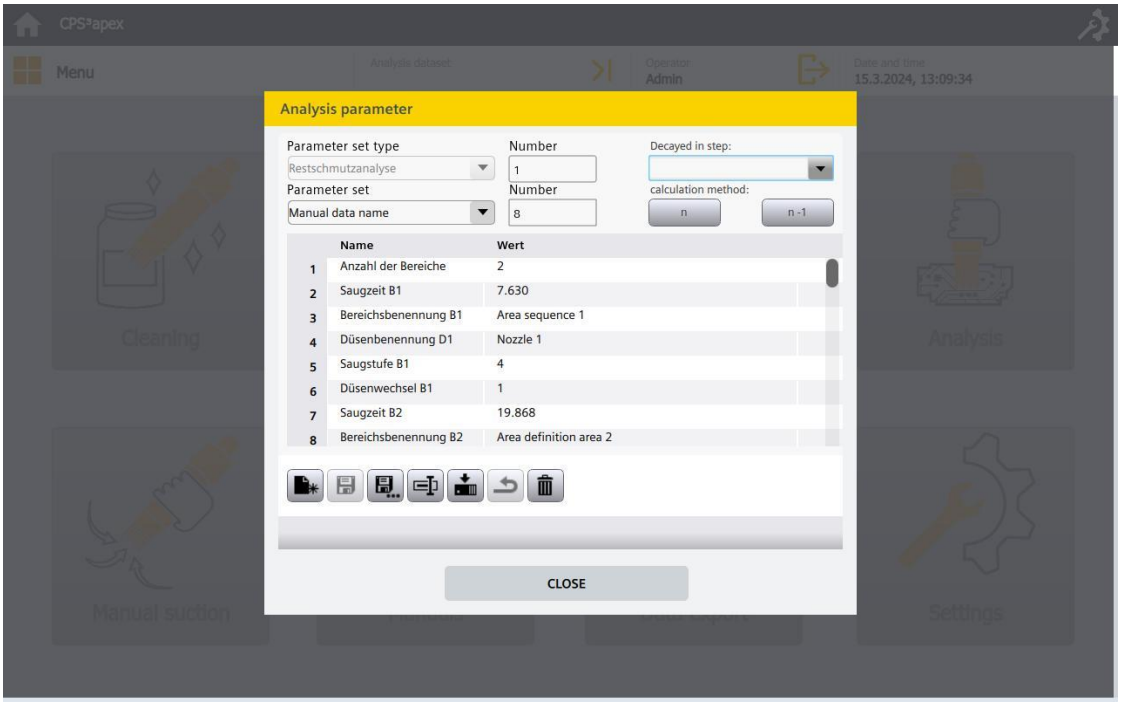
The suction unit can be started via the ***Start/Stop*** button or alternatively with the Bluetooth remote control. The suction time for the respective area starts as soon as the operating point of the system is reached.

The entire decay measurement can be assigned a name by pressing the ***Name data set*** button. By pressing the ***Save*** button, this data set is transferred to the recipes (see chapter 8.6) and is thus available for later analyses. If saving was successful, the ***data record name*** field is highlighted in green.

NOTE Depending on whether a decay measurement or dual measurement is used for the qualification test, 2 or 6 steps must be performed.

8.6. Analysis

The arrow next to ***Analysis data set*** takes you to the selection of analysis parameters. Previously performed and saved data sets for analyses can be found here. The appropriate data set is selected via the ***Parameter set*** selection field.

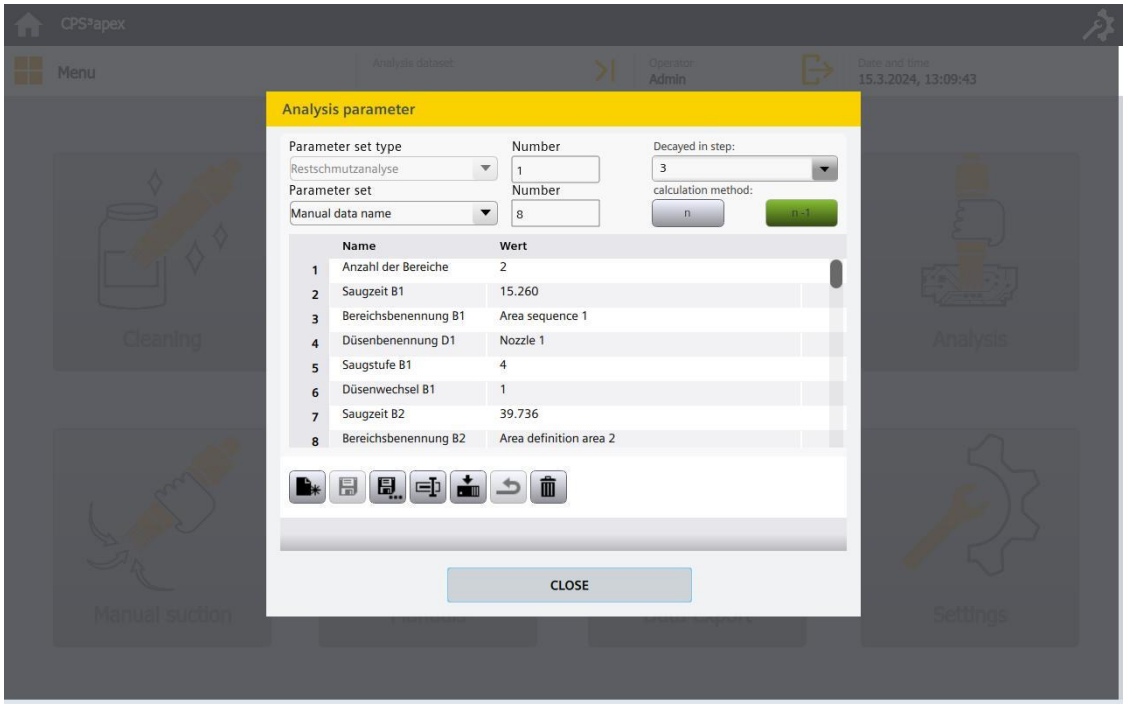


Then you will get access to all the important data about the qualification test or analysis, which you can edit and expand as you like.

The data set is either from a qualification test or from a repeat component. If no data set is available, no qualification test or analysis has been performed for this component so far or you forgot to save the data set. In this case, a qualification test must first be performed as described in chapter 8.5.

After selecting the appropriate data set, all relevant analysis data (areas, suction time, nozzle change, power level, etc.) will appear in the table below. This data should be compared with the test specifications.

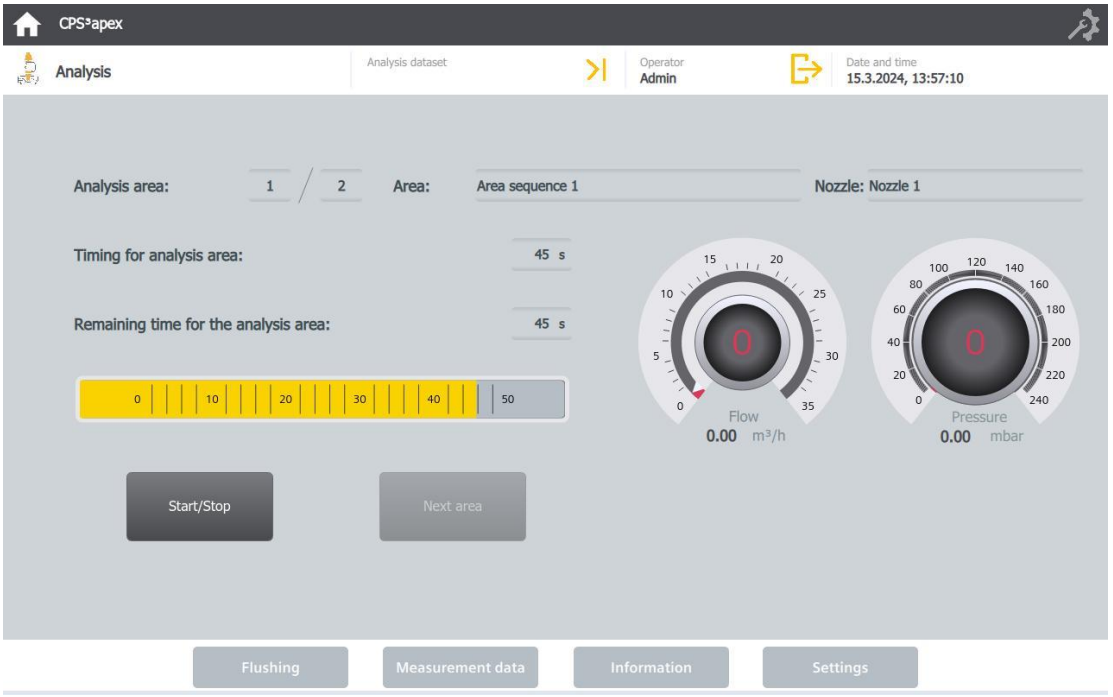
Creating analysis templates based on a data set from a decay measurement



If the data set was created using a decay measurement and the decay measurement has decayed in step 3, for example, the calculation method can be used to adjust the analysis data in compliance with the applied standard. Both the calculation method **n** and **n-1** can be used for this.

After adjusting the analysis data, the data set must be saved.

Then the data set must be uploaded to the control system.



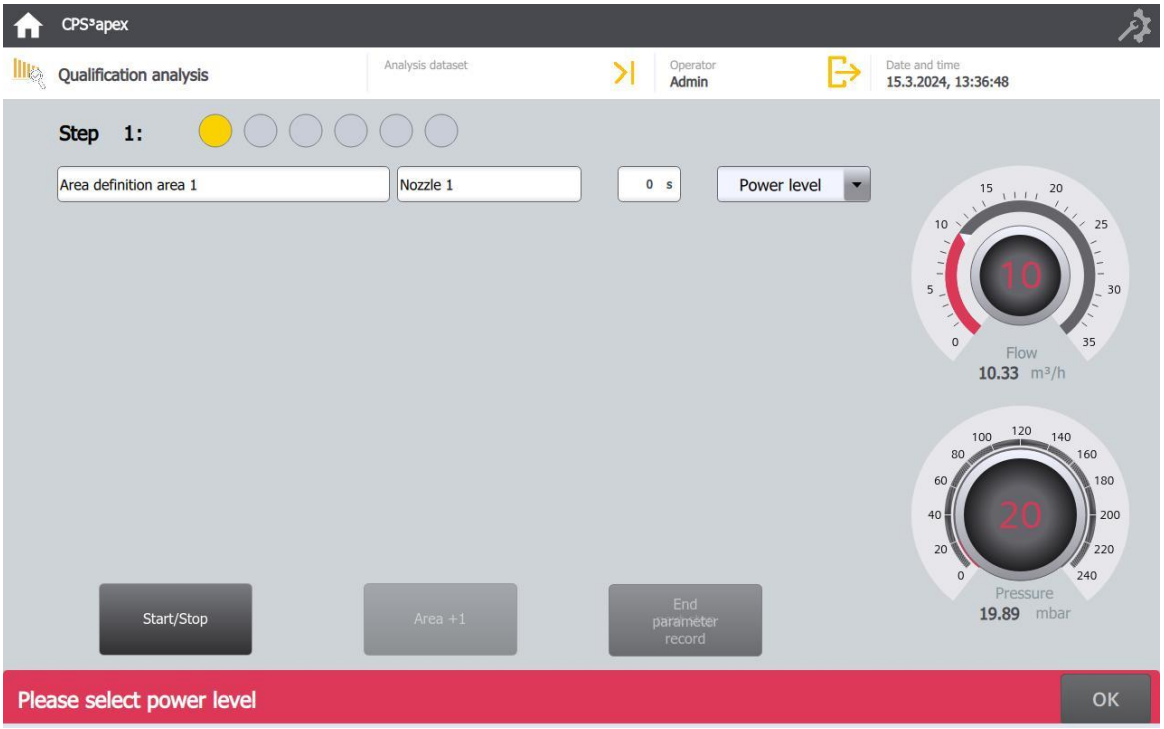
The suction unit can be started via the ***Start/Stop*** button or optionally via the Bluethooth remote control. As soon as the analysis time is finished, the suction unit is automatically switched off. The ***Next area*** button is used to navigate to the next area. As soon as the cleanliness analysis is finished, the ***Next area*** button will be replaced by the ***Finish analysis*** button.

8.7. Fault messages

When performing qualification tests and analyses or determining blank values, faults may occur if the suction unit is not used properly. These are signaled acoustically or visually by means of fault messages.

8.7.1. Fault message 1 – Select power level

This fault message only appears in step 1 of the qualification test or blank value determination and only if ***Automatic power choosing*** is switched off in the settings and no suction level has been selected before the start.



Acoustic warning: “Please select power level”

Visual warning: “Please select power level”

The fault message can be removed by selecting a power level.

8.7.2. Fault message 2 – Failure to maintain the operating point

Acoustic warning message: “Operating point left”

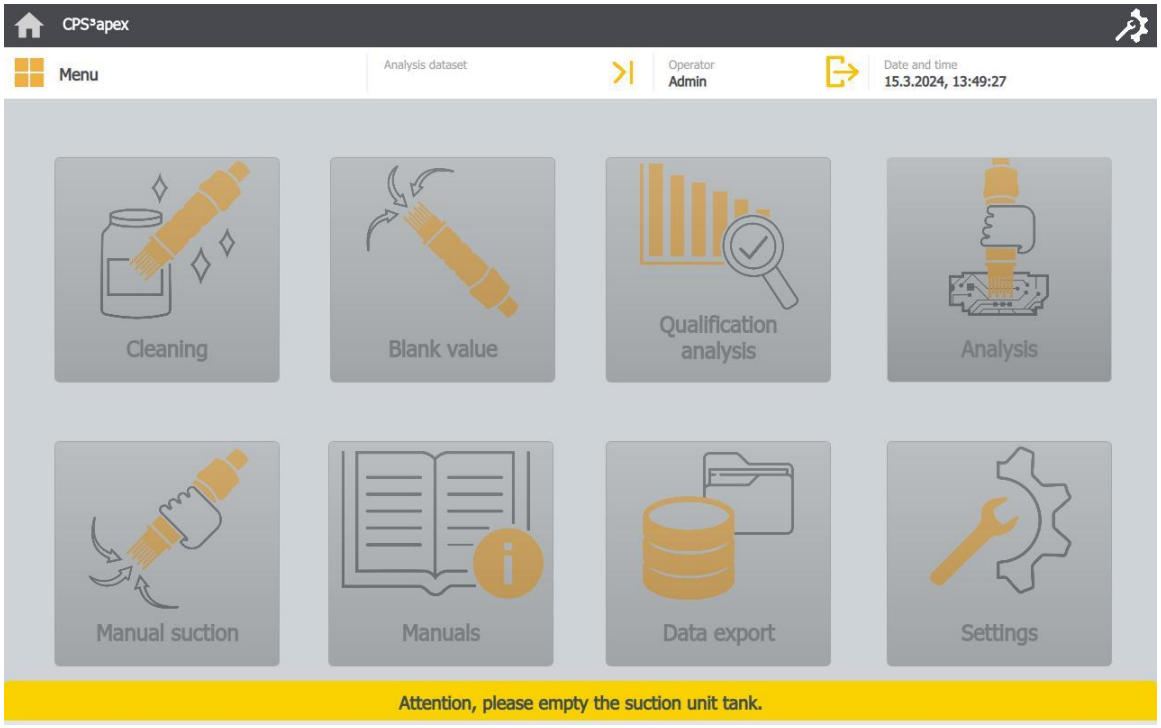
This fault message appears when the operating status is not correct. The cause of this fault message can have various reasons:

- Improper setup of the system (e.g. laboratory bottle not attached, wrong filter inserted)
- Nozzle not suitable for power level
- System blocked (e.g. residues in the suction hose)
- Leaks in the system, such as wrong hoses, plug connections that are not closed correctly or clamping levers which are not closed properly.

If the fault message still sounds after the system has been switched off and these possible causes have been checked, please contact support.

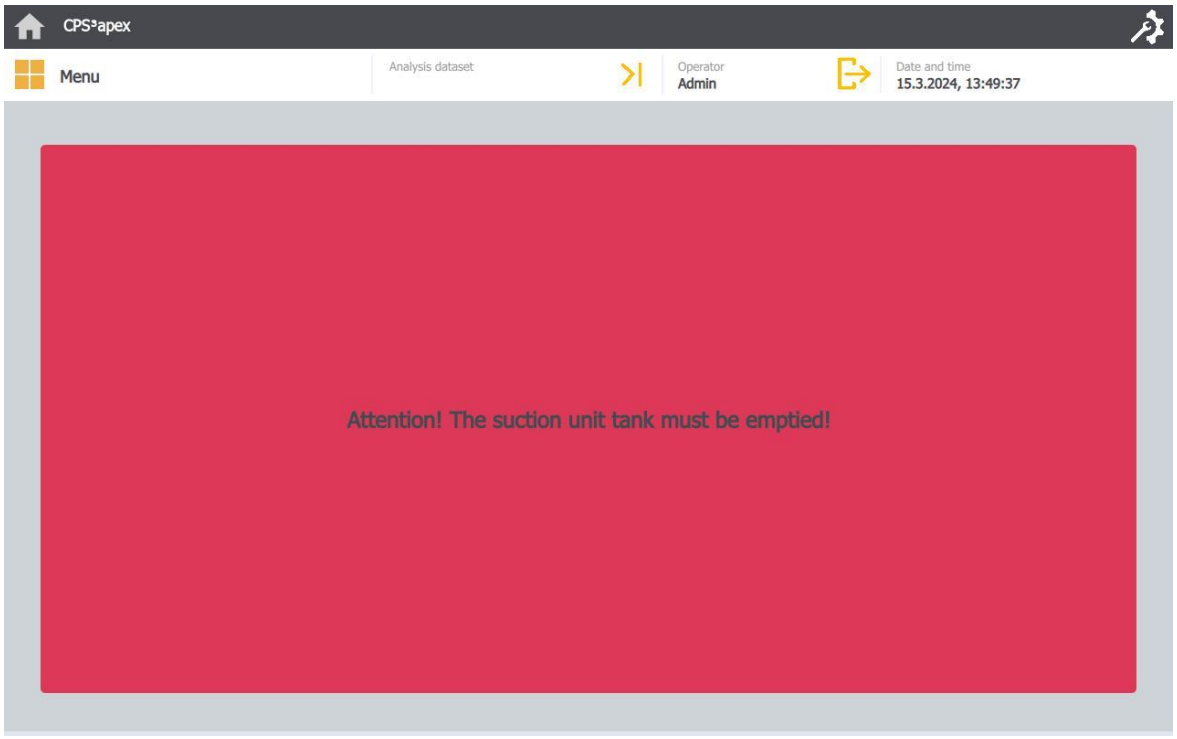
8.7.3. Fault message 3 – Empty suction unit liquid container

This fault message appears when the liquid container of the vacuum cleaner is about to be full or is full and should be emptied. This fault message is thus divided into two warning messages:



Warning message 1: “Attention, please empty the suction unit tank” (visual and acoustic message)

The container must be emptied in a timely manner. However, the system can still be used without any problems.



Warning message 2: “Attention! The suction unit tank must be emptied!”.

The container must be emptied immediately as described in chapter 9.1.

9. Maintenance

Perform maintenance as soon as the warning info appears on the display.

9.1. Changing the suction unit filter and emptying the dirt (water) container

Observe the instructions and safety instructions in the original operating instructions for the FESTOOL suction unit when doing so.

Replacing the mobile dust extractor filter

Emptying the dirt container

⇒ Open the flap of the trolley and pull the suction unit onto the device provided for this purpose.

⇒ Open the two side buckles and lift off the upper part of the suction unit. Place the upper part next to the device and carry the lower part (dirt container) (1) to a suitable disposal location. Drain the liquid.

⇒ If the corresponding disposal location is too far away, close the suction unit (as described in chapter 5) and move the complete suction unit to empty it.

⇒ Put all parts together again.

⇒ Then press the ***Empty suction unit container*** button in the settings.

9.2. Software update

9.2.1. Preparing the installation media

NOTE

Electrostatic discharges can damage the installation media! To avoid possible damage to the installation media, they must be stored in a conductive container. In addition, you must stand on a conductive, grounded floor and/or wear a grounded wristband.

⇒ Take the installation media out of the conductive storage box provided for this purpose from the bottom drawer of the device drawer unit.

Storage box

⇒ Unzip the file Firmware-Update.zip into a folder on your network or computer.

9.2.2. Preparing the installation medium for the control system

⇒ Insert the SIMATIC Memory Card 4 MB into a suitable slot on your computer, laptop, or external card reader.

⇒ Call Windows Explorer and display the contents of the memory card. Delete all folders and files present on the memory card.

⇒ Open the folder with the unzipped files of the firmware update.

⇒ Open the “Control system firmware update Vx.x” folder. Copy the entire contents of the folder to the memory card and safely remove it using the provided Windows function before you actually disconnect the hardware.

9.2.3. Preparing the installation medium for the HMI panel

⇒ Insert the SIMATIC SD Card 32 GB provided for the installation into a free slot on your computer or laptop.

⇒ Call Windows Explorer and display the contents of the memory card. Delete all existing folders and files on the memory card.

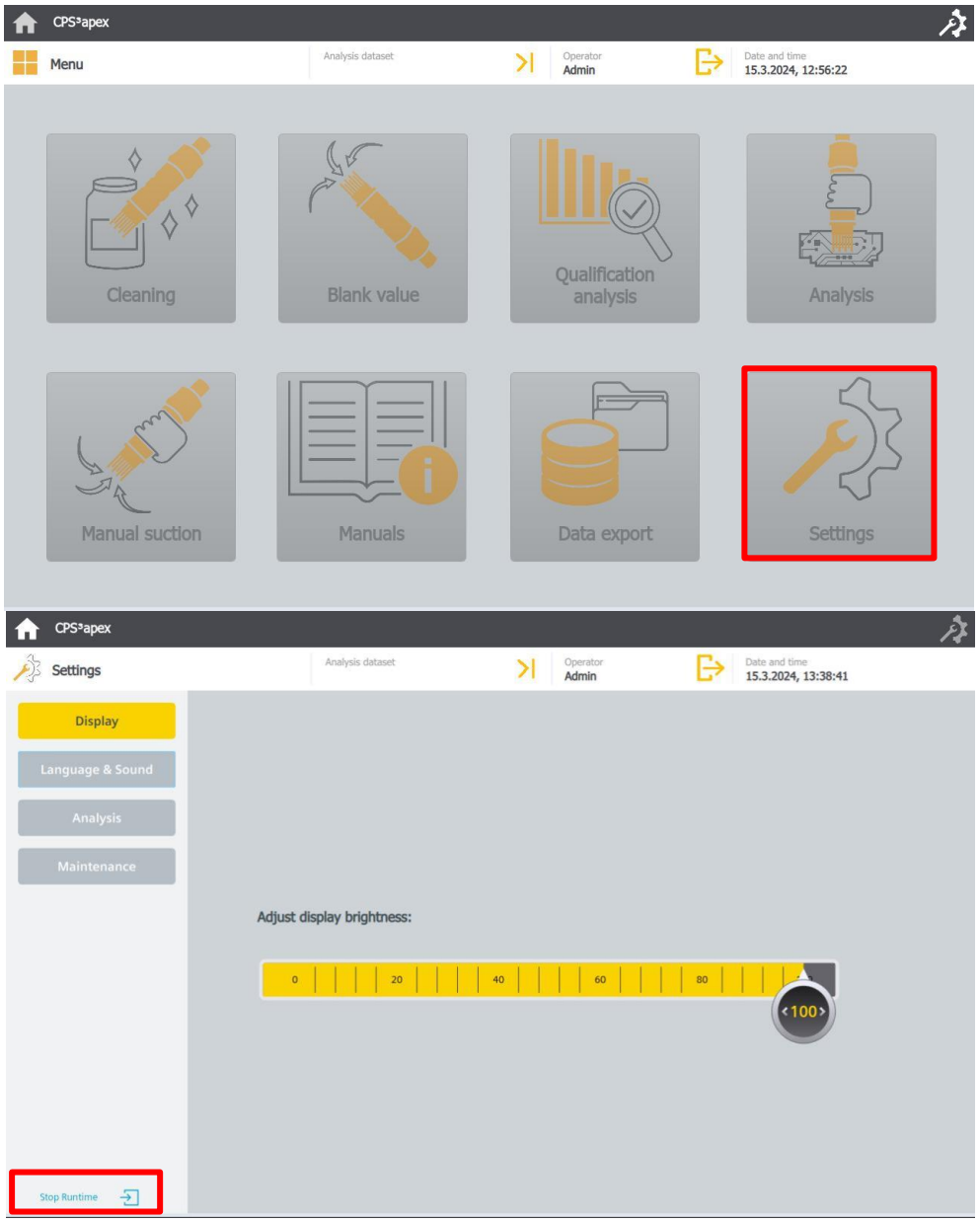
⇒ Open the folder with the unzipped files of the firmware update.

⇒ Open the “Firmwareupdate Panel Vx.x”. Copy the the entire contents of the folder to the memory card and remove it using the provided Windows function before you actually disconnect the hardware.

9.2.4. Installing the firmware update for the HMI panel

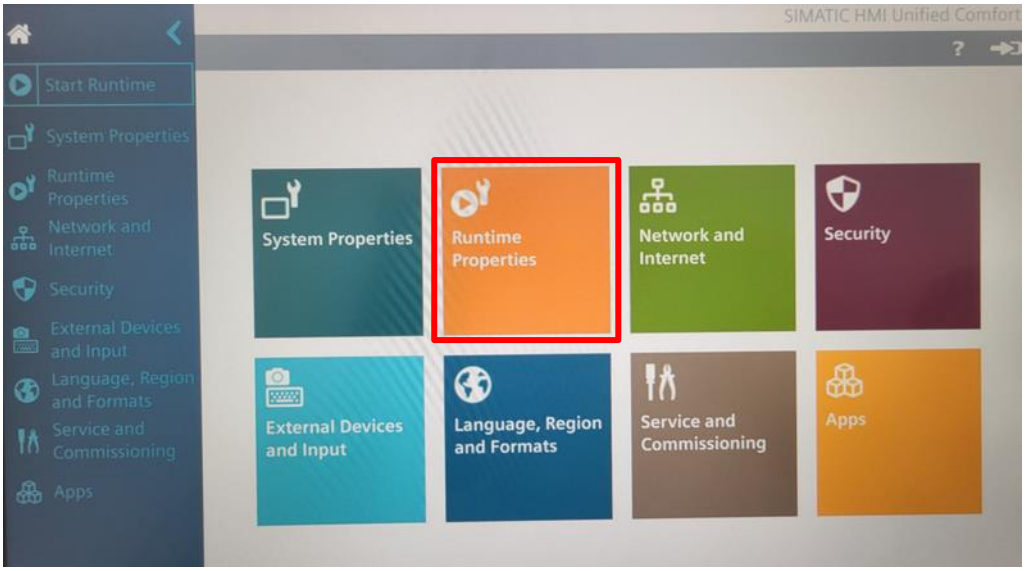
Insert the prepared SIMATIC SD Card 32 GB into the SD socket on the back of the panel.

⇒ Open the settings and press the ***Stop Runtime*** button.

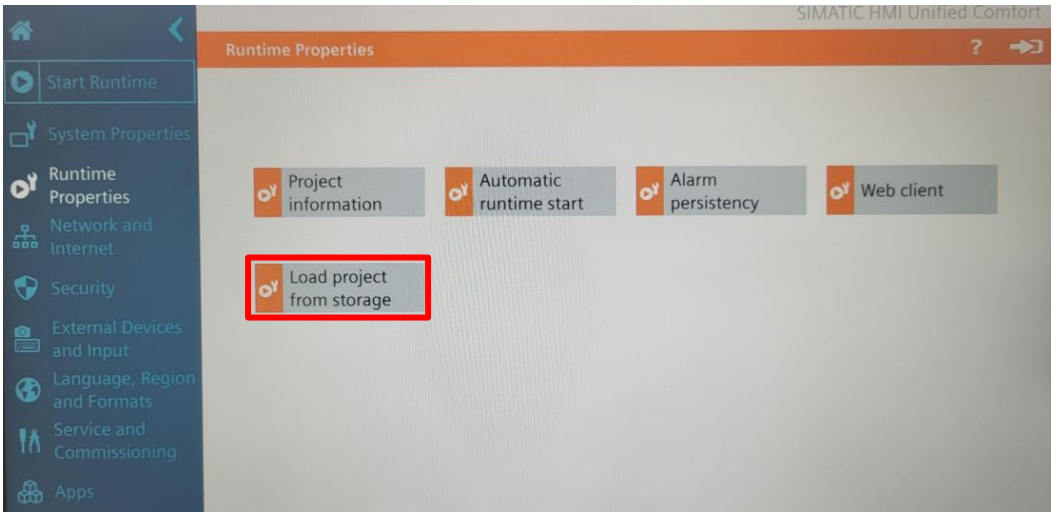


⇒ Another window opens. Press the ***Stop Runtime*** button again here.

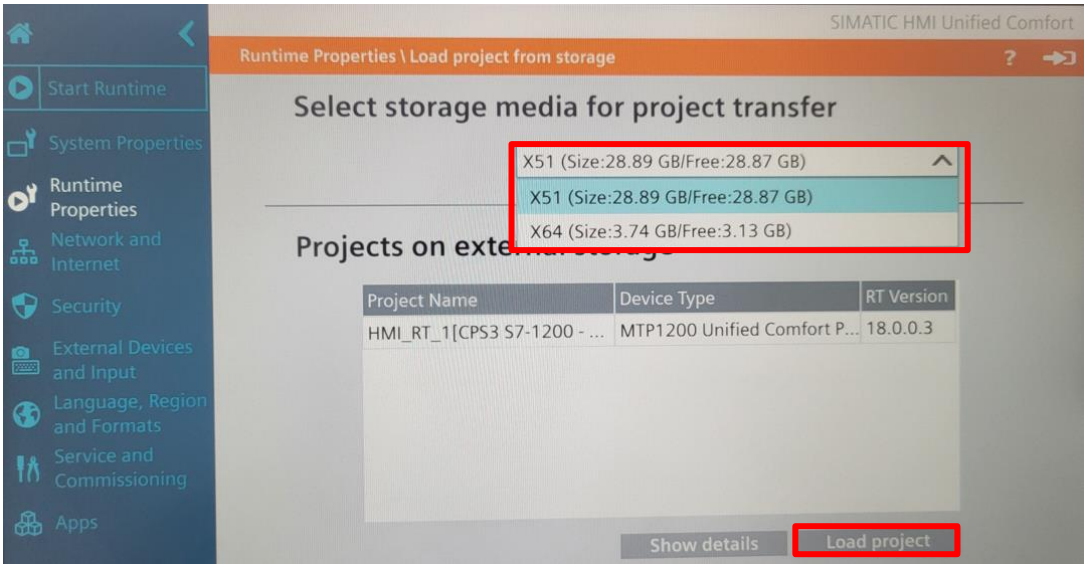
⇒ The Siemens start menu the opens. Press the ***Runtime Properties*** button here.



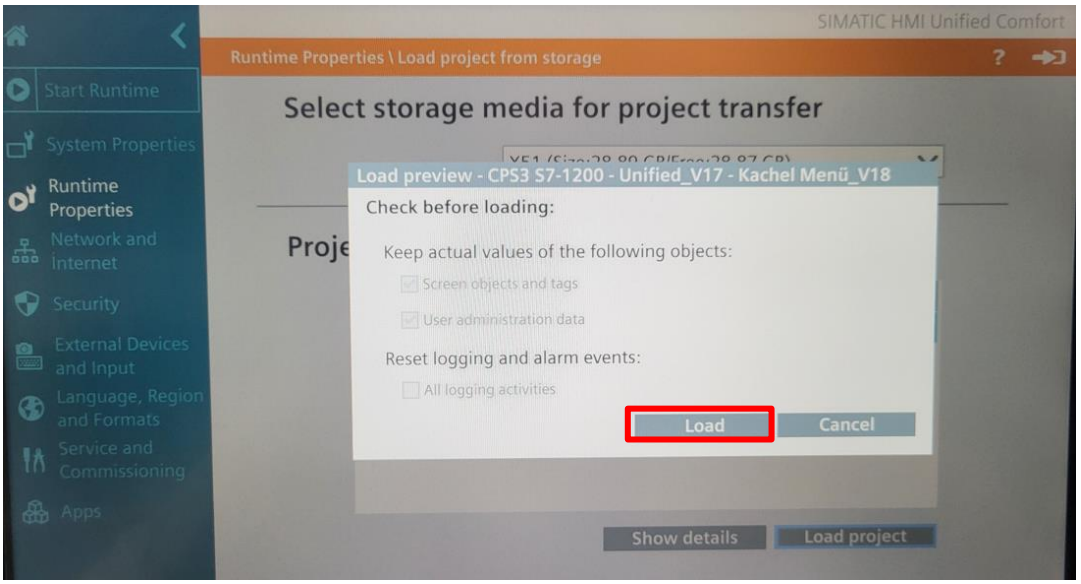
⇒ The Runtime Properties open. Press the ***Load project from storage*** button.



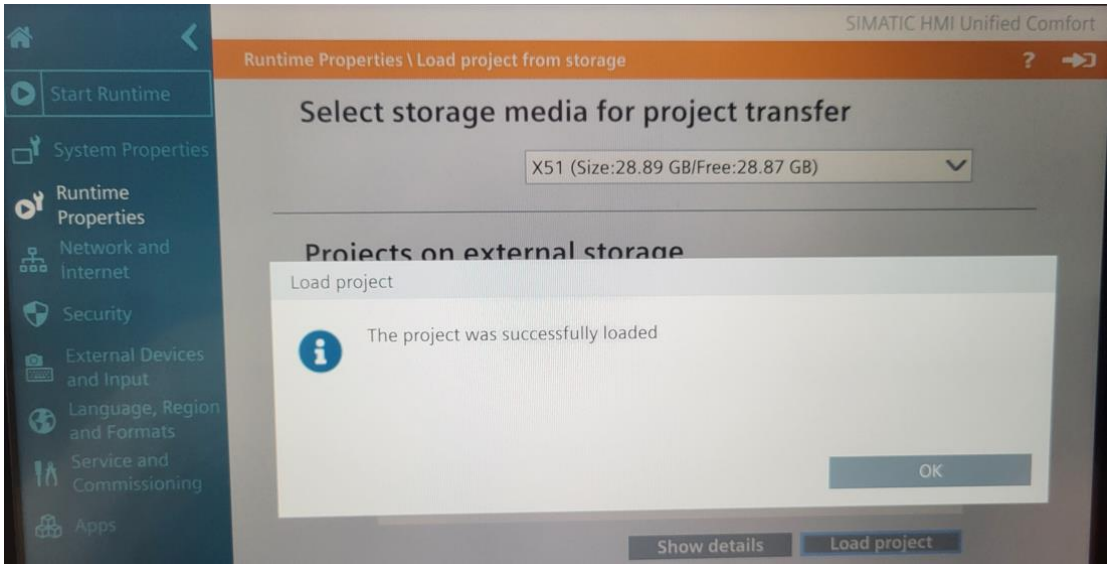
⇒ Select the “X51” interface.



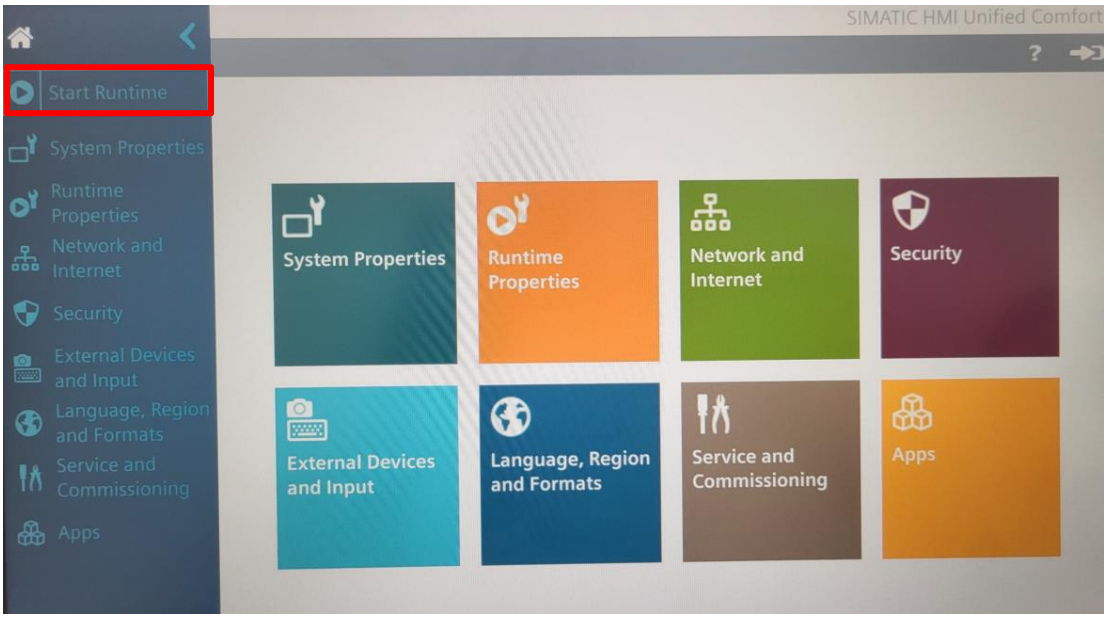
⇒ Select the project and press the ***Load project*** button and confirm again with ***Load***.



The installation is complete as soon as the message “The project was successfully loaded” appears. If the message does not appear, please repeat the process. In case of repeated failures, please contact support.



Finally, press the ***Start Runtime*** button. As soon as the main menu appears in the user interface, the device is ready for use.



9.2.5. Installing the firmware update for the control system

Before installing the firmware updates, make sure that no running processes are active and then switch off the system.

⇒ Switch the system to the Off operating state by toggling the On/Off switch.

⇒ Open the switch cabinet with a switch cabinet key.

CAUTION

Risk of injury

Always hold the service door at the handle opening when opening and closing it, otherwise, your fingers may be crushed if the service door closes.

WARNING

Risk of electric shock!

Never touch or loosen contacts when the switch cabinet is open! There is a danger to life!

⇒ Open the top cover of the control system as shown in the following figure:

Load preview V1

⇒ Insert the SIMATIC memory card prepared with the new firmware into the SD card slot of the control system. (area marked in red)

⇒ Close the top cover of the control system.

⇒ Switch the system to the On operating state by toggling the On/Off switch.

The RUN/STOP LED flashes alternately green and yellow to indicate that the program is being copied. When the RUN/STOP LED is on (and is permanently lit yellow) and the MAINT LED flashes, the copying process is finished.

⇒ Switch the system to the Off operating state by toggling the On/Off switch.

⇒ Open the top cover of the control system, remove the memory card and close the cover.

⇒ Place the installation media back into the conductive storage box and stow it again in the drawer unit.

⇒ Switch the system to the On operating state by toggling the On/Off switch.

The RUN LED must light up green after some time. If this is not the case, repeat the installation procedure. If the installation fails several times, contact the manufacturer.

⇒ Close the switch cabinet with a switch cabinet key.

The system is now ready for operation again!

10. Scope of delivery/equipment

SUCTION UNIT

Designation	Art. No.	Number
FESTOOL mobile dust extractor CLEANTEC CTL MIDI I	6002973	1

Suction unit

Drawer 1

Designation	Art. No.	Number
Tweezers for handling the mesh filters	61364	1
5 µm PET mesh filter for the filter unit	6002095	100
Filter frame and archiving card	61138	20
Insert box medium	6002310	1
ESD box for filters	6003758	1
ESD box for filter frame	6004450	2
ESD box for archiving cards	6004383	1
Waterproof felt-tip pens, black + blue	61759/60	2
Hose adapter	6003636	1
Long hand piece	6006131	1
Large ESD plug brush + adapter	6005339	1
Laboratory bottle	61574	6
ESD flat nozzle	6005588	1
USB stick with firmware + SD card with firmware	6006866	1
Conductive box	6006399	1
Bluetooth remote control	6003016	1
Sleeve	6003148	1
O-Rings	6003144	2

Analysis and extraction equipment drawer 1

Button for flushing

Drawer 2

Designation	Art. No.	Number
Safety hood	6006244	1
Cleaning wire, 2.5 m	61675	1
Cleaning tab	61606	1
Cleaning cloths	6002221	1
Wet cleaning adapter	6006188	1
ESD spray bottle	6004454	1
Particle trap adapter	6006233	1
Particle trap	30001	2
Plastic tube	6005522	1
Connection hose between the cyclone unit & filter unit, 0.5 m long	6006020	1
Suction hose, 2 m long	6006022	1

Analysis and extraction equipment drawer 2