



Technology for Vacuum Systems

Instructions for use



VHC^{pro}



After sales service:

Contact your local dealer or call +49 9342 808-5500.

The document "Safety information for vacuum equipment" is part of this manual! Read the "Safety information for vacuum equipment" and observe the instructions contained therein!

Trademark index:

VACUU•LAN® (US-Reg.No 3,704,401), VACUU•BUS®, VACUU•CONTROL®, Peltronic®, VARIO® (US-Reg.No 3,833,788), VACUUBRAND® (US-Reg. No 3,733,388) and also the shown company logos are trademarks of VACUUBRAND GMBH + CO KG in Germany and/or other countries.

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Safety information!

Important information!

! WARNING

- ☞ **Keep this manual complete and accessible to personnel at all times!**
- ☞ **Read this manual carefully before installing or operating the equipment. Observe the instructions contained in this manual.**

- ☞ **Do not modify the equipment without authorization.**

NOTICE

This manual is an integral part of the equipment described therein. It describes the safe and proper use of the vacuum pump.

Make operating personnel aware of dangers arising from the pump and the pumped substances.

VACUUBRAND disclaims any liability for inappropriate use of these pumps and for damage from failure to follow instructions contained in this manual.

This manual is only to be used and distributed in its complete and original form. It is strictly the users' responsibility to check carefully the applicability of the guidance in this manual with respect to his product.

Manual-no.: 20901311

The following signal word panels and safety symbols are used throughout this manual:



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury and death.



➔ DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



☞ WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



• CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.

Formatting used in this manual:

Note: The signal word panels in all sections of this manual always refer to all paragraphs of the same format (➔ / ☞ / • / plain text) following each signal word panel.

General information

WARNING

- ☞ **Read and comply with this manual before installing or operating the equipment.**
- ☞ **Before operating the equipment read and comply with the section "Cleaning and decontamination"!**

NOTICE

Remove all packing material, remove the product from its packing-box, remove the protective covers from the inlet and outlet ports and keep, inspect the equipment.

If the equipment is damaged, notify the supplier and the carrier in writing within three days; state the item number of the product together with the order number and the supplier's invoice number. Retain all packing material for inspection.

Do not use the equipment if it is damaged.

Intended use

WARNING

- ☞ The device may only be used by well trained and skilled personnel.
- ☞ The device may not be used for in vivo applications (e. g., not at humans or animals).

NOTICE

Ensure that the equipment and all components are suitable for the intended application. Use the system only for **aspiration of liquids**.

Setting up

NOTICE

The VHC^{pro} is intended to be connect to a suitable suction system, e. g., VACUUBRAND BVC systems.

Comply with all **applicable and relevant safety requirements** (regulations and guidelines), **implement the required actions and adopt suitable safety measures**.

Ambient conditions

CAUTION

- The systems are designed for **ambient temperatures** during operation between +10°C and +40°C. Check the maximum temperatures.

Operating conditions

DANGER

- ➔ The devices are **not suitable** to aspirate:
 - **unstable substances**
 - substances which react explosively under **impact** (mechanical stress) and/or when being exposed to **elevated temperatures** without air,
 - **self inflammable** substances,
 - substances which are **inflammable without air** and
 - **explosive substance**
- ➔ The devices have **no approval** for operation below ground.

WARNING

- ☞ The pumps are **not suitable** for aspiration of dust.

CAUTION

- **Take into consideration interactions and chemical reactions of the aspirated media.**
- Ensure that the materials of the wetted parts are compatible with the aspirated substances, see section "Technical data".

NOTICE

If aspirating **different substances**, it is recommended that the aspiration hose be purged prior to changing the media in order to rinse out residues and to avoid reactions of the substances with each other and with the materials.

Safety during operation

DANGER

- ➔ Ensure that while operating the device no persons can be endangered.
- ➔ Wear personal protection equipment.
- ➔ Comply with requirements when using infectious liquids, pathogenic germs, toxic, radioactive or aggressive substances.
- ➔ Prior to operation check all relevant safety and health requirements and determine the applicability of regulatory limitations prior to use if necessary.
- ➔ Comply with material safety data sheets and notes on safe use of the manufacturer.
- ➔ Comply with the biosafety level of the laboratory.
- ➔ Use appropriate safety work materials and methods if necessary, e. g., steam sterilization, sterilization indicators or germicides. For notes concerning the sterilization of wetted parts, see the “Technical Data” section and “Cleaning and decontaminating”. It is the user’s responsibility to ensure effective sterilization.
- ➔ Never operate a defective or damaged device.

WARNING

- ☞ Comply with applicable regulations when disposing of chemicals. Take into consideration that chemicals may be polluted.
- ☞ Use only **OEM spare parts and accessories**; otherwise safety and performance of the equipment as well as the electromagnetic compatibility of the equipment might be reduced.
- ☞ In case of leaks in the aspiration hose, aspirated substances might be released into the environment. Comply especially with notes on operation and use.

NOTICE

Ensure that, in case of failure, the system will always return to a safe status. Provide appropriate protective measures (i.e., precautions which allow for the requirements of the respective application) even for the case of failure and **malfunction**.

Maintenance and repair

DANGER

- ➔ Attention: The device might be contaminated with noxious or otherwise dangerous chemicals that have been aspirated during operation. Ensure that the device is decontaminated before maintenance.

WARNING

- ☞ Take adequate precautions to protect people from the effects of dangerous substances if contamination has occurred. Wear appropriate safety-clothing when you come in contact with contaminated components.

NOTICE

Ensure that **maintenance** is carried out only by suitably trained and supervised technicians. Ensure that the maintenance technician is familiar with the safety procedures which relate to the products processed by the system. In order to comply with law (occupational, health and safety regulations, safety at work law and regulations for environmental protection) vacuum pumps, components and measuring instruments returned to the manufacturer can be repaired only when certain procedures (see section "**Repair - Maintenance - Return - Calibration**") are followed.

Technical data

Type		VHC ^{pro}
Permissible ambient temperature storage / operation	°F °C	14 to 140 / 50 to 104 (-10 to +60 / +10 to +40)
Permissible relative atmospheric moisture during operation (no condensation)	%	30 to 85
Adapters for		Pipettes with outer diameter 5.5 - 8 mm Pipette tips 2 - 200 µl and 50 - 1000 µl
Length of aspiration hose	m	2.5
Dimensions L x W x H approx. (without aspiration hose)	mm	185 x 30 x 38
Weight (with aspiration hose) approx.	g	125

Wetted parts

Components	Wetted parts
Aspiration hose	Silicone rubber
Adapter pipettes	TPE / PP
Adapter pipette tips	PP
Screw cap, adjusting knob, operating lever	PPS, glass fibre reinforced
Housing	PP, glass fibre reinforced

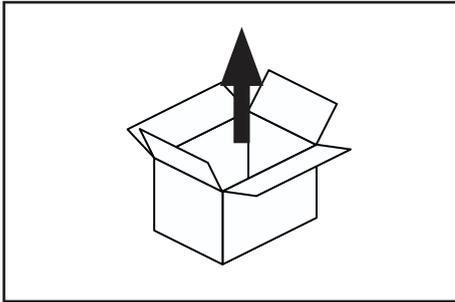
We reserve the right for technical modifications without prior notice!

System parts

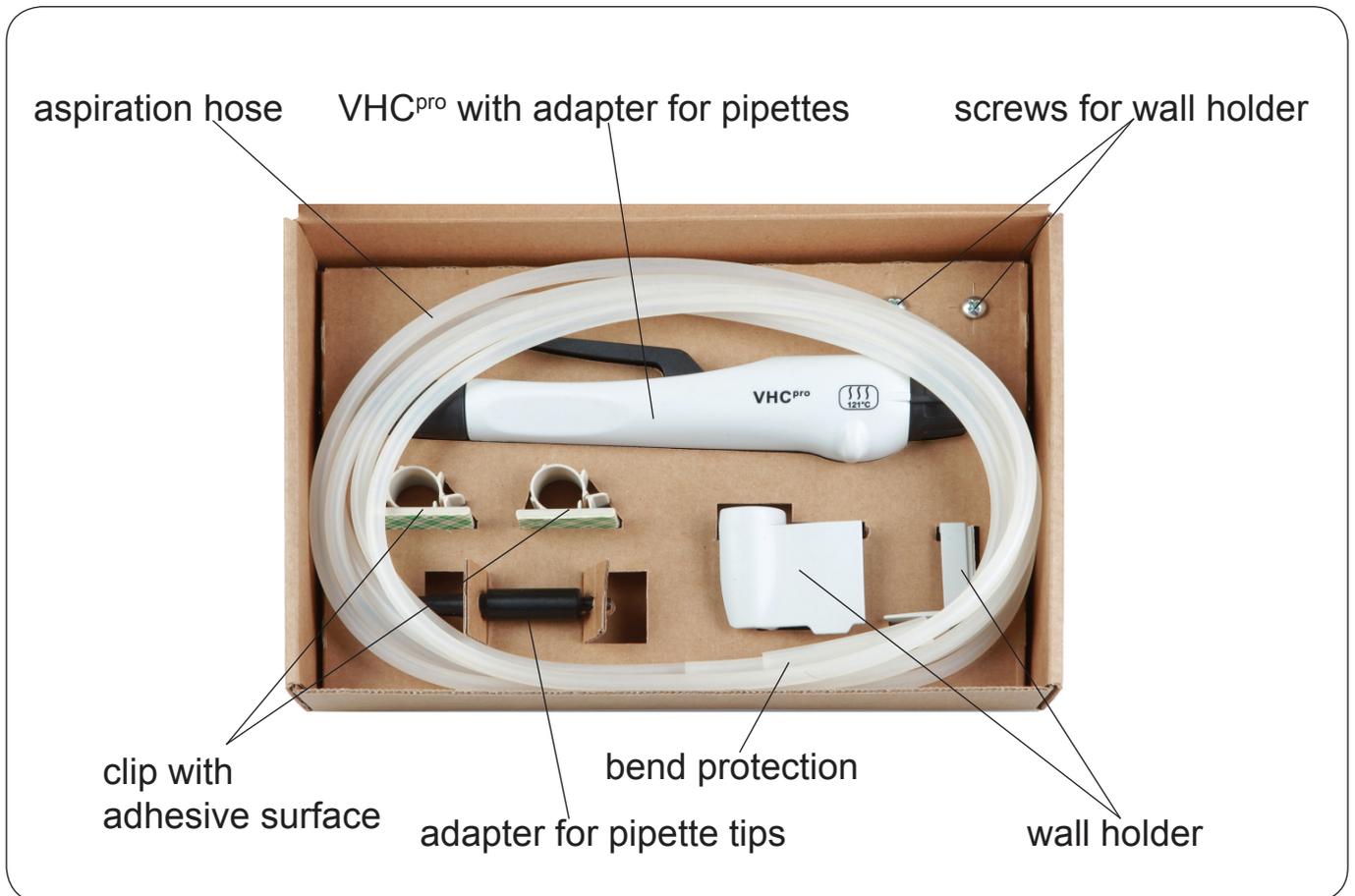
Position	Designation
1	operating lever
2	aspiration hose
3	adjusting knob
4	screw cap



Use and operation

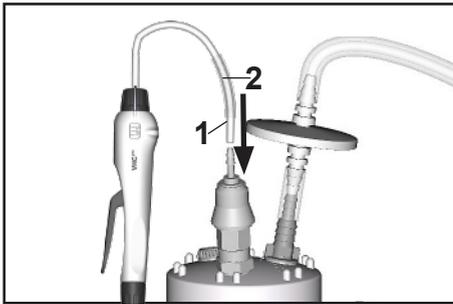


Unpack the equipment.





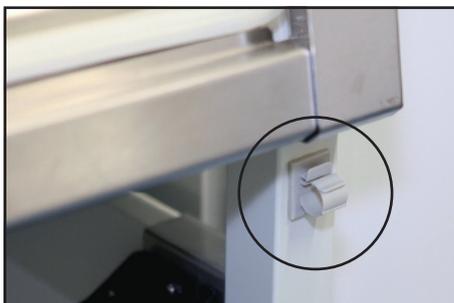
Attach the aspiration hose of the VacuuHand-Control VHC^{pro} to a suitable aspiration system, e. g., VACUUBRAND BVC systems.



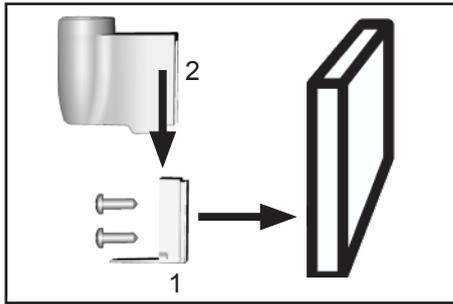
Attach the aspiration hose (1) first, then slide on the bend protection (2).



Enclosed are two clips with an adhesive surface. Affix these clips to the biosafety cabinet to guide the aspiration tubing.



Assembling the wall holder



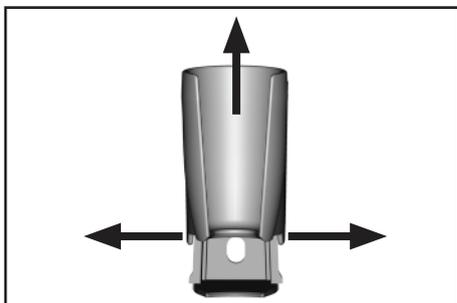
The surface of the wall has to be smooth, dry and free of grease.

Remove the protective foil from the adhesive tape at the wall holder part 1. Align part 1 with cover directed downward and press firmly on the wall for 1 minute.

The full load is achieved after 72 h at 20°C.

Alternatively screw part 1 of the wall holder to the wall using the two screws enclosed in the delivery.

Assemble part 2 of the wall holder to part 1 and click into place.



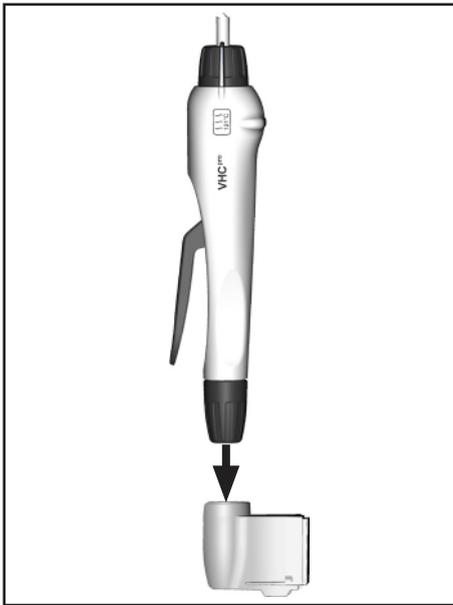
Disassembling

Push both wings of the wall holder (part 2) apart and slide the part upwards.

NOTICE

When replacing the adhesive tape to fix the wall holder we recommend to use the 3M™ VHB™ high performance connection system 4932P.

3M™ and VHB™ are trade marks or registered trade marks of 3M.



For keeping, position the VHC^{pro} in the wall holder.



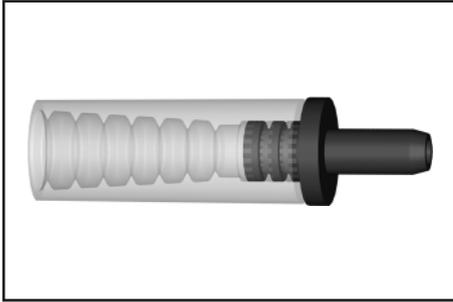
Alternatively to keeping the VHC^{pro} in the wall holder position the VHC^{pro} in a table stand for Vacuu Hand Control VHC^{pro} (Accessory), see section „Accessories and spare parts”.

Adapters

Two adapters are enclosed in the delivery.

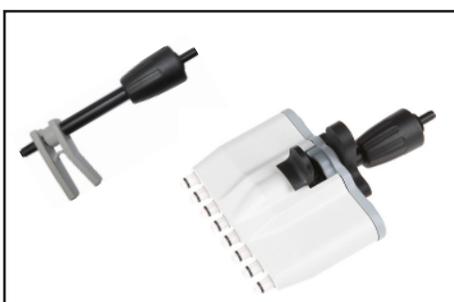
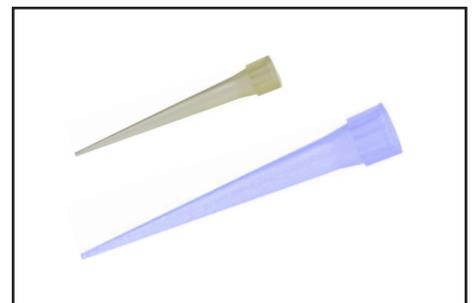
Adapter for pipettes with outer diameter of 5.5 - 8.0 mm

- Pasteur pipette
- Aspiration pipette
- Graduated pipettes



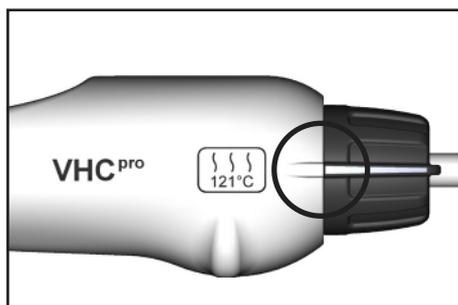
Adapter for pipette tips

- Pipette tips 2 - 200 μ l
- Pipette tips 50 - 1000 μ l



An adapter for pipette tips 2 - 200 μ l with tip ejector and an 8-channel tip adapter with ejector for pipette tips 2 - 200 μ l and 50 - 1000 μ l are available as accessories, see section "Accessories and spare parts".

Changing the adapter



Ensure that there is no liquid in the tube to avoid risk of contamination.

Aspirate until the aspiration tube is empty and decontaminate if necessary.

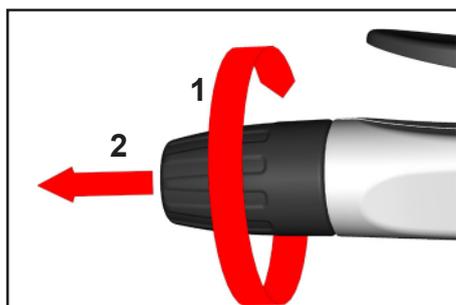
Select continuous aspiration.

We recommend to switch off vacuum supply or to close connection to the vacuum supply.

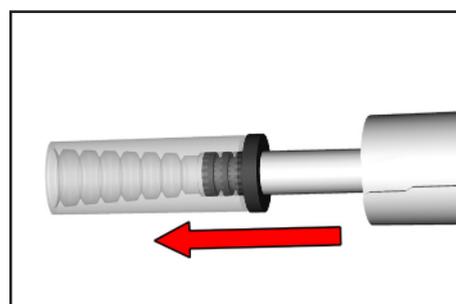
Remove pipette if necessary.

⚠ DANGER

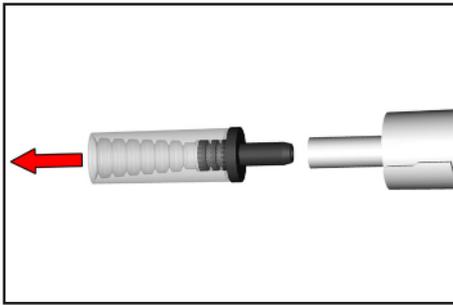
- ➔ Attention: Liquid in the tube may leak. Adopt suitable measures to prevent the release of dangerous, toxic, explosive, corrosive, noxious or polluting fluids, vapors and gases. In such cases, use an appropriate collecting and disposal system and take protective action for personnel, equipment and environment.



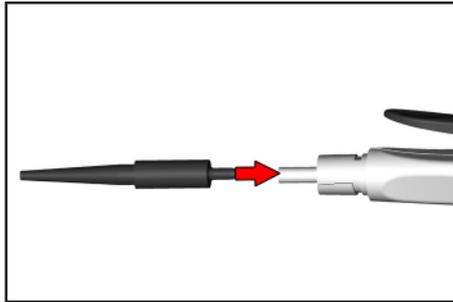
Turn cap (1) and remove (2).



Pull adapter with hose out of the VHC^{pro}.

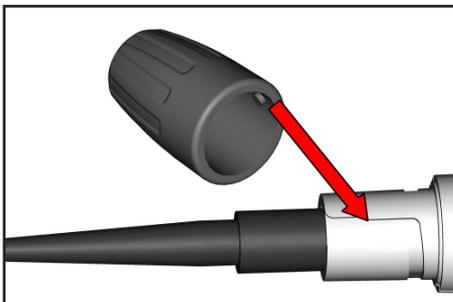


Remove adapter from hose.

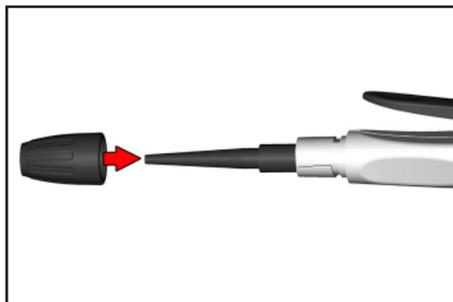


Attach new adapter to the hose.

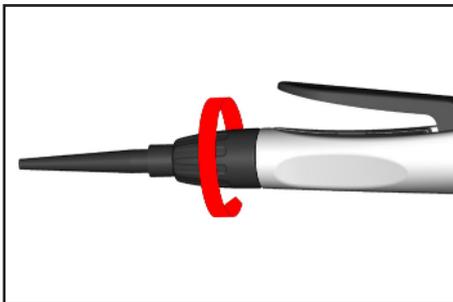
Pull the adapter with hose back into the VHC^{pro}.



Align mark at the cap when reassembling the cap.

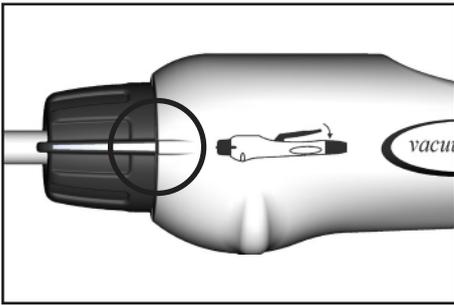


Attach cap over the adapter to the VHC^{pro}.

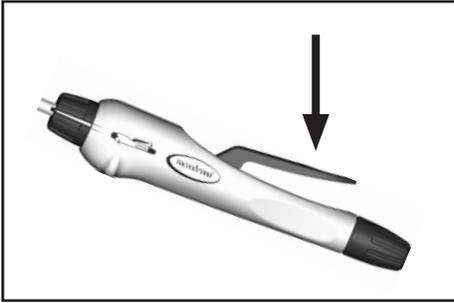


Screw cap.

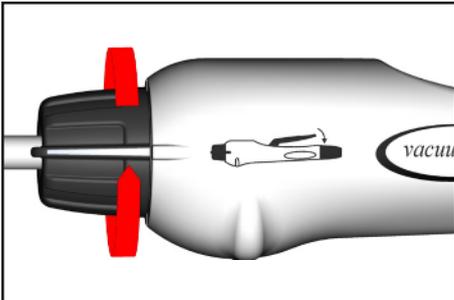
Settings



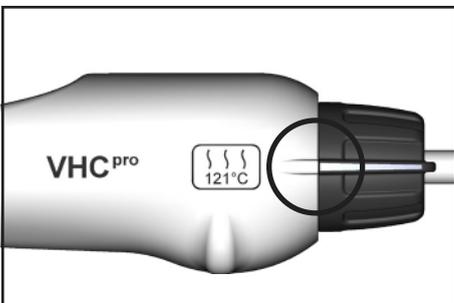
Setting “Aspiration”.



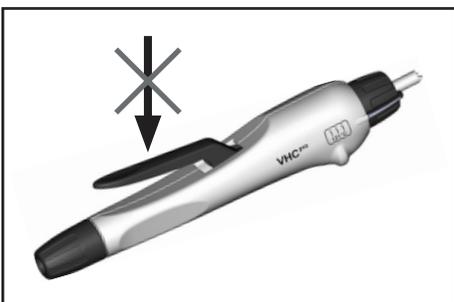
When the VHC^{pro} is set to “Aspiration” press the lever to aspirate.



The adjustment knob can be turned through 360°, but the knob is not removable.



Setting “Continuous aspiration” and “Autoclaving”.



Continuous aspiration / Autoclaving

The setting “continuous aspiration / autoclaving ” is designated to aspirate larger amounts of liquid. The handle aspirates without pressing the lever.

Select this setting also for autoclaving, see section “Cleaning and decontamination”.

Handling

Hold the VHC^{pro} so it is comfortable for working, see examples below:



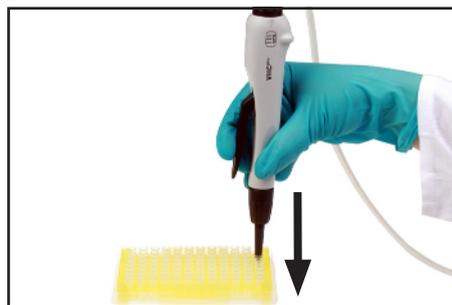


Prior to aspiration

Choose the appropriate adapter and carefully insert the pipette into the adapter.

To ease the assembly, loosen the screw cap prior to inserting the pipette and then retighten screw cap if necessary.

Attention: Never insert a filled pipette due to risk of contamination and infection. Wear protective gloves!



Aspiration of liquid

Use only appropriate vessels.

Dip pipette tip into the liquid.

Setting aspiration: Press the lever until the liquid has been aspirated. Release the lever to stop aspiration.

Setting continuous aspiration: In setting continuous aspiration it is not necessary to press the lever. Remove pipette from liquid to stop aspiration. If necessary set the adjusting knob to “Aspiration” to stop continuous aspiration.



After aspiration

At the end of aspiration, continue to aspirate until there is no more liquid in the aspiration tubing and purge (suck through) with cleaning or disinfectant agent if necessary.

Carefully pull pipette out of the adapter.

To ease the disassembly loosen the screw cap prior to removing the pipette and then retighten screw cap if necessary.

Attention: Risk of contamination and infection. Wear protective gloves and eye protection! Dispose of pipettes according to appropriate regulations.



**! DANGER**

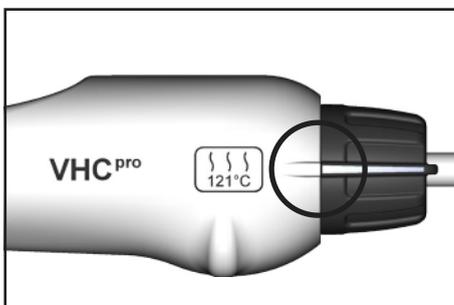
- ➡ Attention: When removing the aspiration controller VHC^{pro}, liquid in the tube may leak especially when using systems without couplings!

At the end of aspiration, continue to aspirate until there is no more liquid in the aspiration tubing and purge with cleaning or disinfectant agent if necessary.

Adopt suitable measures to prevent the release of dangerous, toxic, explosive, corrosive, noxious or polluting fluids, vapors and gases. In such cases, use an appropriate collecting and disposal system and take protective action for personnel, equipment and environment.

Shutdown**NOTICE**

At the end of aspiration, continue to aspirate until there is no more liquid in the aspiration tubing and purge with cleaning or disinfectant agent if necessary.



Set the VHC^{pro} to continuous aspiration to avoid a possible agglutination of the aspiration hose.

To avoid a permanent load on the vacuum supply, we recommend to switch off vacuum supply or to close connection to the vacuum supply.

Store the device in dry conditions.

Cleaning and decontaminating



Autoclaving

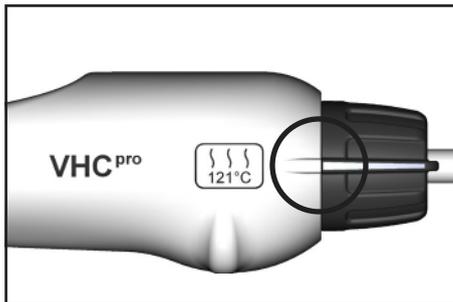
The VacuuHandControl VHC^{pro} with adapters and aspiration hose is designated for steam sterilization at 121°C and 2 bar absolute (1 bar overpressure). Time of exposure according to DIN 58946 $t_e = 20$ minutes.

Ensure not to exceed a temperature of 121°C.

Comply with instructions for use of the manufacturer of the autoclave.

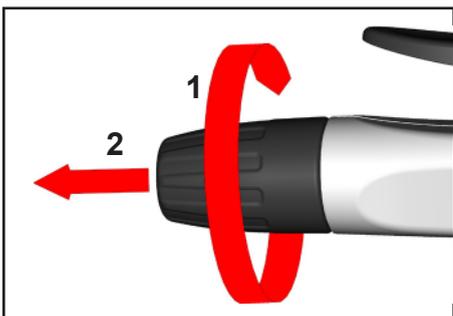
NOTICE

It is the user's responsibility to ensure effective autoclaving.



NOTICE

Prior to autoclaving set the VHC^{pro} to "auto-claving".



Prior to autoclaving turn cap (1) and remove (2).

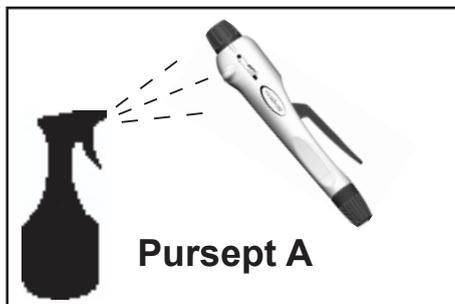


NOTICE

It is not possible to disassemble the VHC^{pro} completely.

It is possible to disassemble and replace the adapters, the screw cap and the aspiration hose, see "Accessories and spare parts".

If the housing opens slightly by mistake, e. g., if the handle is dropped, press the gap together by hand. Perform a function test.



Chemical disinfection

A wiping and spray disinfection of the Vacuu-HandControl VHC is possible by using the germicide Pursept A.

NOTICE

Over time, discoloration and material changes (e.g., resiliency, elasticity/tightness, cracking) due to repeated steam sterilizations may occur.

Important notes on use of disinfectants

Aggressive disinfectants which release chlorine or oxygen radicals, e.g., sodium hypochlorite (chlorine bleach) or peroxide compounds can corrode the materials.

The use of the disinfectant **Sekusept® Plus** (Manufacturer: Ecolab GmbH & Co OHG, Düsseldorf, Germany) in extensive in-house testing did not cause any damage. Hence the disinfectant Sekusept® Plus is preferred. Comply with use and safety instructions of the manufacturer!

CAUTION

- ☞ Using corrosive disinfectants may result in damage, malfunction and/or failure of the equipment.
- ☞ Chlorine may damage the materials of the equipment or the vacuum supply.
- ☞ Leaking of liquid from a damaged aspiration hose may lead to exposure of personnel and material or to damage/destruction of wetted equipment or laboratory furniture.
- ☞ For information about the compatibility with the materials, ask the manufacturer of the disinfectant.
- ☞ The wetted materials of the system are listed in the section "Technical data".

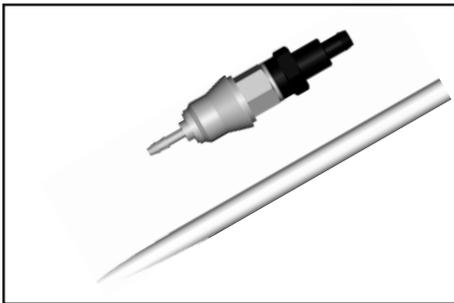
Accessories and spare parts



VacuuHandControl VHC^{pro}**20688061**
 Spare hose for VHC**20636156**
 (minimum order quantity 2 m)

Silicone hose 9/6 mm (length in cm)**20638263**
 (bend protection)

Extension kit second VHC connection**20699943**
 (to be assembled at a VACUUBRAND BVC,
 without VHC^{pro}, without quick coupling)



Set of quick-coupling**20635807**
 for connection VHC-bottle for VACUUBRAND BVC
 including adapter and inlet tube
 (suitable as extension kit for a second VHC^{pro})

Quick coupling made of PVDF, with adapter to connect a VHC to a collection bottle. When disconnected, the collection bottle closes vacuum tight.

Attention: The quick-coupling accessory set is not suitable for use with sodium hypochlorite (chlorine bleach).



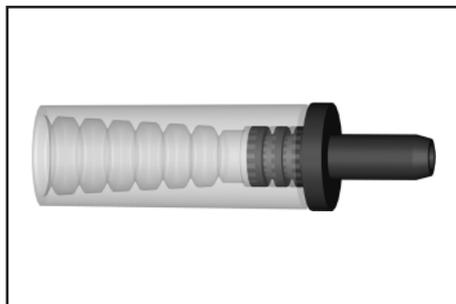
VHC^{pro} Basis**20635639**
 as spare part, without aspiration hose,
 without adapters and without accessories



Wall holder**20635644**
for Vacuu Hand Control VHC^{pro}
for adhesive fixing and screw assembly



Stand for Vacuu Hand Control VHC^{pro}**20635680**



Adapter for pipettes**20635683**
for pipettes with outer diameter of 5.5 - 8.0 mm



Adapter for pipette tips**20635689**
for pipette tips 2 - 200 µl and 50 - 1000 µl



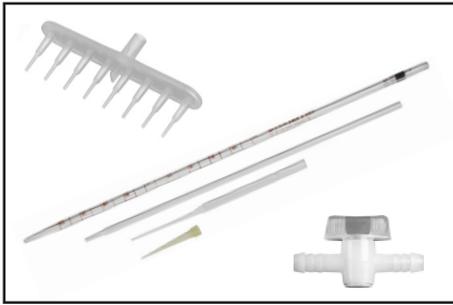
Adapter for pipette tips with tip ejector**20635638**
for pipette tips 2 - 200 µl



8-channel tip adapter with ejector**20635679**
for pipette tips 2 - 200 µl and 50 - 1000 µl



Screw cap**20635711**

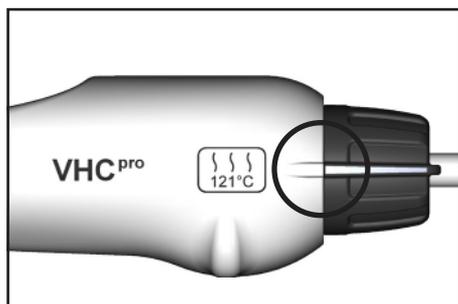


Pipettes or pipette tips, 8-channel manifold as well as straight-bore stopcocks with nozzles are available from BRAND GMBH + CO KG (www.brand.de/en) via laboratory products distributors.

Troubleshooting

Fault	Possible cause	Remedy
<input type="checkbox"/> No aspiration at the VHC ^{pro} , pipette drips.	<ul style="list-style-type: none"> ➔ Adapter or aspiration tube defective? ➔ Aspiration hose clogged or agglutinated? ➔ Poorly fitting pipette or tips? ➔ Leak in the system? ➔ No vacuum? 	<ul style="list-style-type: none"> ✓ Replace adapter with aspiration hose. ✓ Remove clogged or agglutinated hose section or replace hose. ✓ Connect pipette securely or choose an appropriate adapter. ✓ Check the system for leaks. ✓ Check the vacuum system.
<input type="checkbox"/> Pipette does not held properly in the adapter.	<ul style="list-style-type: none"> ➔ Adapter wet or greasy? ➔ Pipette with improper diameter selected? 	<ul style="list-style-type: none"> ✓ Clean or replace adapter. ✓ Choose appropriate pipette or change adapter.
<input type="checkbox"/> Broken pipette in the adapter.	<ul style="list-style-type: none"> ➔ The pipette was damaged or forced into the adapter? 	<ul style="list-style-type: none"> ✓ Remove the glass splinters by means of forceps, replace adapter and aspiration hose if necessary.

Replacing the aspiration hose



Ensure that there is no liquid in the tube to avoid risk of contamination.

Aspirate until the aspiration tube is empty and decontaminate if necessary.

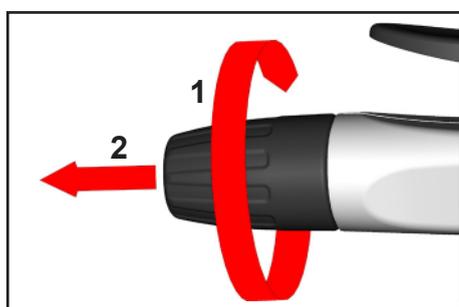
Select continuous aspiration.

Switch off vacuum supply or close connection to the vacuum supply.

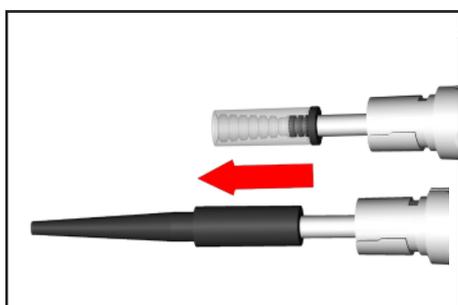
Remove pipette if necessary.

! DANGER

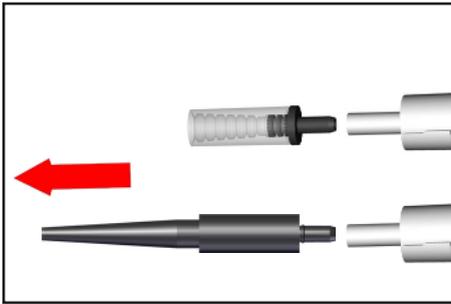
- ➔ Attention: Liquid in the tube may leak. Adopt suitable measures to prevent the release of dangerous, toxic, explosive, corrosive, noxious or polluting fluids, vapors and gases. In such cases, use an appropriate collecting and disposal system and take protective action for personnel, equipment and environment.



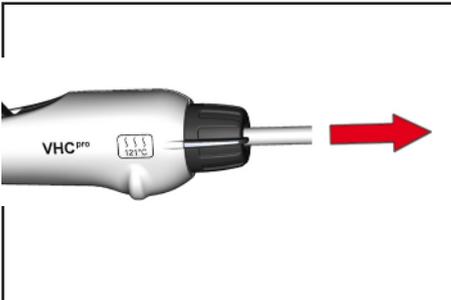
Turn cap (1) and remove (2).



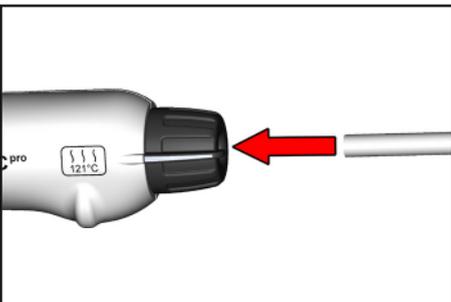
Pull adapter with hose out of the VHC^{pro}.



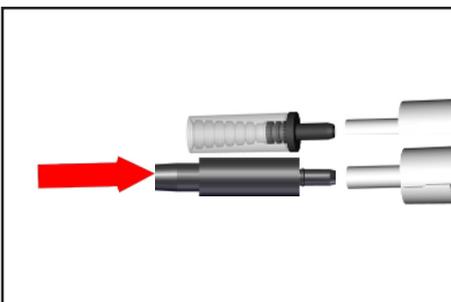
Remove adapter from hose.



Pull aspiration hose out of the handle.

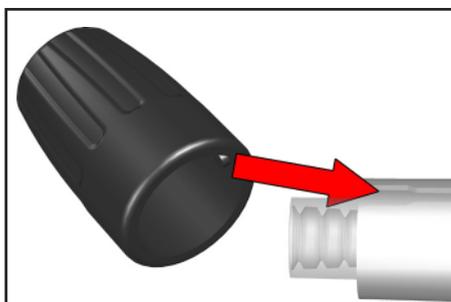


Insert new aspiration hose into the handle and push through.

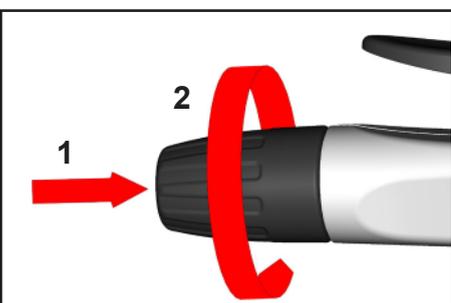


Attach adapter to the hose.

Pull the adapter with hose back into the VHC^{pro}.



Align mark at the cap when reassembling the cap.



Attach cap over the adapter to the VHC^{pro}.

Screw cap.

Repair - Maintenance - Return - Calibration

IMPORTANT

Every employer (user) is held responsible for the health and safety of his employees. This also applies to service personnel performing repair, maintenance, return or calibration.

The **health and safety clearance form** informs the contractor about any possible contamination of the device and forms the basis for the risk assessment.

In case of devices which have been in contact with biological substances of risk level 2 contact the VACUUBRAND service absolutely before dispatching the device. These devices have to be completely disassembled and decontaminated by the user prior to shipment. Do not return devices which have been in contact biological substances of risk level 3 or 4. These devices cannot be checked, maintained or repaired. Also decontaminated devices must not returned to VACUUBRAND due to a residual risk.

The same conditions apply to on-site work.

No repair, maintenance, return or calibration is possible unless the correctly completed health and safety clearance form is returned. Devices sent are rejected if applicable. Send a completed copy of the **health and safety clearance form** to us in advance. The declaration must arrive before the equipment. Enclose a second completed copy with the product.

Remove all components from the device that are no original VACUUBRAND components. VACUUBRAND will not be responsible for lost or damaged components that are no original components.

Drain the device completely of fluids and residues. Decontaminate the device. Close all openings airtight especially if using substances hazardous to health.

To expedite repair and to reduce costs, please enclose a detailed description of the problem and the product's operating conditions with every product returned.

If you do not wish a repair on the basis of our **quotation**, the device may be returned to you disassembled and at your expense.

In many cases, the components must be cleaned in the factory prior to repair.

For cleaning we use an environmentally friendly water based process. Unfortunately the combined attack of elevated temperature, cleaning agent, ultrasonic treatment and mechanical stress (from pressurised water) may result in damage to the paint. Please mark in the health and safety clearance form if you wish a repaint at your expense just in case such a damage should occur. We will also replace parts for cosmetic reasons at your request and at your expense.

Before returning the device

Pack the device properly, if necessary, please order original packaging materials at your costs.

Mark the package completely

Enclose the completed health and safety clearance form.

Notify the carrier of any possible contamination if required.

Scrapping and waste disposal

Dispose of the equipment and any components removed from it safely in accordance with all local and national safety and environmental requirements. Particular care must be taken with components and waste oil which have been contaminated with dangerous substances from your processes. Do not incinerate fluoroelastomer seals and O-rings. You may authorize us to dispose of the equipment **at your expense**. Otherwise we return the device at your expense.

Health and safety clearance form

1. Device (Model):

2. Serial no.:

3. Reason for return / malfunction:

4. Has the device been used in a copper process step (e.g., semiconductor production): yes no

5. Substances (gases, liquids, solids, biological material, e. g. bacteria, viruses) in contact with the device / which have been pumped:

.....
.....
.....
.....

6. Risk level of the used biological material: none 1 2* 3** 4**

* Contact the VACUUBRAND service absolutely before dispatching the device.

** Devices which have been in contact with biological substances of risk level 3 or 4 cannot be checked, maintained or repaired. Also decontaminated devices must not returned to VACUUBRAND due to a residual risk.

7. Radioactive contamination: yes no

8. Prior to return to the factory the device has been decontaminated: yes no

Description of the decontamination method and the test / verification procedure:

.....
.....

9. All parts of the device are free of hazardous, harmful substances: yes no

10. Protective measures required for service staff:

.....

11. If the paint is damaged, we wish a repaint or a replacement of parts for reason of appearance (repaint and replacement at customer's expense): yes no

12. Legally binding declaration

We assure for the returned device that all substances, which have been in contact with the device are listed in section 5 and that the information is complete and that we have not withheld any information. We declare that all measures - where applicable - have been taken listed in section "Repair - Maintenance - Return - Calibration". By our signature below, we acknowledge that we accept liability for any damage caused by providing incomplete or incorrect information and that we shall indemnify VACUUBRAND from any claims as regards damages from third parties. We are aware that as expressed in § 823 BGB (Public Law Code of Germany) we are directly liable for injuries or damages suffered by third parties, particularly VACUUBRAND employees occupied with handling/repairing the product. Shipping of the device must take place according to regulations.

Name: Signature:

Job title: Company's seal:

Date:

Release for repair grant by VACUUBRAND (date / signature):.....
Protective measures: Protective gloves, safety goggles Hood External cleaning



Disclaimer: Our technical literature is only intended to inform our customer. The applicability of general empirical values and results obtained under lab conditions to your specific operations depends on a number of factors beyond our control. It is, therefore, strictly the users' responsibility to very carefully check the application of these data to their specific requirements. No claims arising from the information provided in this literature will, consequently, be entertained.



Alfred-Zippe-Str. 4 · 97877 Wertheim / Germany
T +49 9342 808-0 · F +49 9342 808-5555
info@vacuubrand.com · www.vacuubrand.com

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