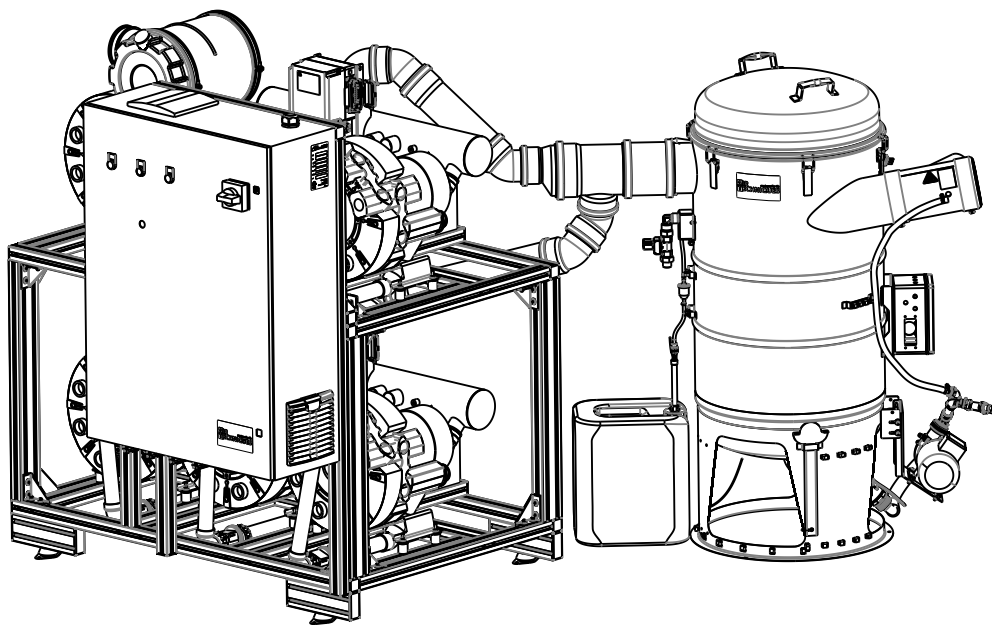


VACSTAR[®]

Clinical Dry Vacuum Systems VS60, VS75 & VS90

PLANNING & INSTALLATION INSTRUCTIONS



AIR
TECHNIQUES equipped for life[®]

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* Pages 41 through 44 are filled out and returned to Air Techniques after installation.



Important information

1. General information

The planning information here is designed to provide information concerning the correct layout, installation and commissioning of the device manufactured by Air Techniques together with information regarding the correct usage of such appliances.



The examples of planning contained herein are purely recommendations. When installation layout differs from the one shown, contact Air Techniques.

Correct installation of the appliances is essential for safe operation.

Further information can be obtained from our Service Team or from one of our authorized dealers.

Therefore it is important:

- That you are familiar with the contents of this planning information and understand it completely.
- That you do not carry out any operation where you are not absolutely sure what the effect will be.
- That you pass on all safety and warning notices to all concerned, including on-site fitters.



Please note, suction performance of between 550 SCFM and 600 SCFM at the largest diameter must be ensured for all suction unit planning layouts.

1.1 Validity

The planning information contained here is valid for the following units manufactured by Air Techniques:

- Vacuum units VS60, VS75, VS90 in combination with accessories E5119 (Clinical Display) and E5129 (Amalgam Separator)

If you have questions regarding the selection of clinic suction systems, necessary components etc., please contact:

Air Techniques
 1295 Walt Whitman Road
 Melville, New York 11747- 3062
 Phone: 800-247-8324
 Fax: 888-247-8481
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1.2 Copyright

© 2018, Air Techniques, Inc.

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2. About this document

These planning and installation instructions form part of the unit.



If the instructions and information in these Planning and Installation Instructions are not followed, Air Techniques will not be able to offer any warranty or assume any liability for the safe operation and the safe functioning of the unit.

2.1 Warnings and symbols

Warnings

The warnings in this document are intended to draw your attention to possible injury to persons or damage to machinery.

The following warning symbols are used:



General warning symbol



Warning – risk of dangerous electric voltages



Warning - automatic start-up of the unit



Biohazard warning



Warning – hot surfaces

The warnings are structured as follows:



SIGNAL WORD

Description of the type and source of danger

Here you will find the possible consequences of ignoring the warning

Follow these measures to avoid the danger.

The signal word differentiates between four levels of danger:

– DANGER

Immediate danger of severe injury or death

– WARNING

Possible danger of severe injury or death

– CAUTION

Risk of minor injuries

– NOTICE

Risk of extensive material/property damage

Other symbols

These symbols are used in the document and on or in the unit:



Note, e.g. specific instructions regarding efficient and cost-effective use of the unit.



Please read all of the accompanying documents.



Wear protective gloves



Wear ear protectors



Dispose of properly in accordance with all applicable local code and regulations.



CE labeling with the number of the notified body



Off



On



Manufacturer



Order number/model type



Serial number



Unique Device Identifier

2.2 Copyright information

All names of circuits, processes, names, software programs and units used in this document are protected by copyright.

Any reprinting of the planning and installation documentation, in whole or in part, is subject to prior approval in writing from Air Techniques.

3. Safety

Air Techniques has designed and constructed this unit so that when used properly and for the intended purpose it does not pose any danger to people or property. Nevertheless, residual risks can remain. You should therefore observe the following notes.

3.1 Intended purpose

The VacStar Clinical (VSC) Dry Vacuum systems are designed to generate a vacuum in order to aspirate saliva, rinsing water and other fluids that are present during dental treatment and need to be transported into the waste water system.

3.2 Proper intended usage

VSC suction units are to be used with a central separation tank in dry suction systems in dental or dental-medical clinics. They are arranged at the end of the aspiration chain, downstream of the central separation tank. It is absolutely necessary that separation of secretions and air takes place upstream of the VSC suction unit.

The surfaces of the suction units should be cleaned off periodically to avoid buildup of dust and other debris, which may lead to overheating and failure of the units. In the devices upstream of the suction unit, only use cleaning agents and disinfectants that will not damage the materials, e.g. CleanStream or equivalent. Correct usage of the device also involves following the Planning and Installation Instructions and adhering to the conditions concerning set-up, operation and maintenance.



NOTE

Machine damage can be caused by fluids and particles entering the vacuum pumps (e.g. prophylaxis powder, filling residue)

This unit may be suitable for the aspiration of nitrous oxide (laughing gas). However, when assembling a system for aspiration of nitrous oxide, it is important to ensure that the other components in the system are also suitable for this purpose. Those responsible for setting up the system must assess this and approve and release the system for the aspiration of nitrous oxide.



Operation with nitrous oxide is only permitted if the exhaust air is transported from the unit to the outside of the building.

3.3 Improper usage

Any other usage or usage beyond this scope is deemed to be improper. The manufacturer accepts no liability for damages resulting from this. In these cases the user/operator will bear the sole risk.

- The unit must not be used to aspirate any other substances, such as dust, sludge, plaster or similar in the practice.
- Do not use non-approved cleaning agents and disinfectants that could damage the materials.
- Never use foaming chemicals like instrument disinfectant baths or agents that contain tensides.
- Do not use chemicals that contain chlorine (such as sodium hypochloride).
- A separation vessel (separation of air and water) must always be installed immediately upstream of the Pump Module.
- Make sure that the water connection for the chemicals adding unit has a pipe interrupter in accordance with local codes.
- Do not install the system in a room that does not have ventilation. The temperature near the motor must not exceed 104°F (40°C).
- Not suitable for wet rooms.
- Do not use the unit to aspirate flammable liquids, gases or solvents, e.g. acetone or milking machine cleaner.
- Do not use the unit to aspirate potentially explosive gases – the machine does not have explosion protection. Do not use the unit in a potentially explosive environment.
- Do not operate the unit without a condensation separator or tank particularly in tropical climates.

3.4 General safety notes

- Always comply with the specifications of all guidelines, laws, and other rules and regulations applicable at the site of operation for the operation of this unit.
- Check the function and condition of the unit prior to every use.
- Do not convert or modify the unit.
- Observe the operating instructions.
- Make the Planning and Installation Instructions available to the person operating the device at all times.

3.5 Combining devices safely

Take care when connecting units together or to parts of other systems as there is always an element of risk (e.g. due to leakage currents).

- Only connect units when there can be no question of danger to operator or to patient.
- Only connect units when it is safe to do so and there is no risk of damage or harm to the surroundings.
- If it is not 100% clear from the unit specification sheet that such connections can be safely made or if you are in any doubt, always get a suitably qualified person (e.g. the manufacturer) to verify that the setup is safe.

Where applicable, the requirements for medical products have been taken into account in the development and construction of the device. As a result, this device is suitable for installation within medical supply equipment.

- Where this device is installed within other medical supply equipment, the requirements set out in FDA 21 CFR 820 Regulation and the relevant standards must be complied with.

3.6 Specialist personnel

Operation

Unit operating personnel must ensure safe and correct handling based on their training and knowledge.

- Instruct or have every user instructed in handling the unit.

Installation and repairs

- Installation, readjustments, alterations, upgrades and repairs must be carried out by Air Techniques or by qualified personnel specifically approved and authorized by Air Techniques.

3.7 Protection from electric shock

- Before connecting the device, always check that the values stated on the device for the supply voltage and mains frequency match those of the mains power supply.
- Comply with all the relevant electrical safety regulations when working on the unit.
- Replace any damaged cables or plugs immediately.

3.8 Only use original parts

- Only use Air Techniques parts or accessories and special accessories specifically approved by Air Techniques.
- Only use only original wear parts and replacement parts.



Air Techniques accepts no liability for damages or injury resulting from the use of non-approved accessories or optional accessories, or from the use of non-original wear parts or replacement parts.

3.9 Transport



WARNING Infection due to contaminated unit

- Disinfect the unit before transport.
- Close all media connections.

The original packaging provides optimum protection for the device during transport.

If required, original packaging for the unit can be ordered from Air Techniques.



Air Techniques will not accept any responsibility or liability for damage occurring during transport due to the use of incorrect packaging, even where the unit is still under guarantee.

Only transport the device in its original packaging.

- Keep the packing materials out of the reach of children.

3.10 Disposal



The unit must be disposed of properly. In accordance with all applicable local laws.



The unit may be contaminated. Instruct the company disposing of the waste to take the relevant safety precautions in this case.

- Decontaminate potentially contaminated parts before disposing of them.
- Uncontaminated parts (e.g. electronics, plastic and metal parts etc.) should be disposed of in accordance with the local waste disposal regulations.
- If you have any questions concerning correct disposal, please contact Air Techniques or your usual dental supplier.

4. Ambient conditions

Ambient conditions during storage and transport

Temperature	°F	14 to 140
	°C	-10 to +60
Relative humidity	%	< 95

Ambient conditions during operation

Temperature	°F	50 to 104
	°C	+10 to +40
Relative humidity	%	< 70

This device is not suitable for use in areas with potentially explosive atmospheres. Areas where explosions could occur are those where flammable anesthetic agents, skin cleansers, oxygen or skin disinfectants are present.

Furthermore, the devices are also not suitable for use in areas with a combustible atmosphere.

General notes on installation and set-up

Set-up alternatives will vary according to model type and/or the particular building restrictions. Installation in a purpose-built room, e.g. in a boiler room, must be checked with local building regulations.

- The devices should be set up in such a way that the serial plate can be read at all times.

4.1 Ventilation and air extraction

- For room temperatures above 95°F (35°C), additional ventilation must be provided in the room in which the unit is set up. The delivery depends on the performance of the individual unit in operation.



Please note that suction units radiate approx. 30% and compressor units approx. 70% of their stated input power (P_{el}) into the room as heat (P_w), which can lead to a considerable increase in the ambient temperature and thus the temperature of the room (depending on size of the room and the installation conditions).

- The **exhaust air** from the suction unit contains **germs and bacteria**, therefore it is important that the **exhaust air is always routed outside of the building**.
- The air circulation slots for the room should be designed so that the device stands directly in the path of the flow of air.



Ensure that there is adequate ventilation, otherwise there is a risk of overheating (refer to the accompanying rough calculation).

Example:

What amount of fresh air is required in the installation room when using a AS120 (60 Hz) compressor and a VS90 (60 Hz) vacuum system?

Rough calculation:

Electric power rating of compressor	
22 kW x 70% =	N approx. 15.4 kW
Electric power rating of suction unit	
26 kW x 30% =	N approx. 7.8 kW
Heat output	N _{tot} approx. 23.2 kW

N _{tot}	approx. 23.2 kW
Safety	1.0 kW
N _{tot}	24.2 kW

Permitted room temperature increase

$$\Delta\delta = 15 \text{ °C (assumed)}$$

$$P_L = \text{Room air density } 1.29 \text{ kg/m}^3$$

$$C_p = \text{Specific heat capacity of room air} \\ = 1.005 \times 10^3 \frac{\text{Wsec}}{\text{kg °C}}$$

Approx. amount of fresh air required

$$V^\circ = \frac{N_{tot}}{P_L \times C_p \times \Delta\delta}$$

$$V^\circ = \frac{(24.2 \times 10^3)}{(1.29 \times 1.005 \times 10^3 \times 15)} = 1.24 \text{ m}^3/\text{sec}$$

$$V^\circ \sim 74.4 \text{ m}^3/\text{min} = 4464 \text{ m}^3/\text{h} = 2627 \text{ CFM}$$

5. Plumbing and pipe dimensions

The connection options on the suction unit will vary according to model type and/or the particular building restrictions.

- Waste water pipes must be carried out in strict accordance with local and national regulations.
- The connection between the pipe line and suction unit itself should be executed using a rubber sleeve.

5.1 Pipe materials

Pipes on the suction side and for connection to the waste water system must only be made of the following pipe materials:

- Internally smooth pipes made of polypropylene (PP) (e.g. DN-compliant HT-pipe, marked red, low combustible, airtight).
- Chlorinated polyvinyl chloride (PVC-C), unplasticized polyvinyl chloride (PVC-U) and polyethylene (PEh).
- National and local fire safety regulations and building regulations must be observed at all times.
- The pipes must be designed for a vacuum of at least 15 inHg.

The following materials must not be used:

- HT-pipes with O-ring seals.
- Pipes made of acrylonitrile-butadiene-styrene (ABS) and styrene-copolymer blends (SAN+PVC)



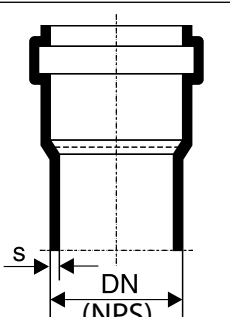
For thermal reasons the **wall thickness** for pipes positioned on the suction side **in the room of installation** should be **1/8 inch (3 mm)**.

5.2 Pipe dimensions

Diameters

The diameters of the pipes in the planning examples are marked DN.

The following is a table with the relevant mm values and NPS equivalent:

	DN [mm]	s [mm]	NPS (inch)	s [inch]
	40	1.8	1.5	0.071
	50	1.8	2	0.071
	75	1.9	~3	0.075
	90	2.2	~3.5	0.087
	110	2.7	~4.5	0.107
	125	3.1	~5	0.122
	160	3.9	~6	0.154

Vacuum and exhaust pipes

Differing pipe cross sections will be used depending on the suction system used and the corresponding suction power of the suction unit.

Relevant information can be found in the planning examples for the various suction systems.

The rate of flow should reach approximately 7 to 10.5 SCFM (200-300 l/min) with the large cannula.



Rates of flow above 14 SCFM (400 l/min) can cause the mucous membranes of the patient to dry out and lead to pain or discomfort at the neck of the tooth. In addition, the cooling flow to the turbine will be redirected leading to the danger of overheating of the dentine and of the pulp.

The actual magnitude of the rate of flow will also depend to a large extent on the internal features of the treatment unit being used. Hoses with a smaller cross-section (e.g. <math><1/2</math> inch) reduce the suction power (rate of flow), and this can only partly be compensated by using a greater pipe cross section.

Waste water drain pipe

- **NPS 2 inch** min. 2% gradient
- or choose a pipe diameter in line with national and local regulations

6. Electrical installation

6.1 Notes on installation

- Suction units must only be connected to a suitable and correctly installed Air Techniques control unit.
 - Before initial start up, all equipment and supply lines must be checked for signs of damage. Damaged supply lines and connections must be replaced immediately.
 - Installation must be carried out by a qualified expert.
- Electrical installations must be performed in accordance with the requirements set out in EN 60364, EN 60601, UVV-BGV 1,4,5,103, and in other countries in accordance with applicable national regulations, e.g. CEE.
- When connecting to the mains electricity supply, ensure that the circuit is fitted with an all-pole disconnect switch (all-pole switch) with contact opening width >3 mm.

6.2 Conductor cross-sections



The required **conductor cross-sections** depend on the current consumption, length of line and the ambient temperature of the suction unit. Information about the current consumption can be found in the technical data sheet of the suction unit.

The minimum required conductor cross-sections are shown in the table below.

Current consumption of unit A	AWGmm ²
> 10 and ≤ 16	16
> 16 and ≤ 25	14
> 25 and ≤ 32	12
> 32 and ≤ 40	10
> 40 and ≤ 63	8

6.3 Notes on connecting cables



The following information on connecting cables is in accordance standards. Relevant national standards and rules and regulations must also be observed.

480V mains power supply, fixed line

- NYM-J (5-wire) in accordance with DN VDE 0250 Part 204

480V mains power supply, flexible

The connection between the "fixed connecting cable" and the "suction unit" itself should be executed using an unit socket and PVC-sheathed cable H05VV-F 5G (5-wire) (IEC 60227 Code 53) or H05 RN-F 5G (5-wire), H05 RR-F 5G (5-wire)

230V mains power supply, fixed

- NYM-J 3 x 16 AWG

230V mains power supply, flexible

PVC hose connection H05VV-F 3G 16 AWG or rubber tubes H05 RN-F 3G 14 AWG, H05 RR-F 3G 14 AWG

Protective earth connection

The control unit and the suction unit frame must be directly connected to each other using a protective ground cable. This applies both to installation on the suction unit frame and to wall mounting of the control unit.

On a dry suction system with a separation vessel, t must additionally be connected to the separation vessel via a protective ground cable. The cross-section of the connecting cable should be at least 10 mm².

24V control line, protective low voltage

- Suction unit relay (manifold signal) or hose manifold
- 3 x 14 AWG

Fixed routing

- (N)YM (St)-J, shielded sheathed cable in accordance with DN VDE 0250 part 204/209.

Flexible routing

- LiYCY with sheathed and shielded cable as used for telecommunications or IT applications, or lightweight PVC control cable, sheathed and shielded.

Data cable for display panel for clinic systems, visualisation or amalgam separator display panel.

Fixed routing

- CAT 5.e network cable or higher.

Flexible routing

- Cat 5.e network patch cable or higher (from the amalgam separator to the network socket)
- ISDN standard line with connectors (from the network socket to the display panel, included in the scope of delivery of the unit)

6.4 Control unit

The control unit is designed only to control clinic suction units provided by Air Techniques where the motor current is monitored using a motor protection switch.

The control unit for the clinic suction unit includes one contactor each for switching the motor on and off and a transformer for generating the 24 V AC control voltage. In the treatment room, a relay or micro switch situated in the hose manifold of the treatment unit (chair) controls the contactor so that one of the suction units starts up.

7. Functional description

Clinical Dry Vacuum systems (1) are designed for use as dry suction systems. This means that a **separation stage** must be provided **before the air enters** the pumps. During this separation, the aspirated fluids are separated from the air content.

Clinical Dry Vacuum systems in combination with a central separation tank as a dry suction system.

The central separation tank (6) has up to 2 inlets and a connection to the clinic suction unit. The tangential inlet openings allow a rate of flow of up to 600 CFM (18000 l/min). Up to 90 treatment units can be connected to a central separation tank, while maintaining a useful simultaneous factor of 60%.

Up to **45 treatment units** can be connected to **each inlet** (at 60% SF) of the central separation tank. If there are more than 45 treatment units we recommend distributing them between both inlets in order to provide an even rate of flow.

3 float switches are distributed at different heights in the central separation tank. A float switch will activate the waste water pump (10) if the fluid level reaches approx. 50%. The pump transports the fluid out of the central separation tank to the waste water drain or to the amalgam separator (11).

A safety switch-off is activated at a level of approx. 75% when the 2nd float switch engages, i.e. the suction units remain switched off until the fluid level has fallen. Pressing the yellow button on the control unit cancels the safety switch-off.

The 3rd float switch is used when the control unit is defective and the Clinical Dry Vacuum needs to be operated in **emergency mode**.

When the level of fluid in the central separation tank reaches 75% in emergency mode, the unit is immediately switched off to prevent the risk of excessive suction of fluids.

The aspirated air and fluid mixture is directed over a coarse filter at the inlet connection of the central separation tank and then tangentially fed to the collector. Solid particles greater than 1/8 inch (3 mm) in size are held back by the coarse filter. The aspirated air and fluid mixture is separated in the central separation tank. The air (on vacuum side) will pass through the turbine of the suction units and then escape as exhaust air through the exhaust air filter to the outside.

The fluids (blood, saliva, amalgam etc.) are propelled by the waste water pump out of the system vacuum through a non-return valve and the flow control valve to the waste water drainage system or to an amalgam separator.

The non-return valve serves to ensure that no vacuum can be built up to the amalgam separators.

The flow reducers restrict the waste water flow to max. 0.5 CFM (16 l/min) per amalgam separator. This is the maximum amount that the amalgam separator operating at a separation efficiency of $\geq 95\%$ can cope with. The amalgam separator switches on or off automatically depending on the level of fluids being transported.

A collector rinse (8) using either water or water plus CleanStream is integrated in the central separation tank. The water inflow valve is opened every 24 hours for a period of 3 minutes by the control unit of the clinic suction unit. After 2 minutes the CleanStream valve (7) also opens so that CleanStream is added to the water for approx. 1 minute. This keeps the central separation collector and the connected amalgam separator as hygienically clean as possible.

i When connecting a water rinse the local rules and regulations on water supplies must be observed (e.g. free incline, pipe separation).

The 30 l CleanStream vessel (9) is equipped with a suction tube with a float sensor that sends a signal to the PLC controller when the CleanStream vessel is empty and needs to be changed.

If the control unit fails, it is possible to switch to **emergency mode** using the key-operated switch (5). Two positions can be chosen using the key-operated switch:

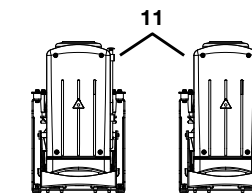
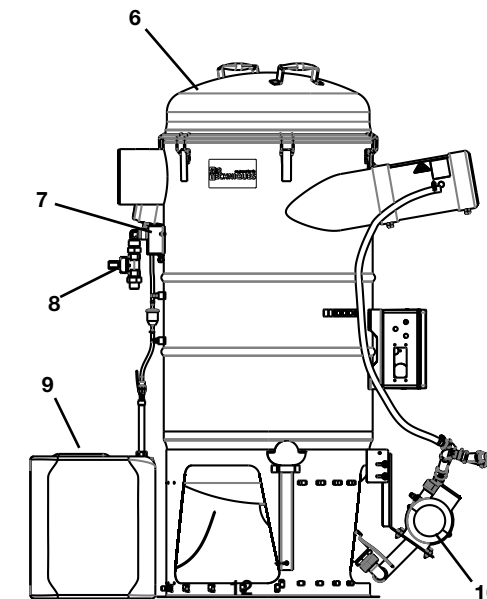
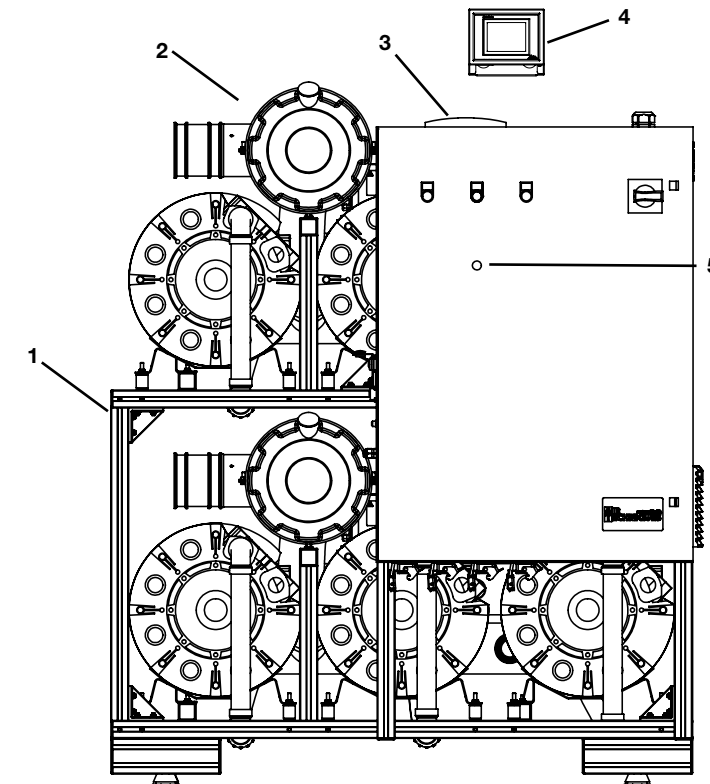
0 - Normal operation

I - Emergency mode

In emergency mode, only one suction unit and the auxiliary air valve are activated. This means the number of treatment units that can be used simultaneously is limited. In this operating mode the vacuum is only limited mechanically via the auxiliary air valve, which can lead to an excessive build-up of vacuum.

Key:

- | | |
|----|-------------------------|
| 1 | Pump module |
| 2 | Exhaust air filter |
| 3 | Control unit |
| 4 | Display panel |
| 5 | Key-operated switch |
| 6 | Central separation tank |
| 7 | CleanStream valve |
| 8 | Collector rinse |
| 9 | CleanStream vessel |
| 10 | Waste water pump |
| 11 | Amalgam separator |





System components

8. Model overview / scope of delivery

8.1 Clinical Dry Vacuum systems

VS60, 480 V, 60 Hz VS60

- Clinic suction unit with 4 suction pumps
- Control unit
- Central separation tank
- Installation materials

VS75, 480 V, 60 Hz VS75

- Clinic suction unit with 5 suction pumps
- Control unit
- Central separation tank
- Installation materials

VS90, 480 V, 60 Hz VS90

- Clinic suction unit with 6 suction pumps
- Control unit
- Central separation tank
- Installation materials

8.2 Accessories



The parts listed as special accessories are **not** part of the standard scope of delivery but can be ordered separately.

- Display panel for clinic systems E5119
- Visualization gateway E5188
- Network switch E5186

8.3 Special accessories

The following optional item can be used with the unit:
Amalgam Separator CA 4 E5129E

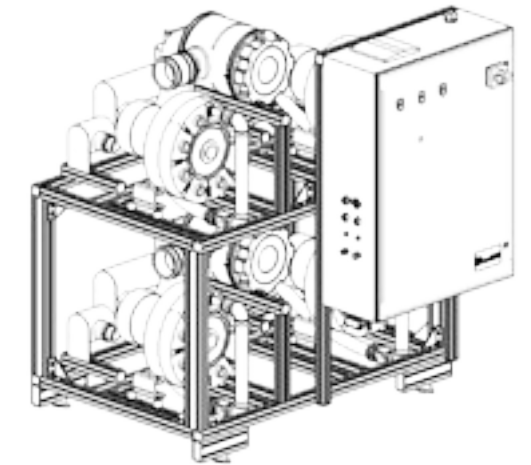
8.4 Consumables

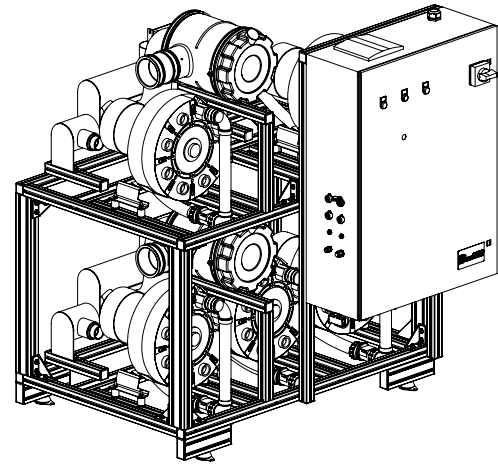
- Filter insert for exhaust air bacterial filter E5131
- CleanStream Evacuation System Cleaner (30L) 57630
- Clinical Vacuum Maintenance Kit E5257

9. Technical data

9.1 VS60 (Pump Module)

Nominal Voltage (rated voltage)	480 VAC ± 10%			
Wiring Configuration	3/N/PE			
Rated Current or Rated Power (current or power consumption)	38 A			
Duty Cycle	100%			
Frequency	60 Hz			
Site Circuit Breaker	50 A			
Protection class	1			
IP protection	20			
Sound Pressure Sum Levels	77 dB(A)			
Pump Module	D	W	H	
	inches	53	58	70
	cm	135	147	178
Tank Module	Ø26 x 61 H (in)			
	Ø66 x 155 H (cm)			
Weight				
Pump Module	1,040 lbs			
	472 kg			
Tank Module	180 lbs			
	82 kg			
Environmental Conditions Transport/Storage:				
Temperature range:				
minimum	14°F (-10°C)			
maximum	140°F (+60°C)			
Relative humidity:	95%			
Air Pressure:	N/A			
Environmental Conditions for Operation:				
Temperature range:				
minimum	50°F (+10°C)			
maximum	104°F (+40°C)			
Relative humidity:	70%			
Air Pressure:				
maximum	14.1 psia			
minimum	14.9 psia			



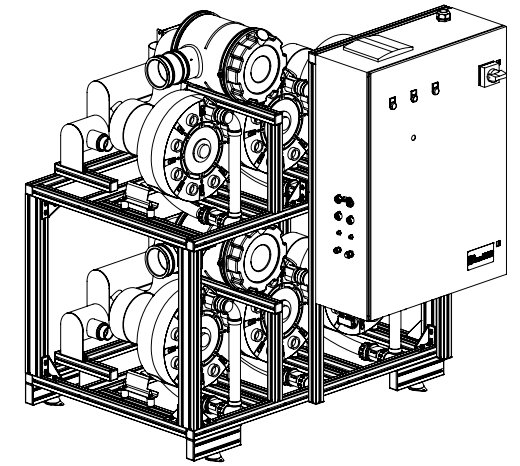


9.2 VS75

Nominal Voltage (rated voltage)	480 VAC ± 10%		
Wiring Configuration	3/N/PE		
Rated Current or Rated Power (current or power consumption)	47.5 A		
Duty Cycle	100%		
Frequency	60 Hz		
Site Circuit Breaker	60 A		
Protection class	1		
IP protection	20		
Sound Pressure Sum Levels	78 dB(A)		
Pump Module	D	W	H
	inches	53	58 70
	cm	135	147 178
Tank Module	Ø26 x 61 H (in)		
	Ø66 x 155 H (cm)		
Weight			
Pump Module	1,180 lbs		
	535 kg		
Tank Module	180 lbs		
	82 kg		
Environmental Conditions Transport/Storage:			
Temperature range:			
minimum	14°F (-10°C)		
maximum	140°F (+60°C)		
Relative humidity:	95%		
Air Pressure:	N/A		
Environmental Conditions for Operation:			
Temperature range:			
minimum	50°F (+10°C)		
maximum	104°F (+40°C)		
Relative humidity:	70%		
Air Pressure:			
maximum	14.1 psia		
minimum	14.9 psia		

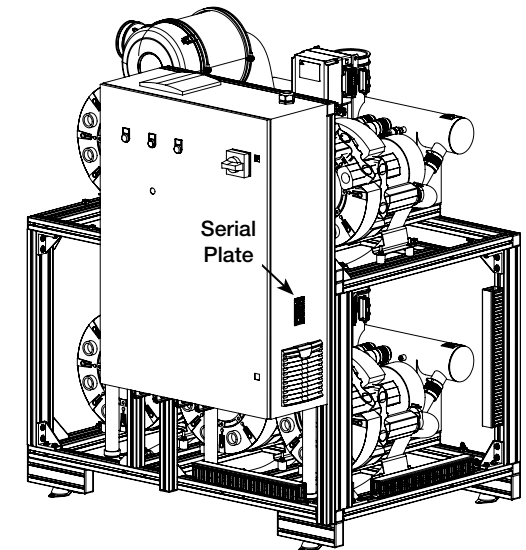
9.3 VS90

Nominal Voltage (rated voltage)	480 VAC ± 10%		
Wiring Configuration	3/N/PE		
Rated Current or Rated Power (current or power consumption)	57 A		
Duty Cycle	100%		
Frequency	60 Hz		
Site Circuit Breaker	80 A		
Protection class	1		
IP protection	20		
Sound Pressure Sum Levels	79 dB(A)		
Pump Module	D	W	H
	inches	53	58 70
	cm	135	147 178
Tank Module	Ø26 x 61 H (in)		
	Ø66 x 155 H (cm)		
Weight			
Pump Module	1,320 lbs		
	600 (kg)		
Tank Module	180 lbs		
	82 kg		
Environmental Conditions Transport/Storage:			
Temperature range:			
minimum	14°F (-10°C)		
maximum	140°F (+60°C)		
Relative humidity:	95%		
Air Pressure:	N/A		
Environmental Conditions for Operation:			
Temperature range:			
minimum	50°F (+10°C)		
maximum	104°F (+40°C)		
Relative humidity:	70%		
Air Pressure:			
maximum	14.1 psia		
minimum	14.9 psia		



9.4 Serial plate

The serial plate of the unit is located on the side on the Control Panel.



10. Control panel

480 V model type, 3~, 60 Hz
for suction units VS60 / VS75 / VS90

10.1 Technical data

Control unit for VS60 / VS75 / VS90

Voltage	V	480, 3-phase
Frequency	Hz	60
Connected load, max. *	A	57
Motor protection switch setting range	A	6.3 - 10
External error messages	V	230
Switch contact X4, max.	A	10
	kW	1
Weight	Lbs (kg)	345 (156)

* Current consumption depends on the units connected.

10.2 General information

Protection class (with protective ground conductor)	I
Type of protection	IP 21

10.3 Special accessories

Connecting cable between control unit and suction motor:

16 feet (5 m)	E5281
33 feet (10 m)	E5282

10.4 Functional description of control unit

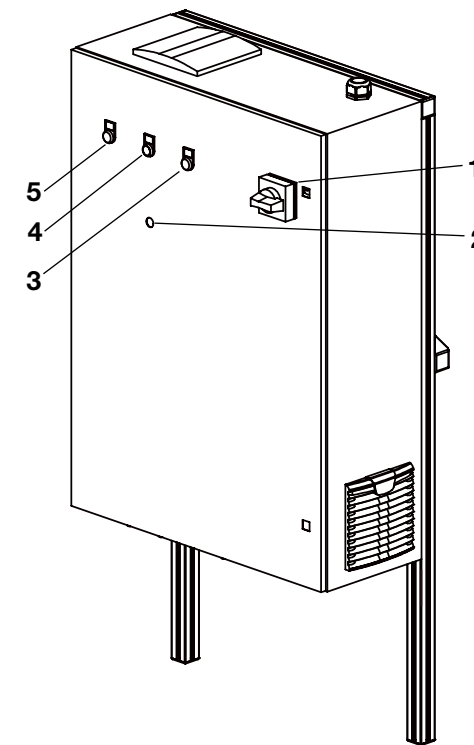
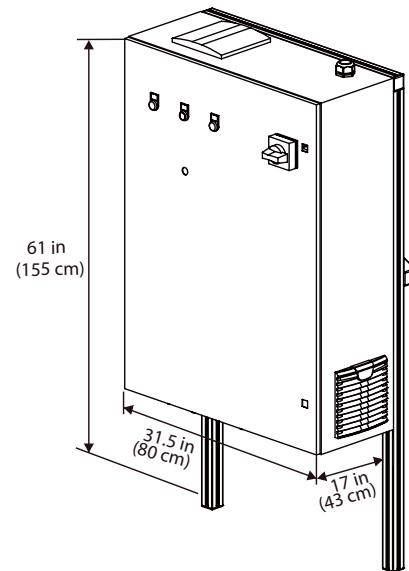
The control unit is adapted to the VS60 / VS75 / VS90 clinic suction unit used. Before commissioning and first start-up, check the mains voltage against the voltage indicated on the model identification plate.

Electrical connection to the mains power supply must be executed using an all pole disconnect switch (all-pole switch or circuit breaker) with a contact opening width > 1/8 in. (3mm).

- 1 Main power switch
- 2 Key-operated switch with 2 possible positions:

0 - Normal operation

When a suction hose is lifted off the treatment unit the 1st suction unit starts to run. The remaining suction units switch on or off depending on the supply of vacuum. The vacuum is monitored by a sensor integrated in the system.



I - Emergency mode

If the control unit fails, it is possible to switch to emergency mode using a key-operated switch. In emergency mode, **only one suction unit** is activated. This means the number of treatment units that can be used simultaneously is limited. In this operating mode the vacuum is not regulated, which can lead to an excessive build-up of vacuum. If the level of fluid in the central separation tank reaches 75% in emergency mode then the unit will immediately switch off.

- 3 Green LED: System running
- 4 Blue button: Delete (RESET)
- 5 Red LED: Fault

10.5 Sensor monitoring

If one or more suction units are running and the vacuum falls below 0.295 inHg for longer than 35 seconds, the unit will automatically switch to "Sensor Defect Mode".

In "Sensor Defect Mode" only one suction unit is activated. As soon as the vacuum rises above 0.295 inHg again, the yellow RESET button S1 should be pressed in order to return to normal operating mode.

10.6 External error messages

Switching elements have been integrated into the control unit that allow remote monitoring of the operating status of the suction units via a control LED, e.g. in the technical equipment room.

10.7 Connection overview VS60 / VS75 / VS90

Depending on the design of the suction system and the number of suction units, not all connections may be required.



The original circuit diagrams can be found in the control box and should always be kept there.

Connections on the right hand side

X4 External fault message
Maximum permitted connected loads:
230 V, 10 A, 1 kW

X13 Display panel voltage supply

X13.1 Display panel signal line (network cable)

X14 Control line (manifold signal 1)

X15 Control line (manifold signal 2)

X16 Pressure sensor 1, B11

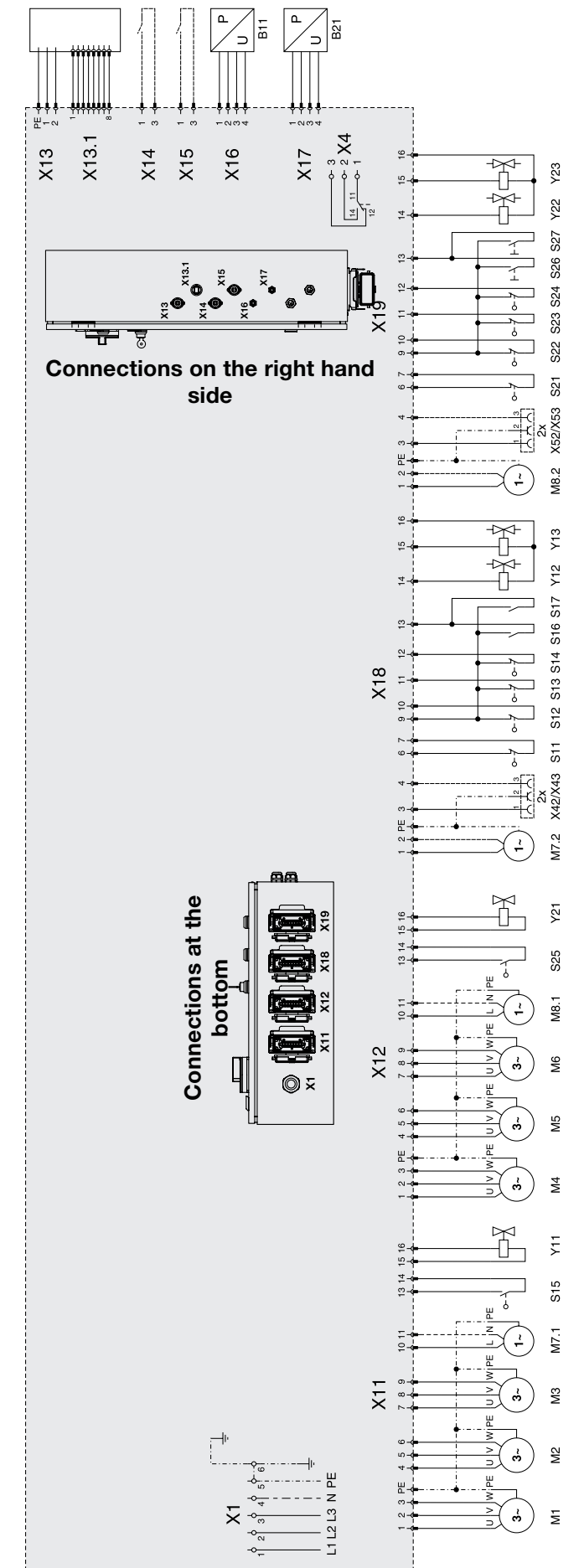
Connections at the bottom

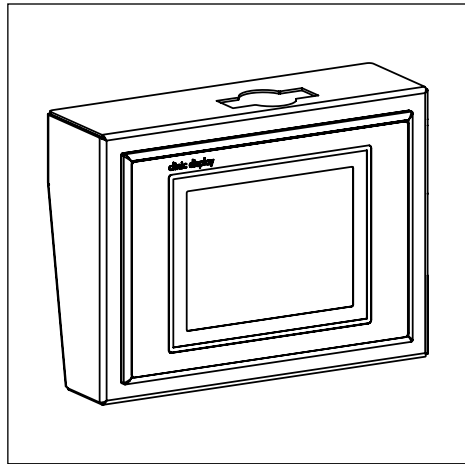
X1 Power supply to suction system

X11 Suction unit group 1 (16-pole)
Suction unit M1-M3

X12 Suction unit group 2 (16-pole)
Suction unit M4-M6

X18 Separation tank 1 connection (16-pin):
Waste water pump M7.2
Power outlets for amalgam separator X42/X43
Float sensor 75%, tank, emergency operation S11
Float sensor 50%, tank S12
Float sensor 75%, tank S13
Float sensor for disinfectant S14
Amalgam separator 1 (CA 4, X6), tank S16
Amalgam separator 2 (CA 4, X6), tank S17
Water rinse valve Y12
Disinfection valve Y13





11. Display panel for clinic systems

11.1 Model overview

Display panel for clinic systems E5119

11.2 Special accessories:

Network Switch (8-fold) E5186

Power unit for the display panel G8116
(Only used when Display Panel is placed away from Control Unit.)


Wall Mount for Panel Display E5369-K

11.3 Functional description

When the suction unit is set up the display panel must be used to configure various adjustments.

In addition, the display panel is used to display or query various operating states for both operators and maintenance personnel. Several suction units, pressure stations or central disinfection stations can be connected to a single display panel. However, in this case a switch must be inserted between the suction units and the display panel.

Up to 18 control units and up to 8 display panels can be connected together in a network of clinic devices and display panels.

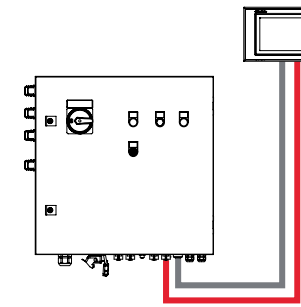
 Information on settings, use of the display and maintenance can be found in the Installation and Operating Instructions supplied with the display panel.

11.4 Display panel installation options

- Installation on the frame of the control unit
- Installation on the suction unit frame either from the top or from the front
- Wall installation, e.g. in a monitoring room.
- Fixing to a tabletop (using screws or double-sided adhesive tape), e.g. in a monitoring room.

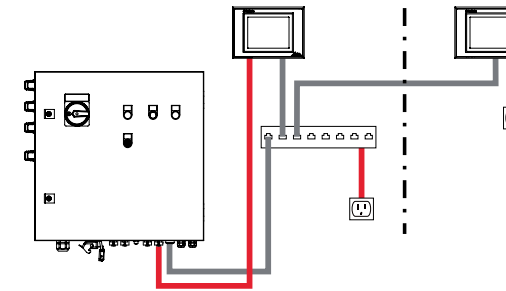
11.5 Connection variants

Variant 1:



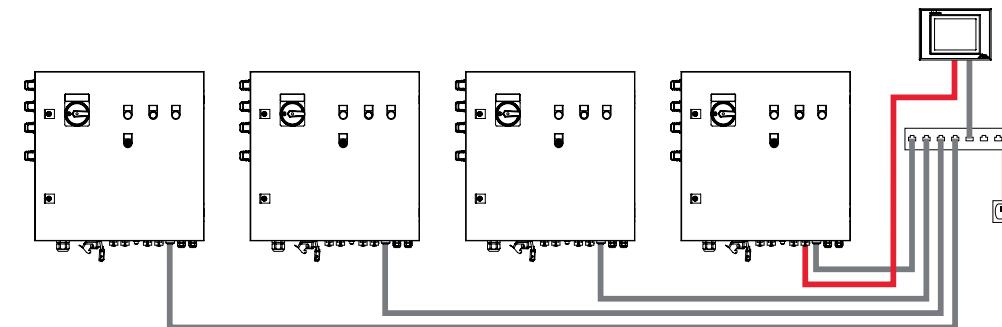
Suction module with control unit and **one** display panel either on the suction module or in the vicinity of the control unit. Power supply (24 V) for the display panel from the control unit.

Variant 2:



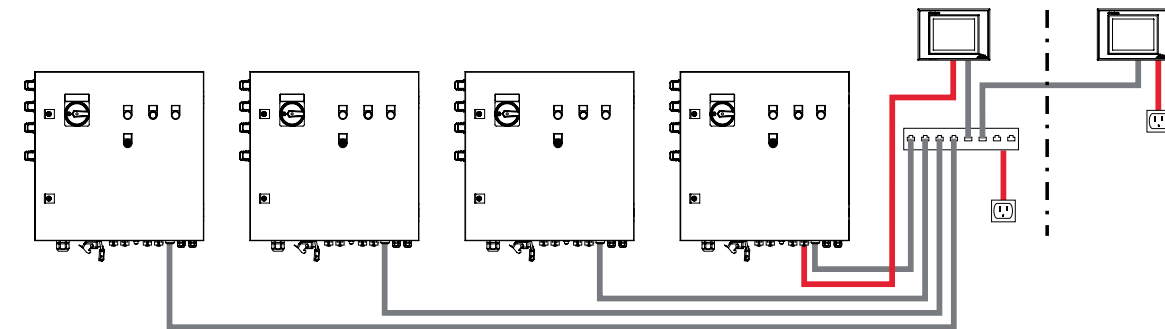
Suction module with two display panels and the necessary switch with power supply 120 V (220 V). One display panel set up at the suction module or in the vicinity of the control unit. Power supply (24V) from the control unit. A further display panel, e.g. in a monitoring room, with individual power supply 120 V (220 V) to supply power.

Variant 3:



Several suction units with one display panel and a switch with power supply 120 V (220 V). Display panel set up at the suction module or in the vicinity of the control unit. Power supply (24V) from the control unit.

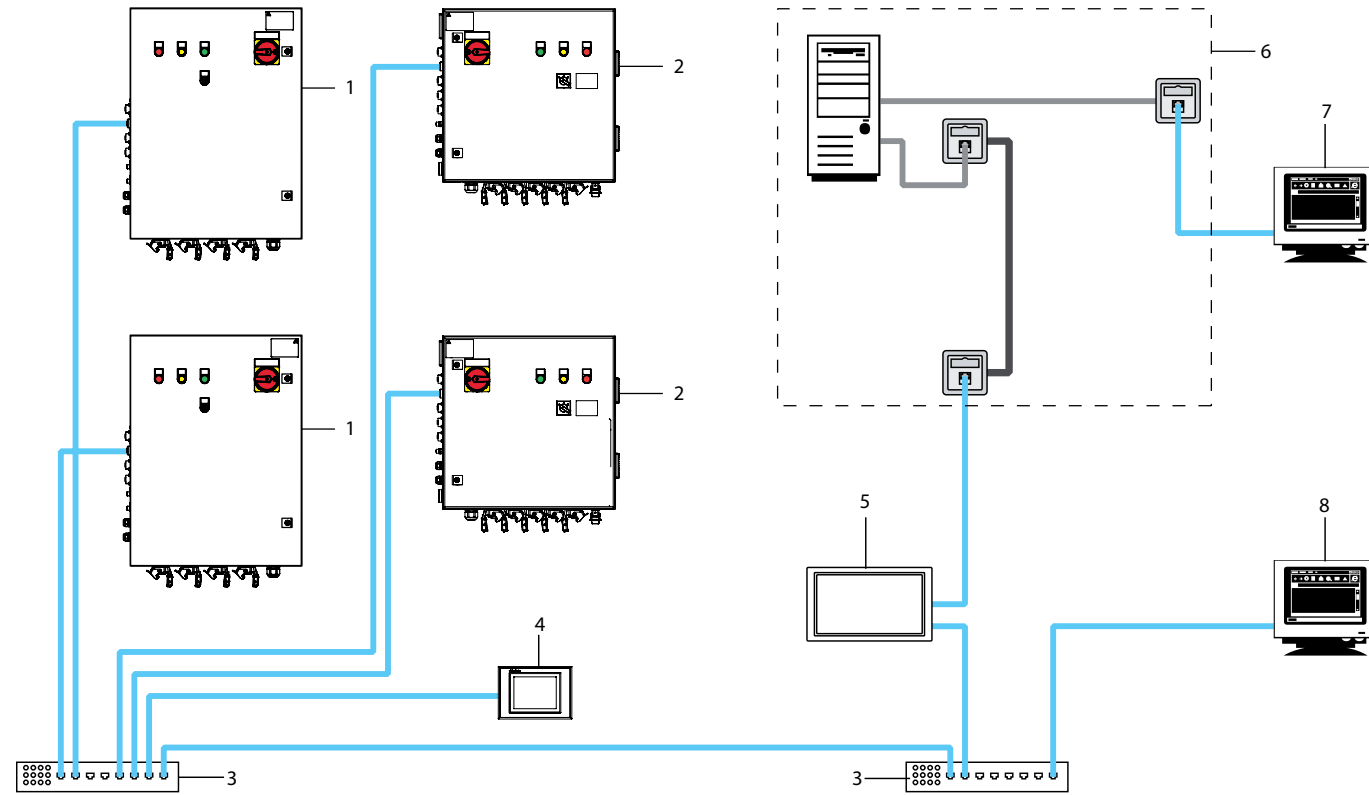
Variant 4:



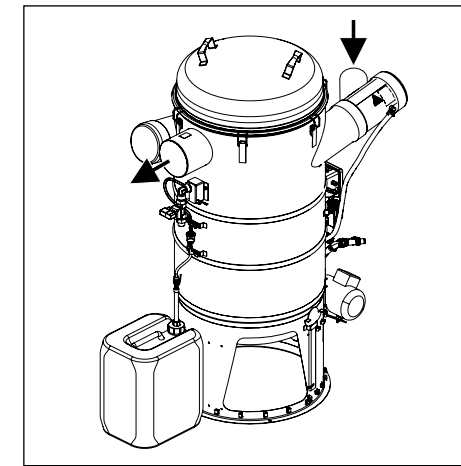
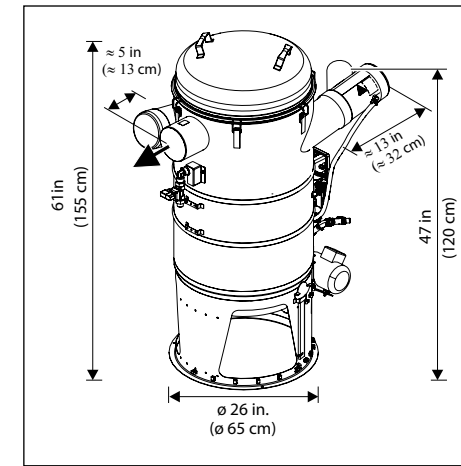
Several suction units with two display panels and a switch with power supply 120 V (220 V). One display panel set up at the suction module or in the vicinity of the control unit. Power supply (24V) from the control unit. A further display panel, e.g. in a monitoring room, with individual power supply 120 V (220 V) to supply power.

12. Clinic visualization

In addition to the normal display it is also possible to incorporate a complete clinic visualization system for the Air Techniques units. Here, the clinic devices are networked together and can be visualized or operated on different devices (clinic display panel only).



- 1 Clinic suction system VS60, VS75 or VS90
- 2 Clinic pressure station AS60, AS90 or AS120
- 3 Network switch (8-fold)
- 4 Display panel for clinic systems
- 5 Air Techniques VNC server (gateway)
- 6 Clinic network (clinic server)
- 7 Computer with VNC Viewer in the clinic network
- 8 Computer with VNC Viewer in the network of the Air Techniques clinic devices



13. Central separation tank (CST)

13.1 Model overview

Central separation tank with waste water pump and vessel rinse set

13.2 Technical data

Pressure	in Hg	-15
	(mbar/hPa)	(-508)
Volume capacity, approx.	gal / (L)	79 / (300)
Vessel material		
Steel designation		X2CrNiMo17-12-2
Material number		1.4404
Material designation		AISI 316L
Dimensions		
Diameter	in / (cm)	26 / (65)
Height	in / (cm)	61 / (155)
Weight, approx.	lb / (kg)	180 / (82)
Connections:		
2x inlet	in / (DN)	NPS 4 1/2 / (DN 110)
1x outlet to suction unit	in / (DN)	NPS 6 / (DN 160)
Waste water / drain	in / (DN)	NPS 1 1/2 / (DN 40)
Fresh water		GU 3/4"
Water pressure	psi / (bar)	44 to 73 / (3 - 5)
Float sensor:		
Protective low voltage	V AC	24
Switching current	A	6
Waste water pump:		
Voltage	V	110
Current consumption	A	8.4
Output	W	550
Type of protection		IP 55

13.3 Scope of delivery

The following items are included in the scope of delivery:

Central separation tank (CST) with waste water pump and vessel rinse set

Includes pipes for connection between the suction module and the central separation tank

13.4 Special accessories



The parts listed as special accessories are **not** part of the standard scope of delivery but can be ordered separately.

Amalgam separator CA 4, 60 Hz E5129E

13.5 Consumables

CleanStream Evacuation System Cleaner (30L) . 57630
Clinical Vacuum Maintenance Kit E5257

13.6 Fresh water separation

Depending on the national legal requirements, a safety fitting may need to be installed on the building side in the supply line for container rinsing. Its task is to prevent any back pressure or backflow of non-potable water into the public supply.

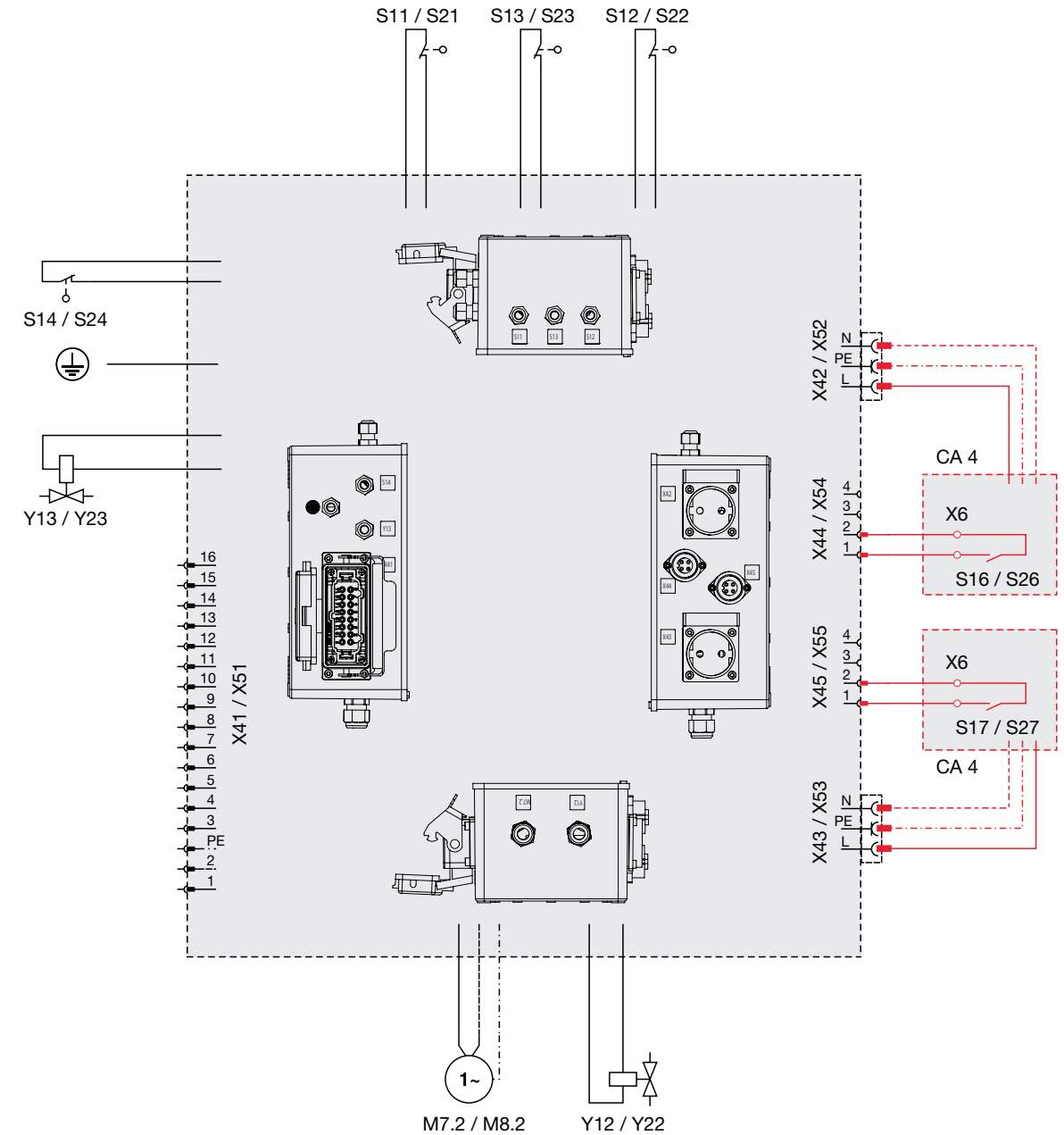
The secretion accumulated in the central separation tank is classified in drinking water hazard category 5.

13.7 Pre-filter

A fine filter should be installed immediately upstream of the water valve on the CST. This should prevent particles that may be present in the water from causing malfunctions at the water intake valve.

13.8 Overview of the electrical connections of the central separation tank (CST)

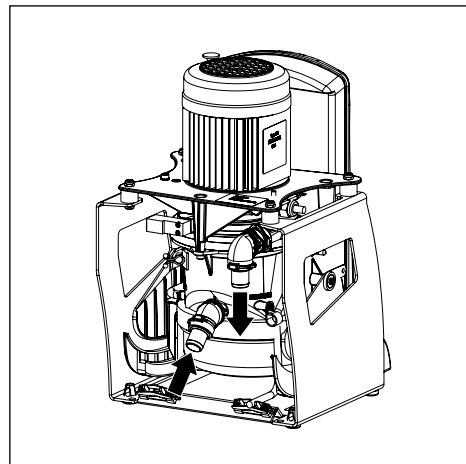
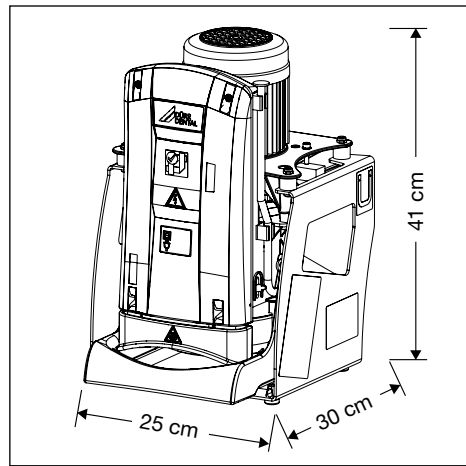
On the central separation tank there is a distribution box to which all sensors, valves, etc. on the CST are connected or will be connected. The CST is connected to the control unit with a cable with 16-pin plugs. An overview of the connections is shown below. Detailed circuit diagrams can be found in the control unit of the suction units.



The following designations are used in the circuit diagrams for one or two CST(s)

- X41 / X51** Connection to the control unit
- X42 / X52** Power outlet for amalgam separator ONLY; no other devices must be connected here.
- X43 / X53** Power outlet for amalgam separator ONLY; no other devices must be connected here.
- X44 / X54** Connection for fault signal from amalgam separator 1

- X45 / X55** Connection for fault signal from amalgam separator 2
- S11 / S21** Float sensor 75%, emergency operation
- S12 / S22** Float sensor 50%
- S13 / S23** Float sensor 75%
- S14 / S24** Float sensor, disinfection
- S16 / S26** Switch for fault signal from amalgam separator 1
- S17 / S27** Switch for fault signal from amalgam separator 2
- M7.2 / M8.2** Waste water pump
- Y12 / Y22** Water rinse valve
- Y13 / Y23** Disinfection valve



14. Amalgam separator CA 4

14.1 Model overview

- 230V~ 60Hz

14.2 Technical data

Voltage	V	230 / 1~
Frequency	Hz	60
Nominal current	A	1.2
Starting current, approx.	A	5
Type of protection		IP 21
Protection class		I
Over-voltage category		II
Max. volume of fluid	l/min	16
Min. volume of fluid	l/min	0.1
Usable volume of collector vessel, approx.	ccm	600
Separation rate	%	≥95
Weight		
without housing, approx.	lb (kg)	22 (10)
with housing; approx.	lb (kg)	39 (18)
Noise level		
approximately.	dB(A)	56

* Compliant with ISO 11143



Planning information

15. Installation notes for the suction system

In order to avoid unnecessary loss of vacuum and the resulting drop in suction performance, it is important to ensure that the pipe system is correctly dimensioned. The following values should be observed as a general guideline for clinic suction units with pipe lengths of up to 262 feet (80 m) and a simultaneity factor of 100%.

Supply lines for:

- 1 - 2 workplaces: NPS 1½" (DN 40)
- 3 - 5 workplaces: NPS 2" (DN 50)

Collecting pipes/downpipes:

- 8 - 15 workplaces: NPS 2" (DN 75)
- 16 - 30 workplaces: NPS 4½" (DN 110)

(The exact connection sizes and their positions must be taken from the installation instructions of the appropriate unit manufacturer.)

Maximum pipe lengths:

- NPS 1½" (DN 40) : 33 feet (10 m)
- NPS 2" (DN 50): 100 feet (30 m)

On reaching the specified lengths, the next larger diameter must be used to minimise loss of vacuum. Thus, for example, a NPS 2" (DN 50) line with a length of 131 feet (40 m) must be executed as follows:

- NPS 1½" (DN 40) lines must be used from up to 5 floor sockets up to the NPS 2" (DN 50) collector line. These stub lines should not exceed a length of 33 feet (10 m).
- The NPS 2" (DN 50) line must be executed in NPS 2" (DN 50) from this collection point for the next 100 feet (30 m). The last 33 feet (10 m), between the treatment units and the main line, must be executed in NPS 3" (DN 75).
- The NPS 3" (DN 75) ends in the NPS 4½" (DN 110) main line or downpipe.

Excessive temperature differences will lead to an increased build-up of condensation water. In order to prevent excessive build-up of condensation, suction pipes should not be installed close to external walls. The following criteria should be met when installing a condensation separator:

- At the lowest position in the main vacuum supply line
- As near to the suction units as possible
- In an accessible position

The exhaust air line from the suction unit must lead out into the outside, via the roof if possible. The following values are a general guideline.

Exhaust air line for:

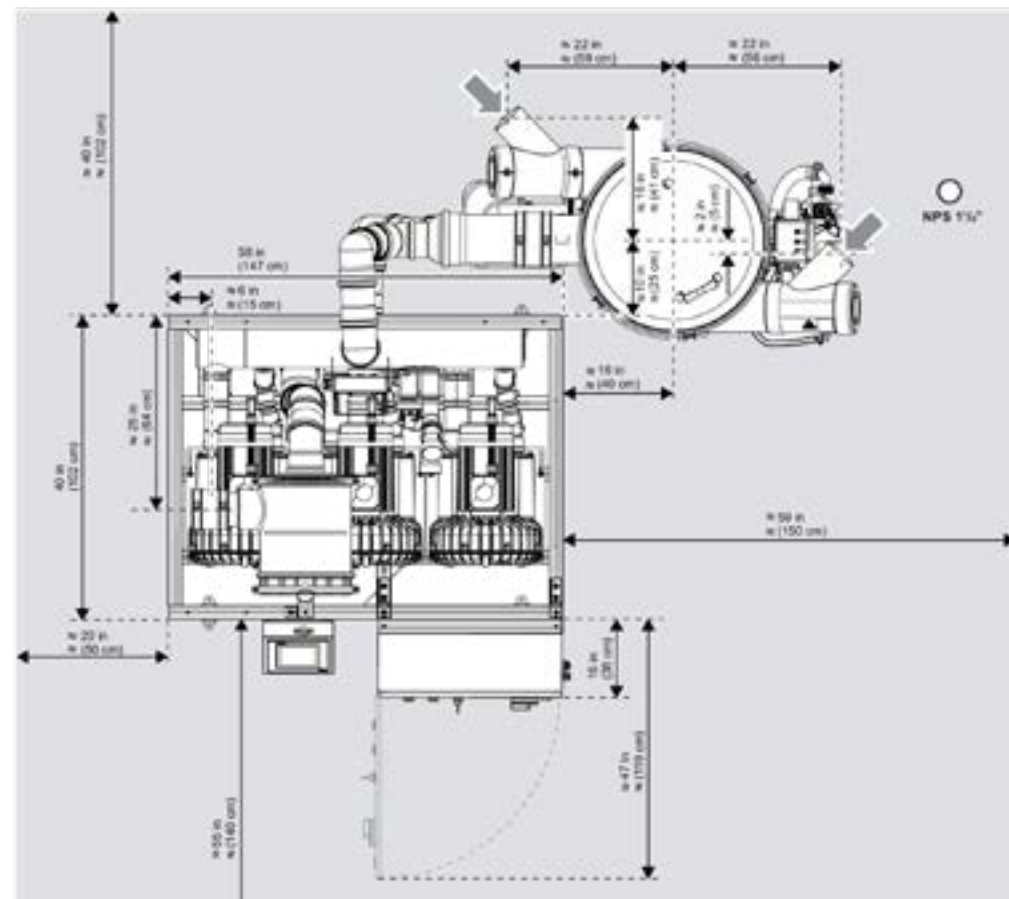
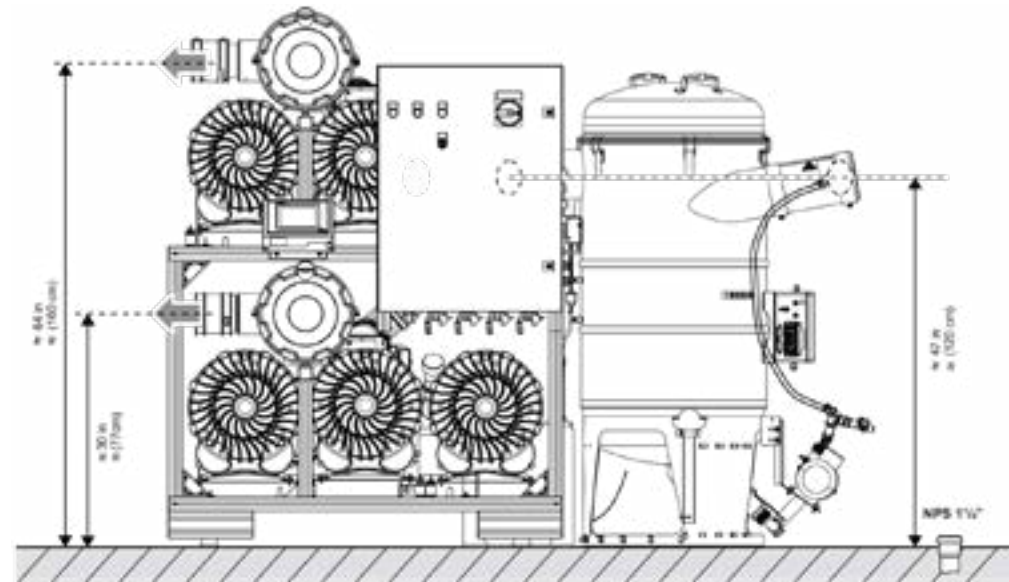
VS60 / VS75/ VS90 NPS 6" (DN 160) or
2x NPS 4½" (DN 110)

For long air extraction lines more than 65 feet (20 m) the cross section should be increased by one size.

Example: NPS 4½" (DN 110) to NPS 6" (DN 160)

16. Installation example with space requirements and connection positions

16.1 VS60 / VS75/ VS90

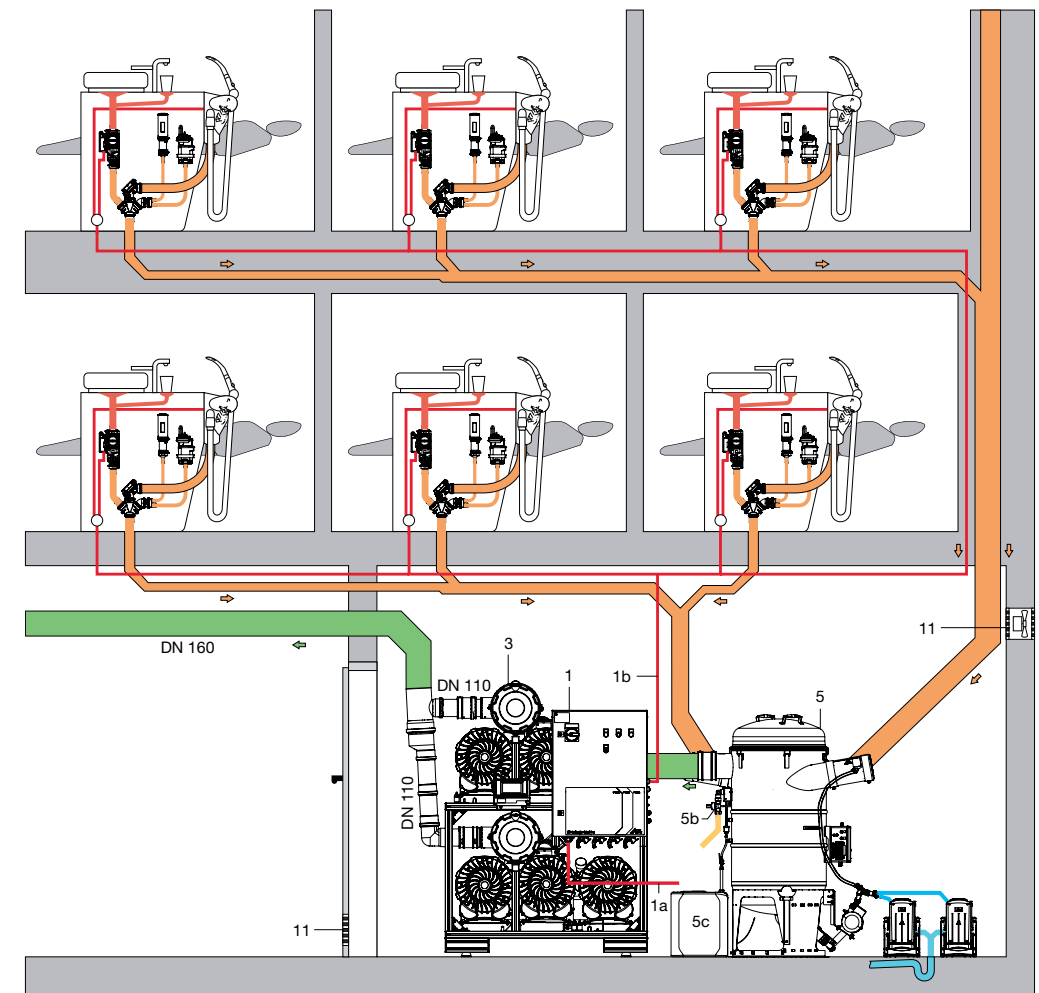


17. Planning examples VS60 / VS75 / VS90

17.1 Key to planning examples and sample pipe dimensions below

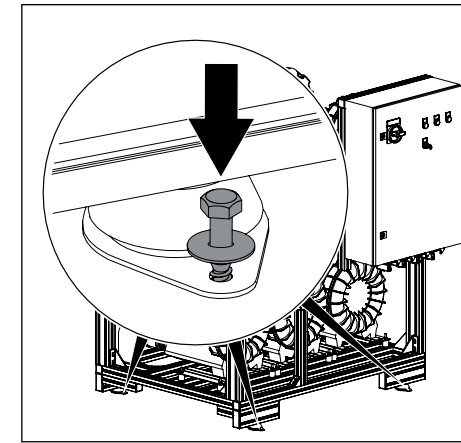
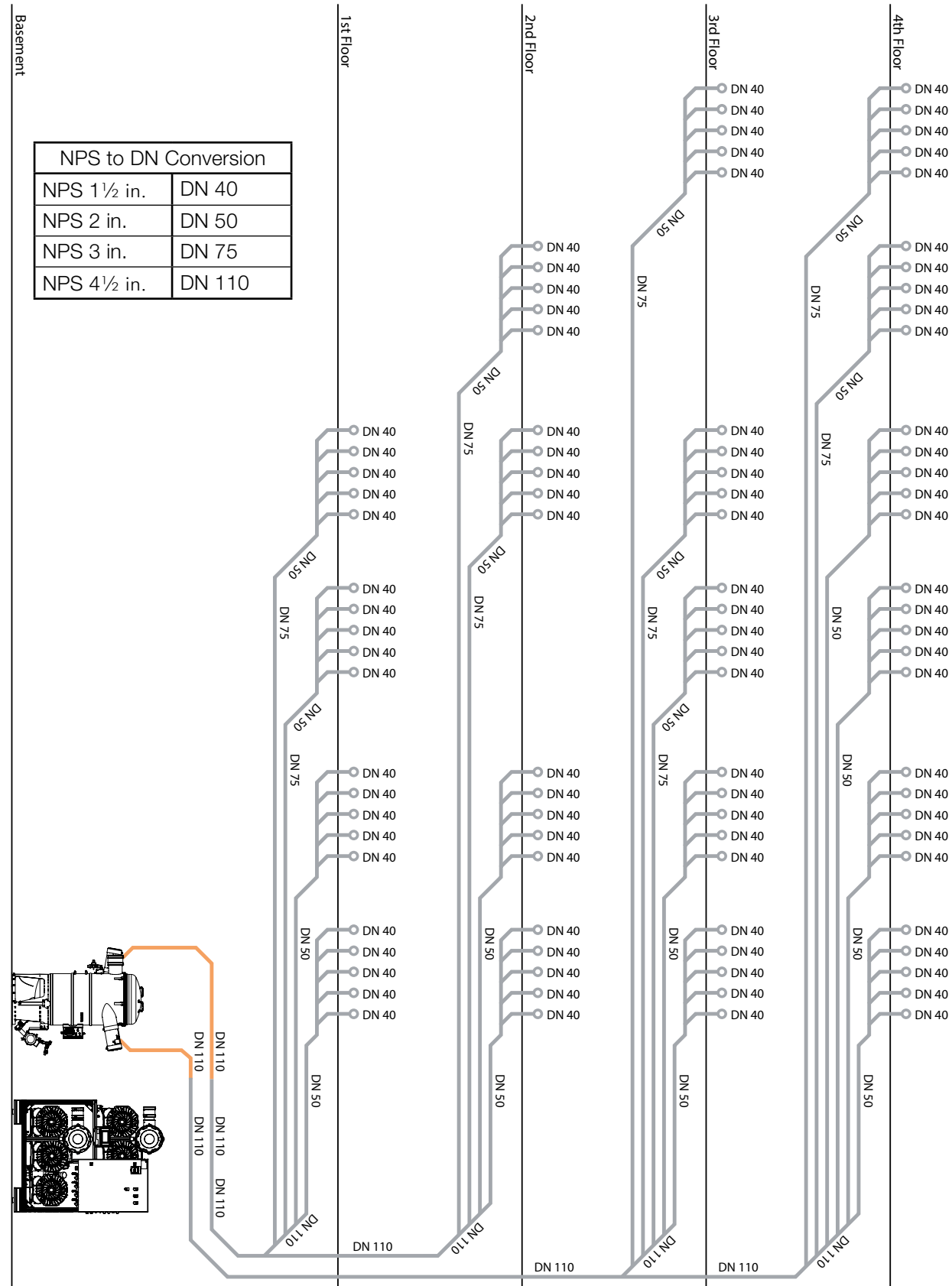
- **Electrical connections**
- 1** Control panel with PLC
- 1a** 480 V mains power supply
- 1b** Control line (24 V control voltage, internal)
- **Suction pipe for secretions**
- **Dry suction pipe / exhaust air line to the outside**
- **Drainage pipe for condensation separator** NPS 1 1/2" (DN 40), minimum gradient of 2%
- 2** Exhaust air bacteria filter
- 3** Central separation tank
- 3a** Vessel rinse water valve 24 V
- 3b** CleanStream vessel 30 L
- **Fresh water for rinsing** 48 to 58 PSI (3-4 bar), GU 3/4"
- **Waste water drainage** NPS 1 1/2" (DN 40), minimum gradient of 2%
- 4** Ventilation

17.2 Planning example – VS90 with amalgam separators



17.3 Pipe dimensions – VS90 for up to 90 treatment units

Refer also to point 15. Installation notes for the suction system



Installation

18. Set-up and installation

18.1 Transport

The clinic suction unit is delivered on a pallet.

- Unload the clinic suction unit with a forklift truck, lift it off the pallet and move to its set-up location.
- Remove all transport locks and protection.

18.2 Setting up and securing the modules

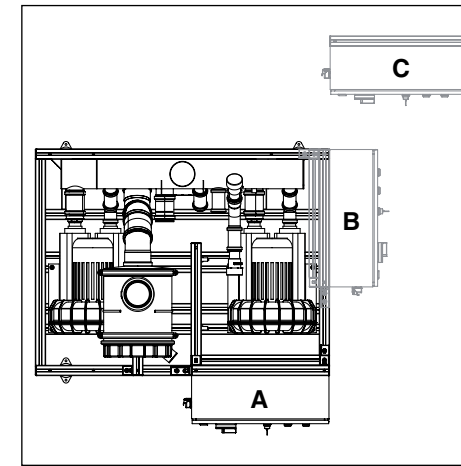


Wait until the different devices in the suction system have been commissioned before bolting them with the supplied fixtures to the floor, as this will allow you to adjust any positions as required.



The fixtures and fittings are supplied in the scope of delivery.

- Detach the modules from the pallets (transport locks).
- Use a forklift truck or pallet truck to move the modules to the location chosen for installation.
- Drill the required holes into the floor for the fixtures.
- Insert the mounting anchors.
- Securely bolt the modules to the floor.



18.3 Installation of the control unit

Options for installation of the control unit

- Standard installation (A) at the front of the suction unit frame
- On the right (B) of the suction unit frame
- Wall mounting (C).



Depending on the installation, make sure that there is sufficient space to open the door.

Securing the control unit to the VS60 / VS75 / VS90 suction unit frame

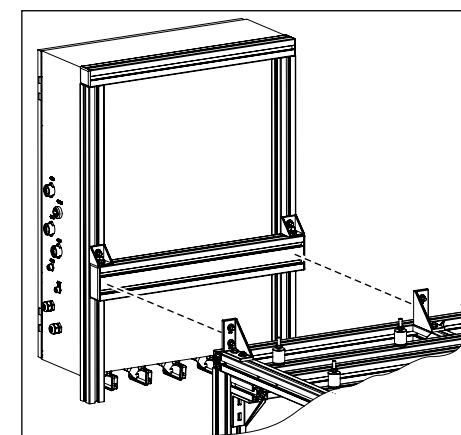
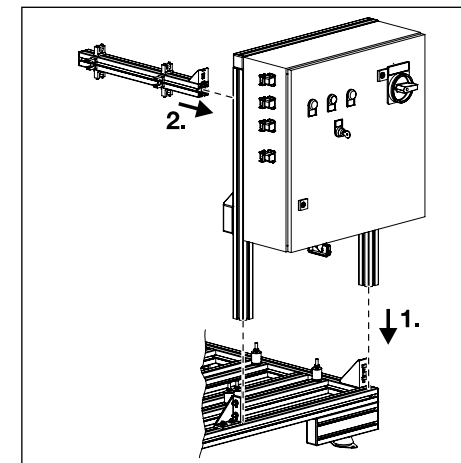
- Place the control unit with the cross strut onto the frame of the suction unit.
- Position the nuts for the angle bracket through the slots of the aluminium profiles and tighten them with the nuts.

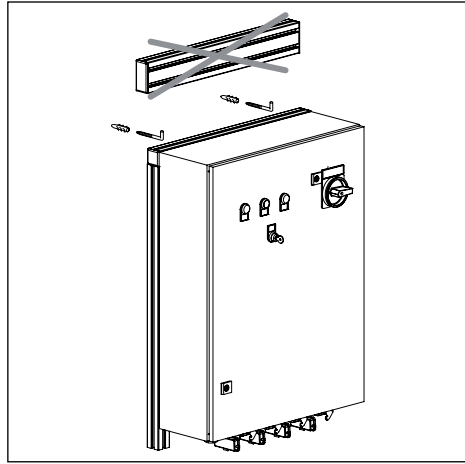
Securing the control unit to the wall

- Remove the cross strut from the control unit so it can lie flush against the wall.
- Screw the fixtures to the wall.
- Hang the controller unit into the aluminium profiles on the wall fixtures.



For installation on the wall, longer connection cables may be required. See "Special accessories – Control unit".





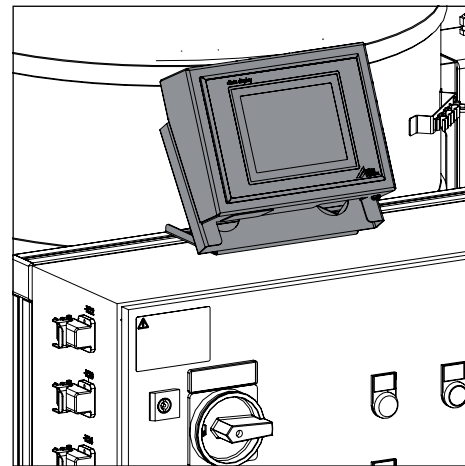
18.4 Installation of the central separation tank (CST) with amalgam separator CA 4

- Position the CST as shown by Section 16, Installation example with space requirements and connection position".
- Establish the pipe connections between the CST and the clinic suction unit.



If a different set-up variant is selected, additional pipes may have to be provided.

- Set up the amalgam separators in an easily accessible location next to the central separation tank so that a waste water sample can be taken at the outflow side at any time.
- Connect the amalgam separator to the 230 V connection of the central separation tank.



18.5 Exhaust air connection

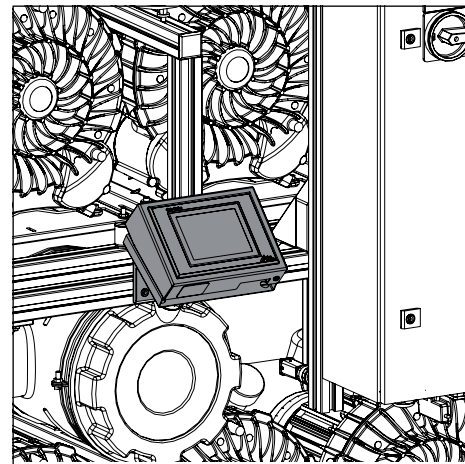
Establish a pipe connection between the outlet of the bacteria filter and the on-site exhaust air line. In the case of suction units with two bacteria filters, either route two pipes to the on-site exhaust air connection or combine the two outlets from the bacterial filters together and use a single pipe with a larger cross section to route the emissions to the exhaust air connection.

18.6 Connection of the pipes

Please check whether the pipes are securely fixed to the wall/ceiling with the necessary pipe mounting clamps.



Vibrations are generated during operation of the clinic suction unit. To prevent these vibrations from being transmitted to the pipe system, use the supplied rubber fitting to connect the vacuum/exhaust air pipe.



18.7 Mounting the display panel

Installation options

- Installation on the frame of the control unit
- Installation on the suction unit frame either from the top or from the front
- Wall installation, e.g. in a monitoring room.
- Fixing to a tabletop (using screws or double-sided adhesive tape), e.g. in a monitoring room.

Mounting the display panel

- Mount the fastening screws for the aluminium profile in the mounting bracket.
- Position the mounting bracket on the aluminium profile tighten the nuts.
- Route the power supply cable and the data line through the aperture in the mounting bracket and connect them to the display panel.
- Use strain relief to secure the cables in place.
- Place the display panel onto the metal bracket.
- Route the power supply line and data cable to the control unit and connect them to the corresponding labelled slots.

18.8 Connecting the display panel and connecting it to the network

Multiple clinical systems can be connected to one or more display panels. The clinical systems and display panels are networked using a switch. The clinical systems and the display panels must all be assigned sequential numbers (node numbers). These numbers are used to identify the different devices in a network. A number must not be used more than once for the same type of device in a network. On delivery, all clinical systems and display panels are set to 1.

- Connect the power supply from the display panel to X13 on the control panel of the system.
- Connect the signal cable (network cable) to X13.1 on the control panel.



If multiple clinical systems are connected to a display panel, a separate power supply unit can also be used to power the display panel.

18.9 Hose manifold – signal

The control signal from the suction unit relay in the treatment unit is connected to the plugs X14 and X15 at terminals 1 and 3. The connections can also be seen in the circuit diagram.

18.10 External error messages

Switching elements have been integrated into the control unit that allow remote monitoring of the operating status of the suction units. If required a cable can also be set up for a control LED from the control unit, terminal strip X4 and terminals 1, 2, 3 using 5 x 1.5² wire, to a suitable room (e.g. clinic technical equipment room).

18.11 Supply voltage

The connection to the mains supply voltage of 480 V 3/N/PE AC 60 Hz is made at terminal strip X1 via the terminals L1, L2, L3, N, PE. The fuses and the cross-section of the supply lines to the control box must be appropriate for the actual current consumption of the clinic suction unit, the line length and any local regulations in force. If multiple suction unit groups are being operated then each unit must be individually protected with fuses as described above.

19. Commissioning

19.1 Prior to commissioning and initial start-up

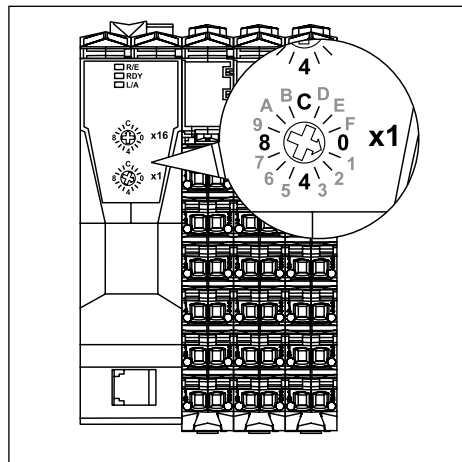


Clean the pipes of any debris, dust or other deposits; otherwise the clinic suction unit may be damaged. During the first test run leave the gauze sieve/coarse filter in the pipe line and remove it after commissioning is finished together with any dirt or dust that has been drawn in.

The operator controls on the control unit such as the main power switch, fault acknowledgement, error messages and display panel can be operated or viewed by the user externally. Error messages are indicated with a red LED. A further control LED can be connected using a potential-free normally closed/normally open contact.

19.2 Commissioning

- Connect the dummy plug at the control box (on dry air suction systems with condensation separator).
- Adjust the numbers of the unit in the control box and on the display panel.
- Check the electrical connections.
- Configure the system.
- Check all functions of the system.
- Check the direction of rotation of the motor.
- Adjust the motor protection switch.
- Perform an electrical safety check and document the results accordingly.
- After the test run remove the gauze filter.



19.3 Adjusting the numbers in the control unit

On the front of the PLC in the control unit there are two small rotary switches for setting up the sequential numbering. Up to 15 control units can be installed in the network. Only the rotary switch marked **x1** is used.

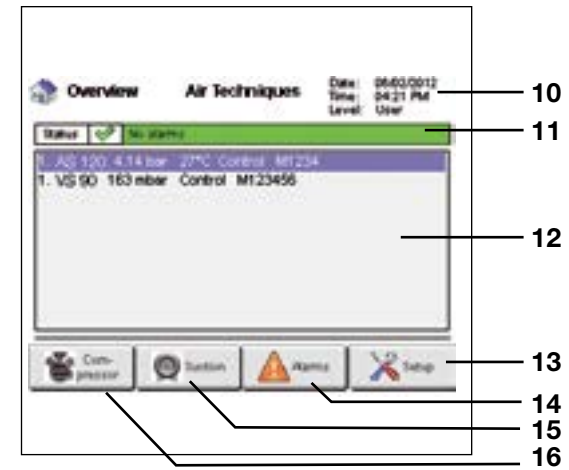


The rotary switch marked **x16** should be left in the position **0**.

Rotary switch position	1	2	..	9	A	B	C	D	E	F
Number	1	2	..	9	10	11	12	13	14	15

Example:

No.	Device	Description
1	PLC in control unit 1	VS90
2	PLC in control unit 2	VS60
3	PLC in control unit 3	VS60
1	Display panel 1	Machine room
2	Display panel 2	Monitoring room



19.4 Adjusting the PLC of the control unit to the connected system

Before start-up and first use of the unit, the PLC controller must be told which suction system is connected to the control unit. This calibration is performed via the **display panel**.

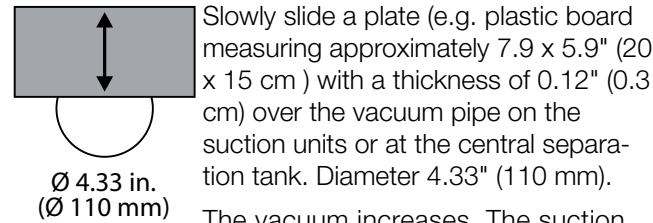
Once you switch on the display panel – and after a short wait – the **Overview** menu appears. From the various submenus you can return to the main menu via the **Home** button.

- 10** Display of the date, time and logged-on user status.
- 11** Status LED for all connected systems.
- 12** Display window with list of connected systems and display of operating states.
- 13** **Setup** button for opening the setup menu.
- 14** **Alarms** button for viewing active alarm messages.
- 15** **Aspiration** button for querying the status of the connected suction systems.
- 16** **Compressor** button for querying the status of the connected compressor systems

Further information about admin and operation of the system via the display panel can be found in the instructions enclosed with the display panel.

20. Testing the suction systems

- Switch on the main power switch at the control unit (red switch)
- Bridge connectors X14 or X15 (depending on the system, 1 + 3), which will cause the suction unit to start up.



Slowly slide a plate (e.g. plastic board measuring approximately 7.9 x 5.9" (20 x 15 cm) with a thickness of 0.12" (0.3 cm) over the vacuum pipe on the suction units or at the central separation tank. Diameter 4.33" (110 mm).

The vacuum increases. The suction units switch off depending on the amount of vacuum present until only one suction unit is switched on. Closing off the vacuum pipe any further will cause the vacuum relief valve to open.

- Once the vacuum pipe is completely closed, slowly slide the plastic board or plate away (takes approx. 2 mins) to open the vacuum pipe. The flow rate increases and the vacuum is reduced.
- When the vacuum in the suction system drops due to the opening of the pipe, the suction units switch on again depending on the pressure.
- Activate one of the applicable motor protection switches in the control unit (set the switch to 0). The red remote display lights up on the cover of the control unit.
- Switch the motor protection switch back on again and acknowledge the error message by pressing the yellow reset button. The red light goes out.
- Measure the rate of flow at the treatment unit and in the connection box at the vacuum pipe NPS 1½" (DN 40).



WARNING Risk of infection due to bacteria present in the central separation tank

- Always wear protective gloves and a face mask when working on the unit.

- Check the float sensors in the central separation tank: remove the cover from the central separation tank and briefly lift the float switch for the 50% level. The waste water pump switches "ON".



If there is no water in the central separation tank, fill with a minimum of 0.5 gallon before lifting the flow switch. If the tank is empty, the waste water pump could get too hot and be damaged in the process.

- Test the float switch for the 75% level: briefly lift the float monitor for the 75% level. The suction units are switched off.
- Check the float sensors for emergency mode: activate emergency mode at the control unit. Lift the float monitor for emergency mode, which will cause the suction unit to switch off.

21. Maintenance for Service Technicians






All maintenance work must be performed by a qualified expert or by one of our Service Technicians. Maintenance Kit for a yearly and bi-yearly service can be ordered as kit P/N E5257.



To prevent any risk of infection, always wear protective equipment (e.g. liquid-tight protective gloves, protective goggles, face mask).



To prevent the risk of hearing damage, always wear ear protection when working on noisy units.

Maintenance work	Maintenance interval	Order number
1. Check non-return valves on exhaust air side of the clinic suction units, change if necessary	12 months	54139
2. Measurement of rate of flow at system air exhaust: 45 SCFM minimum w/ one pump running.	12 months	N/A
3. Change filter cartridge of exhaust air filter (number of hours on control unit display panel)	3,500 hours or 12 months	E5131
 WARNING Risk of infection due to bacteria present in the exhaust air filter		
• Wear protective gloves and a face mask when changing the filter.		
4. Function check of vacuum control Activation of units	12 months	N/A
5. Check operating hours on display panel	12 months	N/A
6. Check mechanical operation of vacuum relief valve	12 months	55701
7. Clean float switch in central separation tank (50%/75%), replace if necessary	12 months	E5142
 WARNING Risk of infection due to bacteria present in the central separation tank		
• Always wear protective gloves and a face mask when working on the unit.		
8. Check float switch in CleanStream vessel	12 months	E5286
 WARNING Risk of infection due to bacteria present in the central separation tank		
• Always wear protective gloves and a face mask when working on the unit.		
9. Check water valve on the central separation tank	12 months	E5143
101. Check CleanStream valve on the central separation tank	12 months	E5285
11. Replace sewage check valve	12 months	E5133

22. Order overview

Designation	Order no.	Quantity
Suction units		
VS60 with control unit and central separation tank *	VS60	
VS75 with control unit and central separation tank *	VS75	
VS90 with control unit and central separation tank *	VS90	
Suction unit accessories		
Display Panel for each installation room	E5119	
Display Panel Power Unit	G8116	
Display Panel Wall Mount	E5119-W	
Display Panel Surface Mount	E5119-S	
Switch (8-way) for networking clinic devices and display panels	E5186	
Remote Control Panel	53111	
Amalgam Separator CA4 (60 Hz)	E5129	
Amalgam Separator CA4 Remote Screen Display	E5378	
Amalgam Separator CA4 Cable	E5379	
Amalgam Separator CA4 Base	E5213	
Cyclone Separator	E5250	
Vibration Pad Kit	80184	
Electrical Panel Key	E5045	
Consumables		
Clinical Vacuum Maintenance kit	E5257	
CleanStream refill	57630	
Bacteria Filter Clamp	E5335	
Durr Connect "T" Joint	H4193	
CST Water Valve	E5143	
CST "Y" Connection	E5175	
Exhaust Hose Replacement	E5236	
Foot Replacement	E5420	
Amalgam Separator CA4 Replacement Cassette	E5148	
Circuit Breaker	E5092	
Pump Replacement	E5248	

* Order display panel separately for each installation room



Final Testing/Handover Examination Documentation for Clinical Dry Vacuum Systems

Models VS60, VS75, VS90

Order Number: _____

Address of set-up location (clinic):

Name and address of customer:

Inspect delivery for:

Name and address of installation company/service technician:

- Possible damaging to packaging
 Possible damage to units/delivery
 Completeness of the delivery

This document confirms the qualified handover and instructions in use pertaining to the following unit(s):

Vacuum System(s)	Model: _____	Serial Number(s): _____
Amalgam Separator(s)	Model: _____	Serial Number(s): _____
	Model: _____	Serial Number(s): _____
Display Panel(s)	Model: _____	Serial Number(s): _____
Tank Expansion Kit	Model: _____	Quantity: _____
Cleaner Container(s)	Model: _____	Quantity: _____

Additional unit(s):

Type: _____ Model: _____ Serial Number(s): _____
 Type: _____ Model: _____ Serial Number(s): _____
 Type: _____ Model: _____ Serial Number(s): _____

Installation arrangement of units (photo documentation) is appended.



Date of installation: _____

Setup Location: _____

- Vacuum level was set to _____ inHg (± 0.5) during installation and verified on site.
- A check that the connection to ground is not interrupted has been carried out.
- The electrical safety of the system according to current national and local code has been carried out.
- The system was checked for signs of leakages.
- All connections were laid correctly, made secure, and checked according to the necessary requirements.
- The system was handed over according to the components listed.
- Acceptance was successful without any restrictions or annotations
- Acceptance was not successful or only partially successful due to the following reasons:

Additional Comments:



Personnel Trained to Maintain the System(s):

Printed Name Title

Signature Date

Printed Name Title

Signature Date

Printed Name Title

Signature Date

I hereby confirm handover and acceptance according to the information above:

Signature of Service Technician Date

Signature on Behalf of Customer Date

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 - Caries Detection Aid
 - Intraoral X-ray
 - Film Processors

- ❑ **Utility Room**
 - Dry Vacuums
 - Wet Vacuums
 - Air Compressors
 - Amalgam Separator
 - Utility Accessories
 - Utility Packages

- ❑ **Merchandise**
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 - Enzymatic Cleaner
 - Hand Sanitizer and Lotion
 - Waterline Cleaner
 - Evacuation System Cleaner
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 - Chemistry
 - Processor Accessories

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