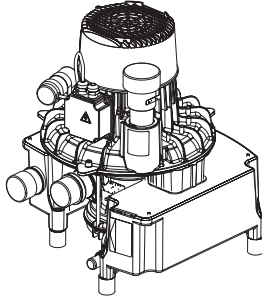
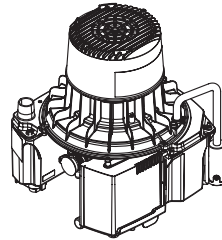


Combination Suction Unit

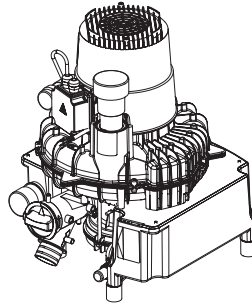
VS 600



VS 300 S



VS 900 S / VS 1200 S



Installation and Operating Instructions

CE 0124

9000-606-79/30



 **DÜRR
DENTAL**

EN

2010/11

Content



Important Information

- 1. General** 4
 - 1.1 Note on Conformity 4
 - 1.2 General Notes 4
 - 1.3 Notes on medical products 4
 - 1.4 Notes on EMC and medical products 4
 - 1.5 Correct Usage 4
 - 1.6 Incorrect Usage 5
 - 1.7 Connecting peripheral appliances 5
- 2. Safety** 5
 - 2.1 General Safety Notes 5
 - 2.2 Electrical safety instructions 5
- 3. Warnings and Symbols** 6
 - 3.1 Model identification plate 6
- 4. Delivery Contents** 7
 - 4.1 VS 300 S suction unit 7
 - 4.2 VS 600 S suction unit 7
 - 4.3 VS 900 S suction unit 8
 - 4.4 VS 1200 S suction unit 8
- 5. Technical Data** 9
 - 5.1 VS 300 S suction unit 9
 - 5.2 VS 600 S suction unit 10
 - 5.3 VS 900 S suction unit 11
 - 5.4 VS 1200 S suction unit 12
 - 5.5 Ambient conditions 13
- 6. Functional Description** 13
- 7. Functional layout** 14



Mounting

- 8. Set-up** 15
 - 8.1 Room for Set-up 15
 - 8.2 Set-up alternatives 15
 - 8.3 Bacterial filter / noise reduction (muffler) 15
 - 8.4 Installation of surge tank in combination with amalgam separator 15
 - 8.5 Rinsing Unit 15
 - 8.6 Tubing 16
 - 8.7 Hose materials 16
 - 8.8 Hose and pipe laying 16
- 9. Possible Connections** 17
 - 9.1 Connection VS 300 S 17
 - 9.2 Connection VS 600 18
 - 9.3 Connection VS 900 S / VS 1200 S 19
- 10. Electrical Connection** 20
 - 10.1 Notes on connection lines 20
 - 10.2 Control unit (VS 600, VS 900 S, VS 1200 S) 20
 - 10.3 Motor terminal box connections 21
- 11. Start-up** 22

EN



Use

- 12. Cleaning and disinfection of the suction unit** 23
- 13. Maintenance** 23



Trouble-shooting

- 14. Tips for Operators and Technicians** .. 24



Disposal

- 15. Appliance disposal** 25



Important Information

1. General

1.1 Note on Conformity

This product has been tested for conformity according to the appropriate directives as laid down by the European Union and has been found to conform to all the required specifications.

1.2 General Notes

- These Installation and Operating Instructions form an integral part of the unit. They must be kept close to the unit at all times. Precise observance of these instructions is a precondition for use of the unit for the intended purpose and for its correct operation. New personnel must be made aware of the contents, and they should be passed on to future operating staff.
- Safety for the operator as well as trouble-free operation of the unit are only ensured if use is made of original equipment parts. Additionally, only parts specifically referred to in these Installation and Operating Instructions or accessories specifically recommended by Dürr Dental may be used. If other accessories are used with this appliance, Dürr Dental cannot guarantee safe operation or proper functioning. No liability on the part of the manufacturer will be accepted in the case that damage arises through the use of non-approved accessories.
- Dürr Dental are only responsible for the equipment with regard to safety, reliability and proper functioning where assembly, resetting, changes or modifications, extensions and repairs have been carried out by Dürr Dental or an agency authorized by Dürr Dental and if the equipment is used in conformity with the Installation and Operating Instructions.
- These Installation and Operating Instructions conform to the relevant version of the equipment and the underlying safety standards valid at the time of going to press. All circuits, processes, names, software and appliances quoted are protected under industrial property rights.

- The translation of these Installation and Operating Instructions has been carried out in good faith. No liability can be accepted for mistakes in the translation. The enclosed German version of these Installation and Operating Instructions is the reference version. If there is any doubt about the translation please consult your dealer.
- Any reprinting of the technical documentation, in whole or in part, is subject to prior approval of Dürr Dental being given in writing.
- Retain the packaging for possible return of the product to the manufacturers. Ensure that the packaging is stored away from children. Only the original packaging provides adequate protection during transport of the unit. Should return of the product to the manufacturers be necessary during the guarantee period, Dürr Dental accepts no responsibility for damage occurring during transport where the original packaging was not used!

1.3 Notes on medical products

- This product is a technical medical appliance and, as such, may only be operated by such persons who, as a result of training or experience, can be confidently expected to operate it correctly and safely for patients and staff alike.

1.4 Notes on EMC and medical products

Medical products should be treated with respect when it comes to electro-magnetic compatibility and special safety measures must be taken. Special instructions concerning electro-magnetic compatibility for medical products can be found in our special leaflet, order number 9000-606-67/30, or the information can be found on the internet (www.duerr.de) in the Technical Documentation download pages.

1.5 Correct Usage

The suction unit is designed to provide vacuum pressure in order to aspirate saliva, rinsing water and other fluids which are present during dental treatment and to transport these into the waste water system.

The suction unit should be cleaned and disinfected carefully according to the manufacturer's instructions.



Correct usage infers the strict observance of the Installation and Operating Instructions and all notes concerning set-up, operation and maintenance.

Installation within other medical supply equipment:

During development and construction of the suction unit care has been taken to incorporate all requirements of medical products as far as was possible. As a result this appliance is suitable for installation within medical supply equipment.

Where this appliance is installed within other medical supply equipment then the installation and assembly must meet all requirements of directive 93/42 EWG as well as any and all relevant standards.

1.6 Incorrect Usage

Do not use this appliance to aspirate inflammable or explosive gas mixtures. This unit is not suitable for use as a vacuum cleaner.

Any use of this appliance/these appliances above and beyond that laid down in the Installation and Operating Instructions is deemed to be incorrect usage. The manufacturer cannot be held liable for any damage resulting from incorrect usage. The operator will be held liable and bears all risks.

1.7 Connecting peripheral appliances

- Appliances may only be connected together or connected to any other assemblies where complete and utter safety of the patients, operators and staff and of the environment will not be affected in any way.

Where any doubts remain concerning the safety when connecting to other units then the operator is obliged to ascertain that such connection can in no way affect the safety of operator, patient or other staff by referring to the manufacturer or a fully qualified and competent expert.

2. Safety

2.1 General Safety Notes

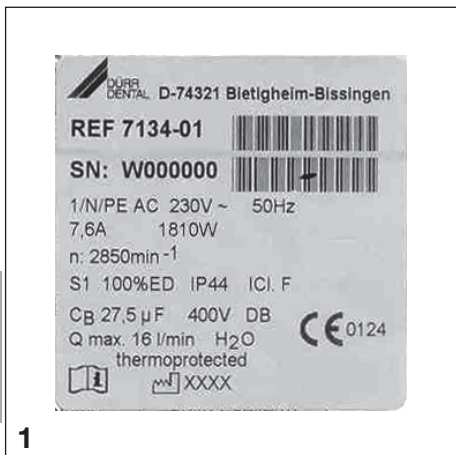
This appliance has been so designed and developed by Dürr Dental that under correct usage that there can be no danger to operator or pa-

tient. In spite of this, we feel it is our duty to mention the following safety measures in order to prevent any possible danger.

- When using this appliance all local and relevant regulations must be observed! Converting or modifying the appliance in any way is strictly prohibited. In such cases, any and all guarantees immediately become invalid. The operation of modified appliances can be punishable by law. In the interests of trouble-free operation the operator is responsible for observing these regulations.
- Installation must be carried out by a technical expert.
- Before every use the operator must check the functional safety and the condition of the appliance.
- The operator must be knowledgeable in the operation of the appliance.
- The product is not designed to be used in medical treatment areas where there exists the danger of explosion. Areas where explosions could occur are those where flammable anesthetic material, skin cleansers, oxygen and skin disinfectants are present. This appliance is not to be used in areas where the atmosphere could cause fire.

2.2 Electrical safety instructions

- This appliance may only be connected to a correctly installed Dürr Control unit (VS 600, VS 900 S, VS 1200 S).
- Before connecting to the electricity supply the appliance must be inspected and checked that the supply voltage and the supply frequency correspond to that of the local electrical supply.
- Before initial use and start-up the appliance and all supply lines must be checked for any signs of damage. Damaged supply lines and connections must be replaced immediately.
- Never come into contact with patients and open plug-in connections on the appliance at the same time.
- When using the appliance observe all the relevant electrical safety procedures.



3. Warnings and Symbols

In the operating instructions the following warnings and symbols have been used:



CAUTION

Instructions including regulations and warnings regarding safety of persons and damage avoidance.



Warning - dangerous electrical voltage.



Automatic start up



Hot surface



Information and/or instructions or prohibitions regarding personal safety or extensive material damage.



For their own protection, operating staff should always wear protective gloves when working with the suction unit.



Take environmental and ambient conditions into account.



Ground connection

3.1 Model identification plate

The model identification plate of the VS 600 / VS 900 S / VS 1200 S can be found on the turbine housing and on the VS 300 S it is located on the noise reducer housing (muffler unit).

REF Order no. / model no.

SN Serial-No.



Observe the Operating Instructions



Date of manufacturer



4. Delivery Contents



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

4.1 VS 300 S suction unit

4.1.1 Delivery contents

Model 7122-01/002

model type 230 V, 1~, 50 Hz
with controller

Model 7122-02/002

model type 230 V, 1~, 60 Hz
with controller

Model 7122-05/003

model type 100 V, 1~, 50 -60 Hz
with controller

4.1.2 Accessories

Pipe connection set	7122-001-00
Suction hose LW 30, grau	9000-317-27
Hose LW 20	9000-317-22
Hose LW 30, aluminium	9000-317-37
OroCup (not Japan)	0780-350-00

4.1.3 Special accessories

Wall mounting bracket.	7130-190-00
Housing	7122-200-00
Exhaust air bacterial filter with accessories	7120-143-00
Rinsing unit.	7100-250-50
Ventilation kit.	7122-981-51

4.2 VS 600 S suction unit

4.2.1 Delivery contents

Model 7128-01/002

model type 230 V, 1~, 50 Hz
with control unit 230 V, 1~

Model 7128-02/002

model type 400 V, 3~, 50 -60 Hz
with control unit 400 V, 3~

Model 7128-02/003

model type 230 V, 3~, 50-60 Hz
with control unit 230 V, 3~

Model 7128-05/003

model type 200 V, 3~, 50-60 Hz
with control unit 230 V, 3~

4.2.2 Accessories

Control unit	
for model 7128-01/002	0700-500-50
for model 7128-02/002	0732-100-56
for model 7128-02/003	0732-100-57
for model 7128-05/003	0732-100-57
Pipe connection set	7128-001-00
Hose LW 40	9000-318-70
Hose LW 50	9000-317-002
Hose LW 20	9000-317-22
OroCup	0780-350-00

4.2.3 Special accessories

Noise reducing hood	7131-991-00
Surge tank	7112-101-00
Wall mounting bracket.	7130-190-00
Console for floor set up.	7130-191-00
Exhaust air bacterial filter	0705-991-53
Muffler (silencer unit) for exhaust air	0730-991-00
Rinsing unit.	7100-250-50
Ventilation kit.	7122-981-50



4.3 VS 900 S suction unit

4.3.1 Delivery contents

Model 7134-01/002

model type 230 V, 1~, 50 Hz
with control unit 230 V, 1~

Model 7134-02/002

model type 400 V, 3~, 50 Hz
with control unit 400 V, 3~

Model 7134-02/003

model type 230 V, 3~, 50 Hz
with control unit 230 V, 3~

4.3.2 Accessories

Control unit

for model 7134-01/002 0732-100-55

for model 7134-02/002 0732-100-56

for model 7134-02/003 0732-100-57

Pipe connection set 7133-001-00

Hose LW 20 9000-317-22

Hose LW 50 (0.6m) 9000-317-001

Hose LW 50 (1.5m) 9000-317-002

OroCup 0780-350-00

4.3.3 Special accessories

Noise reducing hood 7131-991-00

Surge tank 7130-991-00

Wall mounting bracket. 7130-190-00

Console for floor set up. 7130-191-00

Exhaust air bacterial filter 0705-991-53

Muffler (silencer unit) for

exhaust air 0730-991-00

Rinsing unit. 7100-250-50

Ventilation kit. 7122-981-50

4.4 VS 1200 S suction unit

4.4.1 Delivery contents

Model 7138-02/002

model type 400 V, 3~, 50 Hz
with control unit 400 V, 3~

Model 7138-02/003

model type 230 V, 3~, 50 Hz
with control unit 230 V, 3~

Model 7138-03/002

model type 400 V, 3~, 60 Hz
with control unit 400 V, 3~

Model 7138-03/003

model type 230 V, 3~, 60 Hz
with control unit 230 V, 3~

4.4.2 Accessories

Control unit

for model 7138-02/002 0732-100-61

for model 7138-02/003 0732-100-57

for model 7138-03/002 0732-100-56

for model 7138-03/003 0732-100-59

Pipe connection set 7133-001-00

Hose LW 20 9000-317-22

Hose LW 50 (0.6m) 9000-317-001

Hose LW 50 (1.5m) 9000-317-002

OroCup 0780-350-00

4.4.3 Special accessories

Noise reducing hood 7131-991-00

Surge tank 7130-991-00

Wall mounting bracket. 7130-190-00

Console for floor set up. 7130-191-00

Exhaust air bacterial filter 0705-991-53

Muffler (silencer unit) for

exhaust air 0730-991-00

Rinsing unit. 7100-250-50

Ventilation kit. 7122-981-50

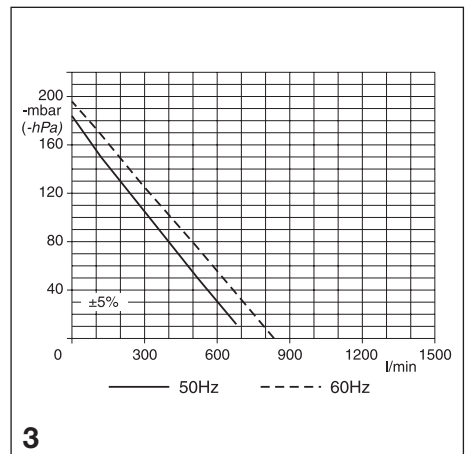
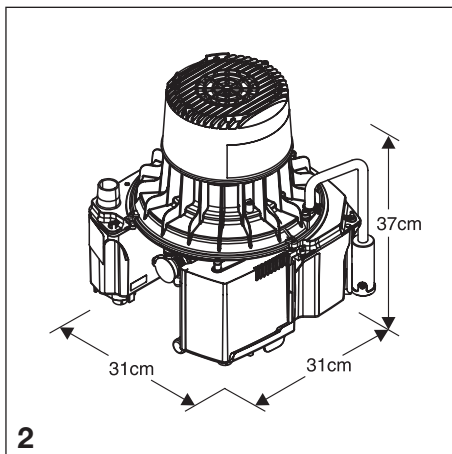
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5. Technical Data

5.1 VS 300 S suction unit

Model 7122		-01	-02	-05
Voltage	V	230, 1~	230, 1~	100, 1~
Frequency	Hz	50	60	50-60
Rated current	A	2,9	3,7	8,0-10
Starting current	A	8,2	9,1	21-20,5
Motor protection switch		Motor winding overheat protector 160°C (±5°C)		
Power output	W	580	800	650-850
RPM	min ⁻¹	2750	3100	2810-3200
Duty cycle	%		100	
Fuse type			IP 24	
Protection class			I	
Medical device			Class IIa	
Max. volume of fluid	l/min		4	
Air flow rate			see characteristics	
Weight				
without housing	kg		ca. 12.5	
with housing	kg		ca. 21	
Noise levels **				
without housing	dB(A), ±1.5	63 - 64	64 - 65	63 - 65
with housing	dB(A), ±1.5	53 - 54	54 - 64	53 - 55
Vacuum connection		DürrConnect Special ø 30 mm		
Exhaust air connection		ø 30 mm (external)		
Waste water connection		DürrConnect ø 20 mm		
Auxiliary air valve settings	mbar		-	
Protective low voltage	V		24 ~	
Output	VA		4	

** Tested according to EN ISO 1680 Noise emissions; measured in a sound-proofed room.
In rooms with poor sound-proofing characteristics higher values may be obtained.



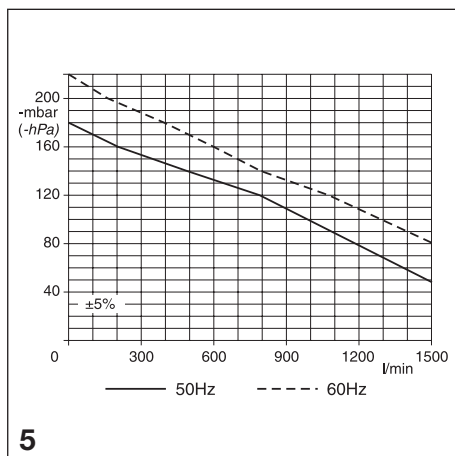
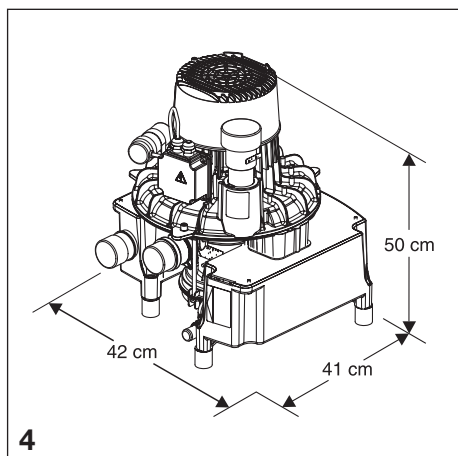


5.2 VS 600 S suction unit

Model 7128		-01	-02	-05
Voltage	V	230, 1~	400, 3~	230, 3~
Frequency	Hz	50	50-60	50-60
Rated current	A	5,0	1,8-2,3	3,1-4,1
Starting current	A	22	8	9
Motor protection switch *	A	-	2,5-4,0	3,5-4,5
Power output	W	1100	1000	1420
RPM	min ⁻¹	2850	2850/3300	
Duty cycle	%	100		
Fuse type		IP 44		
Protection class		I		
Medical device		Class IIa		
Max. volume of fluid	l/min	10		
Air flow rate		see characteristics		
Weight	kg	ca. 25		
Noise levels **				
without housing	dB(A), ±1.5	63	63-68	63-68
with housing	dB(A), ±1.5	-	-	-
Vacuum connection		ø 40 mm (external)		
Exhaust air connection		ø 50 mm (external)		
Waste water connection		DürrConnect ø 20 mm		
Auxiliary air valve settings	mbar / hPa	ca. 170		

* Recommended setting values. As the motor protection switch is subject to a small amount of tolerance, the current should be measured during installation and the motor protection setting adjusted accordingly.

** Tested according to EN ISO 1680 Noise emissions; measured in a sound-proofed room. In rooms with poor sound-proofing characteristics higher values may be obtained.

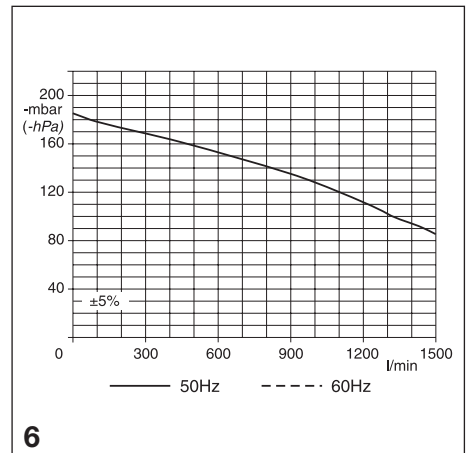
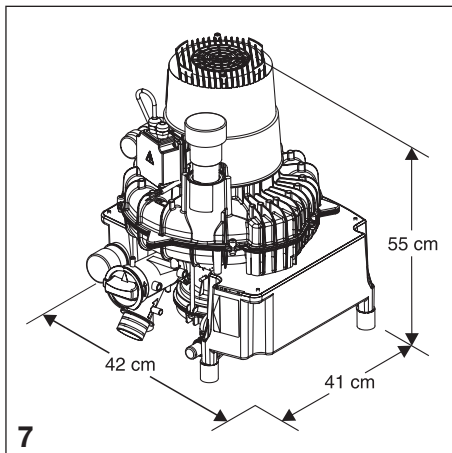


5.3 VS 900 S suction unit

Model 7134		-01	-02
Voltage	V	230, 1~	230/400, 3~
Frequency	Hz	50	50
Rated current	A	7,4	6,5/3,8
Starting current	A	32	42/25
Motor protection switch *	A	10	6,3/4
Power output	W	1680	1970
RPM	min ⁻¹	2780	2870
Duty cycle	%		100
Fuse type			IP 44
Protection class			I
Medical device			Class IIa
Max. volume of fluid	l/min		16
Air flow rate			see characteristics
Weight	kg		ca. 32
Noise levels **			
without housing	dB(A), ±1.5		65
with housing	dB(A), ±1.5		60
Vacuum connection			ø 50 mm (external)
Exhaust air connection			ø 50 mm (external)
Waste water connection			DürrConnect ø 20 mm
Auxiliary air valve settings	mbar / hPa		ca. 170

* Recommended setting values. As the motor protection switch is subject to a small amount of tolerance, the current should be measured during installation and the motor protection setting adjusted accordingly.

** Tested according to EN ISO 1680 Noise emissions; measured in a sound-proofed room. In rooms with poor sound-proofing characteristics higher values may be obtained.



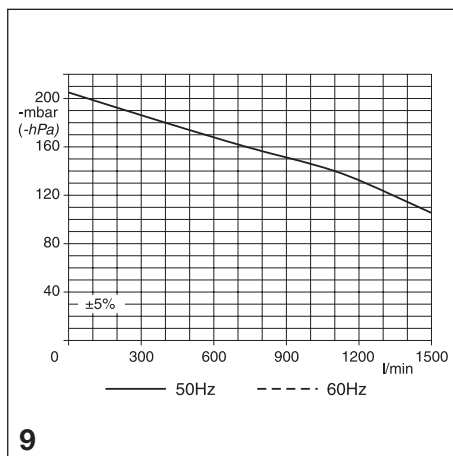
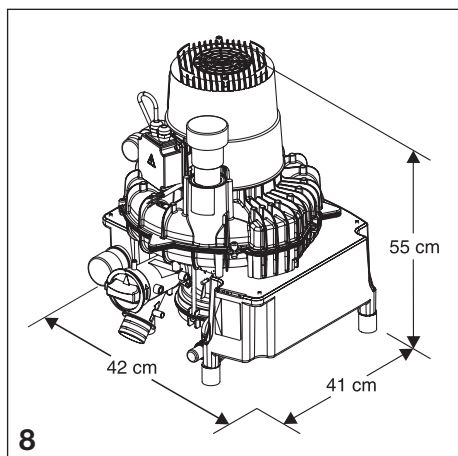


5.4 VS 1200 S suction unit

Model 7138		-02	-03
Voltage	V	230/400, 3~	230/400, 3~
Frequency	Hz	50	60
Rated current	A	6,5/3,8	6,8/3,9
Starting current	A	43/25	26
Motor protection switch *	A	6,3/4	7/4
Power output	W	2000	2400
RPM	min ⁻¹	2860	3180
Duty cycle	%		100
Fuse type			IP 44
Protection class			I
Medical device			Class IIa
Max. rate of flow of fluids	l/min		24
Air flow rate			see characteristics
Weight	kg		ca. 32
Noise levels **			
without housing	dB(A), ±1.5	66	67
with housing	dB(A), ±1.5	61,5	62
Vacuum connection			ø 50 mm (external)
Exhaust air connection			ø 50 mm (external)
Waste water connection			DürrConnect ø 20 mm
Auxiliary air valve settings	mbar / hPa	ca. 170	ca. 160

* Recommended setting values. As the motor protection switch is subject to a small amount of tolerance, the current should be measured during installation and the motor protection setting adjusted accordingly.

** Tested according to EN ISO 1680 Noise emissions; measured in a sound-proofed room. In rooms with poor sound-proofing characteristics higher values may be obtained.



5.5 Ambient conditions



Take environmental and ambient conditions into account. Do not operate the unit in damp or wet conditions.

Storage and transport

Temperature: -10 °C to +60 °C

Rel. humidity: max. 95 %

Operation

Temperature: +10 °C to +40 °C

Rel. humidity: max. 70 %

6. Functional Description

Example showing suction unit VS 900

Inside the suction unit the aspirated fluids and solid particles are passed through a two-step separation system and separated from the suction air. This separation system consists of a cycloneseparator and a separation turbine.

The suction operation functions continuously.

The mixture drawn in consisting of fluids, solid particles and air Luft passes through the inlet connection (D) and into the suction unit. The coarse filter (B) serves to hold the solid particles back. The rest of the mixture passes to the cycloneseparator (I) and is set into a spiral motion. In **this first step** the centrifugal forces generated cause the fluid and smaller particles remaining to be thrown against the outside wall of the separation chamber of the cycloneseparator. This initially creates a coarse separation of the fluid waste.

In the second stage the separation turbine (J) effects a fine separation of the remaining fluid from the flow of air which has carried it so far. The waste water pump (H) feeds the fluid emanating from the centrifuge stage and together with the finer solid particles through the waste water system connection (E) into the central waste water network.

The air which has been separated from the fluid mix in the second stage is drawn in by the vacuum pressure which is created by the turbine wheel (K) and can now be passed through the exhaust air connection (C).

Both the turbine wheels and the waste water pump are driven by the motor (L).



In order to separate out any dental amalgam present it is necessary to have an amalgam separator, e. g. model CA 4, located behind the waste water connection (E).



As the separation step of the VS 1200 S is approved for use with up to 24 l fluid then, depending on the particular installation and national regulations, a second CA 4 must be connected to this unit. The maximum permitted water volume of 16 l/min for one CA 4 must not be exceeded.

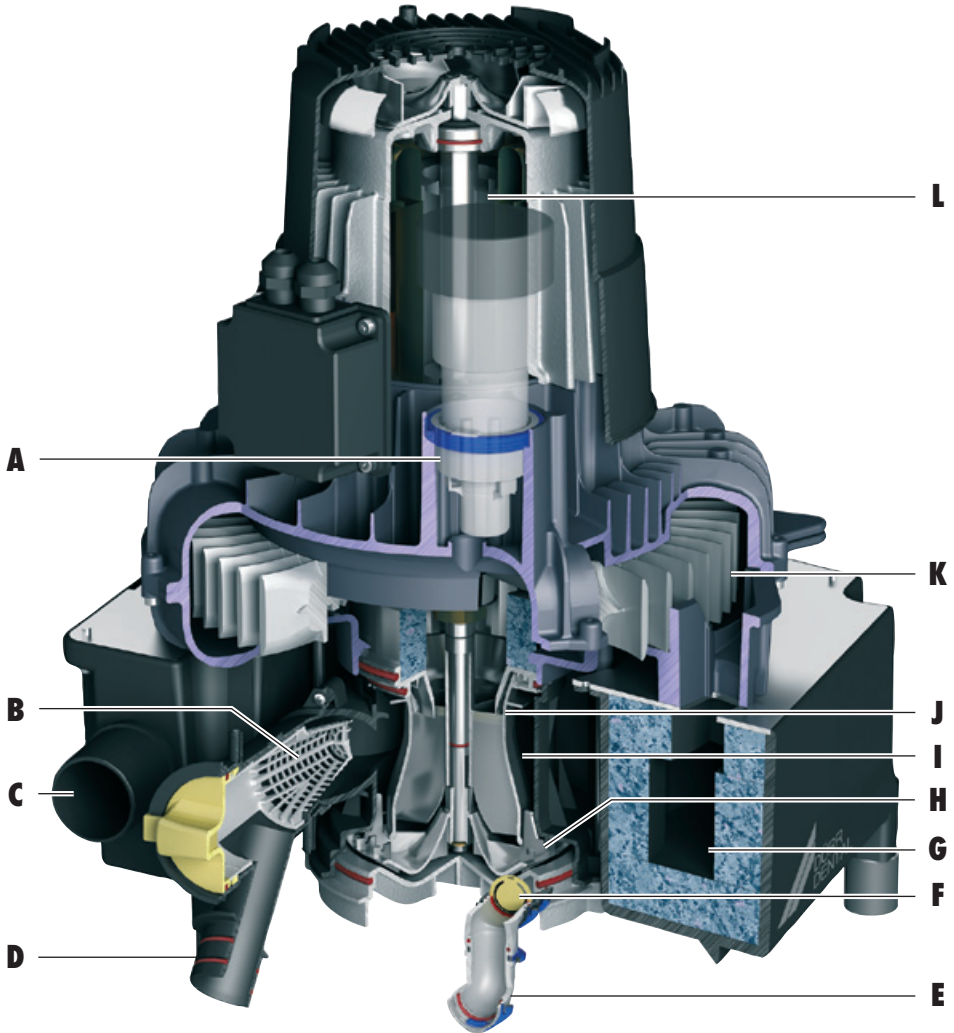


Where an amalgam separator provided by a different manufacturer is connected then the max. fluid flow volume of the suction unit must be strictly observed.



7. Functional layout

EN



- A Auxiliary air valve
- B Coarse filter
- C Exhaust air connection
- D Intake nozzle
- E Waste water connection
- F Membrane valve

- G Exhaust air muffler
- H Waste water pump
- I Cyclone separator
- J Separation turbine
- K Turbine wheel
- L Motor



Mounting

8. Set-up



More information can be found in the planning information for suction units.

8.1 Room for Set-up

- Installation in special purpose rooms, e. g. in boiler room, must be checked first against prevailing building regulations.
- Installation in wet rooms is not permitted.
- When installation is in a cabinet or a machine room then sufficient intake and exhaust air openings must be provided for; these must have at least 120 cm² clear cross-section. Where ventilation is not sufficient, then a ventilation fan must be provided with a performance of at least 2 m³/min; appropriate slots to allow the intake of cool air must also be provided for.

When cabinet installation is preferred then a special ventilation kit can be used.

8.2 Set-up alternatives

- On the same level as the surgery room or in a room on a floor below.

VS 300 S

Where installation of the VS 300 S is carried out in a cellar or similar room then the unit must be set up on a platform or fixed to the wall at a height of 30 cm above the floor level.

- Set-up on the floor and in combination with an amalgam separator should be carried out using a floor unit or platform.



The suction unit itself should be set up at least 20 cm above any installed Dürr amalgam separator that might be present.

- For wall mounting we recommend the Dürr wall mounting bracket.
- In well-ventilated cabinet (e.g. Dürr PTS).
- In Dürr housing (VS 300 S only) as extension to the treatment unit.



Information concerning installation can be found in the installation instructions provided with the floor unit or the wall mounting bracket.

8.3 Bacterial filter / noise reduction (muffler)

Bacterial filter: for reasons of hygiene we strongly recommend that a bacterial filter is provided for in the exhaust air connection. Where the suction unit is installed in the surgery rooms and the exhaust air cannot be fed to the outside of the building then a bacterial filter must be fitted. Depending on the model type and condition of the bacterial filter this must be replaced every 1-2 years at the latest.

Noise reduction muffler: where the noise of the exhaust air extraction at the outlet is too loud then a muffler can be installed into the exhaust air line.

8.4 Installation of surge tank in combination with amalgam separator

- Suction units VS 600, VS 900 S and VS 1200 S require the installation of a surge tank when used in combination with an amalgam separator.



Information on installation can be found in the installation instructions supplied with the surge tank.



Where a VS 900 is replaced by a VS 900 S or VS 1200 S then we also strongly recommend replacing the syphon with a surge tank. (Order number see under Special accessories.)

8.5 Rinsing Unit

When carrying out surgical treatments then we recommend using a rinsing unit together with the suction unit; this provides a small amount of water during the aspiration phase which then serves to thin the secretions which arise and makes it easier to transport these through the system.

The rinsing unit should be installed within the treatment unit itself or set up in the vicinity of the suction unit.



8.6 Tubing



The following materials may NOT be used:
Acrylonitril butadiene styrene or Styrol-copolymer-blends (e. g. SAN+PVC).

Only the following plumbing materials may be used:

airtight HT-waste water tubes of polypropylene (PP), chlorinated polyvinyl chloride (PVC-C), unplasticized polyvinyl chloride (PVC-U) and polyethylene (PEh).

8.7 Hose materials



The following materials may NOT be used:
hose materials which are not resistant to dental disinfectants and chemicals, rubber hoses or full PVC-hoses which are not sufficiently flexible.

For waste water systems and suction connections only flexible spiral PVC hoses with integrated spiral or hoses of a comparable quality may be used.



As all plastic hoses are subject to deterioration with age, these must be checked and inspected frequently and replaced when necessary. When a suction unit is replaced, we recommend that all hose connections also be replaced at the same time.

8.8 Hose and pipe laying

- **Waste water connections** must be carried out in strict accordance with local and national regulations.



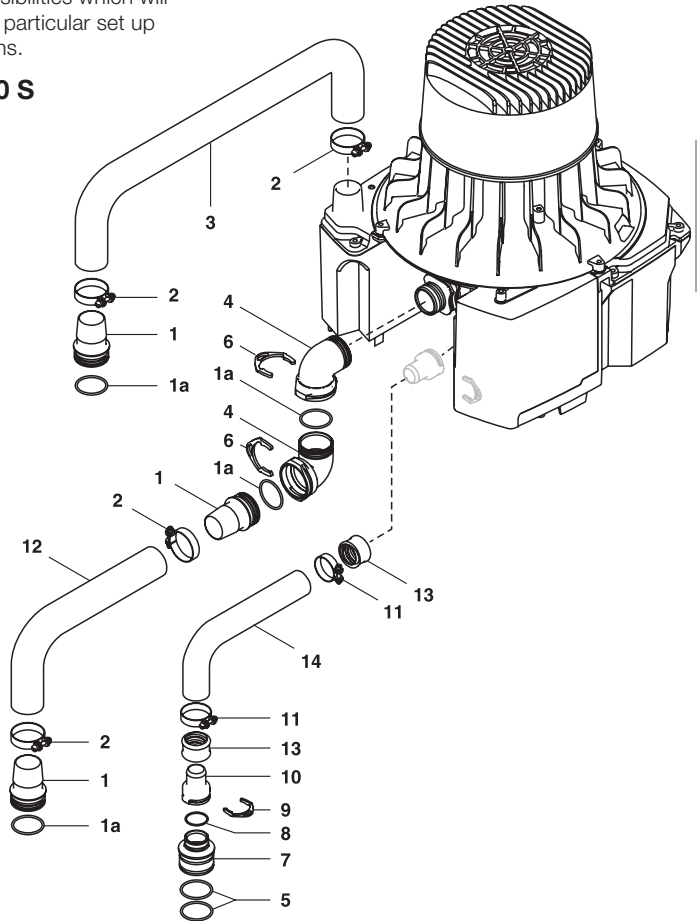
The connection between the pipe line and connection to the suction unit should be kept straight, without bends, and as short as possible using the flexible hoses provided. This will reduce the amount of vibration in the plumbing system.

9. Possible Connections



The alternative set up arrangements shown here are designed only to indicate the range of possibilities which will vary according to the particular set up location and conditions.

9.1 Connection VS 300 S

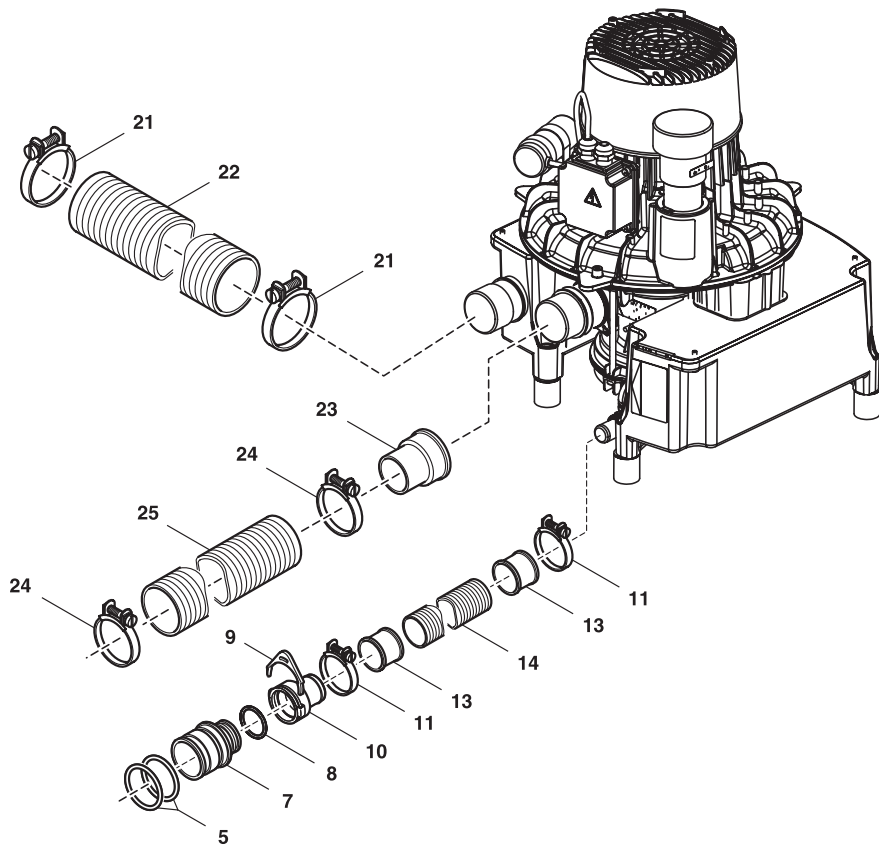


- 1 Connector 30/36
- 1a O-Ring
- 2 Hose clamp $\varnothing 30$ mm
- 3 Exhaust air hose (aluminium) $\varnothing 30$ mm internal
- 4 Elbow piece DN 30
- 5 O-Ring 30x2
- 6 Safety clamp
- 7 Connector $\varnothing 36$ mm external
- 8 O-Ring 20x2.0
- 9 Safety clamp
- 10 Hose joint piece $\varnothing 25$ mm
- 11 Hose clamp $\varnothing 28$ mm
- 12 Suction hose $\varnothing 30$ mm internal
- 13 Hose sleeve
- 14 Waste water hose $\varnothing 20$ mm internal

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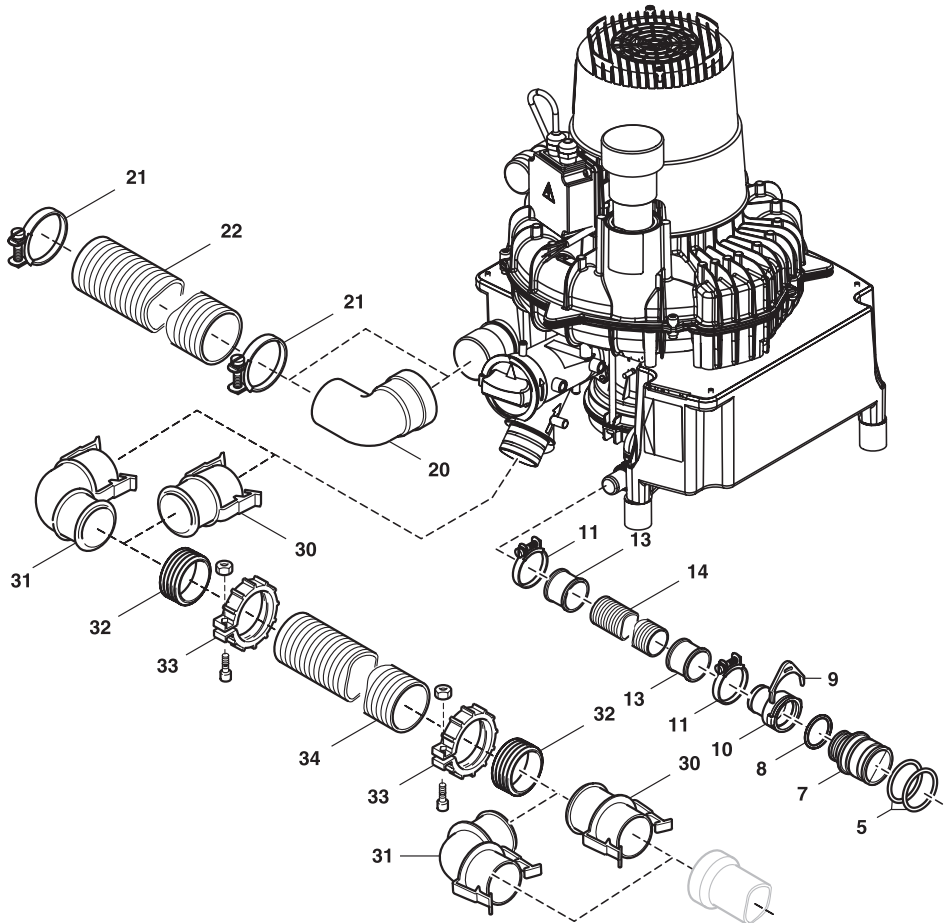


9.2 Connection VS 600



- 5 O-Ring 30x2
- 7 Connector Ø36 mm external
- 8 O-Ring 20x2.0
- 9 Safety clamp
- 10 Hose joint piece Ø20 mm
- 11 Hose clamp ø28 mm
- 13 Hose sleeve
- 14 Waste water hose ø20 mm internal
- 21 Hose clamp ø55 mm
- 22 Exhaust air hose ø50 mm internal
- 23 Hose connections DN 40/50
- 24 Hose clamp ø46 mm
- 25 Suction hose ø40 mm

9.3 Connection VS 900 S / VS 1200 S



- 5 O-Ring 30x2
- 7 Connector Ø36 mm external
- 8 O-Ring 20x2.0
- 9 Safety clamp
- 10 Hose joint piece Ø20 mm
- 11 Hose clamp ø28 mm
- 13 Hose sleeve
- 14 Waste water hose ø20 mm internal
- 20 Elbow piece DN 50
- 21 Hose clamp ø55 mm
- 22 Exhaust air hose ø50 mm internal
- 30 Straight inlet connection
- 31 Curved inlet connection
- 32 Sealing sleeve
- 33 Locking nut
- 34 Suction hose ø55 mm internal



10. Electrical Connection



The electrical connections must be carried out observing any and all technical regulations concerning the set up of low voltage systems in areas used for medical purposes.

- Before start-up and first use the supply voltage must be compared with the voltage instructions to be found on the model identification plate.
- When carrying out electrical connections to the main power supply an all-polar insulating device (all-polar circuit breaker or all-polar power safety switch (fused)) with a minimum 3 mm contact opening width must be built into the system.
- Suction units can only be connected to the mains power supply using a fixed cable connection.
- The suction unit is operated using the controller located in the external control unit.

Circuit protection: LS-switch 16 A, characteristics B, C and D according to EN 60898

10.1 Notes on connection lines

100–110 V / 230 V / 400 V power supply line (to mains, fixed supply line):

- NYM-J 3 x 1,5 mm² / 5 x 1,5 mm²

100–110 V / 230 V / 400 V power supply line (to mains, flexible supply line):

Connection of control unit and suction unit or between appliance socket and suction unit must be made using PVC-hose connection:

H05 VV-F 5G1.5 mm² / 5G1.5 mm²

or rubber connection:

H05 RN-F 3G1.5 mm² / 5G1.5 mm²,

H05 RR-F 3G1.5 mm² / 5G1.5 mm²

Connection of the VS 300 S allows reduction of the cross-section to 1 mm².

24 V Control line, VS 600, VS 900 S, VS 1200 S

Protective low voltage for:

- Hose holder
- Place selection valve
- Spittoon valve

Fixed layout: (N)YM (St)-J 4 x 1.5 mm² shielded plastic-sheathed cable.

Flexible layout: data cable LiYCY 4 x 1.0 mm² with shielded cable as used for IT purposes or light-PVC-control line with shielded casing.

24 V Control line for VS 300 S

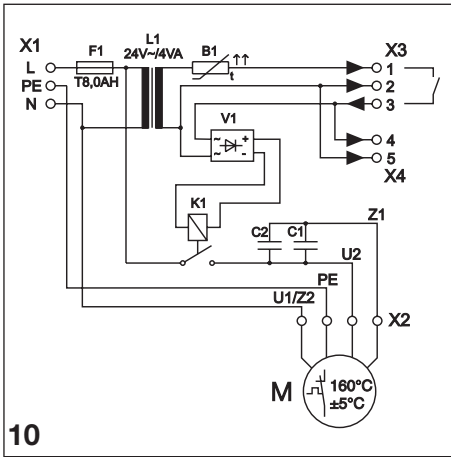
Flexible layout: PVC data transmission cable LiYY 3 x 0.5 mm²
order number 9000-118-83

10.2 Control unit (VS 600, VS 900 S, VS 1200 S)

The suction unit can be connected to a control unit which is either part of the delivery contents or, if not, can be ordered as a special accessory. Connection plans and circuit diagrams can be found in the Control Unit Installation and Operating Instructions.



The control box is factory set for connection to the suction unit; this should be kept in mind when replacing the suction unit with a unit of a different size.



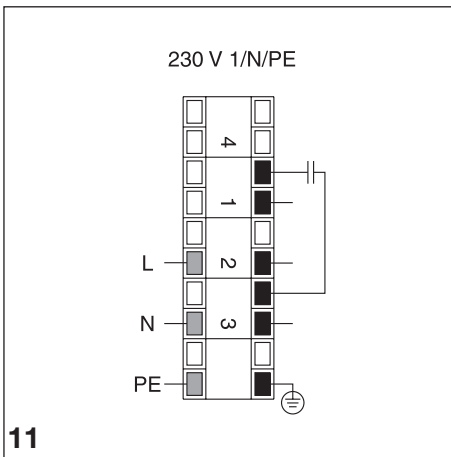
10.3 Motor terminal box connections

Connect the power supply line from the control unit to the appropriate terminal in the motor terminal box.

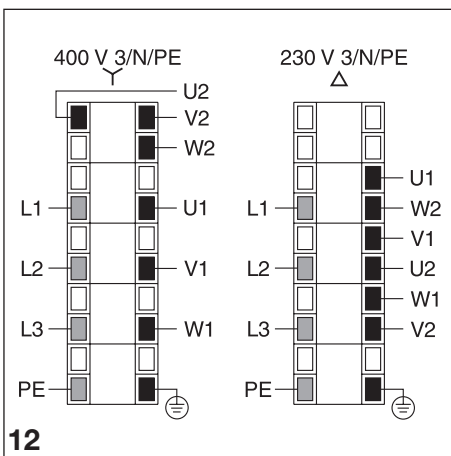
10.3.1 VS 300 S

1/N/PE AC 230 V, with controller integrated in the noise reduction housing, see fig. 11.

- X1** Power supply connection
- X2** Motor connection
- X3** Hose manifold 24 V AC / max. 80 mA connection
- X4** Control signal output
24 V AC / max. 20 mA



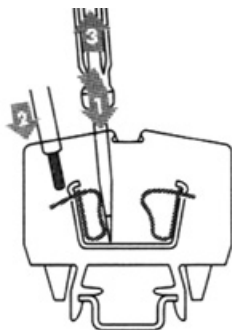
10.3.2 VS 600, 230V 1~ VS 900 S, 230V 1~



10.3.3 VS 600, 230V/400V 3~ VS 900 S, 230V/400V 3~ VS 1200 S, 230V/400V 3~



Handling terminal strip in terminal box of VS 600, VS 900 S and VS 1200 S



13

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11. Start-up



The suction unit must not be operated without the coarse filter, otherwise larger particles such as bits of broken tooth or fillings could cause damage to the unit.

- Check that the coarse filters (e. g. in spittoon) have been placed in position.
- Switch on the unit power switch or the main surgery switch.
- Carry out a function control of the suction unit and the control unit.
Check the motor rotation direction (3/N/PE AC)
Set the motor protection switch in the control unit.
- Check all connections for signs of leakages.
- Carry out an electrical safety check of the control unit and the suction unit according to national and local regulations (e.g. any and all regulations concerning set up, operation and application of medical products) and record the results as appropriate, e.g. in the technical log book.



In many countries technical medical products and electrical devices are subject to regular checks at set intervals. The operator should be informed as necessary.



Use

12. Cleaning and disinfection of the suction unit



Do not use any foaming agent, e.g. household cleaning agent, instrument disinfection agent or abrasive cleaners.



Do not use agents containing chlorine or any sort of solvent such as acetone. These agents can affect the materials. This will lead to loss of any claims under the guarantee.

For reasons of hygiene and perfect function, after every patient treatment

one glass of cold water should be aspirated through both the larger and the smaller of the suction hoses - even if only the saliva extractor was used for aspiration.



Aspiration using the larger suction hose allows a larger amount of fresh air (~300 l/min) to be drawn up and this increases considerably the cleaning efficiency.

Before lunch break and at the end of the day

the suction unit should be cleaned and disinfected by drawing up through the system a suitable cleaning and disinfecting agent as recommended by the manufacturer, e.g. OROTOL Ultra or OROTOL Plus.

Further information can be found in the leaflet "Disinfection and Cleaning of Suction Units", order number 9000-605-10/.. or in our information sheet on the cleaning of contaminated suction units, order number P007-235-01.

Weekly

Where the local water contains high levels of lime we recommend the application once a week, preferably before the midday break, of Dürr MD 555 specialised cleaner for suction units.

13. Maintenance



Wear water-proof protective gloves!

Every 4 weeks (for VS 600, VS 900 S, VS 1200 S every 3 months) the filter located at the suction connection of the suction unit should be checked and cleaned if necessary. To do this, slide the suction hose from the suction unit connection. If required, extract the filter from the suction connection piece and clean.

A Service Technician is required to check the condition (e.g. signs of leakages or aging) of the waste connection valves at least once a year and to replace if necessary.

Every two years (VS 600, VS 900 S, VS 1200 S) the auxiliary air valve must be checked and cleaned and/or replaced as necessary.

The exhaust air bacterial filter (when present) should be replaced every 12-24 months.



The integrated separation unit within the suction unit does not hold bacteria back, which is why it is strongly recommended to install a bacterial filter in the exhaust air system.



The bacterial filter is delivered together with a memo sticker; this should be stuck into the surgery planner to remind staff when the filter changing is imminent.



Trouble-shooting

14. Tips for Operators and Technicians

Any repairs above and beyond routine maintenance must be carried out by suitably qualified personnel or one of our service technicians.



Before starting any trouble-shooting activities ensure that the appliance has been removed from the power supply.

Problem	Probable cause	Solution
1. Suction unit does not start up.	• No supply voltage.	• Check the mains fusing, fuse in control unit or on the PCB and replace if necessary. Check supply voltage.
	• Under or overvoltage.	• Measure the supply voltage, if necessary call an electrician.
	• Motor protection switch set too low (for values see Technical Data).	• Measure current. Set the motor protection switch to measured value plus safety margin.
	• Motor protection switch defectly.	• Check motor protection switch; if defectly, replace.
	• Capacitor defectly	• Measure the capacitance and replace if necessary.
	• Turbine is blocked due to solid particles or dirt (e.g. by using unsuitable cleaning and disinfectant agents); motor protection switch activated.	• Disassemble the suction unit and clean the turbine .
2. Suction unit produces unusual noises.	• Solid particles in turbine.	• Disassemble the suction unit and clean the turbine .
3. Water leaks from exhaust air connection.	• Membrane valve blocked.	• Check the membrane valve at waste water connection and if necessary clean or replace.
	• Foam in turbine through using incorrect cleaning and disinfectant agents	• Do not use foaming cleaning and disinfectant agents.
	• Condensed water build-up in the exhaust air line	• Check the plumbing system, avoid sudden cooling



Problem	Probable cause	Solution
4. Suction unit performance too low.	<ul style="list-style-type: none">• Mechanical sluggishness of turbine caused by dirt.• Coarse filter blocked.• Suction connection not waterproof.	<ul style="list-style-type: none">• Disassemble the suction unit and clean the turbine .• Clean coarse filter at intake nozzle.• Check the suction lines and connections for leaks and correct as necessary.



Disposal

15. Appliance disposal



The unit could possibly be contaminated. Inform the waste management company so that they can take all necessary safety steps.



Non-contaminated plastic parts of the suction unit can be disposed of for recycling.

The control board, electronics (PCB) and components are electronic waste and must be disposed of as appropriate. Other metal parts (e. g. turbine housing) can be disposed of as metal waste.

When returning the appliance, e. g. to your dealer's depot or to Dürr Dental, be sure to close all connections.

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