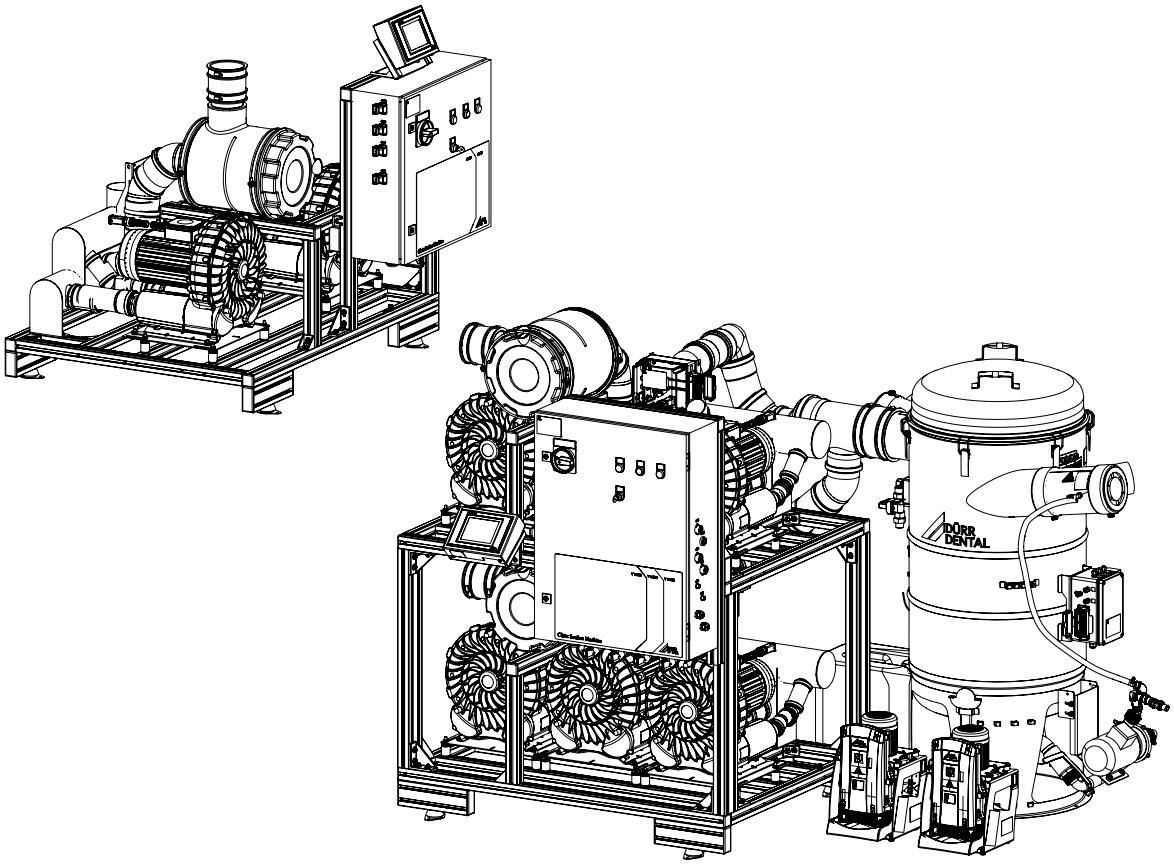
Clinic Suction Units

V 6000 / V 9000 / V 12000 / V 15000 / V 18000

EN



Operating Instructions for Dry and Semi-dry Suction Systems

CE 0297

9000-606-104/01

DÜRR DENTAL

2015/09

Content

Important information

Use

EN

Important information

1. General

1.1 Evaluation of conformity

The product was subject to a conformity acceptance process under the European Union guidelines covering these types of device and conforms with the essential requirements of these regulations.

EN

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 for the operator. Precise observance of these installation and operating instructions is a prerequisite for use of the unit for the intended purpose and for its correct operation, new personnel must be sufficiently trained and instructed in its use. New personnel must be made aware of the contents of the installation and operating instructions, 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. In addition, only those accessories may be used which are specifically mentioned in the Installation and Operating Instructions or have been authorised by Dürr Dental. If other accessories are used with this appliance, Dürr Dental cannot guarantee safe operation or proper functioning. No liability on the part of the manufacture 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 installation, resettings, changes or modifications, extensions and repairs have been carried out by Dürr Dental or an agency authorised 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 installation and operating instructions, 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 pakkaging is kept out of the reach of 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 Appliance disposal

EU directive 2002/96/EG - WEEE (Waste Electric and Electronic Equipment) of 27th January 2003 and their current adaption in national laws lays down that dental products are governed by these same guidelines and therefore, within the European Union, are subject to special disposal procedures.
If you have any questions concerning disposal of the product, please contact Dürr Dental or your specialist dental supplier.

1.4 Correct Usage

Clinic suction units are to be used in combination with separating units in so-called dry or semi-dry suction systems in dental or dental-medical clinics.
The suction unit must be cleaned and disinfected according to the manufacturer's instructions.
Correct usage also involves observing the operating instructions and observing the conditions concerning set-up, operation and maintenance.

NOTE
Machine damage caused by fluids and particles entering the system (e.g. prophylaxis powder, filling residue)

- Fluids and air to be separated before the clinic suction unit.

1.5 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. Fluids should not be drawn up into the suction unit.
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 owner/operator bears all risks.

WARNING
Risk of explosion due to inflammation of combustible materials

- Do not use the appliance in rooms in which combustible mixtures may be present, e.g. in operating theatres.

1.6 Use of peripheral units

- 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, 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 designed and constructed by Dürr Dental so that correct usage of the appliance is virtually free of any possible injury or danger. In spite of this, we feel it is our duty to mention the following safety measures in order to prevent any possible danger.

- When operating the appliance, observe all local rules and regulations.
  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 owner and operator is responsible for observing these regulations.
- Installation must be carried out by suitably qualified personnel.
- Before every use the operator must check the functional safety and the condition of the appliance.
- The operator must be familiar with the operation of the appliance.
- This product is not designed for operation in an area at risk through explosion, or where the atmosphere could contribute to combustion arising. Areas where explosions could occur are those where flammable anaesthetic 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 Safety notes concerning protection from electrical current

- Before connecting the appliance, it is required to check that the supply voltage and the electrical frequency of the appliance correspond to the values of the mains power supply.
- 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.
- When working on and with the appliance, always observe the local electrical safety procedures.

3. Warnings and symbols

The following terminology and symbols are used in these Installation and Operating Instructions to denote especially important information:

Restrictions and regulations concerning the prevention of injury or damage.

Special information regarding the economical use of the equipment and other information.

Warning - Dangerous electrical voltage

Biohazard warning

Automatic start up

Warning - High temperatures

Appliance fuse

OFF

ON

3.1 Model identification plate

Information on the model identification plate can be found in the documents for planning and installation (order number 9000-617-06/..).

Order no./Model no.

Serial no.

Observe accompanying documentation!

Dispose of appropriately as under EU Directive (2002/96/EG-WEE)

4. Scope of delivery

The scope of delivery and accessories depends on the particular model type of the unit and the suction system employed (dry or semi-dry). Information on this can be found in the documents for the planning and installation or on the delivery note of the system.

4.1 Disposable materials

Orotol Plus 30 l vessel (in combination with a central separation vessel) CDS110P9599

5. Technical Data

5.1 V 6000

Type		1802-51	
Workplaces SF 100 % / 60 %		20 / 30	25 / 40
Flow rate			
p = 0 mbar/hPa	l/min	9200	
p = 160 mbar/hPa	l/min	6000	
Voltage	V	400/3/N/PE AC	
Electrical frequency	Hz	50	60
Power output	kW	5.6	7.4
Current consumption	A	12.1	14.1
Motor protection switch settings	A	2 x 6.3	2 x 7
Mains fusing [3]	A	16	20
Speed	rpm	2880	3380
Type of protection:		IP 20	
Protection class		I	
Duty cycle	%	100	
Weight, approx.	kg	175	
Dimensions (H x W x D)	cm	115 x 130 x 130 [4]	
with noise reducing hood [2]	cm	115 x 140 x 125	
Additional space required			
Front and sides	cm	100	
Rear	cm	50	
Noise level [1]	dB(A)	73	74
with noise reducing hood	dB(A)	64	65
Vacuum connection		DN 110	
Exhaust air connection		DN 110	

[1] according to EN ISO 1680 Noise emissions; measured in soundproofed room. The values are average values with tolerances of approx. ±1.5 dB(A). Set-up in a reverberant room (e.g. room with tiled walls) can lead to higher noise levels.

[2] the control unit is not attached to the frame of the suction unit where a noise reducing hood is fitted.

[3] the lowest mains fusing level for activation can be calculated as a factor of the number of suction units connected times the set value at the motor protection switch

[4] incl. control unit.

5.2 V 9000

Type		1803-51	
Workplaces SF 100 % / 60 %		30 / 50	37 / 60
Flow rate			
p = 0 mbar/hPa	l/min	13800	
p = 160 mbar/hPa	l/min	9000	
Voltage	V	400/3/N/PE AC	
Electrical frequency	Hz	50	60
Power output	kW	8.2	10.9
Current consumption	A	16.6	19.6
Motor protection switch settings	A	3 x 6.3	3 x 7
Mains fusing [3]	A	20	25
Speed	rpm	2880	3380
Type of protection:		IP 20	
Protection class		I	
Duty cycle	%	100	
Weight, approx.	kg	215	
Dimensions (H x W x D)	cm	115 x 130 x 130 [4]	
with noise reducing hood [2]	cm	115 x 140 x 125	
Additional space required			
Front and sides	cm	100	
Rear	cm	50	
Noise level [1]	dB(A)	75	76
with noise reducing hood	dB(A)	66	67
Vacuum connection		DN 110	
Exhaust air connection		DN 110	

EN

EN

5.3 V 12000

Type		1804-51	
Workplaces			
SF 100 % / 60 %		40 / 70	50 / 80
Flow rate			
p = 0 mbar/hPa	l/min	18400	
p = 160 mbar/hPa	l/min	12000	
Voltage	V	400/3/N/PE AC	
Electrical frequency	Hz	50	60
Power output	kW	10.8	14.4
Current consumption	A	21.1	25.1
Motor protection switch settings	A	4 x 6.3	4 x 7
Mains fusing [3]	A	25	35
Speed	rpm	2880	3380
Type of protection:		IP 20	
Protection class		I	
Duty cycle	%	100	
Weight, approx.	kg	335	
Dimensions (H x W x D)	cm	180 x 130 x 130 [4]	
with noise reducing hood [2]	cm	210 x 140 x 125	
Additional space required			
Front and sides	cm	100	
Rear	cm	50	
Noise level [1]	dB(A)	76	77
with noise reducing hood	dB(A)	63	64
Vacuum connection		2x DN 110	
Exhaust air connection		2x DN 110	

5.4 V 15000

Type		1805-51	
Workplaces			
SF 100 % / 60 %		50 / 80	62 / 100
Flow rate			
p = 0 mbar/hPa	l/min	23000	
p = 160 mbar/hPa	l/min	15000	
Voltage	V	400/3/N/PE AC	
Electrical frequency	Hz	50	60
Power output	kW	13.4	17.9
Current consumption	A	25.6	30.6
Motor protection switch settings	A	5 x 6.3	5 x 7
Mains fusing [3]	A	35	35
Speed	rpm	2880	3380
Type of protection:		IP 20	
Protection class		I	
Duty cycle	%	100	
Weight, approx.	kg	375	
Dimensions (H x W x D)	cm	180 x 130 x 130 [4]	
with noise reducing hood [2]	cm	210 x 140 x 125	
Additional space required			
Front and sides	cm	100	
Rear	cm	50	
Noise level [1]	dB(A)	77	78
with noise reducing hood	dB(A)	65	66
Vacuum connection		2x DN 110	
Exhaust air connection		2x DN 110	

5.5 V 18000

Type		1806-51	
Workplaces			
SF 100 % / 60 %		60 / 100	75 / 120
Flow rate			
p = 0 mbar/hPa	l/min	27600	
p = 160 mbar/hPa	l/min	18000	
Voltage	V	400/3/N/PE AC	
Electrical frequency	Hz	50	60
Power output	kW	16	21.4
Current consumption	A	30.1	36.1
Motor protection switch settings	A	6 x 6.3	6 x 7
Mains fusing [3]	A	35	40
Speed	rpm	2880	3380
Type of protection:		IP 20	
Protection class		I	
Duty cycle	%	100	
Weight, approx.	kg	415	
Dimensions (H x W x D)	cm	180 x 130 x 130 [4]	
with noise reducing hood [2]	cm	210 x 140 x 125	
Additional space required			
Front and sides	cm	100	
Rear	cm	50	
Noise level [1]	dB(A)	78	79
with noise reducing hood	dB(A)	66	67
Vacuum connection		2x DN 110	
Exhaust air connection		2x DN 110	

5.6 Ambient conditions

Ambient conditions for storage and transport

Temperature	°C	-10 to +60
Rel. humidity	%	< 95

Environmental conditions for operation

Temperature	°C	+10 to +40
Rel. humidity	%	< 70

EN

6. Functional Description

Clinic suction units (1) are designed for use in combination with dry or semi-dry suction systems. This means that **before the air enters the** clinic suction unit, **separation m**ust take place. During this separation, the aspirated fluids are separated from the air content.

F**or dry air suction systems** the separation occurs at each treatment unit, e.g. using an integrated Dürr Dental CS 1 or CAS 1.

F**or semi-dry suction systems** the separation takes place via a central separation vessel to which several treatment units can be connected.

During patient treatment fluids (saliva and blood) or even larger particles (amalgam, dentine, plastic particles) are aspirated and drawn into the cannula. Therefore a fine filter is usually installed in the vicinity of the treatment unit in order to hold back the larger particles.

One or two condensate separators (7) should be fitted In front of the clinic suction unit depending on the model (for dry air suction systems only as accessories). The model type with two condensate separators needs a collector pipe installed before the condensate separator (10). Depending on temperature fluctuations in the pipe line, the condensate separators hold back accumulating condensed water in order to protect the clinic suction unit from damage.

Clinic suction units operate on the side channel principle and are driven by a highly reliable three-phase current motor.

As the exhaust air from the suction unit contains bacteria and germs, we recommend that the exhaust air pipeline leads to the roof and then into the surroundings. Moreover, also for hygienic reasons, a bacteria filter for the exhaust air (2) should be integrated. After approx. every 3,500 operational hours, a message will appear on the display (6) of the control unit (4) requesting a change of the filter cartridge in the exhaust air bacteria filter.

The clinic suction unit is fitted with a programmable controller (SPS) integrated in the control unit, which utilises a pressure sensor to switch the individual suction units on or off as required to provide smooth and even suction power.

During extraction of fluids from the patient's mouth and a rate of flow of approx. 3000 l/min. (approx. 10 operators) **one** suction unit is in operation. Depending on the level of vacuum, a mechanical auxiliary air valve (3) and an electrically controlled valve open and additional air flows in. This prevents the suction power from rising too high. The auxiliary air also exerts a cooling effect on the clinic suction unit.

When the vacuum falls below a certain level due to a rising number of operators, a further suction unit will switch on and there may be several **suction units** operating at one time. In addition, mechanically regulated auxiliary air valves control the required intake air. A nonreturn valve on the waste air side of each suction unit prevents air from entering the turbine of an idle suction unit which would normally lead to a loss of suction performance.

The SPS controller is equipped with an intelligent selector switch function which continually changes the order in which suction units operate, depending on the number of operating hours a unit has been working. This serves to provide steady and constant operation of the suction units.

In the condensate separator (dry air suction systems only) there is a level sensor new (8) which, at max. level, gives a signal to switch on the condensation pump (9) and empty the condensate collector vessel.

If the condensate separator is not emptied, a red warning light will show on the control unit 60 seconds after exceeding the max. level. As soon as the problem has been solved, the red warning light display can be reset by pressing a key.

Clinic suction units in combination with a central separation unit as semi-dry suction system.

The central separation unit (11) has two inlets and a connection to the clinic suction unit. The tangential inlets permit a rate of flow of up to 18000 l/min. Up to 100 treatment units, at a simultaneity factor of 60 %, can be connected to a central separation unit.

Up to **50 treatment units** can be fitted **per inlet** (at 60 % SF) on the central separation unit. For more than 50 stations, we recommend distributing the workstations between both inlets in order to provide an even rate of flow.

The central separation unit is fitted with 3 float switch sensors at varying heights. One float switch activates a waste water pump (12) at a fluid level of approx. 50 %. The pump transports the fluid out of the central separation unit to the waste water drain or to the amalgam separator (16).

A safety switch operation 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 key on the control unit deactivates the safety switch operation.

The 3rd float switch is used when the control unit is defective and the clinic suction unit must be operated in **emergency mode**.

When the level of fluid in the central separation unit under emergency mode reaches 75 %, the unit is immediately switched off, thus preventing the possibility of excessive suction of fluids.

The aspirated mixture of air and fluid is fed through a coarse filter at the inlet to the central separation unit tangentially to the collector. Solid particles greater than 3 mm in size are collected by the coarse filter. The aspirated mixture of air and fluid will be separated in the central separation unit. 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 against the system vacuum through a non-return valve and the flow control valve to the waste water drainage 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. 16 l/min per amalgam separator. This is the maximum amount that the amalgam separator operating at a separation efficiency of ≥ 95 % can cope with.
The amalgam separator switches on or off automatically depending on the level of fluids being transported.
A collector rinse (13) using either water or water plus Orotol is integrated in the central separation unit. The clinic suction unit controller is programmed to open the water inflow-valve once every 24 hours for a period of 3 minutes. After 2 minutes, the Orotol valve (14) also opens so that Orotol Plus is added to the water for approx. 1 minute. This means that the central separation collector and the amalgam separator connected are kept virtually hygienically clean.

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 Orotol vessel (15) is equipped with a suction tube with a float sensor which will send a signal to the SPS controller when the Orotol vessel is empty and must be changed.
When the control function breaks down, it is possible to change to emergency mode using the key switch (5). Two positions can be chosen using the key:

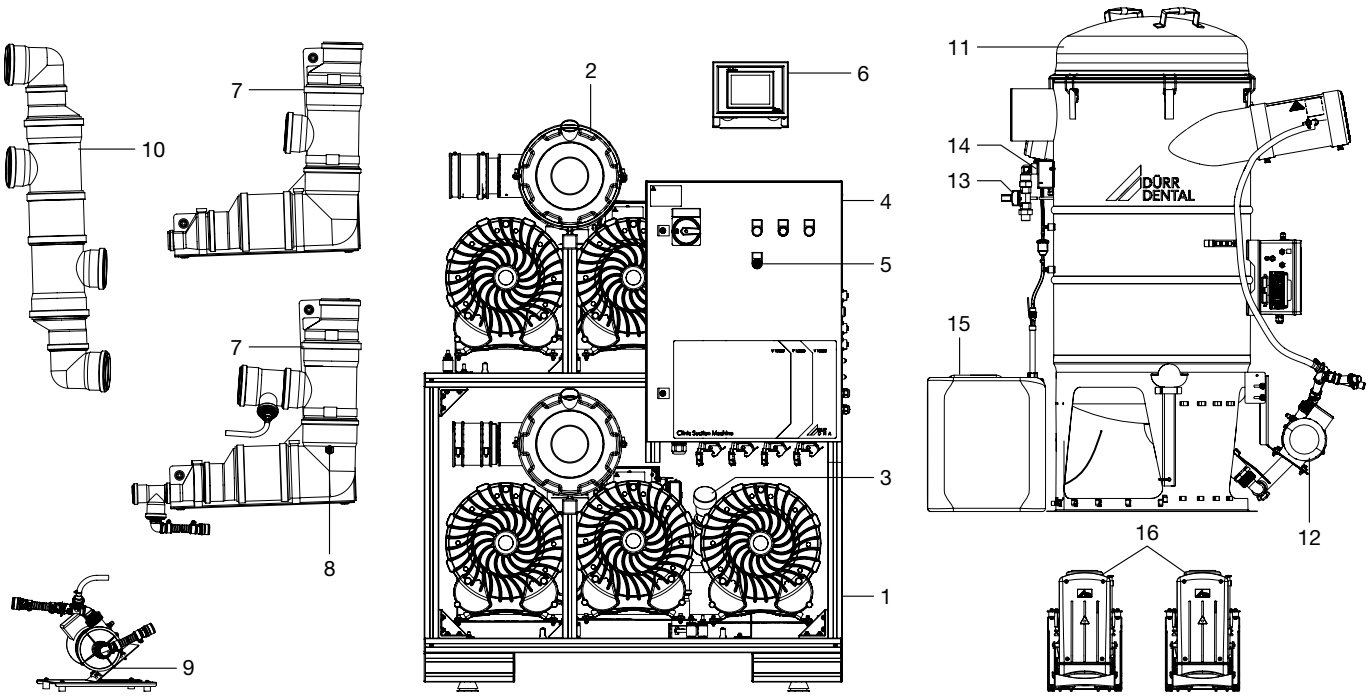
0 - Standard operation

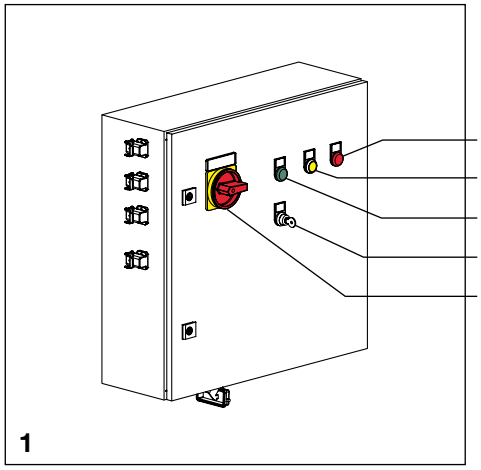
I - Emergency mode

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

Key:

1	Clinic suction unit
2	Exhaust air filter
3	Auxiliary air valve
4	Control unit
5	Key-operated switch
6	Display
7	Condensate separator
8	Float sensor
9	Condensation pump
10	Manifold
11	Central separation unit
12	Waste water pump
13	Collector rinse
14	Orotol valve
15	Orotol vessel
16	Amalgam separator





EN

Use

7. Operation and display on the control unit

1 Main power switch
The main power switch is used to switch the complete system on or off

2 Key-operated switch
The key-operated switch is used to change the unit over to emergency mode in the event of a system fault (see also Functional Description).

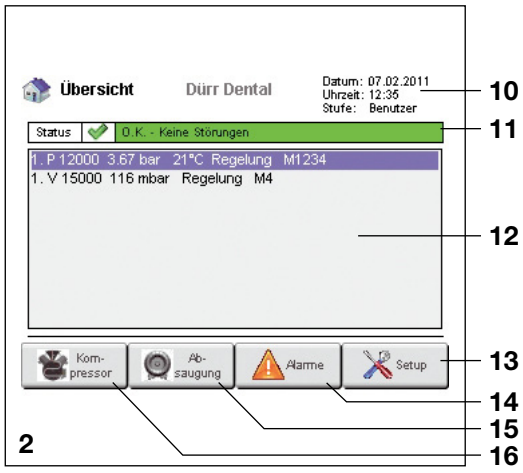
3 The green LED is lit when the unit is switched to "Operation.

4 Press the yellow key to extinguish the warning display of the unit.

5 The red LED lights if there is a fault with the unit.

8. Operation and controls on the display

Once you switch on the display - and after a short wait - the **Overview** menu appears. You can return to the home page from the various sub-menus using 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.

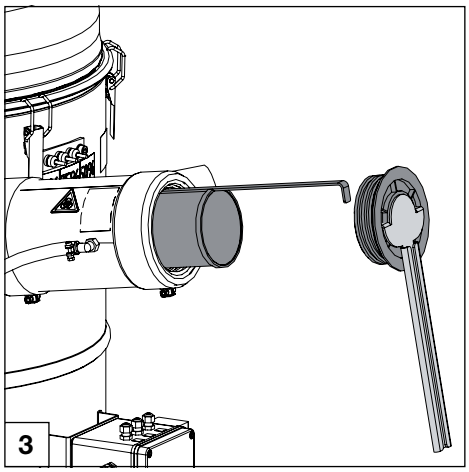
13 **Setup** button for opening the setup menu.

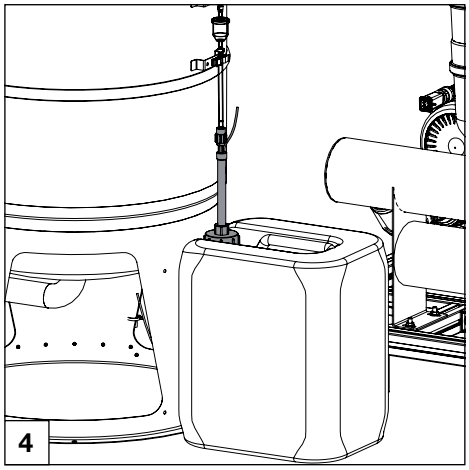
14 **Alarms** button for viewing active alarm messages.

15 **Aspiration** button for querying the status of the connected suction units.

16 **Compressor** button for querying the status of the connected compressor systems

Further information on administration and operation of the units using the display panel can be found in the instructions provided with the panel





9. Central separation unit

9.1 Cleaning the coarse filter

To avoid any danger of infection, protective clothing should be worn (e.g. protective gloves, goggles, mask)

Take out and clean the coarse filter 1 x monthly. To do so, use the tool supplied.

- Loosen the filter lid with the tool and unscrew.
- Pull out the filter for cleaning.

9.2 Changing the Orotol vessel

The Orotol vessel is sufficient for approx. 6 months.

Vessel empty:
The status LED on the display changes colour and the text "Warning - A warning has occurred" appears. In the "Alarm" user level, the reason for the warning is displayed, e.g. "Filling level in Orotol vessel too low 1st station: V1".

Proceed as follows:

- Unscrew the lid of the empty vessel.
- Carefully take out the intake manifold.
- Insert the intake manifold into the full vessel and screw tight.

10. Maintenance for Service Technicians

All maintenance must be carried out by suitably qualified staff or one of our after-sales service technicians. Positions 10 - 13 depend on the actual type of suction unit and hence may not be necessary.

Maintenance work	Maintenance interval	Order number
1. Check noice reducer, change if necessary	12 months	0705-481-50
2. Check nonreturn valve on exhaust air side of the clinic suction units, change if necessary	12 months	0705-405-00
3. Measurement of rate of flow at largest suction hose: 250-330 l/min	12 months	Rate of flow gauge 0700-060-50
4. Change filter cartridge of exhaust air filter (number of hours on control unit display)	3,500 hours	0705-991-05

WARNING
Danger of infection caused by bacteria present in exhaust air filter
• When changing the filter wear protective gloves and a mouth mask.

5. Check function vacuum regulation operation of generators	12 months	
6. Check operating hours on display	12 months	
7. Check mechanical operation of auxiliary air valve	12 months	7130-060-00
8. Check electrical operation of auxiliary air valve	12 months	7560-500-70
9. Check condensate separator	12 months	Level sensor 9000-139-12E
10. Clean float switch in central separation unit (50 %/75 %), replace if necessary	12 months	9000-139-19

WARNING
Danger of infection caused by bacteria present in central separation collector
• When working on unit, wear protective gloves and a mouth mask.

11. Check float switch in Orotol vessel	12 months	0704-493-00

WARNING
Danger of infection caused by bacteria present in central separation collector
• When working on unit, wear protective gloves and a mouth mask.

12. Check water valve on the central separation unit	12 months	9000-303-78
13. Check Orotol valve on the central separation unit	12 months	9000-303-89

DÜRR DENTAL AG
Höpfigheimer Strasse 17
74321 Bietigheim-Bissingen
Germany
Phone: +49 7142 705-0
www.duerr.de
info@duerr.de

DÜRR DENTAL