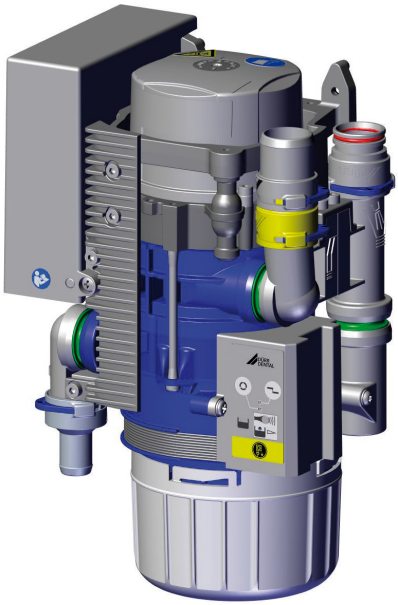
CAS 1 Combi-Separator

EN



Installation and operating instructions

CE

7117100018L30

DÜRR DENTAL

2011V003

Contents

EN

Important information

1 About this document 3
- 1.1 Warnings and symbols 3
- 1.2 Copyright information 4

2 Safety 4
- 2.1 Intended purpose 4
- 2.2 Intended use 4
- 2.3 Improper use 4
- 2.4 Systems, connection with other devices 5
- 2.5 General safety information 5
- 2.6 Specialist personnel 5
- 2.7 Notification requirement of serious incidents 5
- 2.8 Electrical safety 5
- 2.9 Only use original parts 6
- 2.10 Transport 6
- 2.11 Disposal 6

Product description

3 Overview 7
- 3.1 Scope of delivery 7
- 3.2 Accessories 7
- 3.3 Optional items 7
- 3.4 Consumables 7
- 3.5 Wear parts and replacement parts 7

4 Technical data 8
- 4.1 CAS 1 Combi-Separator 8
- 4.2 Type plate 12
- 4.3 Evaluation of conformity 12
- 4.4 Approvals 12

5 Operation 13
- 5.1 Operation 14
- 5.2 Separation 14
- 5.3 Spittoon connections 14
- 5.4 Station selection valve / safety valve 14
- 5.5 Amalgam separation 14
- 5.6 Sediment level measurement . . . 15
- 5.7 Operating problems 15
- 5.8 Service key 15

Assembly

6 Requirements 16
- 6.1 Installation/setup room 16
- 6.2 Setup options 16
- 6.3 Hose materials 16
- 6.4 Installation and routeing of hoses and pipes 16
- 6.5 Information about electrical connections 16
- 6.6 Information about connecting cables 16

7 Installation 17
- 7.1 Combining devices safely 17
- 7.2 Installation of the CAS 1 in treatment units 17
- 7.3 Electrical connections, controller . 18
- 7.4 Electrical connections 19

8 Commissioning 20

9 Service program 21

10 Description of the service program . . 22
- 10.1 Service program ON/OFF 22
- 10.2 Display test 22
- 10.3 Sediment level measurement . . . 22
- 10.4 Motor start - motor braking 22
- 10.5 Input and output signals 22

Usage

11 Display/handling 23
- 11.1 Ready for operation 23
- 11.2 Amalgam collector vessel is 95% full 23
- 11.3 Amalgam collector vessel is 100% full 23

EN

11.4 Amalgam collector vessel not in position 23
11.5 Motor fault 23
12 Disinfection and cleaning 24
12.1 After every treatment 24
12.2 Daily after the end of treatment . 24
12.3 Once or twice a week before the midday break 25
13 Replace the amalgam collector vessel 25
13.1 Disposal of the collector vessel . 25
14 Maintenance 27
14.1 Tests 28

Troubleshooting

15 Tips for operators and service technicians 29
16 Transporting the unit 32
16.1 Close CAS 1 32

Appendix

17 Handover record 33

EN

Important information

1 About this document

These installation and operating instructions represent part of the unit.

If the instructions and information in these installation and operating instructions are not followed, Dürr Dental will not be able to offer any warranty or assume any liability for the safe operation and the safe functioning of the unit.

The German version of the installation and operating instructions is the original manual. All other languages are translation of the original manual. These installation and operating instructions apply to:
CAS 1
REF: 7117-100-51

1.1 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


Biohazard warning

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.


Refer to Operating Instructions.


Wear protective gloves.


Disconnect all power from the unit.


Hose manifold connection


Spittoon connections


Suction unit connection


Drain connection


Unit in operation


Unit operation interrupted


Audible signal/melody sounds


Do not reuse


CE labelling

EN

REF Order number

SN Serial number

MD Medical device

HIBC Health Industry Bar Code (HIBC)

 Manufacturer

1.2 Copyright information

2 Safety

Dürr Dental 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.
Despite this, the following residual risks can remain:

- Personal injury due to incorrect use/misuse
- Personal injury due to mechanical effects
- Personal injury due to electric shock
- Personal injury due to radiation
- Personal injury due to fire
- Personal injury due to thermal effects on skin
- Personal injury due to lack of hygiene, e.g. infection

2.1 Intended purpose

The CAS 1 Combi-Separator is designed for continuous separation of liquids and air and for separation of amalgam from the entire waste water from dental treatment units.

2.2 Intended use

The Combi-Separator is designed for installation in the suction line of a dry suction system after the hose manifold and spittoon.
Service, maintenance, recurring tests and cleaning must be performed in accordance with the manufacturer's information.
The permissible flow rate must be observed.
A rinsing unit is required for surgical procedures and for procedures using prophy powders.
The disposable amalgam containers must only be used once.

2.3 Improper use

Any use of this appliance / these appliances above and beyond that described 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.
This includes:

– Use for separation of dust, sludge, plaster or similar.
– Use in conjunction with flammable or explosive mixtures.
– Installation in a manner that does not comply with the installation instructions, in particular installation in rooms containing a potentially explosive atmosphere.
– Cleaning and disinfection with agents containing sodium hypochlorite or potassium hypochlorite.

2.4 Systems, connection with other devices

Additional devices connected with medical electrical devices must be proven to conform with their corresponding IEC or ISO standards. All configurations must continue to comply with the standard requirements for medical systems (see IEC 60601-1).
Whoever connects additional devices to medical electrical devices automatically becomes the system configurator and is responsible for ensuring that the system corresponds with the standard requirements for systems. Local laws take priority over the requirements outlined above.

2.5 General safety information

› 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.
› Comply with the specifications of the Installation and Operating Instructions.
› The Installation and Operating Instructions must be accessible to all operators of the unit at all times.

2.6 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 Dürr Dental or by qualified personnel specifically approved and authorized by Dürr Dental.

2.7 Notification requirement of serious incidents

The operator/patient is required to report any serious incident that occurs in connection with the device to the manufacturer and to the competent authority of the Member State in which the operator and/or patient is established/resident.

2.8 Electrical safety

› Comply with all the relevant electrical safety regulations when working on the unit.
› Never touch the patient and unshielded plug connections on the device at the same time.
› Replace any damaged cables or plugs immediately.

Observe the EMC rules concerning medical devices

› The unit is intended for use in professional healthcare facilities (in accordance with IEC 60601-1-2). If the appliance is operated in another environment, potential effects on electromagnetic compatibility must be taken into account.
› Do not operate the unit in the vicinity of HF surgical instruments or MRT equipment.
› Keep a minimum distance of 30 cm between the unit and mobile radio devices.
› Note that cable lengths and cable extensions have effects on electromagnetic compatibility.

NOTICE

Negative effects on the EMC due to non-authorised accessories

› Use only Dürr Dental parts or accessories specifically approved by Dürr Dental.
› Using any other accessories may result in increased electromagnetic interference emissions or the unit having reduced electromagnetic immunity, leading to an erroneous operation mode.

EN

NOTICE

Erroneous operation mode due to use immediately adjacent to other devices or with other stacked devices

› Do not stack the unit together with other devices.
› If this is unavoidable, the unit and other devices should be monitored in order to ensure that they are working correctly.

2.9 Only use original parts

› Only use accessories and optional items that have been recommended or specifically approved by Dürr Dental.
› Only use only original wear parts and replacement parts.

DÜRR MEDICAL 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.

The use of non-approved accessories, optional accessories or non-genuine wear parts / replacement parts (e.g. mains cables) can have a negative effect in terms of electrical safety and EMC.

2.10 Transport

The original packaging provides optimum protection for the unit during transport.
If required, original packaging for the unit can be ordered from Dürr Dental.

Dürr Dental 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 unit in its original packaging.
› Keep the packing materials out of the reach of children.

2.11 Disposal

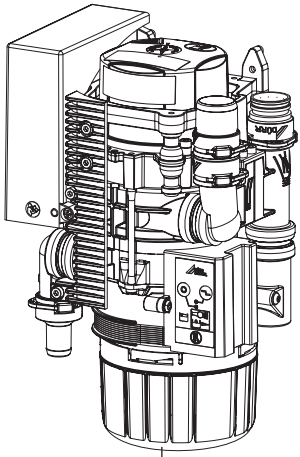
The unit may be contaminated. Instruct the company disposing of the waste to take the relevant safety precautions.

› 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 about the correct disposal of parts, please contact your dental trade supplier.

An overview of the waste keys for Dürr Dental products can be found in the download area at www.duerrdental.com (document no. P007100155).

Product description

3 Overview



1 CAS 1 Combi-Separator

3.1 Scope of delivery

The scope of delivery can vary slightly depending on the version.

The following items are included in the scope of delivery:

CAS 1 7117-100-51

- Combi-Separator
- Replacement disposable amalgam container
- Installation and operating instructions
- Operating Handbook

3.2 Accessories

The following items are required for operation of the device, depending on the application:

Disposable amalgam container . . . 7117-033-00

3.3 Optional items

The following optional items can be used with the device:

Various installation sets are available on request.

Display panel 7805-116-00E
Cable for display panel, 1 m 9000-119-043
Cable for display panel, 3 m 9000-119-042
Station selection valve 7560-500-60
Station selection valve for CAS 1 / CS 1 7560-500-80
Vario rinsing unit 7100-260-50
OroCup care system 0780-350-00
Test vessel 7117-064-00
Rinsing unit II 7100-250-50
Safety transformer 24 V, 100 VA . . 9000-150-46
Housing 7117-800-51

3.4 Consumables

The following materials are consumed during operation of the device and must be ordered separately:

Disposable amalgam container . . . 7117-033-00
DürrConnect protective strainer, 5 pieces 0700-700-18E
DürrConnect protective strainer, 5 pieces 0700-700-28E
Orotol plus (2.5 litre bottle) CDS110P6150
MD 550 spittoon bowl cleaner (750 ml bottle) CCS550C4500
MD 555 cleaner (2.5 litre bottle) . CCS555C6150

3.5 Wear parts and replacement parts

The following working parts need to be changed at regular intervals (refer to the "Maintenance" section):

Bellows 7117-420-25E
Service kit (3-year interval) 7117-980-32
Service kit (5-year interval) 7117-980-30

Information about replacement parts is available from the portal for authorised specialist dealers at: www.duerrdental.net.

EN

4 Technical data

EN

4.1 CAS 1 Combi-Separator

Electrical data – centrifuge motor		
Rated voltage	V	24 AC
Frequency	Hz	50 / 60
Rated power	VA	100
Current consumption in stand-by	mA	200
Signal input from hose manifold	V Hz	24 AC 50/60
Signal output	V mA	24 DC 300

Media		
Air flow volume	l/min	≤ 350
Flow rate		high
The suction system must be suitable for a high flow rate in accordance with EN ISO 10637.		
Max. pressure	hPa/mbar	-160
Min. volume of aspiration fluid max.	l/min l/min	≥ 0.1 ≤ 1.0
Water supply, spittoon	l/min	≤ 3
Total flow of waste liquids	l/min	≤ 4
Usable volume in amalgam collecting container	ccm	approx. 90
Replacement interval		4 - 6 months

General data		
Drive motor nominal speed	rpm	2800
Operating mode		S5 95% duty cycle*
Type of protection		IP 20
Protection class		II
Noise level ** approx.	dB(A)	55
Dimensions (H x W x D)	mm	255 x 157 x 110
Weight, approx.	kg	2.7
Separation rate	%	≥ 95

* DC = duty cycle
** Noise level in accordance with EN ISO 3746

Ambient conditions during storage and transport		
Temperature	°C	-10 to +60
Relative humidity	%	< 95

EN

Ambient conditions during operation		
Temperature	°C	+10 to +40
Relative humidity	%	< 70
Classification		
Medical Device Class		I
Electromagnetic compatibility (EMC) Interference emission measurements		
High-frequency emissions in accordance with CISPR 11		Group 1 Class B
Interference voltage at the power supply connection CISPR 11:2009+A1:2010		Compliant
Electromagnetic interference radiation CISPR 11:2009+A1:2010		Compliant
Emission of harmonics IEC 61000-3-2:2005+A1:2008+A2:2009		Compliant
Voltage changes, voltage fluctuations and flicker emissions IEC 61000-3-3:2013		Compliant
Electromagnetic compatibility (EMC) Interference immunity measurements		
Immunity to electrostatic discharge IEC 61000-4-2:2008		Compliant
Immunity to high-frequency electromagnetic fields IEC 61000-4-3:2006+A1:2007+A2:2010		Compliant
Immunity to near fields of wireless HF communication devices IEC 61000-4-3:2006+A1:2007+A2:2010		Compliant
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012		Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012		Compliant
Immunity to interference, surges IEC 61000-4-5:2005		Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013		Compliant
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013		Compliant
Immunity to power frequency magnetic fields IEC 61000-4-8:2009		Compliant

EN

Electromagnetic compatibility (EMC) Interference immunity measurements	
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant

Immunity to interference levels, near fields of wireless HF communication devices		
Radio service	**Frequency band MHz**	**Test level V/m**
TETRA 400	380 - 390	27
GMRS 460 FRS 460	430 - 470	28
LTE band 13, 17	704 - 787	9
GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE band 5	800 - 960	28
GSM 1800 CDMA 1900 GSM 1900 DECT LTE band 1, 3, 4, 25 UMTS	1700 - 1990	28
Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE band 7	2400 - 2570	28
WLAN 802.11 a/n	5100 - 5800	9

Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to fast electrical transients/bursts – AC mains voltage IEC 61000-4-4:2012 ± 2 kV 100 kHz repetition rate	Compliant
Immunity to surges, line-to-line IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV	Compliant
Immunity to surges, line-earth IEC 61000-4-5:2005 ± 0.5 kV, ± 1 kV, ± 2 kV	N/A

EN

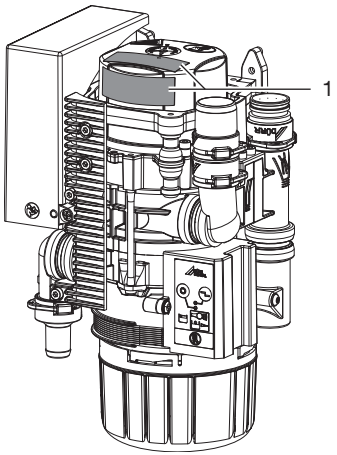
Electromagnetic compatibility (EMC) Interference immunity measurements on the supply input	
Immunity to conducted disturbances, induced by radio-frequency fields – AC mains voltage IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant
Immunity to voltage dips, short interruptions and voltage variations IEC 61000-4-11:2004	Compliant
N/A = not applicable	

Electromagnetic compatibility (EMC) Interference immunity measurements SIP/SOP	
Immunity to electrostatic discharge IEC 61000-4-2:2008 ± 8 kV contact ± 2kV, ± 4 kV, ± 8 kV, ± 15 kV air	Compliant
Immunity to electrical fast transients/bursts – I/O, SIP/SOP ports IEC 61000-4-4:2012 ± 1 kV 100 kHz repetition rate	Compliant
Immunity to impulse voltages, conductor to earth IEC 61000-4-5:2005 ± 2 kV	N/A
Immunity to conducted disturbances, induced by radio-frequency fields – SIP/SOP ports IEC 61000-4-6:2013 3 V 0.15–80 MHz 6 V ISM frequency bands 0.15–80 MHz 80% AM at 1 kHz	Compliant
N/A = not applicable	

EN

4.2 Type plate

The type plates are located on the cover of the motor.



1 Type plate

4.3 Evaluation of conformity

This device has been subjected to conformity acceptance testing in accordance with the current relevant European Union guidelines. This equipment conforms to all relevant requirements.

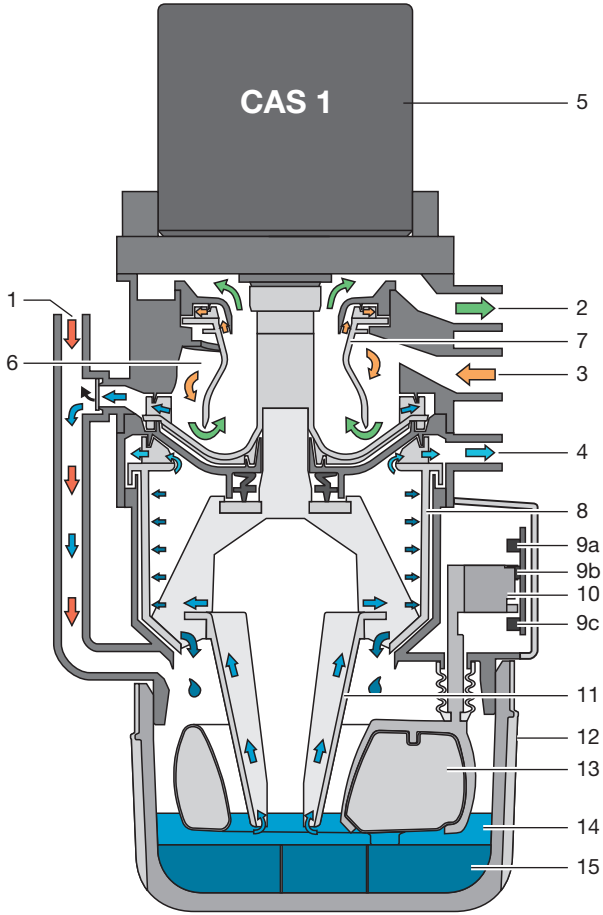
4.4 Approvals

Centre of Competence in Civil Engineering, Berlin	
Test number	Z-64.1-20

Separation method compliant with standard	
ISO 11143	Type 1

EN

5 Operation



1 Fluid intake
2 Vacuum, to suction unit
3 Aspiration input
4 Fluid output
5 Motor
6 Separation
7 Separation rotor
8 Centrifuge
9 Light barriers (3x)
10 Sensor enclosure
11 Cone pump
12 Amalgam collector vessel
13 Float sensor
14 Fluids
15 Amalgam particles

EN

5.1 Operation

CAS 1 Combi-Separator

The task of the CAS 1 combi-separator is to provide continuous separation of secretions and air as well as the amalgam separation of all the waste water from the treatment unit.
The waste water flows through the connection (1) from the spittoon directly into the centrifuge (8) and amalgam separation.
During the suction phase the aspirated secretions are separated from the aspirated air in the separation unit (6). The secretions accumulating in the separation unit are continuously transported to the centrifuge (8), where the amalgam particles are then separated.
Underneath the centrifuge is a replaceable amalgam collector vessel (12), into which the separated amalgam particles (15) are rinsed once the centrifuge (8) is switched off. A float sensor (13) checks the level within the collector vessel and sends a signal to the display panel when it needs replacing. In combination with a light barrier (9c), this float sensor also monitors whether a collector vessel is in use.
The compact size of the CAS 1 Combi-Separator allows it to be installed in dental treatment units. This results in short secretion carrying lines. After the centrifuge is switched off, the braking cycle triggers a self-cleaning process. This self-cleaning process also leads to smooth and silent running, as well as providing a separation efficiency of more than 95%, even under heaviest loads.

5.2 Separation

At the inlet connection (3) of the CAS 1, the aspirated fluid/air mix is accelerated and set into a spiral motion in the separation unit (6). The resulting centrifugal forces sling the aspirated particles against the outer wall. The air is continuously separated from the fluid and escapes via the spinning separation rotor (7) to the suction unit. The aspirated air is subject to high centrifugal forces by the separation rotor (7), which is driven by the motor (1), which ensures that no fluid or blood foam can be carried into the suction unit. The spiral motion feeds the separated fluid continuously to the pump wheel, which transports the fluid into the collector vessel. The fluid is transported to the centrifuge (8) via a pump cone (11).

An external station selection valve connects the CAS 1 with the suction unit via the vacuum connection (2).

5.3 Spittoon connections

The waste water from the spittoon flows through a protective strainer on the fluid inlet (1) and into the collector vessel (12). Once sufficient fluid has been collected, the float sensor (13) activates a light barrier (9a) and (9b) via a sensor housing (10) and switches on the motor (1). The fluid is transported to the centrifuge (8) via a pump cone (11).

5.4 Station selection valve / safety valve

The station selection valve has 2 tasks:
1st task:
The station selection valve interrupts the suction flow between the hose manifold and the suction unit. As soon as a suction hose is removed from the hose manifold, a solenoid valve opens the station selection valve and suction flow is enabled.
2nd task:
The station selection valve also acts as a safety valve. If the CAS 1 is over-full or not functioning properly, the system will perform a safety shutdown. This safety shutdown prevents fluids from being drawn into the dry suction pipe.

For single station suction systems, the station selection valve takes over the function of the safety valve.

In various types, a station selection valve is already integrated in the CAS 1. The station selection valve is on the connection (2) of the CAS 1.

5.5 Amalgam separation

The switches in the hose manifold or the light barrier of the sensor system switch on the motor and the associated centrifuge (8).
The fluid containing amalgam particles flows continuously to the collector vessel (12). The fluids ejected by the centrifuge are pumped through the fluid output (4) to the central waste water system.
As soon as no further fluid is fed to the amalgam separator, e.g. when the suction hose is placed back in the hose manifold, the centrifuge drum is switched off after a short delay time. This switch-

off brakes the motor, as a result of which the ring of water, which continues to rotate due to inertia, rinses the separated particles out of the centrifuge (8) downwards into the collector vessel.
The separated amalgam particles form a sediment in the replaceable collector vessel. The level of fluid in the collector is regulated by the pump cone so that the risk of fluid escaping when the collector vessel is changed can be avoided.

5.6 Sediment level measurement

The fill level in the collector vessel (12) is checked by a float sensor (13) every time the main power switch is switched on.
The centrifuge motor starts, fluid is transported via the pump cone to the centrifuge drum (8) and provides a constant level of fluid (underside of the cone pump) in the collector vessel. The float sensor sinks. Two light barriers (9a) and (9b) measure the fluid level. Once the level reaches 95% in the collector vessel, this is displayed on the display panel.

5.7 Operating problems

If the unit is not ready for operation due to a fault, this will be indicated on the display panel via illuminated LEDs and an audible signal.

5.8 Service key

On the display panel there is a service key that can be used to switch off the audible signal in the event of a fill level warning or if a fault message is indicated. This button can also be used to start the device manually. To do this, press the button for longer than 2 seconds until the drive motor starts up.

Assembly

EN

6 Requirements

6.1 Installation/setup room

The room chosen for set up must fulfil the following requirements:
- Closed, dry, well-ventilated room
- Should not be a room made for another purpose (e. g. boiler room or wet cell)

6.2 Setup options

CAS 1 Combi-Separator
- Directly in the treatment unit.
- In a special housing in an extension of the treatment unit.

6.3 Hose materials

For waste connections and suction lines only use the following hose types:
- Flexible spiral hoses made of PVC with integrated spiral or equivalent hoses
- Hoses that are resistant to dental disinfectants and chemicals

Plastic hoses will display signs of ageing over time. Therefore, they should be inspected regularly and replaced as necessary.

The following types of hoses must not be used:
- Rubber hoses
- Hoses made completely of PVC
- Hoses that are not sufficiently flexible

6.4 Installation and routeing of hoses and pipes

› Execute the on-site pipe installation in accordance with the applicable local regulations and standards.

› Lay the hose installation of the drains to or from the unit at a sufficient incline.

If incorrectly laid, the hoses can become blocked with sedimentation.

6.5 Information about electrical connections

› Ensure that electrical connections to the mains power supply are carried out in accordance with current valid national and local regulations and standards governing the installation of low voltage units in medical facilities.

› Install an all-pole disconnect switch with a contact opening width of at least 3 mm in the electrical connection to the mains power supply.

› Observe the current consumption of the devices that are to be connected.

› Install electrical lines without mechanical tension.

› Make the electrical connection via the main power switch of the treatment unit or via the main power switch of the practice.

6.6 Information about connecting cables

Mains supply cable

Installation type	Line layout (minimum requirements)
Fixed installation	– Plastic sheathed cable (e.g. type NYM-J)
Flexible	– PVC flexible line (e.g. H05 VV-F) or – Rubber connection (e.g. H05 RN-F or H05 RR-F)

Control cable

Installation type	Line layout (minimum requirements)
Fixed installation	– Shielded sheathed cable (e.g. (N)YM (St)-J)

Installation type	Line layout (minimum requirements)
Flexible	– PVC data cable with shielded cable sheathing, as used for telecommunications and IT processing systems (e.g. type LiYCY) or – Lightweight PVC control cable with shielded cable sheathing

Wire cross-section

Unit feed:
– 0.75 mm²

Connection external valves / units:
– 0.5 mm²

7 Installation

Prior to working on the unit or in case of danger, disconnect it from the mains.

7.1 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 when there is no risk of damage or harm to the surroundings.
› If it is not 100% clear from the unit data 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.

7.2 Installation of the CAS 1 in treatment units

The CAS 1 Combi Separator for KaVo treatment units must be set up in a defined installation setup in order to meet the relevant safety standards. For this reason it must only be installed in the treatment units that have been designed and approved for this purpose by KaVo.
KaVo-approved treatment units:
New units delivered from 01/2016 onwards: E50, E50 Life, E70/E80, E70/E80 Vision, 1058, 1058 Life
Spare parts requirements for old units such as 1078 and 1080 among others.

WARNING

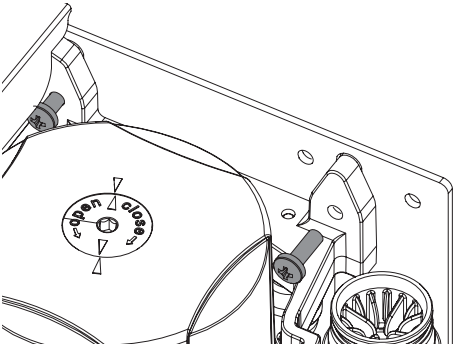
Infection due to contaminated unit

› Clean and disinfect the suction before working on the unit.
› Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

Attach the unit vertically at a suitable position in the treatment unit. The unit is mounted on rubber pads and suspended in a metal frame. This mounting arrangement prevents the transmission of any vibrations to the treatment unit while the

EN

device is running. Vibrations may occur if the unit is not positioned vertically. A minimum distance of 3 mm must be maintained to the surroundings.

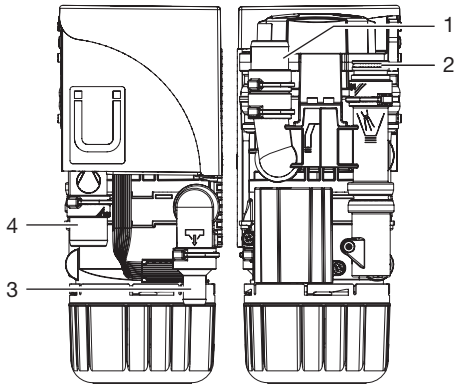


Station selection valve

In various types, the station selection valve is directly mounted on the CAS 1. The station selection valve (for separate installation) should be fitted in the suction pipe in the treatment unit, preferably near the end connection in the floor socket. In some installation setups the station selection valve also functions as a safety valve, so its actuation must be implemented via the CAS 1.
For further information, refer to the station selection valve installation and operating instructions

Inlet and outlet hoses

Connect and attach the inlet and outlet hoses with DürrConnect connectors to the relevant connections on the unit. Route the hoses at an incline.
Recommended diameter of the connection hoses: ∅ 25 mm.
The minimum nominal width for the outlet hose is 15 mm.



1 Hose manifold
2 Spittoon
3 Outlet
4 Suction unit

Spittoon connections

In some dental units it is possible that noises can be heard at the spittoon, which are amplified by the funnel shape of the spittoon itself. In this case, the outlet between spittoon and CAS 1 should be bled. A corresponding siphon trap with ventilation is available as a special accessory.

Rinsing unit

It is recommended that the suction system is equipped with a rinsing unit, e.g. in the treatment unit. The rinsing unit provides a small amount of water during aspiration. This dilutes the aspirated fluids (blood, saliva, rinsing water etc.), which can then be transported more effectively.

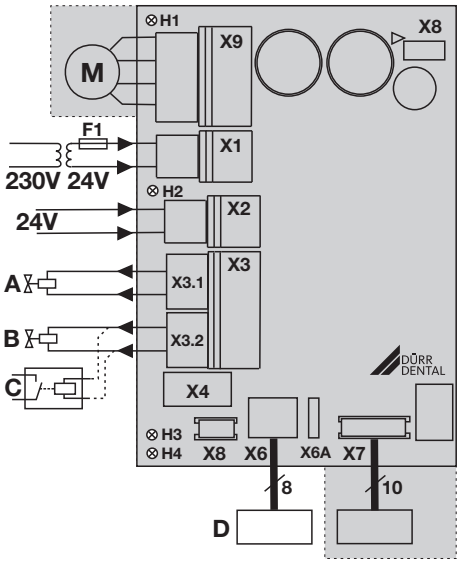
7.3 Electrical connections, controller

Power supply:

– Safety transformer order number: 9000-150-46

or

– Safety transformer 24 V AC with a with an isolator consisting of two means of patient protection (MOPP) between the mains circuit and secondary circuit, min. 100 VA, secondary fuse T 4 AH (or IEC 60127-2/V T 4 AH, 250 V)



X1 Power supply in accordance with EN 60601-1, 24 V AC
X2 Signal input 24 V AC/DC
X3.1 Place selection valve / safety valve (only CAS 1, max. output 8 W)
X3.2 Rinsing unit (CAS 1 only)
X4 CAN bus
X6 Display panel, external (X6A = connection for predecessor model)
X7 Sensor technology
X8 Production interface
X9 Motor
H1 Motor control display
H2 Manifold control display
H3 Place selection valve control display
H4 Control display, collecting container missing
A Place selection valve
B Rinsing unit
C Suction unit relay (alternative)
D Display panel, external

7.4 Electrical connections

Station selection valve / safety valve

› Connect the station selection valve / safety valve using a 2-core wire with connector to the X3 connection of the control.

Rinsing unit

› Connect the rinsing unit using a 2-core wire with connector to the X3 connection of the control.

At the connection for the rinsing unit, a suction unit relay, for example, can be connected if there is no isolation present between the suction unit signal and station selection valve in the treatment unit. Note the power consumption of the suction unit relay.

Display panel

The display panel is used to indicate messages acoustically and visually (via LEDs).

A display panel is already integrated in the unit and should be visible/audible at all times.
If the display panel is not visible/audible, fit an additional display panel in an easily visible location. The display panel is connected to the X6 socket (RJ-45 socket). An existing Dürr Dental display panel with a 6-pin connector can be connected to the X6A connector when replacing an older device.
If the installation of the amalgam separator in a neighbouring room or in the basement results in distances of more than 3 m, we recommend installing a shielded network cable with RJ-45 sockets.

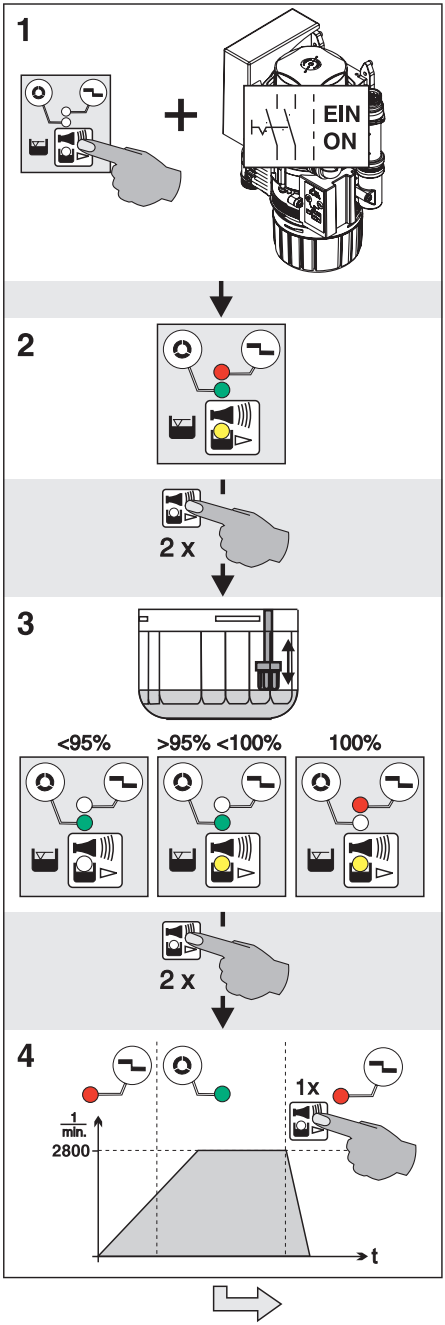
8 Commissioning

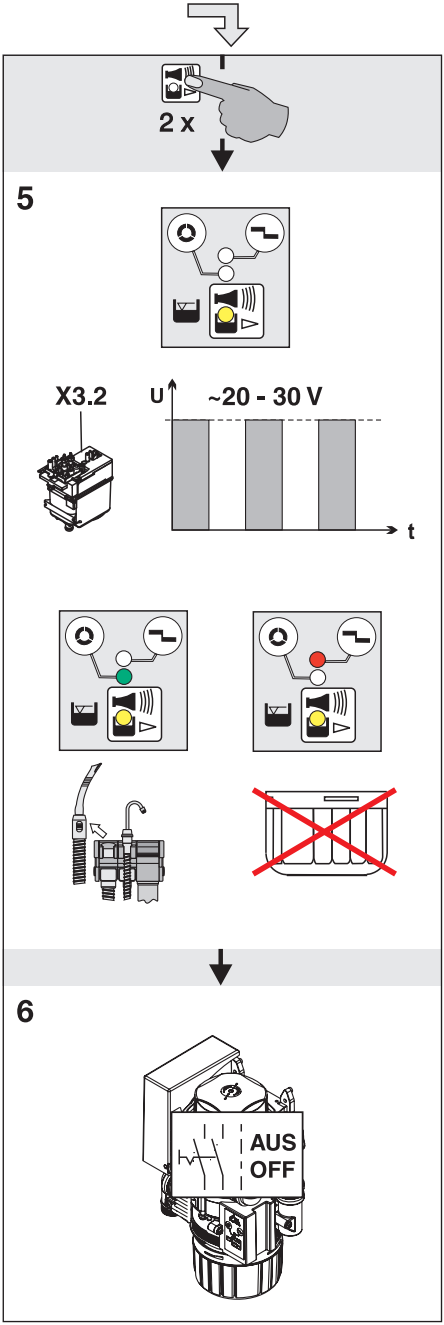
EN

In many countries technical medical products and electrical devices are subject to regular checks at set intervals. The owner must be instructed accordingly.

› Turn on the unit power switch or the main surgery switch.
› Carry out an electrical safety check in accordance with applicable local regulations (e.g. the German Ordinance on the Installation, Operation and Use of Medical Devices / Medizinprodukte-Betreiberverordnung) and record the results as appropriate, e.g. in the technical log book.
› Check the aspiration function.
› Check the start function via the spittoon.
› Check the connections, hoses and device for leaks.

9 Service program





EN

10 Description of the service program

Wear protective equipment to avoid any risk of infection (e.g. liquid-tight protective gloves, protective goggles, face mask).

The various unit functions can be checked with the aid of the service program.
The individual program steps are:
- Display test
- Sediment level measurement
- Motor start and motor braking with rpm check
- Input and output signals

Function of the service key:
- By pressing the service key twice the next individual program step is called up.
- By pressing the service key once that program step is repeated.

A press of the service key is confirmed by an audible signal.

10.1 Service program ON/OFF

On
- Press the service key and switch on the voltage supply to the unit.
- As soon as a signal melody can be heard, release the service key.
  The green, yellow and orange LEDs on the display panel light up (display test) and the service program is activated.

Off
Switch off the main supply to the unit.

10.2 Display test

The display test is activated as soon as the service program is started.
The LEDs on the display panel are checked. All three LEDs must come on. There is also an audible signal, which can be switched off by pressing the service button.

10.3 Sediment level measurement

While the service program is activated, the safety check for the collector vessel is deactivated.

The sediment level measurement can be used to check the function of the sediment sensor and the function of the LEDs.

Every time the service key is pressed, the sediment level is checked. If a test collector vessel is used for this, the different levels can be scanned and made visible on the display panel.
While changing the collectors (collector vessel - test collector vessel) in the service program the unit remains in the ON state.

10.4 Motor start - motor braking

The drive motor starts and, after approx. 5 seconds, braking is applied. If the service key is pressed during these 5 seconds, the motor will immediately be braked.
This procedure can be repeated by pressing the service key 1x again.
The drive motor starts up.
As a result of the rpm monitoring, the LED will change from orange to green upon start-up and from green to orange upon braking.

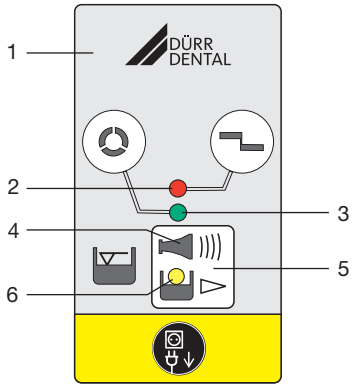
10.5 Input and output signals

- After this program item is activated, the yellow LED flashes and a cycled DC voltage (approx. 22-30 V) can be measured at the terminal for the rinsing unit.
- If the suction hose is lifted off the hose manifold the green LED will also come on.
- Removal of the collecting container causes the red LED to illuminate.

EN

Usage

11 Display/handling



1 Display panel
2 RED display
3 GREEN LED
4 Audible signal/melody
5 Reset/service key
6 YELLOW LED

11.1 Ready for operation

Green LED is on

11.2 Amalgam collector vessel is 95% full

Yellow LED is on

Green LED is on

Audible signal melody sounds

– At a fill level of 95%, the signal melody can be switched off by pressing the reset button. The device is then ready for operation again.
– The yellow LED comes on as a reminder that the amalgam collector vessel is due to be changed. The level display is repeated every time the unit is switched on at the main power switch.

We recommend changing the amalgam collector vessel when it reaches 95% full.

11.3 Amalgam collector vessel is 100% full

Yellow LED is on

Red display flashes

Audible signal melody sounds

– At a fill level of 100% the signal melody can no longer be switched off by pressing the reset button.
– The collecting container needs to be replaced.

Wear protective equipment to avoid any risk of infection (e.g. liquid-tight protective gloves, protective goggles, face mask).

– The separator will not be ready for operation again until the amalgam collecting container has been replaced

11.4 Amalgam collector vessel not in position

Red display flashes

Audible signal

– Press the reset button briefly to switch off the audible signal.
– Switch off the device.
– Insert the collecting container.
– Switch on the unit.
– Green LED lights up – "Ready for operation"

If this error message occurs when the collecting container is correctly inserted, this indicates that there is a technical defect – inform your Service Technician.

11.5 Motor fault

Red display and

green LED flash alternately

Audible signal

– Press the reset button briefly to switch off the audible signal.
– If the reset button is pressed for longer than 2 seconds the unit can be restarted.
– Green LED lights up – "Ready for operation"

EN

If, after pressing the reset button repeatedly, the fault report reappears again each time, this indicates a technical defect – inform your Service Technician.

12 Disinfection and cleaning

NOTICE

Device malfunctions or damage due to use of incorrect media

Guarantee claims may become invalid as a result.

- Do not use any foaming agents such as household cleaning agents or instrument disinfectants.
- Do not use abrasive cleaners.
- Do not use agents containing chlorine.
- Do not use any solvents like acetone.

Dürr Dental recommends
– For disinfection and cleaning:
Orotol plus or Orotol ultra
– For cleaning:
MD 555 cleaner

Only these products have been tested by Dürr Dental.
When using prophy powders, Dürr Dental recommends the water-soluble Lunos prophy powders in order to protect the Dürr Dental suction systems.

12.1 After every treatment

- Aspirate a glass of cold water through the large and the small suction hoses. Do this even if only the small suction hose was actually used during treatment.

Suction through the large suction hose causes a large amount of air to be drawn up, thereby considerably increasing the cleaning effect.

12.2 Daily after the end of treatment

After higher workloads before the midday break and in the evening

The following are required for disinfection/cleaning:
- ✓ Non-foaming disinfectant/cleaning agent that is compatible with the materials.
- ✓ Unit care system, e.g. OroCup
- › To pre-clean, suck up 2 litres of water with the care system.
- › Aspirate the disinfection/cleaning agent with the care system.

12.3 Once or twice a week before the midday break

Under harsher conditions (e.g. hard water or frequent use of prophy powders) 1x daily before the midday break

The following are required for cleaning:
- ✓ Special non-foaming detergent for suction units that is compatible with the materials.
- ✓ Unit care system, e.g. OroCup
- › To pre-clean, suck up 2 litres of water with the care system.
- › Aspirate the cleaning agent with the care system.
- › Rinse with ca. 2 l water after the application time.

13 Replace the amalgam collector vessel

NOTICE

Risk of contamination if the amalgam collector vessel is reused since the collector vessel is not water-tight.

› Do not use the collecting container more than once (disposable item).

Wear protective equipment to avoid any risk of infection (e.g. liquid-tight protective gloves, protective goggles, face mask).

We strongly recommend that the amalgam collecting container should only be changed in the morning before the start of work. This will prevent fluid from dripping out of the drum while it is being changed.

- › Disconnect all power from the unit.
- › Remove the full amalgam collecting container and from the device.
- › Pour disinfectant for suction units (e. g. Orotol plus, 30 ml) into the full amalgam collecting container.
- › Close and secure the full amalgam collecting container using the cap. Observe the markings on the cap and on the collecting container.
- › Place the securely closed amalgam collecting container into its original packaging and seal.
- › Insert a new amalgam collecting container in the unit and clamp it in position.

Only use original amalgam collecting container.

- › Switch on the power supply. The unit is ready for operation again.

13.1 Disposal of the collector vessel

Used amalgam collector vessels must not be sent in the post!

Dürr Dental is not a waste management company and is not allowed by law to accept any filled amalgam collector vessels.

EN

› Arrange to have filled amalgam collector vessels collected from the surgery by a local waste management company.
› New amalgam collector vessels should be ordered from your specialist dental equipment retailer.
› Document the replacement and legally compliant disposal of the filled waste amalgam collector vessel in the Operating Handbook.

In some countries the owner is required to keep an operating handbook. This operating handbook must document all maintenance work, service work, checks and amalgam disposal.

14 Maintenance

All maintenance work must be performed by a qualified expert or by one of our Service Technicians.

EN

WARNING

Infection due to contaminated unit

- Clean and disinfect the suction before working on the unit.
- Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

Prior to working on the unit or in case of danger, disconnect it from the mains.

Maintenance interval	Maintenance work
Dependent upon the level of usage of the device	› Replace the amalgam collecting container when a fill level of 95% or 100% is indicated on the display panel › Clean or replace protective sieves during replacement of the amalgam collecting container. At the latest, do this when the suction or draining power of the device decreases.
Annually	› Cleaning of the suction unit in accordance with the operating instructions. › Clean the float. * › Replace the bellows. *
Every 3 years	› Replace the rubber grommets on the connections. * › Replace the float. *
Every 5 years	› Replace the centrifuge drum and seal. * › Replace all O-rings (from the replacement parts kit) in the device. * › Replace the rubber grommets on the connections. * › Replace the float. *

* to be done by service technicians only

EN

14.1 Tests

WARNING

Infection due to contaminated unit

› Clean and disinfect the suction before working on the unit.
› Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

In some countries the owner is required to keep an operating handbook. This operating handbook must document all maintenance work, service work, checks and amalgam disposal.

Annual inspection

This inspection should only be carried out by suitably trained staff.
For inspection, the following are required:
✓ Test vessel

Work steps to be performed:

› General functional check (e.g. aspiration, spittoon inlet)
› Service program

The following measurement times apply to fill level measurements with a test vessel:
– For a fill level of 95%, the measurement result is displayed after approx. 30 sec, whereby the drive motor is briefly switched off during the measurement.
– At a fill level of 100% the measurement result is displayed after approx. 90 sec continuous running.

Inspection of the general operating condition every 5 years

This inspection must be carried out every 5 years (in accordance with the German Waste Water Regulations, Annex 50, Dental Treatment) by an inspector in accordance with national regulations.
For inspection, the following are required:
✓ Test vessel
✓ Measuring beaker

Work steps to be performed:

› Fill the test vessel with water and insert it into the unit.
› Start the device and wait until it switches off again.
› Once the device has switched off, remove the test vessel and measure the remaining amount of water.

The unit is working correctly if:
– there is at minimum content of 140 ml in the **test vessel**.

If there is less fluid, clean the centrifuge drum or check the operation of the unit.

Troubleshooting

15 Tips for operators and service technicians

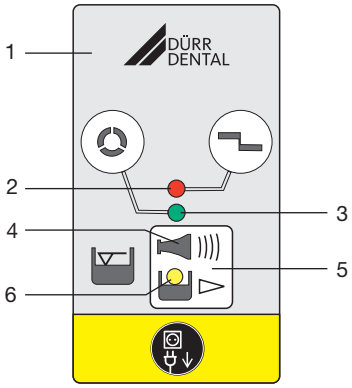
Any repairs exceeding routine maintenance may only be carried out by qualified personnel or our service.

WARNING

Infection due to contaminated unit

- Clean and disinfect the suction before working on the unit.
- Wear protective equipment when working (e. g. impermeable gloves, protective goggles and mouth and nose protection).

Prior to working on the unit or in case of danger, disconnect it from the mains.



1 Display panel
2 RED display
3 GREEN LED
4 Audible signal/melody
5 Reset/service key
6 YELLOW LED

Error	Possible cause	Remedy
Device not "ready for operation" **No display on the display panel.**	The main power switch of the treatment unit or surgery is not switched on	› Main power switch ON
	If an external display panel is fitted: cable not correctly connected	› Check cable connections

EN

Error	Possible cause	Remedy
Yellow display is on GREEN LED illuminates Audible signal melody sounds	Amalgam collecting container is 95% full	› Change the amalgam collecting container.
	Float sensor dirty or blocked	› If this display occurs repeatedly even when the collecting container is empty, check that the float sensor can move freely.
Yellow display is on Red display flashes Audible signal melody sounds	Amalgam collecting container is 100% full	› Change the amalgam collecting container. Audible signal can no longer be switched off.
	Float sensor dirty or blocked	› If this display occurs repeatedly even when the collecting container is empty, check that the float sensor can move freely.
	Waster water line/siphon trap dirty	› Clean the waste water line/ siphon trap. *
The RED and GREEN displays flash alternately Audible signal	Motor is dirty or defective	› Check motor for smooth running; replace the centrifuge if necessary. * › Replace the device. *
	Contact problems at X9	› Plug in the connector correctly. * › Replace the PCB main board and connector on the motor. *
Orange LED flashes Audible signal		Press the service key briefly to switch off the audible signal
	Amalgam collecting container not correctly in position	› Switch OFF the device. › Insert the amalgam collecting container in the correct position. › Switch ON the device.
	Float sensor missing	› Insert the float sensor. *
Water accumulating in the spittoon	Coarse sieve in the fluid inlet blocked	› Clean the coarse sieve.
	Outlet ineffective or not vented	› Check or retrofit the ventilation. *
Suction power too weak or interrupted	Coarse sieve is blocked on the inlet of the aspiration	› Clean the coarse sieve.
	Place selection valve not or incompletely open	› Check the control voltage. * › Clean the place selection valve. *

Error	Possible cause	Remedy
Device running continuously	Float sensor blocked in water start position	› Clean the float. * › Free up the float sensor linkage so that it can move freely. *
	Start signal at the signal input (X2)	› Check the control voltage. *
	Waster water line/siphon trap dirty	› Clean the waste water line/ siphon trap. *
Noise at the spittoon	Outlet ineffective or not vented	› Check or retrofit the ventilation. *
Increased vibration of the device	Pump cone dirty	› Clean or replace the pump cone. *
	Centrifuge dirty	› Clean or replace the centrifuge. *
	Water supply too low	› Introduce water into the suction pipe. › Retrofit the rinsing unit. * › Check the rinsing unit for its correct installation position. * › Check the function of the rinsing unit. *
Water cannot be pumped away or only insufficiently	Centrifuge dirty	› Clean or replace the centrifuge
	Waster water line/siphon trap dirty	› Clean the waste water line/ siphon trap

* Only to be done by service technicians.

16 Transporting the unit

EN

WARNING

Infection due to contaminated unit

› Disinfect the unit before transport.

› Close all media connections.

Wear protective equipment to avoid any risk of infection (e.g. liquid-tight protective gloves, protective goggles, face mask).

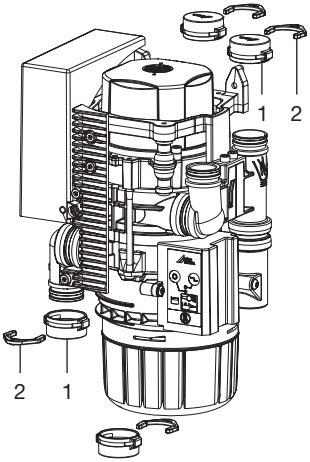
› Before disassembly, clean and disinfect the suction unit and the unit using a suitable disinfectant approved by Dürr Dental.

› Disinfect a defective unit using a suitable surface disinfection agent.

› Seal all connections with sealing caps.

› Pack the unit securely in preparation for transport.

16.1 Close CAS 1



1 Dummy bushing
2 Ring clamp

Appendix

17 Handover record

This document confirms that a qualified handover of the medical device has taken place and that appropriate instructions have been provided for it. This must be carried out by a qualified adviser for the medical device, who will instruct you in the proper handling and operation of the medical device.

Product name	Order number (REF)	Serial number (SN)

- ☐ Visual inspection of the packaging for any damage
- ☐ Unpacking the medical device and checking for damage
- ☐ Confirmation of the completeness of the delivery
- ☐ Instruction in the proper handling and operation of the medical device based on the operating instructions

Notes:

Name of person receiving instruction:	Signature:

Name and address of the qualified adviser for the medical device:

Date of handover:	Signature of the qualified adviser for the medical device:

Hersteller/Manufacturer:

DÜRR DENTAL SE
Höpfigheimer Str. 17
74321 Bietigheim-Bissingen
Germany
Fon: +49 7142 705-0
www.duerrdental.com
info@duerrdental.com

DÜRR DENTAL