

**Zentrales Saugsystem
EXCOM hybrid 1/2**

Gerätedokument
Einbau, Betrieb und Wartung

**Central Suction System
EXCOM hybrid 1/2**

Equipment Logbook
Assembly, operation and maintenance

**Système d'aspiration centralisée
EXCOM hybrid 1/2**

Livret d'appareil
Installation, fonctionnement et entretien

**Sistema centralizzato d'aspirazione
EXCOM hybrid 1/2**

Verbale d'installazione
Montaggio, funzionamento e manutenzione

EXCOM
h y b r i d

 **METASYS**

EN

Index · Explanation of the pictograms

Practice personnel / technicians

1. Index

The footnote found on each page defines the user group particular information is aimed at.

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2. Explanation of the pictograms



Information



Caution!



General warning sign



Follow instructions for use



On



Off



Protective Earth (Ground)



Dangerous voltage



High voltage



Caution, hot surface

3. General information



The safety, reliability and performance of the appliance is only guaranteed by METASYS if the following instructions are observed:

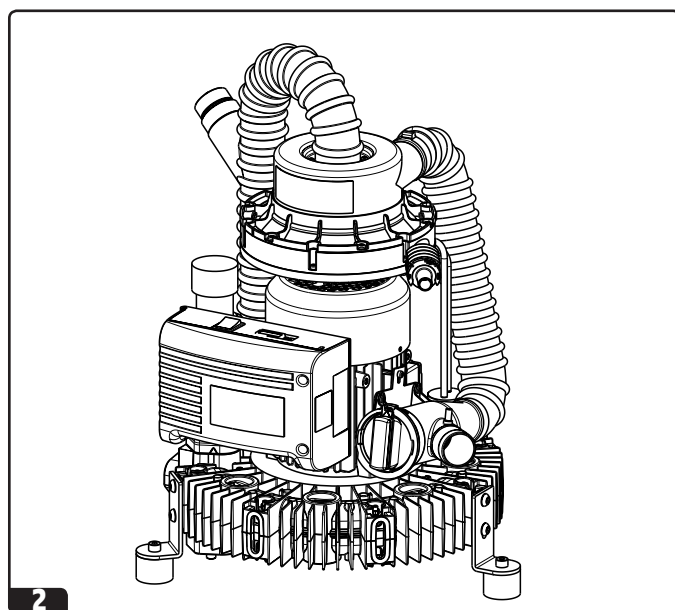
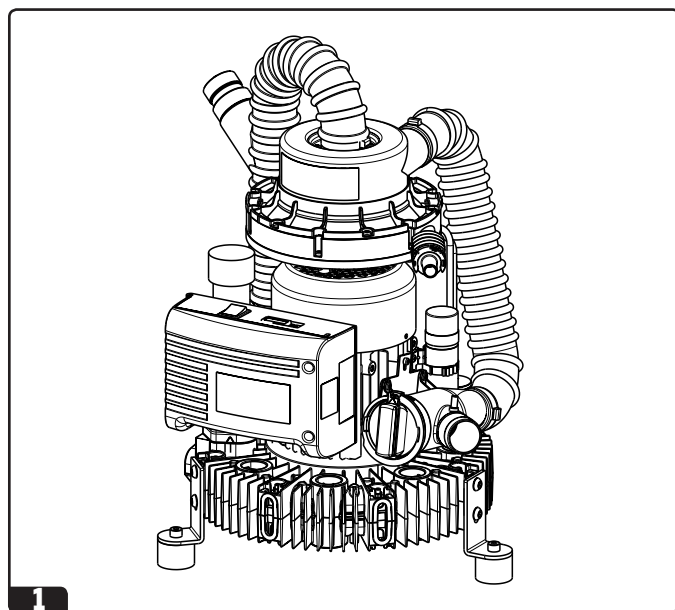
- EXCOM hybrid 1 / 2 are ME equipments externally powered, therefore Class I according to EN 60601-1.
- Assembly, alterations or repairs may exclusively be carried out by authorized service personnel in compliance with EN Standard 60601-1 (International Standard for Medical Electrical Apparatus, in particular Part 1: General Rules for Safety).
- The electrical installation must comply with the regulations of the IEC (International Commission for Electrical Engineering).
- The apparatus must exclusively be used in conformity with the instructions for installation, operation and maintenance.
- Only original parts may be used for repairs or replacements.
- All instructions issued by manufacturers of equipment for the treatment of patients which is connected to the suction engine must be observed.
- After commissioning, complete the proof of installation at the front page of this manual and send this to METASYS in order to define the warranty period.
- All inspection and service work must be entered into the device documentation at the first pages of this manual
- When requested by an authorized engineer, METASYS agrees to make all documents available for the use of technically qualified service personnel.
- METASYS accepts no responsibility for damages caused due to external factors, such as wrong installation, improper use of the apparatus or unauthorized technical intervention.
- Users must study equipment and assure themselves of its good condition before every use.
- Medical products should be treated with respect when it comes to electromagnetic compatibility and special safety measures must be taken. Special instructions concerning electromagnetic compatibility for medical products are given in our special leaflet EMV EN 60601-1-2, which can be found on our website under www.metasys.com/download.



The equipment is not suitable for use in explosive or combustible environment.

Use · Type overview

Practice personnel / technicians



4. Use

The METASYS EXCOM hybrid devices are central suction systems used in dental practices for centralised vacuum production, as well as the separation of air and liquids.

The EXCOM hybrid central suction system is a vacuum engine with integrated separation. It can be operated both as semi-wet or dry suction system.

Application specification

Intended medical indication	Dental treatment
Intended patient population	Dental patients
Intended part of the body or type of tissue applied to or interacted with	No direct contact with patients
Intended user profile	Dentists, educated dental personnel, technicians for maintenance
Intended conditions of use	Place: stationary installation in remote rooms for machinery in dental practices Environment: installation guidelines Frequency of use: during dental treatment, not permanently
Operating principle	Side channel blower pump for generation of vacuum with integrated separation

5. Type overview

1 EXCOM hybrid 1 - 230 V

EXCOM hybrid 1 is a central suction system with integrated air / water separation for simultaneous operation of 1 dental unit or for up to 2 dental units with 60% efficiency.

2 EXCOM hybrid 2 - 230 V

EXCOM hybrid 2 is a central suction system with integrated air / water separation for simultaneous operation of 2 dental units or for up to 3 dental units with 60% efficiency.

EN

6. Construction

3 See illustration

3.1 Suction engine with dynamic separation unit

The suction engine is a powerful dry vacuum engine operating according to the principle of the side channel vacuum pump. The dynamic separation unit centrally separates liquids and solids from the air stream without interruption of the suction's output. This eliminates the need for a separator in the dental unit.

3.2 Control unit

The control unit contains all electrical components to controlling and monitor the complete unit.

3.3 Air inlet valve + noise reducing item

The air inlet valve optimises the vacuum and protects the suction equipment from overheating. To prevent noise formation at the air inlet valve attach the noise reducing item included in the scope of delivery.

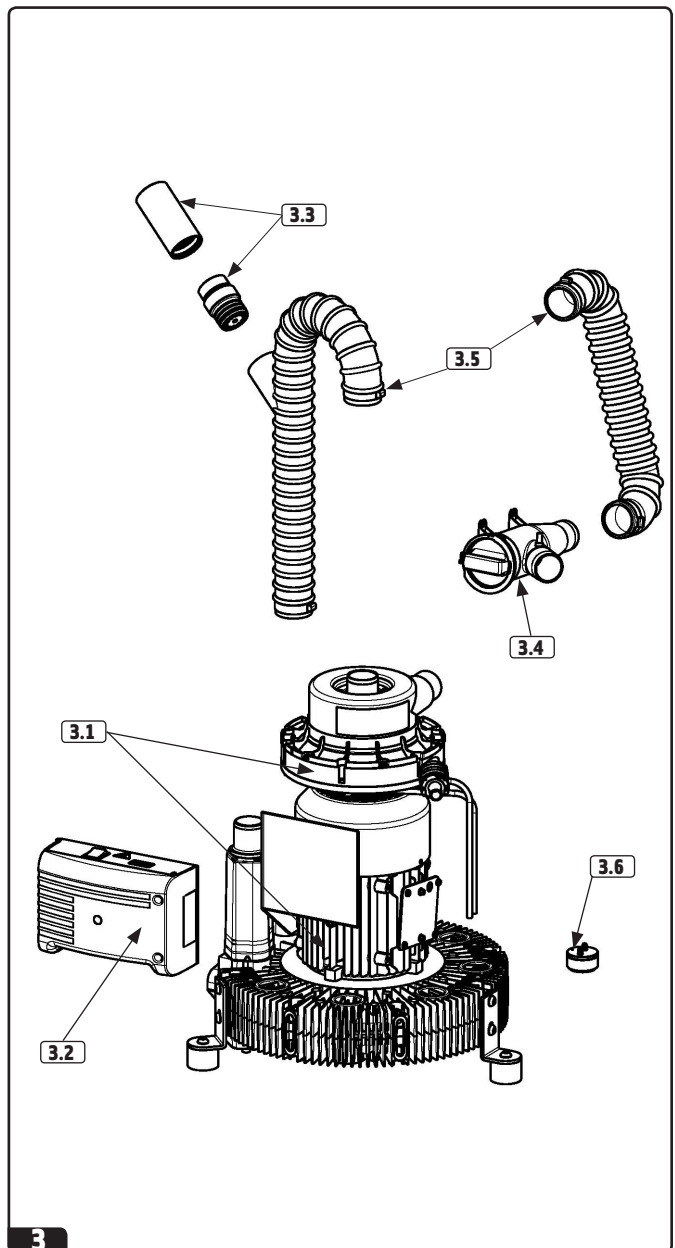
3.4 Prefilter

Coarse solid particles are held back in the prefilter.

3.5 Hose connections

3.6 Water collector

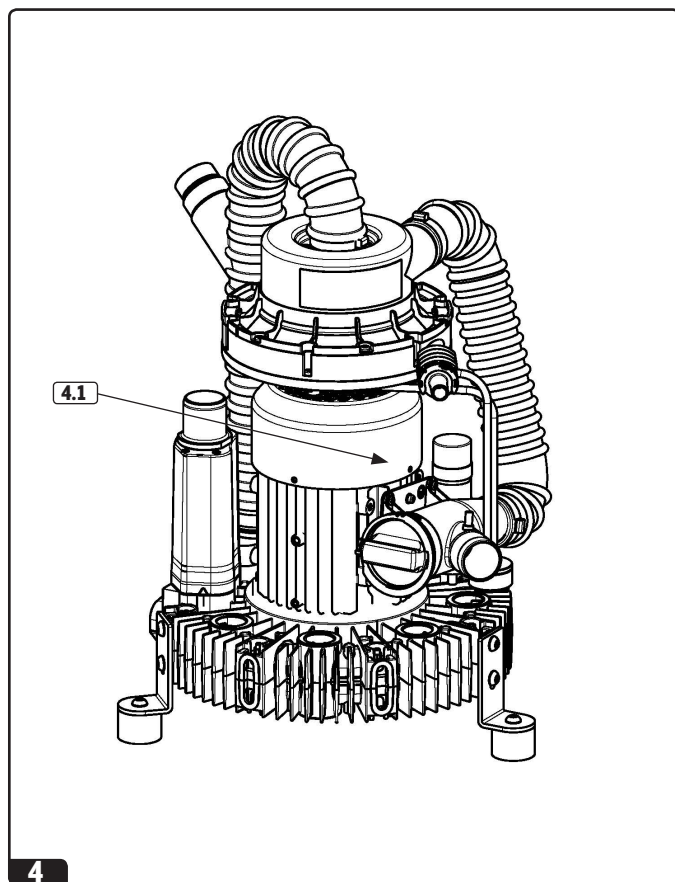
The water collector protects the suction pump from water backdraft and transports the water to the outlet, if necessary.



Explanation of the type plate

Practice personnel / technicians

EN



7. Explanation of the type plate

4 See illustration

The type plate can be found at the outside of the suction motor (4.1).

5 See illustration

5.1 Equipment type

5.2 Mains supply data

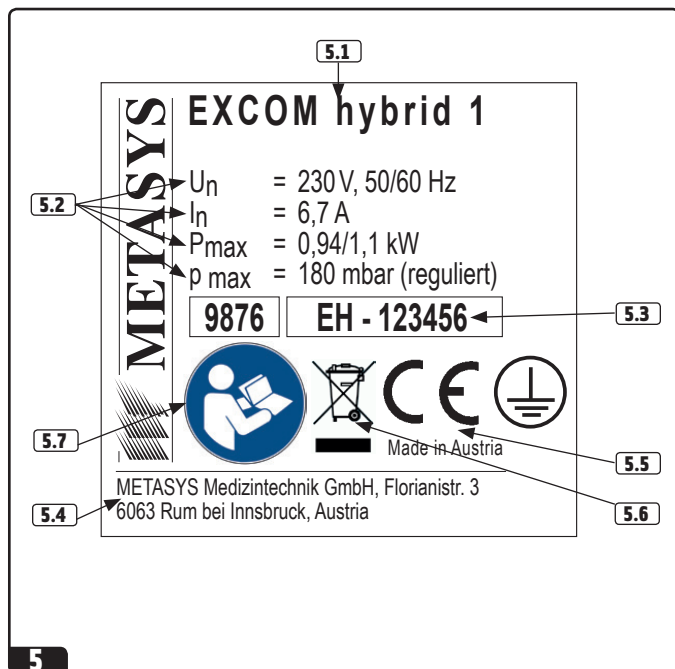
5.3 Serial number

5.4 Address of the manufacturer

5.5 CE conformity mark

5.6 Separate collection electrical/electronic equipment

5.7 Follow instructions for use



Technical data

Practice personnel / technicians

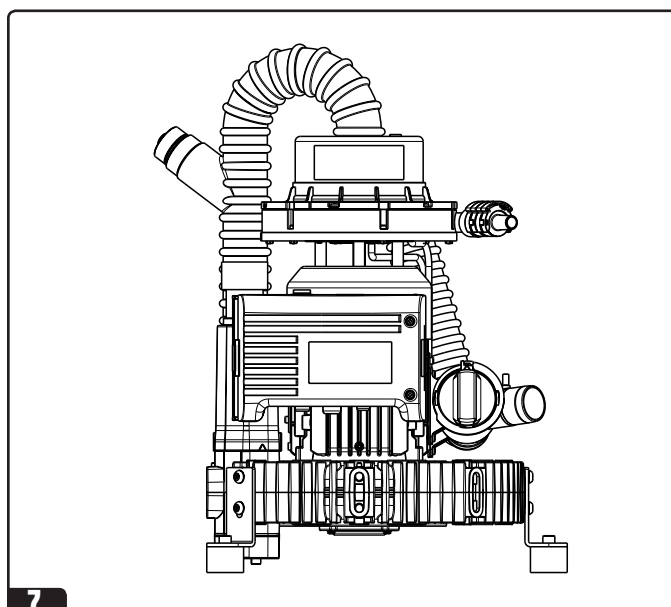
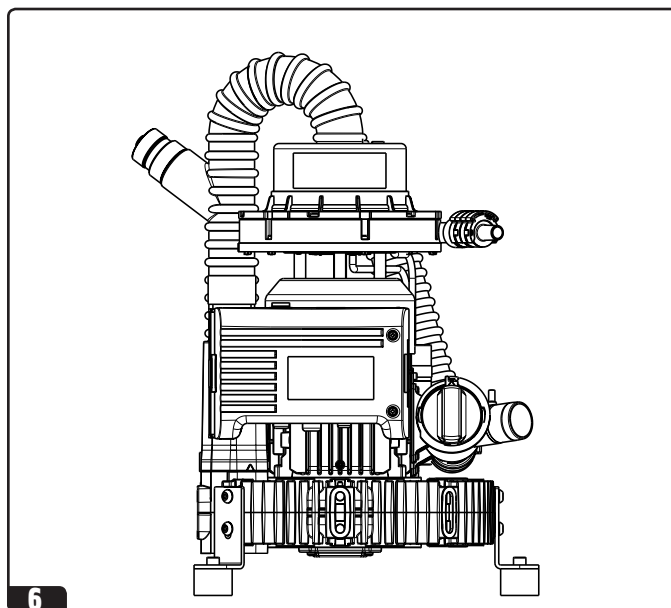
8. Technical data

6 EXCOM hybrid 1

Mains voltage	230 V AC
Frequency	50 / 60 Hz
Max. current consumption	6,7 A
Electrical shaft power	0,94 / 1,1 kW
Max. ambient temperature	40° C
Suction volume	1100 / 1300 l/min
Water flow	0,5 l/min
Vacuum, regulated	180 mbar
Operating time	100 %
Weight	22 kg
Noise level	57 / 62 dB(A)
Dimensions (H x W x D) mm	570 x 422 x 400

7 EXCOM hybrid 2

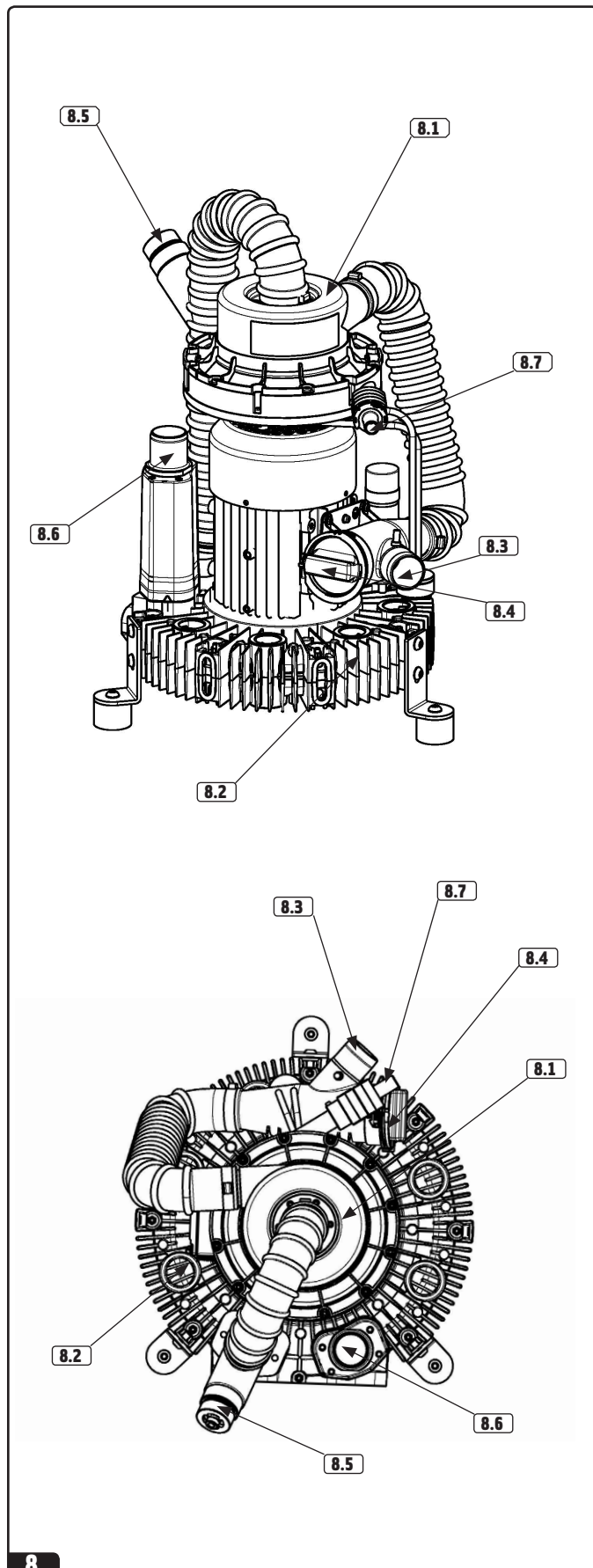
Mains voltage	230 V AC
Frequency	50 / 60 Hz
Max. current consumption	6,7 A
Electrical shaft power	1,1 / 1,3 kW
Max. ambient temperature	40° C
Suction volume	1450 / 1750 l/min
Water flow	1,0 l/min
Vacuum, regulated	180 mbar
Operating time	100 %
Weight	27 kg
Noise level	58 / 63 dB(A)
Dimensions (H x W x D) mm	580 x 450 x 400



EN

Description of function

Practice personnel / technicians



9. Description of function

8 See illustration

On removing a suction hose from its suction tube holder of the dental chair, the dynamic separation (8.1) and the EXCOM hybrid central system suction engine (8.2) start. After the vacuum has been developed, the optionally available place selection valve for the treatment place in use opens. The water from the cuspidor or spittoon runs through the spittoon bowl into the suction hose, which also starts the EXCOM hybrid central suction system through the spittoon valve (item no. 40050002).

The mixture of liquids, solids and air sucked from the dental units flows through the suction connection (8.3) and prefilter (8.4) into the separation chamber (8.1). The mixture is accelerated into a circular movement by the rapidly rotating impeller blades. The liquids and solids are tangentially centrifuged, whilst the air flows through the blade shafts into the hose connection with the air inlet valve (8.5) into the suction engine (8.2). The dry air is discharged via the optional bio-filter into the atmosphere through the exhaust air connection (8.6). The factory-made follow-up time of the dynamic air / water separation and of the suction motor is approx. 60 seconds. This can be extended according to the installation situation.

The centrifuged liquids and solid particles smaller than the mesh of the prefilters (8.4) are either led into the normal sewage system via the water outlet (8.7) and the drainage connection or directed into an amalgam separator (METASYS ECO II or METASYS ECO II Tandem).

Installation guidelines

Practice personnel / technicians

10. Installation guidelines

- The EXCOM hybrid suction system is designed to be installed only in dry, adequately ventilated rooms.



Its use in areas subject to explosive and fire hazards is not permitted.

- The operating temperature ranges from between +10° C and +35° C. The relative humidity must not exceed 70%.
- The storage and transport temperature ranges from between +0° C and 70° C. The relative humidity must not exceed 80%.
- In case of a room temperature of more than +35° C, a fan must be installed for additional ventilation.
- Installation can be on the same level as the dental units, in a side room or one floor lower.
- In order to avoid vibrations, the suction system must be installed on a firm base.
- The maximum altitude is 3000 m.

9 See illustration

When the EXCOM hybrid suction system is installed, the connection side must be placed at least 150 mm from the wall so that the hoses can be connected.

10 See illustration

The front of the device must be easily accessible. If the EXCOM hybrid system is installed with the covering hood, nothing must be placed on top of it. To allow the removal of the covering hood, a free space above equal to the equipment's height equal to half its width at the sides is required. There must be clear space of approx. 50 mm around the device to guarantee adequate air circulation.



**Do not lift the device at separation!
While the suction is used, the device must not be switched off at the main switch!**

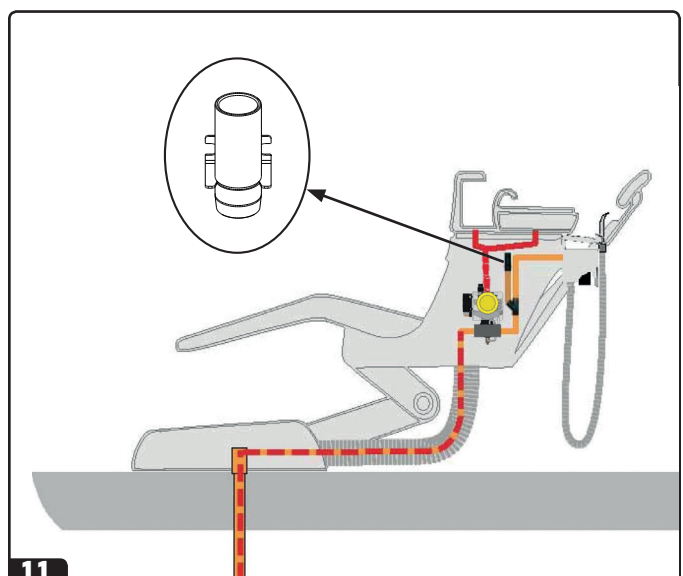
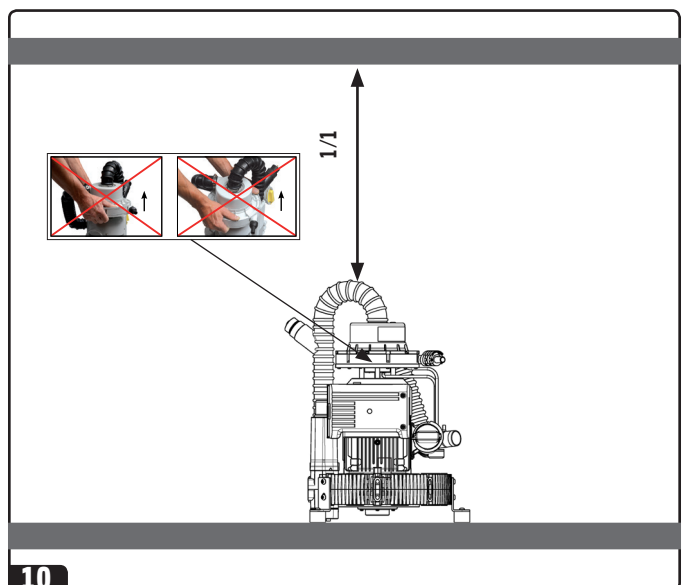
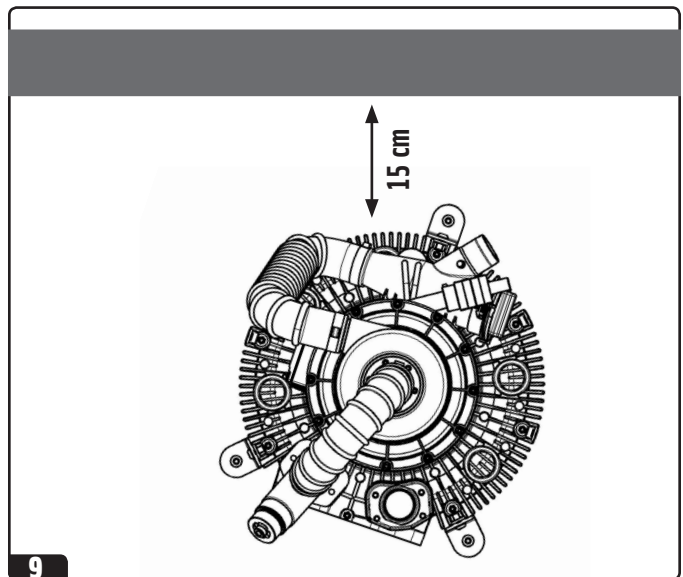
11 Air inlet valve (item no: 40040006)

The suction power of a central suction system can fluctuate if only the spittoon valve without a suction cannula is operated. This can affect the transport of the liquids. To optimize the transport of liquids, an air inlet valve needs to be installed in the dental unit. This ensures an air flow of approx. 100 l/min during operation. This measure guarantees the safe transport of waste water from the spittoon bowl through the suction pipes.

Pipe and hose installation:

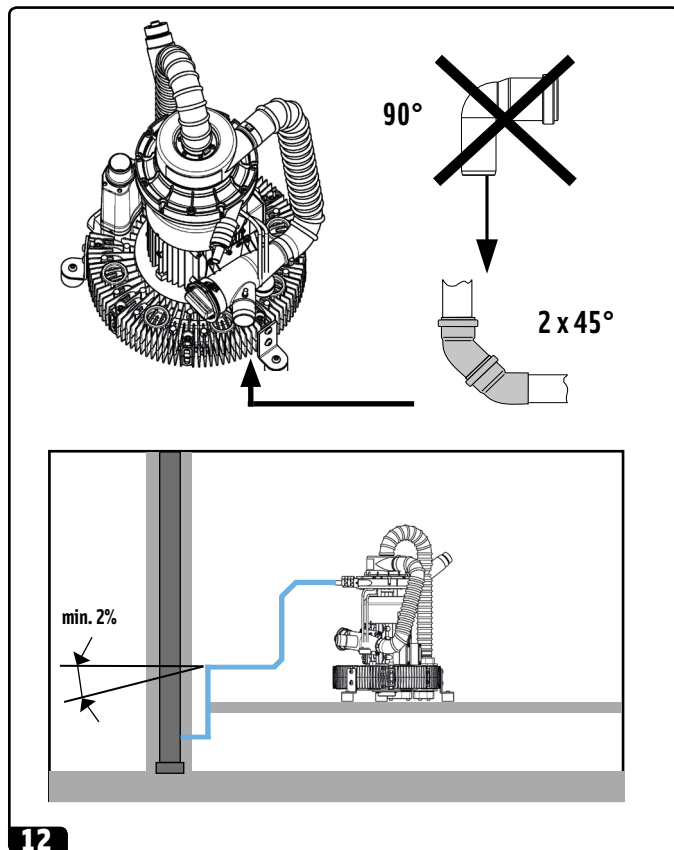


Any pipe or hose used must be vacuum tight and resistant to all chemicals normally used in a dental practice (e.g. HT discharge pipes made from PP, PVC-C, PVC-U, PE-HD).



Installation guidelines · Hose connections · Electrical connections

Practice personnel / technicians



12

10. Installation guidelines

12 See illustration

- Only flexible spiral hoses made from PVC or equivalent materials may be used.
- Connections to the EXCOM hybrid central suction system must be made by flexible hoses and be as short as possible.
- We recommend a pipe diameter of 40 mm. Avoid right-angle bends in order not to lose suction power (recommendation: 2 x 45° degree bends).
- Discharge pipes must meet applicable local legislation or DIN 1986, Parts 1 and 2.
- Waste water must be allowed to drain off freely without any backup. Waste water pipes must have a hydraulic gradient of at least 2 %.
- The air must be discharged out-of-doors. For reasons of hygiene and in order to avoid noise pollution we recommend that the outgoing air connection is fitted with a bio-filter.
- The diameter of the discharged air connection must be equal to or bigger than the diameter of the suction connection.

11. Hose connections

13 See illustration

13.1 Connection for the suction hose (from the dental units):
40 mm diameter

13.2 Connection for exhaust air:
EXCOM hybrid 1/2: 40 mm diameter

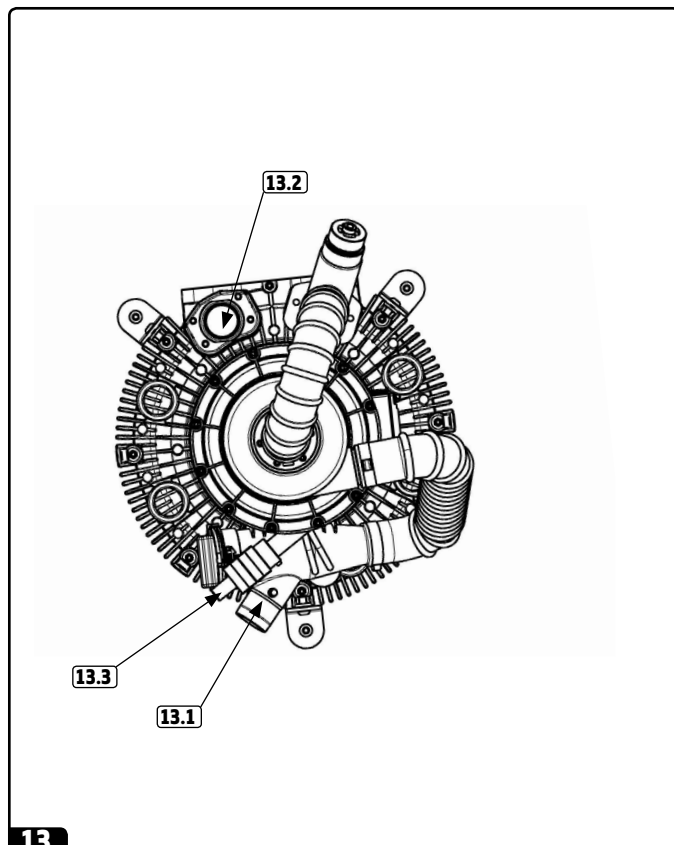
13.3 Connection for waste water (clean water discharge):
15 mm diameter. It is possible to change the outlet size with different adapters to different sizes/diameters.



All hose connections must be secured with hose clamps!
For the exhaust air connections only heat-resistant ($\geq 130^\circ \text{C}$) hose and pipe material must be used.



In case of water discharge at the water collector all connections, especially the water discharge pipe, must be checked.



13

12. Electrical connections

Mains connection:

The mains connection must only be carried out by a trained electrician. The electrical installation must be carried out in accordance with applicable local regulations. Before connecting with the mains, the nominal voltage stated on the type plate on the equipment must be compared with the mains voltage. The EXCOM hybrid suction system must only be connected to the power supply with the supplied power cable. Extension cables must not be used.

Electrical connections

Practice personnel / technicians

12. Electrical connections

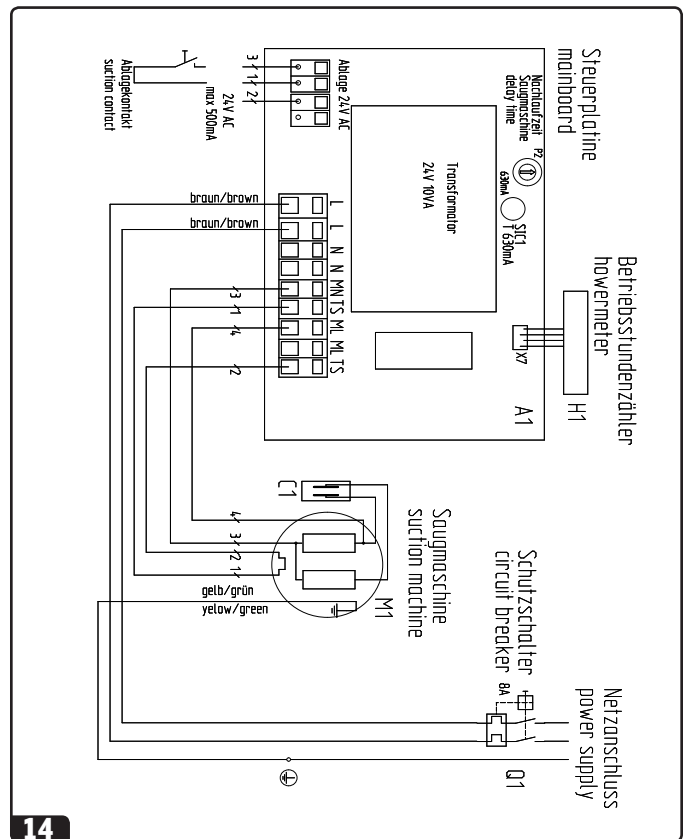
The electrical connections must be carried out observing all technical regulations concerning the setup of low voltage systems in areas used for medical purposes.



The motor connection cable must be laid in such a way that it does not come into contact with hot surfaces. The motor connection cable may not contact hot surfaces!

- Before start-up, check the mains voltage against the voltage indicated on the model identification plate.
- When connecting to the mains electricity supply, ensure that the circuit is fitted with an allpole disconnect switch (all-pole switch)
- Suction units can only be connected to the mains power supply using a fixed cable connection.
- Replacement of supply cord only by authorized person according to EN 60601-8.11.3
- The suction unit is operated using the controller located in the external control box.

Circuit protection: automatic cutout 16 A, characteristics C according to EN 60898



14

Main switch

Connections to the mains, 230 V, must be done after the office' main switch.

The suction unit is operated using the circuit breaker located in the control box. Do not position the suction machine in a way that it is difficult to operate the circuit-breaker. The control box must be easy reachable for the shutdown of the suction unit.

14 Circuit diagram EXCOM hybrid 1/2 - 230 V

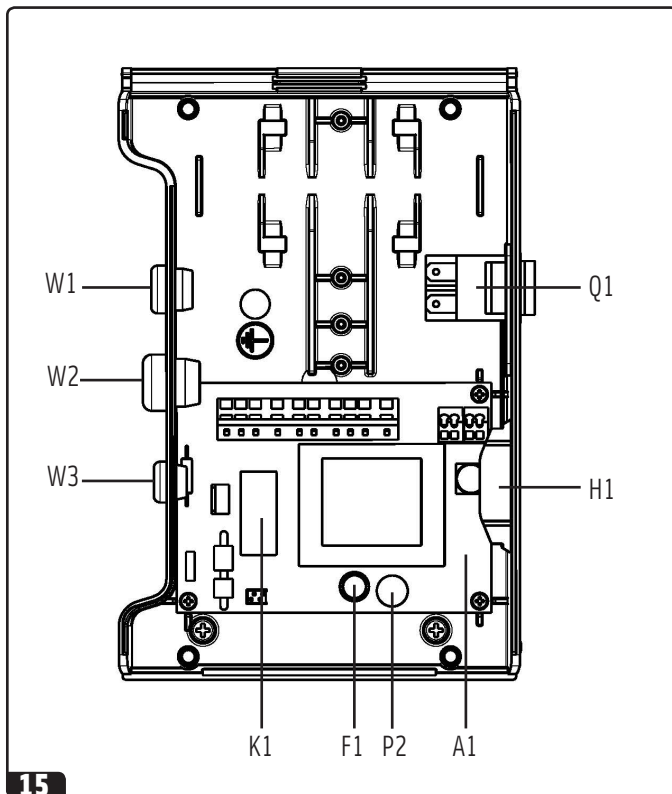
Legend:

A1	control circuit board EXCOM	
C1	condensator	
H1	hour meter	
M1	suction motor	
Q1	protection switch	In = 8 A Un = 240 V Icu = 2 KA
SIC1	fuse	In = 0,630 A Un = 250 V Icu = 35 A
P2	follow-up time	

EN

Electrical connections · Connection of the ECO II with EXCOM hybrid

Practice personnel / technicians



12. Electrical connections

Starting signal at the suction tube holder:

The control cable for the starting signal at the suction tube holder is already connected internally by a 2 pole cable, 3 metres long. The suction system starts when the two contacts are connected. The control cable is to be properly fixed into a junction box.

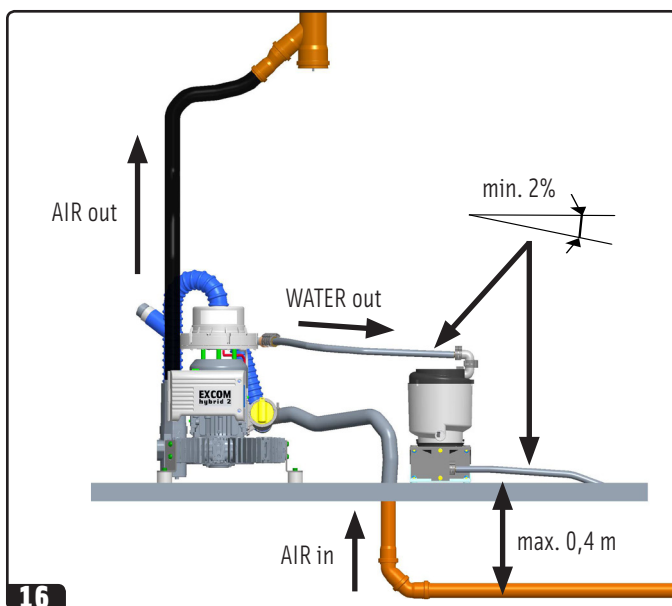
Follow-up time:

The factory-made follow-up time of the suction system is approx. 60 seconds. By turning the knob R1 on the timing relay, this running time can be adjusted.

15 EXCOM hybrid 1/2

Legend:

A1	control circuit board EXCOM	
F1	fuse (0,63 A) SIC1	In = 0,630 A Un = 250 V Icu = 35 A
H1	hour meter	
K1	motor contactor	
Q1	protection switch	In = 8 A Un = 240 V Icu = 2 KA
W1	main power supply	
W2	control cable - suction motor	
W3	control cable - sucking contact	
P2	Follow-up time	

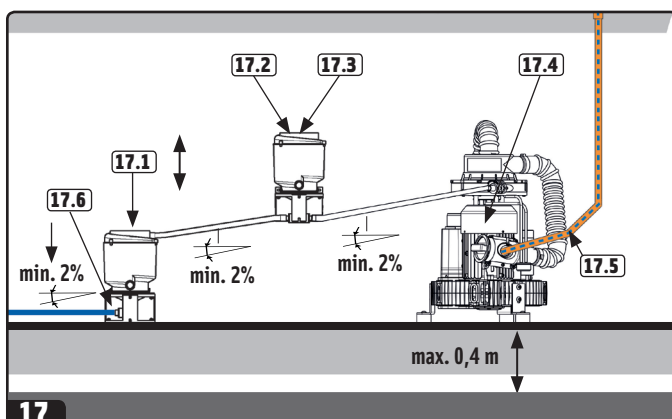


13. Connection of the ECO II/ECO II Tandem with EXCOM hybrid

16 Connection of the sewerage tubes and pipes

17 Optional installation expansion container

In case of high volumes of liquid and spontaneously fulminating large quantities of water, an expansion container (item no. 40040014) needs to be installed between the suction system EXCOM hybrid and the amalgam separator ECO II/ECO II Tandem.



- 17.1 amalgam separator
- 17.2 expansion container
- 17.3 vent valve
- 17.4 suction system
- 17.5 air in
- 17.6 water out

Maintenance, cleaning and disinfection with GREEN&CLEAN M2 and/or GREEN&CLEAN CL

Practice personnel / technicians

14. Maintenance, cleaning and disinfection with GREEN&CLEAN M2 and/or GREEN&CLEAN CL

18 See illustration

After every treatment, the spittoon bowl must be rinsed thoroughly!

19 See illustration

Suck off some water with each of the suction tubes after every treatment!

20 See illustration

Twice a day, after having sucked off some water, use the disinfectant for suction systems and amalgam separators GREEN&CLEAN M2 (item no: 60010201) or the cleanser GREEN&CLEAN CL (item no: 60010301). Ideally a disinfection with GREEN&CLEAN M2 or a cleaning with GREEN&CLEAN CL should be carried out before longer periods of downtimes of the dental unit (e.g. lunch break, end of the working day or holidays).

21 See illustration

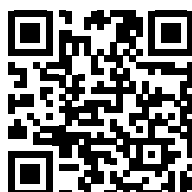
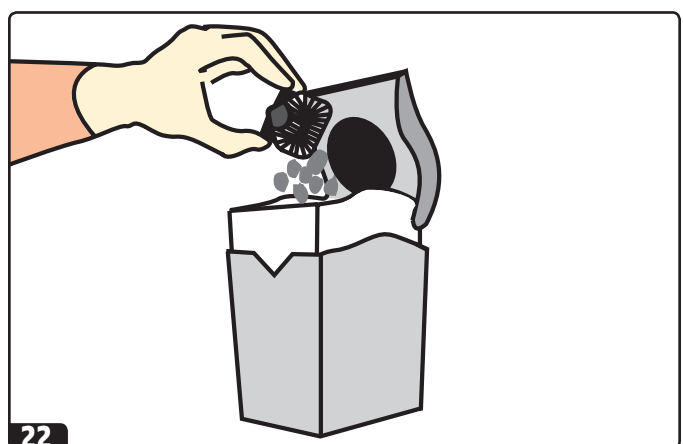
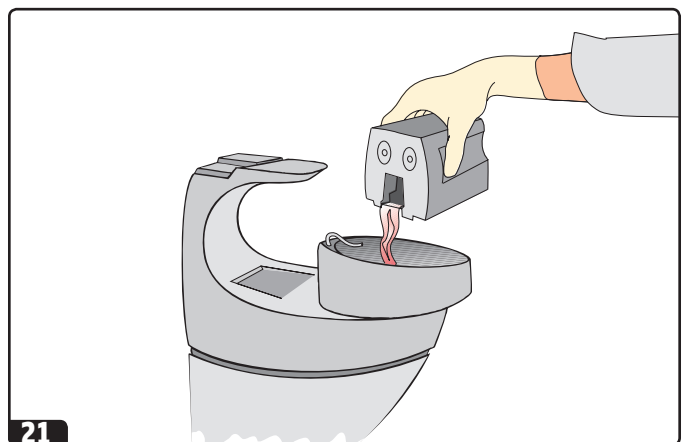
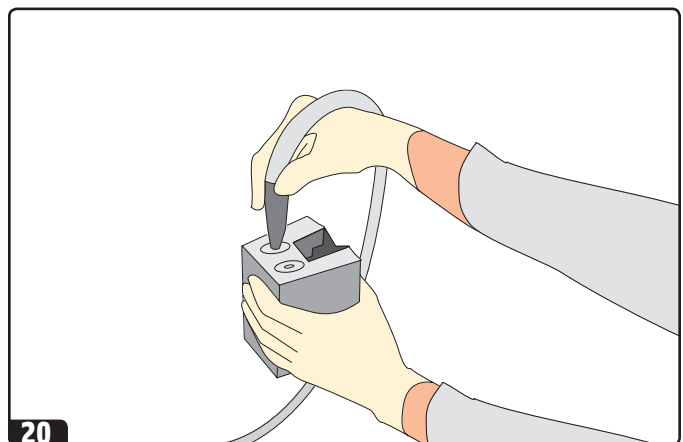
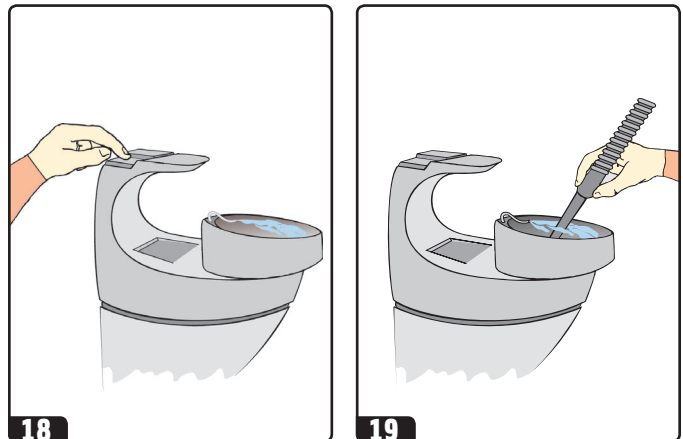
The spittoon bowl should also be rinsed with GREEN&CLEAN M2 or GREEN&CLEAN CL twice a day.

Cleaning the prefilter:

At least once a week clean and empty the prefilter. The cleanout can also be carried out more frequently if necessary.

22 See illustration

Any residues from the prefilter, which might contain amalgam, must be collected in a suitable container (e.g. METASYS ECO CENTER) and disposed off properly with ECO TRANSFORM.



www.youtube.com/user/METASYSMedizintech

EN

Commissioning

Practice personnel / technicians



15. Commissioning

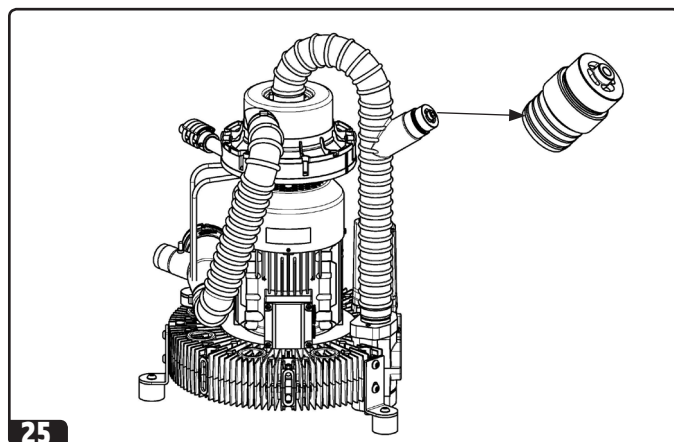
23 See illustration

- Switch on the office and the equipment main switch.



24 See illustration

- Remove the suction hose from its holder.
- Check that all hose connections and other connections in the suction pipe are airtight.



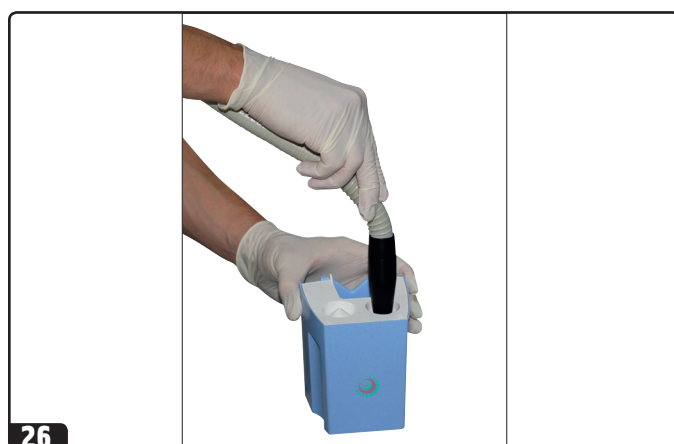
25 Adjust the air inlet valve - see illustration

- The suction flow at the large suction tube should be at least 300 l/min.
- Adjustments cannot be made! Any adjustments done lead to a loss of warranty. The underpressure needs to be measured at the connection „Air in“ with a underpressure measuring device*.

* Digital manometer item no.: 40400005

Protective covering for manometer item no.: 40400006

Negative pressure with air inlet valve: 180 (-20) mbar



26 See illustration

- Suck 3 litres of water and check that the EXCOM hybrid central suction system is operating correctly.
- Undertake electrical safety checks as required by local legislation, and record that the checks have been made.

Maintenance · Disposal of the equipment

Practice personnel / technician

16. Maintenance

27 See illustration

The following filters must be checked and cleaned every week:

- The filter at the suction tube holder, at the dental unit as well as inside the suction line (not illustrated).
- The filter at the spittoon bowl and on the spittoon valve **27.1**
- The filter on the suction machine **27.2**

Cleaning the filters:

The prefilters must be cleaned at least once a week. However, depending on the method of working, this may be necessary every day. A clogged prefilter is perceivable by a reduction of suction power.

Exhaust air filter:

The optional exhaust air biofilter must be changed at least once a year.

17. Disposal of the equipment

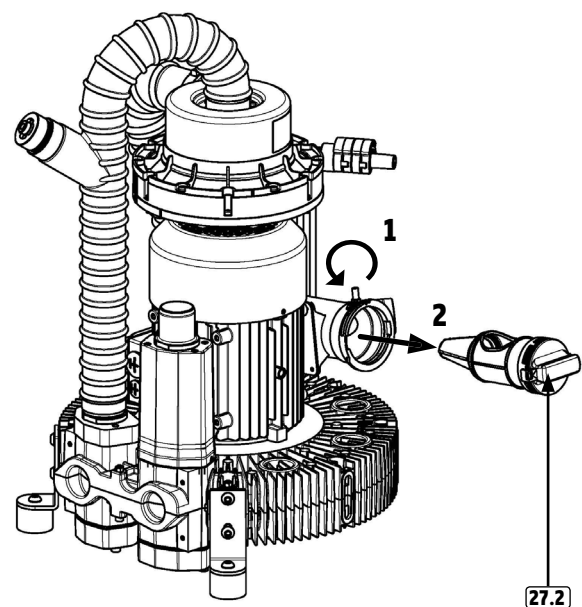
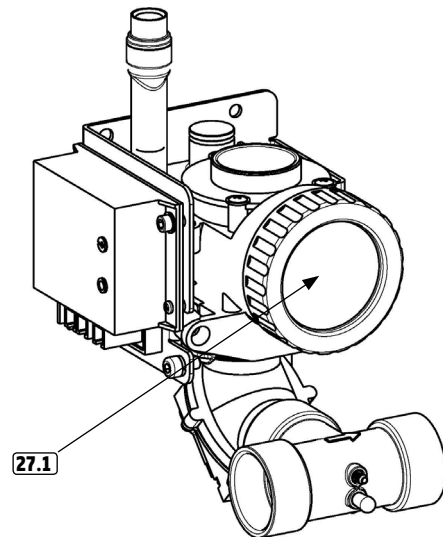


The devices may be contaminated. Please inform the disposal company of this so that the necessary precautions can be taken.

Disposal of amalgam separator components, such as sieves, filters, hoses etc., must also comply with local regulations.

Untaminated plastic components of the suction system may be recycled.
The built-in control unit, electronic circuit boards and components may be disposed of as electro-technical scrap. Other metal components may be disposed of as ordinary metal scrap.

If the device is returned, for example to the dealer or METASYS Medizintechnik GmbH, all connections must be sealed so that they are watertight.



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EN

METASYS ... makes the difference!

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