META Tower
Gerätedokument
Einbau, Betrieb und Wartung

META Tower
Equipment Logbook
Assembly, operation and maintenance

EN

META Tower
Livret d'appareil
Installation, fonctionnement et entretien

META Tower
Verbale d'installazione
Montaggio, funzionamento e manutenzione

META TOWER

METASYS

Table of contents · Explanation of pictograms

Practice personnel, technicians

EN

1. Table of contents

The groups of people to which the relevant range of tasks applies are listed in the header.

2. Explanation of pictograms

Information

Caution!

General warning sign

Refer to instruction manual/booklet

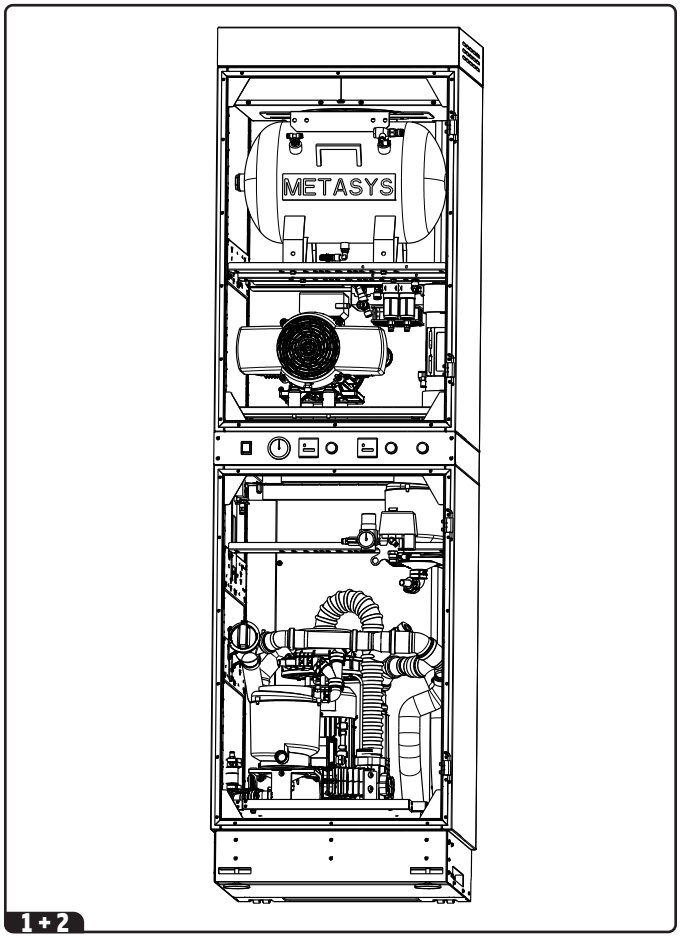
3. General instructions

METASYS can only guarantee device safety, reliability and performance if the following instructions are adhered to:

- Assembly, modifications and repairs may only be carried out by authorised specialized personnel who guarantee that standard EN 60601-1 (international standard regarding medical electrical equipment, in particular part 1: General requirements for basic safety) is adhered to.
- The electrical installation must correspond to the regulations of the IEC (International Electrotechnical Commission).
- The device is only to be used in accordance with the installation, operating and maintenance instructions.
- When carrying out repairs or replacing parts, only original spare parts may be used.
- 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
- On request by an authorised technician, METASYS shall be happy to make available all documentation that may be of use to technically qualified personnel during the servicing and repair of device parts.
- METASYS accepts no responsibility for damage that may arise due to external influences (defective installation), using incorrect information, improper use of the device or repairs being carried out improperly.
- The user must familiarise himself/herself with how to operate the device and ensure that the device is in good condition each time before operating it.
- When the suction machine or the compressor on the META Tower is disassembled at the end of its service life, it must be returned to the manufacturer for correct disposal.
- All manufacturer specifications of the dental units to which the META Tower is connected must be observed.
- Retain the confirmation of disposal of amalgam sludge in accordance with state law.

The device is not suitable for operation in explosive areas or in flammable atmospheres.

Practice personnel, technicians



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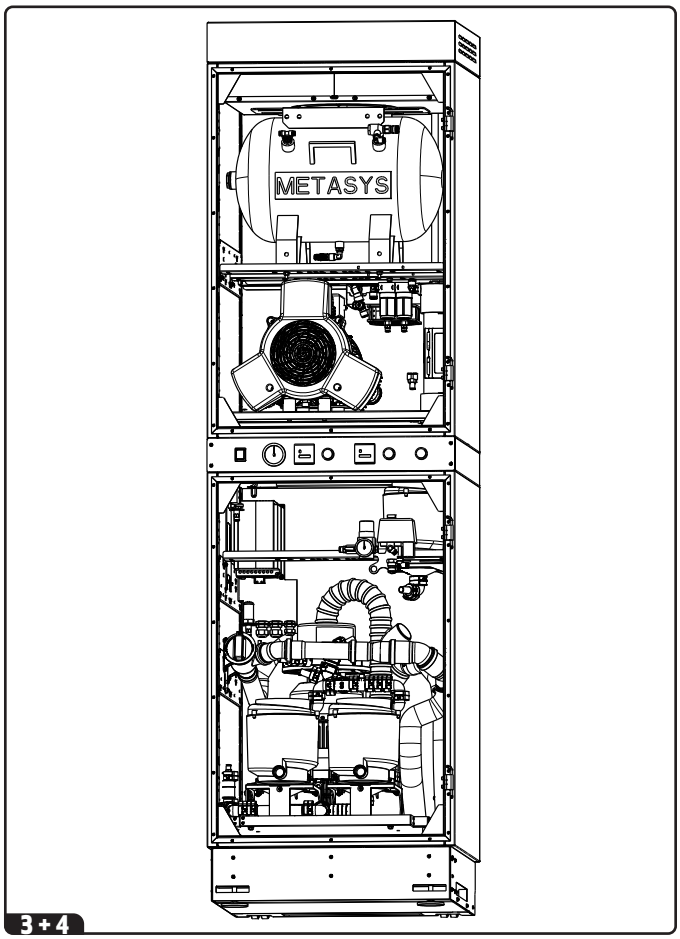


3 + 4

4. Use

The META Tower is a combination of suction system (EXCOM hybrid), compressed air (META Air) and amalgam separation (ECO II).

Suction

The suction system with integrated separation that is installed in the META Tower is separating the fluids and solids that are suctioned during a dental treatment. Separation within the dental unit is therefore no longer required.

This central suction system with integrated separation is intended to operate one or several dental units.

Compressors

The compressor in the META Tower produces dry and filtered compressed air as required to operate dental units or similar applications.

Amalgam separation

The METASYS ECO II / ECO II Tandem are amalgam separators on sedimentation base that are installed after the central suction system in the META Tower.

5. Type overview

1 META Tower 2

The META Tower 2 combines a central suction system with integrated separation and compressed air generation to operate 2 dental units or up to 3 dental units at 60 % capacity.

2 META Tower A2

The META Tower A2 combines a central suction system with integrated separation, compressed air generation and amalgam separation to operate 2 dental units or up to 3 dental units at 60 % capacity.

3 META Tower 5

The META Tower 5 combines a central suction system with integrated separation and compressed air generation to operate 3 dental units or up to 5 dental units at 60 % capacity.

4 META Tower A5

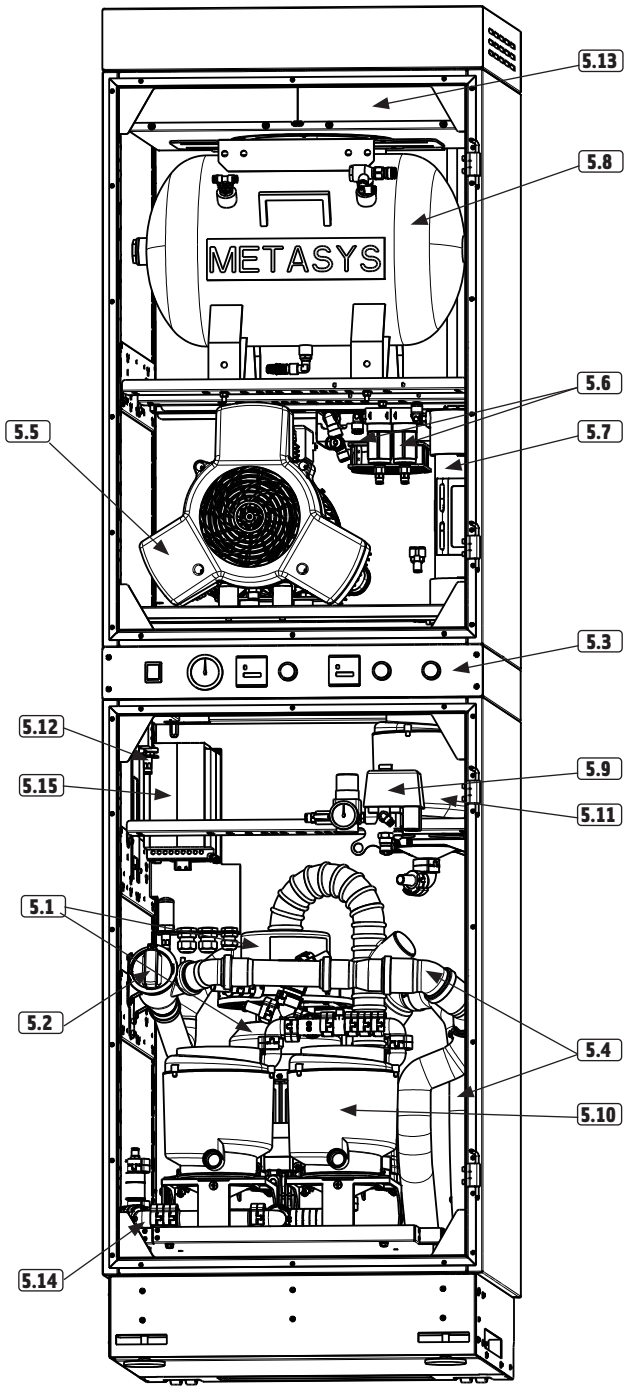
The META Tower A5 combines a central suction system with integrated separation, compressed air generation and amalgam separation to operate 3 dental units or up to 5 dental units at 60 % capacity.

6. Construction

5 See illustration

META Tower A5

- 5.1 Suction system with dynamic separation
- 5.2 Pre-filter
- 5.3 Control box
- 5.4 Hose connection for air and exhaust air
- 5.5 Compressor
- 5.6 Cooler / pre-filter
- 5.7 Dryer
- 5.8 Tank
- 5.9 Pressure switch
- 5.10 Amalgam separator (only for models A2 / A5)
- 5.11 Expansion tank (only for models A2 / A5)
- 5.12 Drain pressure monitor
- 5.13 Tower fan
- 5.14 Drain pipe
- 5.15 Frequency converter (only for META Tower 5/A5)



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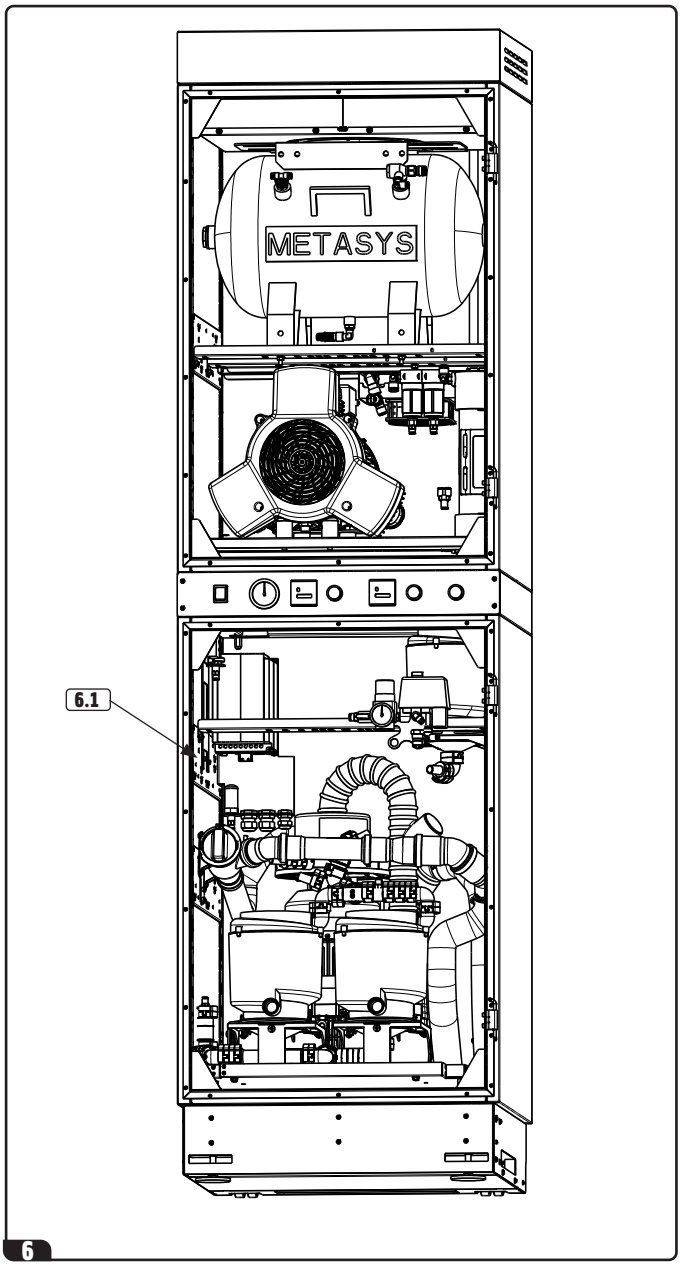
Explanation of the type plate

Practice personnel, technicians



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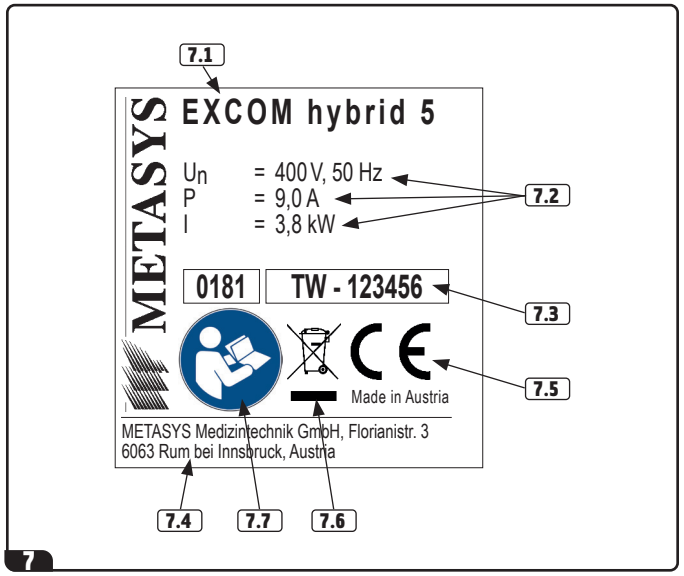

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7. Explanation of the type plate

6 See illustration

On the META Tower 2 / 5 / A2 / A5, the device type plate is on the inside of the bottom housing, next to the pressure monitor 6.1.

7 See illustration

- 7.1 Device description
- 7.2 Connection data
- 7.3 Serial number
- 7.4 Manufacturer's address
- 7.5 CE conformity mark
- 7.6 Separate collection of electrical/electronic devices
- 7.7 Refer to instruction manual/booklet

Technical data

Practice personnel, technicians

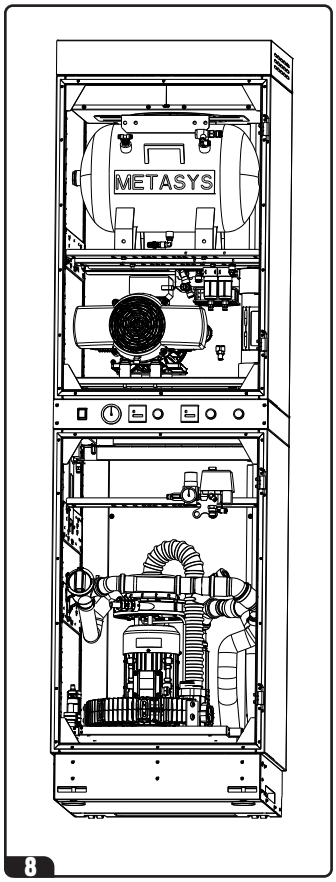
8. Technical data

8	META Tower 2	
Power supply	230 V AC	400 V AC
Frequency	50 Hz	50 Hz
Max. current consumption	17,3 A	9,0 A
Max. electric motor power	2,7 kW	2,54 kW
Max. ambient temperature	40° C	40° C
Operating time	100% (60%) / Compressor 70%	100% (60%) / Compressor 70%
Tank capacity	30 l	30 l
Sound level	53 dB(A)	53 dB(A)
Weight	222 kg	222 kg
Dimensions (H x W x D) mm	2130 x 600 x 600	2130 x 600 x 600

9	META Tower A2	
Power supply	230 V AC	400 V AC
Frequency	50 Hz	50 Hz
Max. current consumption	17,3 A	9,0 A
Max. electric motor power	2,7 kW	2,54 kW
Max. ambient temperature	40° C	40° C
Operating time	100% (60%) / Compressor 70%	100% (60%) / Compressor 70%
Tank capacity	30 l	30 l
Sound level	53 dB(A)	53 dB(A)
Weight	223 kg	223 kg
Dimensions (H x W x D) mm	2130 x 600 x 600	2130 x 600 x 600

10	META Tower 5	
Power supply	230 V AC	400 V AC
Frequency	50 Hz	50 Hz
Max. current consumption	22,2 A	9,0 A
Max. electric motor power	3,8 kW	3,8 kW
Max. ambient temperature	40° C	40° C
Operating time	100% (60%) / Compressor 70%	100% (60%) / Compressor 70%
Tank capacity	30 l	30 l
Sound level	54 dB(A)	54 dB(A)
Weight	224 kg	224 kg
Dimensions (H x W x D) mm	2130 x 600 x 600	2130 x 600 x 600

11	META Tower A5	
Power supply	230 V AC	400 V AC
Frequency	50 Hz	50 Hz
Max. current consumption	22,2 A	9,0 A
Max. electric motor power	3,8 kW	3,8 kW
Max. ambient temperature	40° C	40° C
Operating time	100% (60%) / Compressor 70%	100% (60%) / Compressor 70%
Tank capacity	30 l	30 l
Sound level	54 dB(A)	54 dB(A)
Weight	225 kg	225 kg
Dimensions (H x W x D) mm	2130 x 600 x 600	2130 x 600 x 600



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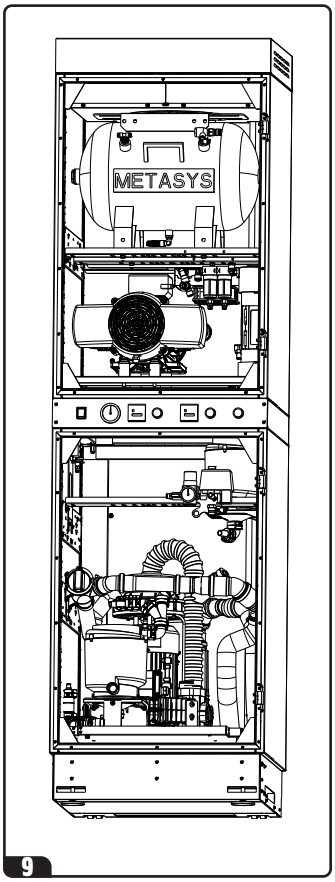

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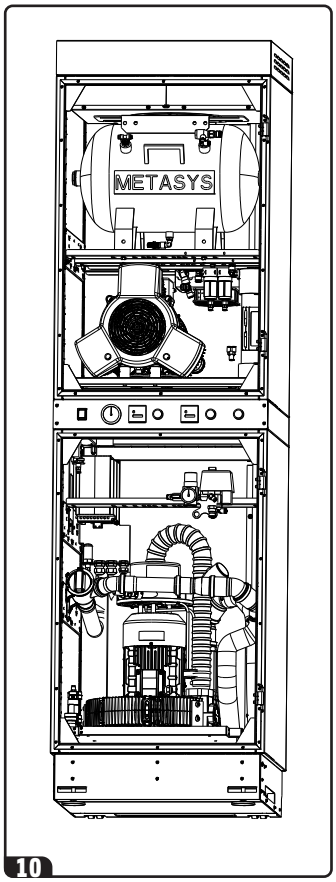

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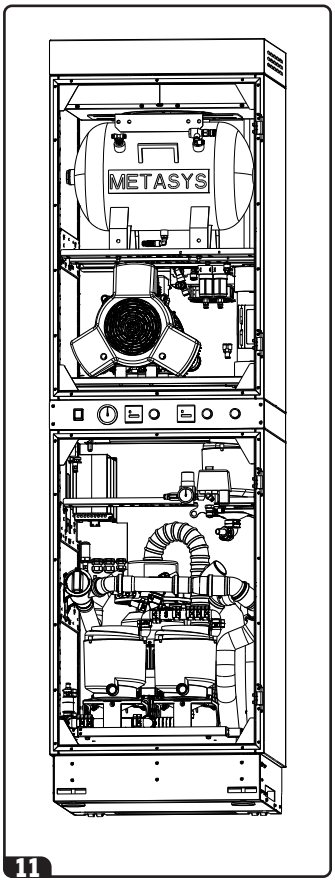

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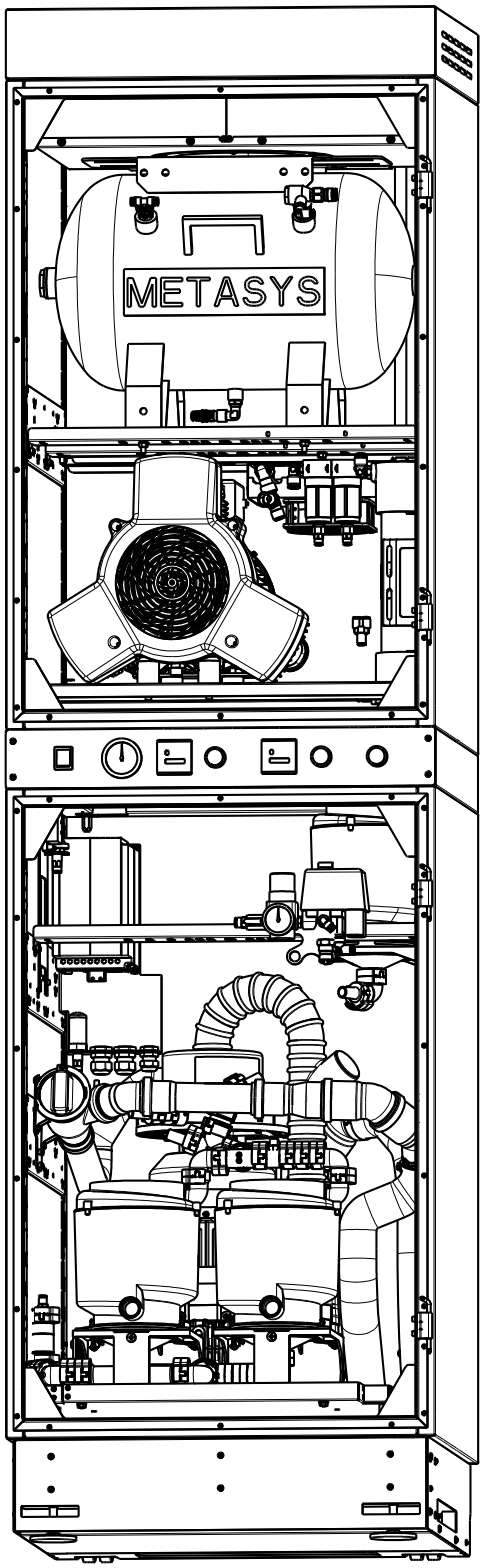

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9. Functional description

The detailed functional descriptions for the devices that are installed in the META Tower are provided in the single device manuals and in the download area on www.metasys.com.

Compressor

The compressor sucks air in from the atmosphere through the suction filter. The air is compressed in an oil-free compression chamber and fed to the tank through the cooler and the dryer. The compressor is controlled by a pressure switch that controls ON/OFF mode.

Dryer

The pre-dried, filtered air is fed via the membrane dryer. The residual moisture is collected by the membrane fibres and the dried air enters the tank.

Suction machine

The suction machine starts after picking up the suction hose from the hose support on the dental unit or via the spittoon valve, and supplies the relevant dental unit with the required suction power.

Amalgam separator (only for models A2 / A5)

The ECOII/ECOII Tandem amalgam separators are installed in the waste water outlet after the suction machine. Their task is to separate and collect the heavy metals and components containing amalgam. They work according to the sedimentation principle.

10. Storage and transport conditions

The META Tower is delivered separately, on a pallet, wrapped in film and secured with plastic straps.

The META Tower must be protected against moisture, dirt and external temperatures during transport. The packaged META Tower must be stored in a dry place so that it is protected against moisture (max. relative air humidity: 70%). The storage temperature must be between -10°C and +40°C.

⚠ **The META Tower must be depressurised when being transported. Before transporting, the tank's compressed air and the hoses must be bled and condensation drained if necessary.**

11. Installation guidelines

- After unpacking the META Tower, it must be inspected carefully in order to ensure that it is in perfect condition.
- The META Tower may only be installed in dry rooms with low dust levels and sufficient ventilation.
- If the ventilation is insufficient, a suitably sized fan or suction system must be used.

⚠ **Use in explosive or flammable locations is prohibited.**

- The permissible room temperature range is between +10° C and +40° C. The relative air humidity must not exceed 70%.
- It can be set up in a separate room on the same floor as the treatment stations or one floor below them. For noise sensitivity reasons, we recommend setting up the META Tower in a separate room.
- The META Tower must be installed on a solid surface in order to prevent vibrations.
- In order to ensure the best possible ventilation for the META Tower, the gap between limitations on the sides (e.g. cupboards) and the META Tower must be at least 5 to 10cm.
- Install the META Tower so that it is easily accessible for operation and maintenance purposes.
- The META Tower must be installed on a level surface with sufficient load bearing capacity.

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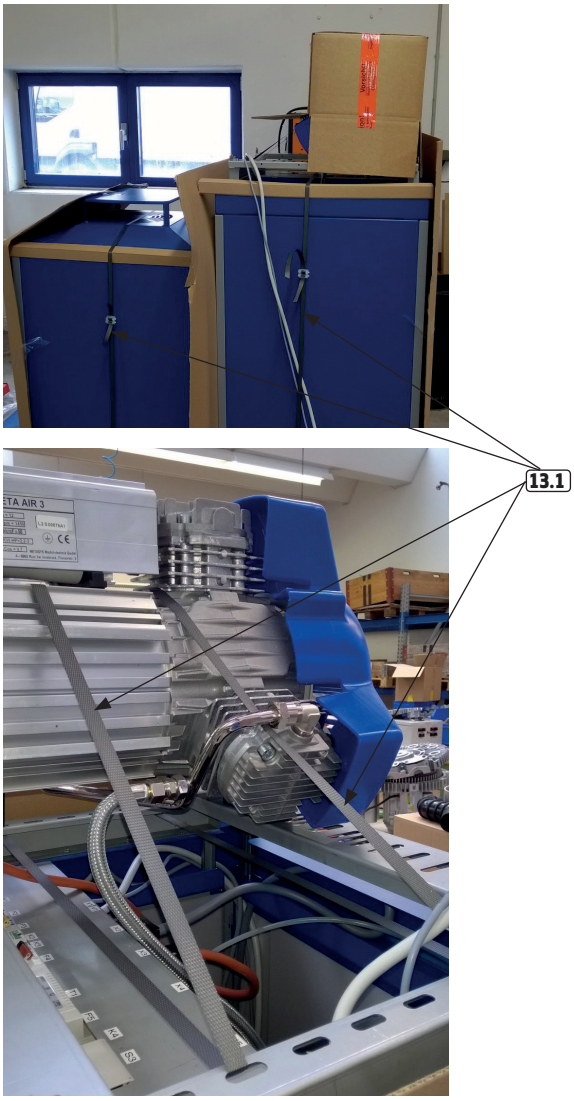

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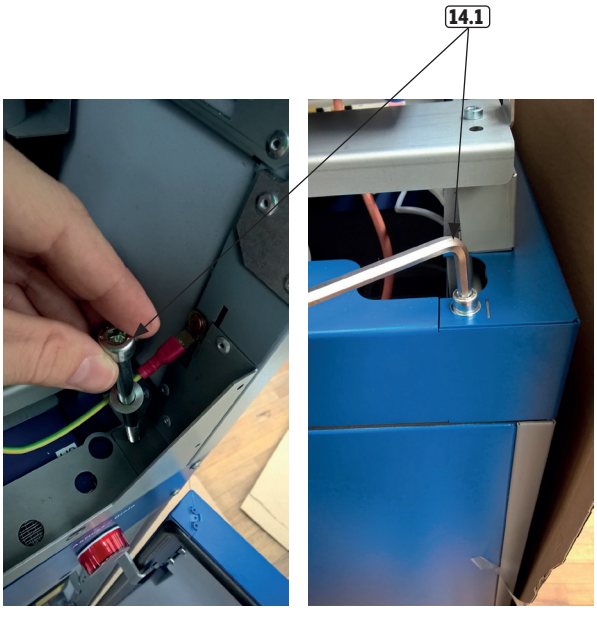

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12. Setup/assembly

Before assembling the META Tower, ensure that all transport fasteners have been removed.

13 See illustration

Remove the packaging and the transport fasteners 13.1

14 See illustration

Set up and mount the top part of the housing to the bottom part

14.1 4 x fastening screws (M8 Allen screws)

12. Setup/assembly

15 See illustration

Connect the hoses (by numbers)

15.1 Connect the compressor to the cooler (no. 1)

15.2 Connect the pressure switch to the pressure tank (no. 2)

15.3 Connect the vent pipe (no. 3)

15.4 Connect the condensation drain pipe to the pre-filter (no. 4)

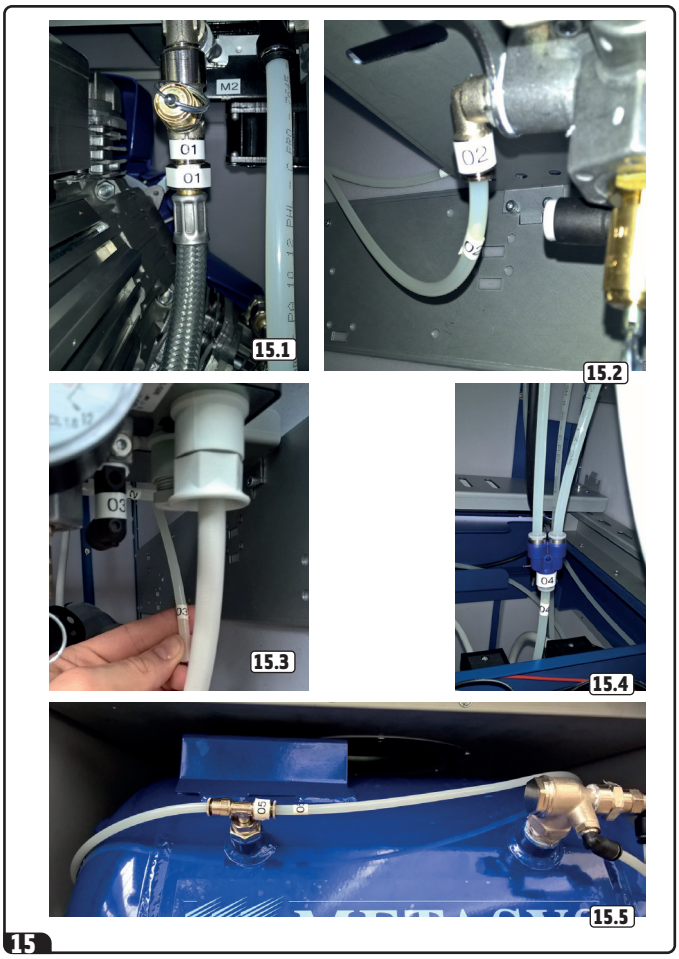
15.5 Connect the tank to the pressure gauge (no. 5)

16 See illustration

Insert the hose nozzles for the exhaust air and suction lines, as well as for the waste water and secure using screws

17 See illustration

Connect earth cable on the doors and between top and bottom housing (total 3).



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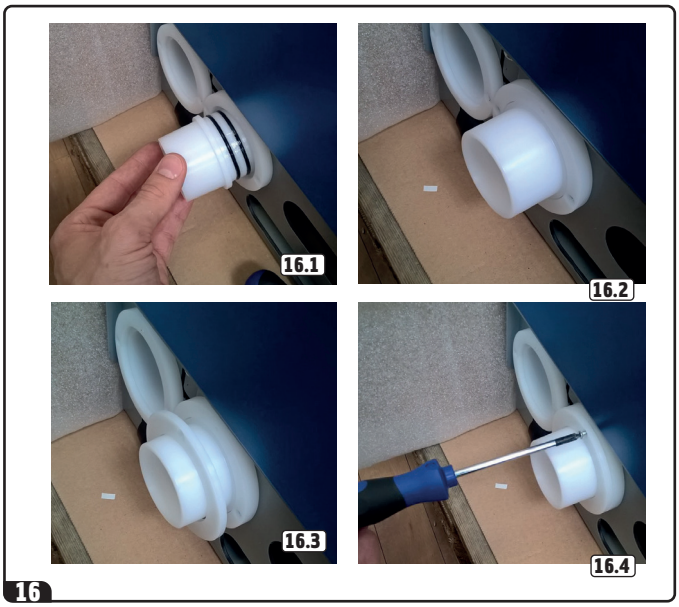

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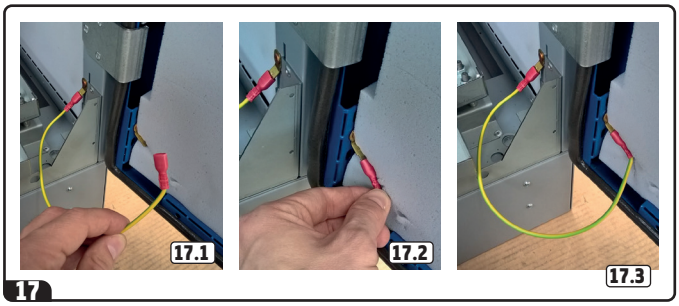

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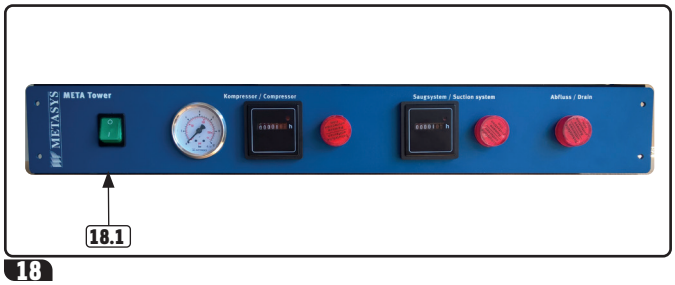
Practice personnel, technicians



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13. Electrical connections

The electrical connection may only be established by trained electricians.

Electrical installation must be carried out in accordance with national regulations.

Before establishing the electrical connection, compare the rated voltage on the device type plate with the mains voltage. A deviation of +/- 5% is permitted. The device must always be earthed for safety reasons.

The META Tower is only permitted to be connected to the supply voltage (230 V / 400 V) using the mains cable provided. The mains cable for the 230 V version must be firmly connected to the mains.

The required circuits must be secured by a magnetothermal circuit breaker and a fault current circuit breaker (tripping current <30 mA) and/or the statutory national standards.

The META Tower is to be connected to a socket (400V) that is protected by a suitable magnetothermal switch. The socket must be easily accessible so that the device can be disconnected from the mains supply easily if there is a hazard.

Extension cables are not permitted.

Main switch

The power supply must be connected after the practice's main switch.

14. Commissioning

Ensure that all hoses for compressed air, supply air and exhaust air, as well as for the waste water, are connected correctly. The META Tower must be connected to the main power supply correctly.

Important: Before connecting the plug to the power supply, check to ensure that main switch 1.1 on the tower is switched off (position „0")!

Furthermore, you must ensure that all plugs are plugged into the correct sockets.

19 Sockets

X1	Suction machine	already connected
X2	Compressor	already connected
X3	Fan for cooler	to be connected
X4	Tower fan	to be connected
X6	Pressure switch	already connected

14. Commissioning

See illustration

All fuses must be switched on in order to switch the META Tower on. Main switch **20.1** must then be pressed into the „I" position. When the mains power supply is present, the switch illuminates green and the LED (Abfluss/Drain) flashes for a short time.

To switch the compressor on, turn pressure switch **20.3** into the „I" position.

The compressor now starts up and is controlled by the pressure switch that stops it when the pressure in the tank reaches the switch-off pressure (7 bar); the compressor starts again when the switch-on pressure (5 bar) is reached.

If the compressed air tank is pressurised, the operating pressure can be adjusted using pressure controller **20.4**: Turn the adjustment screw clockwise to increase the pressure and anticlockwise to lower the pressure. The current pressure can be read from pressure gauge **20.2**. Once the required air pressure is reached, press the adjustment screw downwards to lock it.

While the pressure is being built up, open condensation drain valve **20.5** on the tank and catch the condensation (if present) in a collection tank. Then close it again.

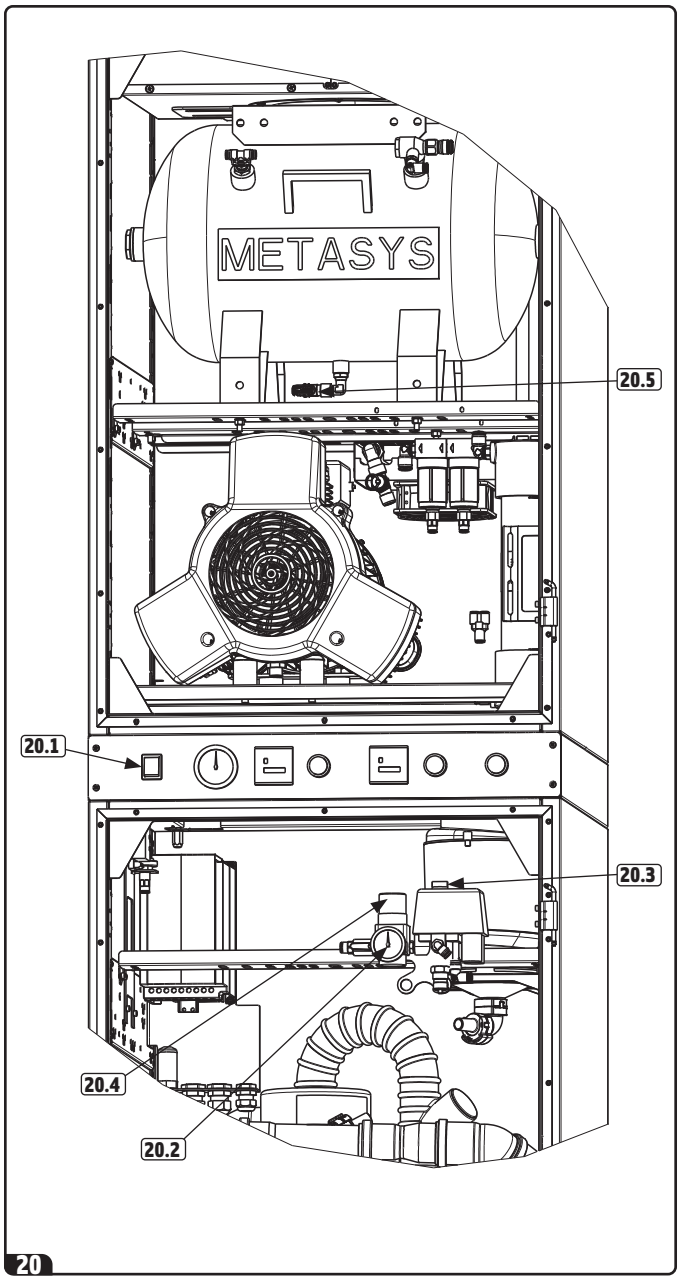
The safety valve is set to 10 bar. The safety valve must be inspected when operating the compressor for the first time. The safety valve is not permitted to be used to drain the pressure tank, as this may impair its functions.

Suction machine

In order to start the suction machine, a suction hose must be picked up from the hose support on the dental unit or the rinsing basin rinsing system (in a wet suction system) must be actuated.

Check that all hose connections and suction line connections are leak-tight.

The suction machine is stopped again by hanging the hose back into the hose support and after a run-on time of approximately 60 seconds.



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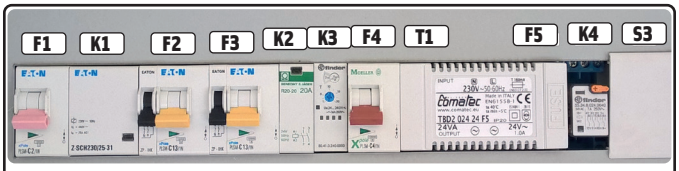

Key

Abbreviation	Designation	Description
F1	Fuse 1	Main fuse characteristic C2 in accordance with IEC/EN 60898-1
K1	Contactor 1	Main contactor
F2	Fuse 2	Fuse for compressor, pressure switch and cooler (fan), characteristic C13 in accordance with IEC/EN 60898-1
F3	Fuse 3	Fuse for suction machine, characteristic C13 in accordance with IEC/EN 60898-1
K2	Contactor 2	Contactor for suction machine
K3	Relay	Time relay: Run-on time for suction machine
F4	Fuse 4	Control fuse: for cabinet fan and pressure monitor (drain), characteristic C4 in accordance with IEC/EN 60898-1
T1	Transformer 1	Transformer: Suction machine control
F5	Fuse 5	Transformer fuse
K4	Relay	Relay for pressure monitor (waste water)
S3	Thermostat	Thermostat for cabinet fan (set to 25°C)

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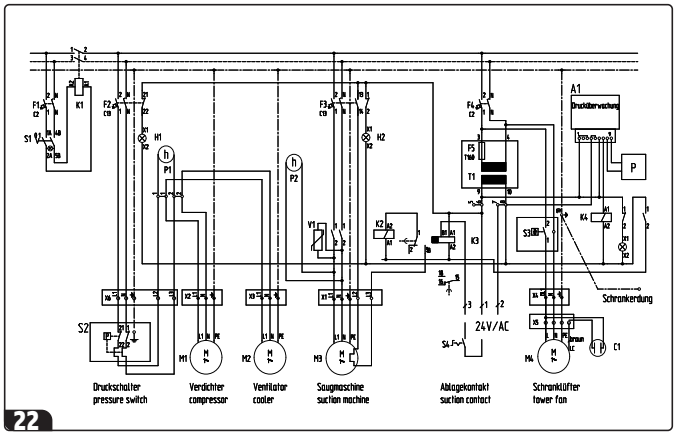
14. Commissioning



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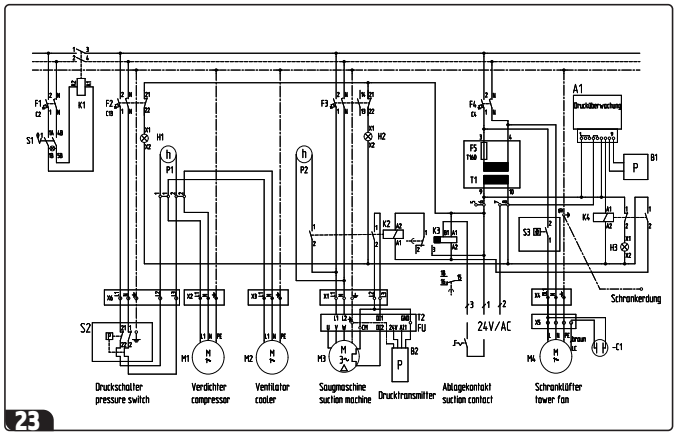

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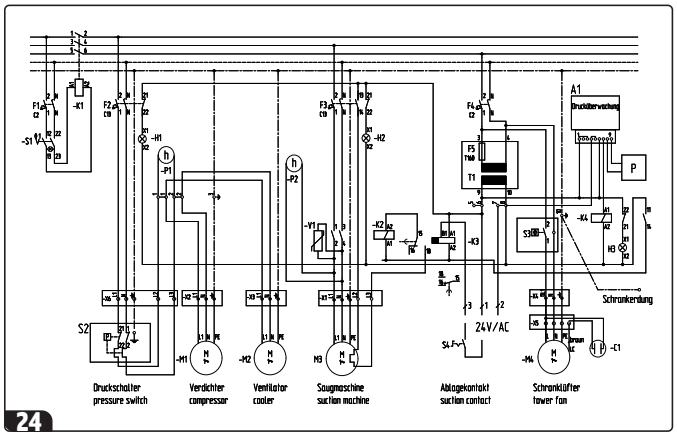

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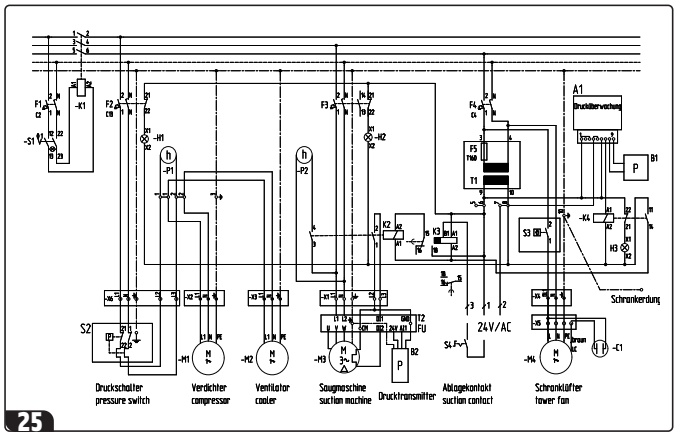

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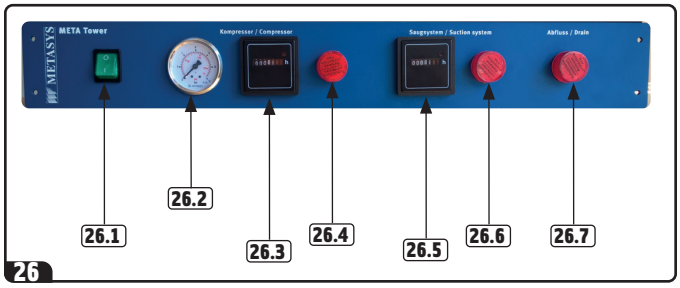
15. Operation

The detailed functional descriptions for the devices that are installed in the META Tower are provided in the single device manuals and in the download area on www.metasys.com.



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26 See illustration

26.1 Main switch:
15A circuit breaker
On (I) / Off (0)

26.2 Pressure indication:

Switch-on pressure	5,0bar
Switch-off pressure	7,0bar

26.3 Compressor operating hours counter

26.4 Compressor fault indicator

26.5 Suction machine operating hours counter

26.6 Suction machine fault indicator

26.7 Drain fault indicator

16. Negative Pressure – Frequency Control

27

27 EXCOM hybrid 5

Legend:

A2	display

28 Frequency control display - see illustration

28

28.1 After being switched on for the first time, **y - H** appears on the display. After a 1-second pause, **30.00** appears.

28.2 This flashes continuously in mode stand-by. Once the first command is entered (command from the dental unit), the display switches to **0.00** and then always shows the current motor speed. This value is always between **35.00** and **70.00**.

EXCOM hybrid 5 are pre-set at the factory to a negative pressure of 180 mbar.

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17. Service and maintenance

All maintenance work required for the devices that are installed in the META Tower is described in the single device manuals and in the download area on www.metasys.com.

Before carrying out any maintenance or repair work, the META Tower must be switched off and disconnected from the mains power supply; the compressed air tank must be depressurised (check on the pressure gauge).

The following filters must be checked and cleaned:

- Filters in the hose support and the suction line
- Filters for the mouth rinsing basin drain and the mouth rinsing basin valve
- Filters on the suction machine

Servicing compressors

The maintenance intervals are binding and must be adhered to. The following maintenance work is prescribed: the annual filter cartridge change (filter cartridge replacement kit), the „3000 h kit + valve block". The maintenance work carried out must be documented on page 4 of this installation manual (device document). METASYS reserves the right to inspect the maintenance records.

Repair work going beyond normal servicing may only be carried out by a qualified technician or by METASYS technical customer service. Only use spare parts approved by the manufacturer and accessories designed for this purpose!

18. Decommissioning and disposal

Decommissioning

If the META Tower is not used for an extended period, we recommend draining the condensation from the pressure tank and running the compressor in the META Tower for around 10 minutes with the condensation drain open. Then switch the compressor off at the pressure switch, close the condensation drain and remove the power plug.

Disposal

After disconnecting the device from the power supply (by removing the plug), the pressure in the pressure tank must be relieved by opening the relevant drain valve.

When disposing of the compressor, take all safety precautions to prevent injury to people and damage to property.

The machines may be contaminated. Advise the disposal company of this so that appropriate precautions can be taken. Parts that are contaminated with amalgam, such as sieves, filters, hoses, etc., must also be disposed of in accordance with the national regulations.

Uncontaminated plastic parts of the suction system can be recycled as normal plastics.

The integrated control unit, circuit boards and components must be disposed of as electronic waste. The remaining metal parts must be disposed of as scrap metal.

All connections must be sealed when sending the device back, e.g. to the depot or to METASYS Medizintechnik GmbH.

Attachment I: Error description negative pressure – frequency control:

Practice personnel / technician

Fault code	Type of faults	Possible fault reasons
OC/ OC1	Overcurrent	Start-up time too short
		Short circuit on the output
		Blocked motor
		Incorrect parameter calibration
O.L1	Inverter overload	Load too heavy
O.L2	Motor overloaded	Load too heavy
O.E	DC overvoltage	Mains voltage too high
		Load inertia too high
		Run-down time too short
		PID parameter set incorrectly
PF0	Output phase loss	Motor faulty
		Motor cable loose
		Inverter faulty
LU	Undervoltage	Mains voltage too low
OH	Excess temperature	Ambient temperature too high
		Poor ventilation
		Fan damaged
		Carrier wave frequency
AErr	Signal error	Analogue signalling line disconnected
		Pressure sensor faulty
Err1	Incorrect password	Password entered incorrectly
		No password entered
Err2	Incorrect parameter calibration	Incorrect motor parameter
Err5	PID parameter set incorrectly	PID parameter set incorrectly
PCE	PMSM distuning error	Motor parameter measurement is incorrect
		Motor is too heavy
GP	Earth leakage	Earth leakage in the motor cable
		Motor insulation faulty
		Inverter error

METASYS ... makes the difference!

METASYS

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