

OPERATING AND INSTALLATION INSTRUCTIONS LBE 250A / LBE 500A



**COMFORT
VENTILATION**



 **PICHLER**

Systematic ventilation.

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1. Introduction

Dear customer

Dear customer,

Thank you for choosing the air humidification unit LBE 250A/LBE 500A.

The air humidification unit is available in the sizes LBE 250A and LBE 500A and complies with the latest state of the art. It convinces by its operational reliability, ease of operation and efficiency.

To operate your air humidification unit safely, properly and economically, please read this instruction carefully and follow the instructions provided.

Use the air humidification unit only when in perfect condition and for its designated use, be aware of safety and any hazards and cognisant of all the notes and information contained in this instruction.

Please always keep the model and serial number (see nameplate on unit) at hand in the case of queries or when ordering spare parts. If you have any further questions, please do not hesitate to contact us.



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Unit type: 08LBE250ARE
Year of manufacture: 09/2021
Air volume flow: Max. 350 m³/h
Dimensions L x D x H: 360 mm x 360 mm x 385 mm
Weight: 25 kg
Voltage / frequency: 230V / 50 Hz
Power consumption: Max. 1450 W
Water inlet pressure: 0.35-0.7 bar
Serial number: C21090010



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Please keep this operating instruction in a safe place and readily available at all times. If you lose the documentation, please contact us.

2. General

This chapter contains some general information about the air humidification unit LBE 250A/LBE 500A.



READ THIS INSTRUCTION CAREFULLY BEFORE COMMISSIONING THE UNIT!

This instruction contains notes and information regarding safe operation and proper installation of the air humidification unit LBE 250A/LBE 500A and regarding its use and servicing. Furthermore, reference this instruction during servicing to ensure proper execution of the tasks. Keep this operating instruction in a safe place and readily available.

Troubleshooting and procedures in the air humidification unit must only be performed by an installation company (specialist company).

Changes reserved:

This instruction has been compiled with the utmost care. This does not, however, imply any rights. We constantly strive to improve and optimise our products technically and we reserve the right to modify our apparatus or technical data fully or in part and without prior notification. Your unit may therefore vary slightly from the description in this instruction.

Our "General terms and conditions" in their latest version apply.



3. Designated use

The air humidification unit LBE 250A/LBE 500A is suitable for the installation in or retrofitting of air conditioning and ventilation systems with a maximum air volume flow of 350 m³/h with the LBE 250A and 500A m³/h with the LBE 500A.

This unit is available to the general public and is intended for installation in residential or industrial buildings.

The compact air humidification unit works according to the natural evaporation principle and provides for constant and optimum supply air humidity.

In addition, the supply air is kept at a constant temperature via an integrated air heater battery.

Designated use also includes adherence to our prescribed operating and installation instruction. Only qualified personnel may work on and with the unit. Persons transporting or working on the unit must have read and understood the corresponding parts of the operating instruction, especially *Chapter 4 "Safety"*.

The system operating company must also be instructed on potential hazards by the system builder.

The air humidification unit LBE 250A/LBE 500A is not a ready-to-use product. It must not be put into operation until it has been properly installed and connected to the air conditioning and ventilation system.

The humidification unit is not suitable for outdoor installation. It may only be installed in suitable and tempered interior spaces.

Changes reserved

It is our constant endeavour to technically improve and optimise our products and we reserve the right to change the design of the units or the technical specifications without prior notice.

3.1 Liability

The LBE 250A/LBE 500A is a compact, automatic air treatment unit for the active humidification and heating of the supply air in air conditioning and ventilation systems.

Any other use shall be deemed improper and may result in personal injury or damage to the air humidification unit LBE 250A/LBE 500A, for which the manufacturer cannot be held liable.

The manufacturer accepts no responsibility for any damage due to:

- non-compliance with the safety, operating and servicing instructions given in this operating and installation instruction.
- the installation of spare parts that have not been supplied by the manufacturer, the responsibility for the use of such spare parts being fully borne by the system builder/installer.
- normal wear and tear.



3.2 Warranty

The warranty period shall commence after the unit is put into operation, but no later than one month after delivery. Warranty details can be found in our "General terms and conditions" in their latest version as well as the merchant conditions of your respective country. The warranty shall be subject to proof of services performed as per our instructions and executed by a licensed installer/ specialised company.

Warranty claims shall be limited to material and/or constructional defects occurring during the warranty period. In the event of a warranty claim, the air humidification unit LBE 250A/LBE 500A must not be dismantled without prior written authorisation from the manufacturer. The manufacturer's liability shall be limited to spare parts installed by a specialist approved by the manufacturer.

The warranty shall automatically lapse at the end of the warranty period, following improper operation if parts other than original manufacturer-supplied parts are installed, or if unauthorised changes or modifications are made to the unit.

The warranty is voided automatically by failure to comply with the information in this installation and operating instruction.

4. Safety

4.1 General information



Read this operating and installation instruction carefully and observe the safety instructions while you carry out installation, commissioning, servicing or general work on the ventilation unit. Keep the operating and installation instruction near the unit for its entire service life.

Always observe the safety regulations, warnings, notes and instructions given in this instruction. The specifications given in this document must not be altered. Non-observance of these safety regulations, warnings, notes and instructions may lead to physical injury or damage to the air humidification unit.

The conclusion of a service contract is recommended to ensure that the unit will be checked at regular intervals. Ask your supplier about approved specialised companies/installers in your area.

SYMBOLS USED IN THIS DOCUMENT

The following Safety symbols highlight text containing warnings in respect of danger and potential hazards. Please familiarise yourself with these symbols.



Note!



Attention! Ignoring this warning may lead to injury or threat to life and limb and/or damage to the unit.



Attention – High voltage!

Ignoring this warning may lead to injury or threat to life and limb.

Installation, initial start-up, maintenance and repairs must only be carried out by an authorised specialist company. Over and above this operating and installation instruction, local and national regulations and standards shall also apply to the operation of this unit without limitation. Take instruction from your installer on the unit and on its control unit following installation. The air humidification unit may only be used in accordance with the information provided in **Chapter 3. Designated use**. All safety and danger notices attached to the unit and specified in this description must be observed.

In the event of malfunctioning, switch off the unit immediately and disconnect the power plug. The unit must be appropriately secured against restart. Faults must be remedied immediately. After repairs and maintenance work, qualified personnel must verify that the unit is safe to operate. Attachment or installation of additional parts and components is not permitted. Any modification of the air humidification unit is prohibited. Only original spare parts may be used. Modifications and alterations to the air humidification unit are prohibited and absolve the manufacturer from all warranties and liability.

Damage that is caused by non-compliance with the operating and servicing instructions is not covered by the warranty.

This unit is not intended for use by persons, including children, with limited physical, sensory or mental capacities or lacking experience and/or knowledge, unless under supervision or instruction of a person responsible for their safety. Ensure that children do not play with the unit.

After the unit has been put into operation, the power supply and water supply must not be interrupted for longer than one day, so that the hygienic requirements can be met.



**Switching off the ventilation unit**

If the ventilation unit is shut down for longer than one day, the air humidification unit must be switched off at least two hours before. In this way, the air humidification unit is dried out, and hygienically flawless functioning is ensured.

**Working on the unit**

Installation, commissioning, service and repairs must be carried out by an authorised specialist (specialised heating company/installation company). When working on the unit, it must be de-energised to zero potential and protected against restart. The water supply must be interrupted.

**UVC disinfection tube**

A UVC tube is an integrated standard part of the unit! It must only be replaced by an originally packaged type as specified on the unit. The UVC tube must only be changed by authorised qualified personnel! Before opening the unit or prior to replacing the UVC it is absolutely required to switch the unit to a de-energised state and to disconnect the mains plug. Never look into the illuminated UVC light source without eye protection.

4.2 Unit installation

The national and local regulations must be heeded when installing and setting up the unit. The unit may only be installed in compliance with national installation regulations. Installation shall be carried out in accordance with the general local building, safety and installation regulations of the relevant community or the water and electricity department and other bodies.

The unit may only be installed in frost-free and dry rooms. The room temperature at the place of installation must be consistently between +5 °C min. and +35 °C max.

The unit is designed for wall installation and may only be set up on a suitable, load-bearing construction. The unit must not be exposed to vibration of any kind.

Air ducts of the ventilation system that are not installed in heated areas must be designed with suitable thermal insulation (risk of temperature drop below the dew point temperature) in order to prevent condensation.

Components such as windows with poor thermal insulation properties or faulty construction as well as old buildings may show condensation in the living space, e.g. on the window glass, when outdoor temperatures are cold and the room air humidity is increased. The surface temperature of the components must be above the dew point temperature of the room air (at least approx. +15 °C).

In normal operation, mould cannot form in the unit, since the humidifier water is continuously treated and sterilised during operation.



Mounting

The unit is intended for horizontal mounting. It must be mounted on a massive, load-bearing wall with a maximum permissible deviation of +/- 1° from the horizontal position. The net operating weight of the humidification unit must be taken into consideration for the suspension. It must be restored immediately to prevent hazards. These worksteps must only be performed by authorised qualified professionals.

Water connections

The water, heating and sewage connections must be established by specialist personnel. For connection to the water supply, only the original connection tubes supplied may be used. Ensure that the pipes are tight. The maximum water pressure of the drinking water connection of 0.7 MPa and the water heater battery of 1 MPa must not be exceeded. The installation of a water stop valve is mandatory.

Water quality

Only drinking water complying with the Drinking Water Ordinance may be used for the water supply. The connection to the drinking water pipeline is to be established using the connection set supplied. With a chlorine content of more than 0.1 mg/l, the standard water filter (5 µm) must be replaced by a dual filter (5 µm / carbon). If the iron content of the drinking water exceeds a value of 0.1 mg/l, an additional iron filter must be mounted in the water supply line.

The unit can be utilised for a maximum water hardness up to 26 °dH (German hardness). When this value is exceeded, the durability of the osmosis membrane is significantly reduced.

Operation of the unit

Any work practices that could potentially impair the safety of the unit are prohibited. All warning and protective devices must be checked for proper functioning at regular intervals. Safety devices must not be dismounted or deactivated.

Mounting, dismounting, maintenance and repair of the unit

If maintenance work or repairs are carried out, the unit must be switched to a de-energised, zero-potential state. No additional equipment must be added on or installed. In this case, consult the manufacturer.

**Electrical / electronic systems**

Work on electrical system parts may only be carried out by persons trained in electrical engineering. If maintenance work or repairs are carried out, the unit must be switched to a de-energised, zero-potential state. If faults occur in the electric power supply, switch off the unit immediately. Only use original fuses with the specified amperage. The electrical equipment of the unit must be checked at regular intervals. Identified defects such as loose connections or scorched wires must be removed immediately. After carrying out electrical work or repairs, the protective measures must be tested (e.g. earthing resistor).

Requirements with regard to the place of installation

The air humidification unit may only be installed in rooms where a water drain is available. Furthermore, safety precautions must be provided for in the room, safely and automatically shutting off the water supply to the air humidification unit in the event of a leakage (water stop valve). The air humidification unit is designed with the IP20 degree of protection.



5. Transport and storage

In order to prevent possible damage brought about by undue force during transport, the humidification unit must be handled with care. If transported manually, ensure that necessary human lifting and carrying forces are reasonable. The unit must not be transported by the connection cable. Avoid knocks and blows.

5.1 Dimensions and weight

	LBE 250A	LBE 500A
Dimensions of the packaging unit (W x H x D)	800 x 460 x 420 mm	870 x 600 x 600 mm
Weight of the packaging unit without optional accessories	approx. 28 kg	approx. 62 kg

5.2 Packaging

The safety markings on the carton must be observed. Upon delivery, check the packaging and unit for possible signs of damage. Complaints or damage must be reported immediately.

5.3 Storage

The unit must be stored in its packaging in a dry, dust-free environment and protected from frost.

5.4 Check for completeness

Make sure that the following conditions are met when the unit is delivered:

- The type number and serial number on the nameplate must comply with the details on the order and delivery documents.
- The equipment (possible optional accessories) must be complete.
- All parts must be in good order and condition.



Note: Any transport damage and/or missing parts must be reported immediately in writing to the forwarder or supplier.

5.5 Scope of supply

The scope of supply includes:

- the air humidification unit
- an operating and installation instruction
- Accessories: Water connection set (*see Chapter 12.6*)
- Optional accessories: for hot water heater battery (*see Chapter 16*)

5.6 Disposal

Dispose of the packaging material and protective packaging in an environmentally-friendly manner and in accordance with local regulations e.g. recycling of wooden pallets or cardboard packages.



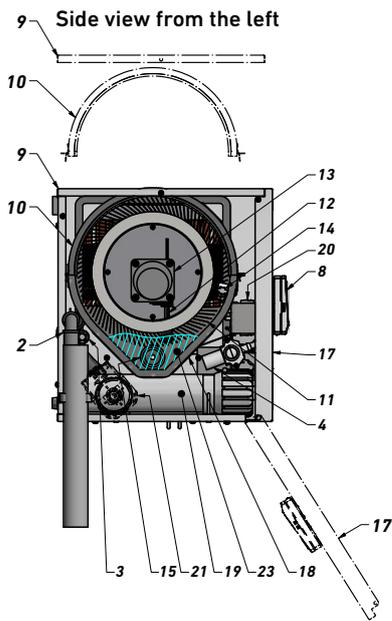
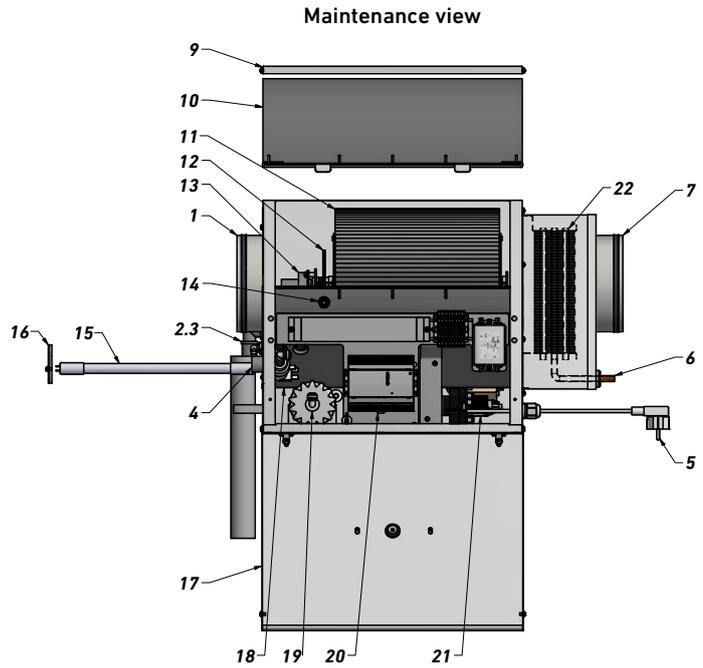
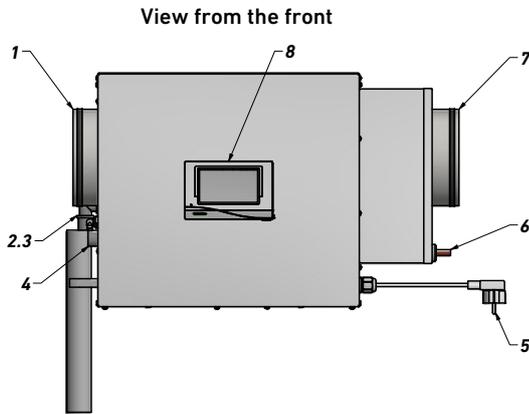
Equipment that is no longer functional must be disassembled by a specialised firm and properly disposed of at a suitable facility. The waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive) apply.



GENERAL

USER

6. Unit design

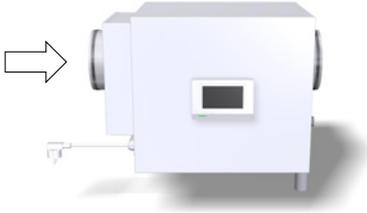
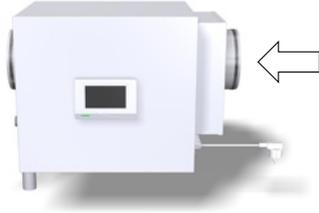
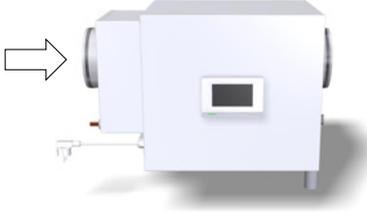
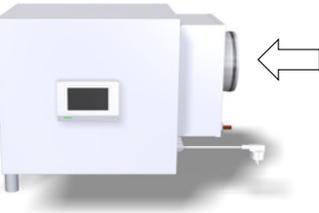
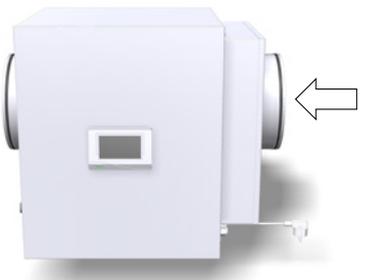
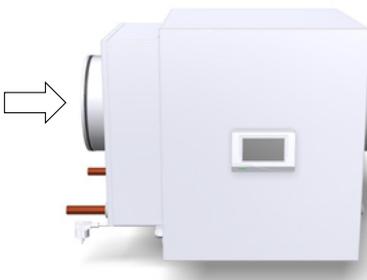
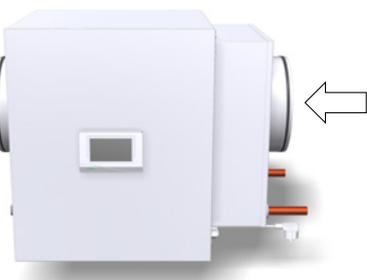


- 1 Air outlet
- 2 Water outlet
- 3 Osmosis outlet
- 4 Water inlet valve
- 5 Mains plug
- 6 Heater battery water connection
- 7 Air inlet
- 8 Control panel
- 9 Maintenance cover
- 10 Water tank maintenance cover
- 11 Rotation lamella evaporator
- 12 Float switch
- 13 Drive motor
- 14 Water inlet
- 15 UVC tube for disinfection
- 16 UVC tube maintenance cover
- 17 Front lid
- 18 Water tank
- 19 Reverse osmosis unit
- 20 Control electronics
- 21 Drain pump
- 22 Heater battery
- 23 Water

SPECIALIST PERSONNEL



7. Model versions

Model versions	Left-hand air inlet	Right-hand air inlet
Art. No. with PTC electric heater battery	08LBE250ALE	08LBE250ARE
		
Art. No. with hot water heater battery	08LBE250ALW	08LBE250ARW
		
Art. No. with PTC electric heater battery	08LBE500ALE	08LBE500ARE
		
Art. No. with hot water heater battery	08LBE500ALW	08LBE500ARW
		

GENERAL

USER

SPECIALIST PERSONNEL



8. Functional description

8.1 Working principle

The air humidification unit is operated in connection with an air conditioning and ventilation system. The installation is carried out directly downstream of the living space ventilation unit in the supply air duct.

The air humidification unit works according to the principle of natural evaporation. When entering the air humidification unit, the supply air flows through a heater battery first. If required, it is heated first, however, the absolute humidity of the air remains constant. Then the air flows via specially coated rotor blades that are wetted with water. This water is absorbed by the air by evaporation (adiabatic humidification) and the absolute air humidity increases. At the same time, the evaporation process causes a decrease in the air temperature; the relative air humidity increases.

The air humidification unit is not suitable for heating the supply air, the heater battery mainly serves to supply energy for the evaporation process. Neither can the unit be used for purposes of cooling. Temperature regulation is subordinate to air humidity regulation. The adjustable air temperature at the outlet of the air humidification unit is between 15 °C and 25 °C. The adjustable relative air humidity is between 40 % and 60 %. Whether these target values are actually achieved always also depends on the condition of the air when it enters the air humidification unit.

The unit works automatically, the humidity in the unit is monitored electronically. Excess humidity of the supply air is therefore ruled out.

The LBE 250A air humidification unit is dimensioned for a maximum operating air volume flow of 350 m³/h, the LBE 500A for a maximum operating air volume flow of 500 m³/h.



Note:

The air humidification unit must not be operated with a higher air volume flow as the one specified in this operating instruction. If the maximum operating volume flow is exceeded, individual water drops can be carried along at the outlet of the air humidification unit. In this way, water may enter the supply air duct!

The humidifier tank is supplied with drinking water from the central water supply. In order to minimise deposits on the rotation lamellae and in the water tank during operation, the air humidification unit comes with a standard reverse osmosis unit. The reverse osmosis unit is integrated into the water supply line between the solenoid valve and the water tank. A pre-filter unit in the form of a water filter, which is to be integrated (externally) into the water supply line in the framework of the installation process, is included in the scope of supply.

Depending on the evaporation performance, the humidifier tank contains a maximum of 2.5 litres of water (LBE 250A) and a maximum of 6 litres of water (LBE 500A). Evaporated water is replaced permanently by fresh water. In addition, the water is completely replaced on a daily basis for hygienic reasons. The maximum water level is limited by means of a float switch. Overflowing of the tank is additionally prevented by an overflow drain.

During humidification operation, the water in the tank is continuously irradiated and disinfected with UVC light, the UVC tube completely illuminating the water tank and evaporation surfaces. For reasons of safety, the UVC tube is actuated with a ballast with an integrated error detection function. If the UVC tube is defective or the maximum operating hours of the UVC tube have been reached, the water in the LBE 250A/LBE 500A is drained and a fault message is output.

8.2 Reverse osmosis

The water pressure in the drinking water pipeline allows for the operation of the reverse osmosis unit. In this process, the untreated water (drinking water) is pressed through a semi-permeable osmosis membrane. The pure water passes through this membrane (however, not back again) and afterwards into the humidifier tank. The residual water with all the substances dissolved in the water (e.g. nitrate, nitrite, germs, lime, ...) is led to the drain. While the filling process is taking place, residual water is also always drained at the same time.

8.3 UVC disinfection

The water in the humidifier tank is disinfected by means of UVC radiation, killing germs and bacteria and preventing their growth. The UVC disinfection offers the advantage of being a non-chemical treatment type that does not pose any hazard to health (no ozone production possible!). Irradiation exclusively takes place in a closed area with a radiation performance of 4.3 watts at a wavelength of 253.7 nm.



**When carrying out maintenance and repair work, never look into the illuminated UVC tube without eye protection!
Only operate the UVC tube in a closed housing that is not damaged.**



8.4 Standby operation

The air humidification unit is in the Standby mode. If the relative humidity set is lower by more than 5 %, the air humidification unit switches on, if it is enabled.

8.5 Starting phase of the active air humidification / switch-on sequence

The drain pump switches on first so as to completely drain potential residual water from the humidifier tank. At the same time, fresh water is then filled into the humidifier tank, the UVC tube is switched on, and the rotor is activated.

8.6 Active air humidification / regular operation

During the active air humidification process, humidity and temperature control take place at the same time:

8.6.1 HUMIDITY CONTROL

The air humidity is regulated via the water level in the humidifier tank and therefore via the part of the rotor lamella surface that is wetted with water. When the water level increases, the lamellae of the rotor immerse deeper into the water, thus enlarging the water-wetted surface on the rotor lamellae. The air flowing over it absorbs moisture via evaporation on the wet lamella surfaces.

8.6.2 EVAPORATION PERFORMANCE

The evaporation performance always depends on the air inlet conditions. Very dry and warm air can absorb more moisture than air that is already saturated or cold. The maximum possible evaporation with typical winter conditions is approximately 7 g/m³. In this way it is possible to, for instance, bring dry air with an inlet condition of 18 °C to an outlet condition of 25 °C with 60 % RH.

This approximately corresponds to a maximum possible evaporation of 1.8 l/h (with 250 m³/h) for the LBE 250A, and 3.6 m³ l/h (with 500 m³/h) for the LBE 500 A.



Note: These data may always show slight deviations in practical applications.

In the case of air inlet temperatures above 25 °C, a max. humidification to 60 % RH cannot be ensured!

8.6.3 TEMPERATURE CONTROL

The air outlet temperature of the humidification unit is measured via the temperature sensor integrated into the unit. Depending on the unit type, the air at the inlet to the humidification unit is heated via an electric PTC heater battery (unit type "E") or a hot water heater battery (unit type "W").



Note: In the case of hot water heater batteries, the minimum flow temperature must be observed – see *Chapter 10. Technical data*.

8.7 Controlled switch-off / switch-off sequence

Controlled switch-off is initiated by the regulation system, for example when, due to the detection of a fault message, the air humidification unit changes from the operating status to the standby mode, or when the unit is switched off. In this process, first the water in the humidifier tank is completely drained, while the rotor lamellae continue rotating for approx. 20 minutes. The UVC tube remains in operation during the overtravel time.

8.8 Daily water change

For hygienic reasons, a complete water change takes place every 24 hours in the humidifier tank. The time for this can be individually chosen by the operator (factory setting 3 pm) and is defined in the "Settings" menu item.



9. Closed-loop and open-loop control

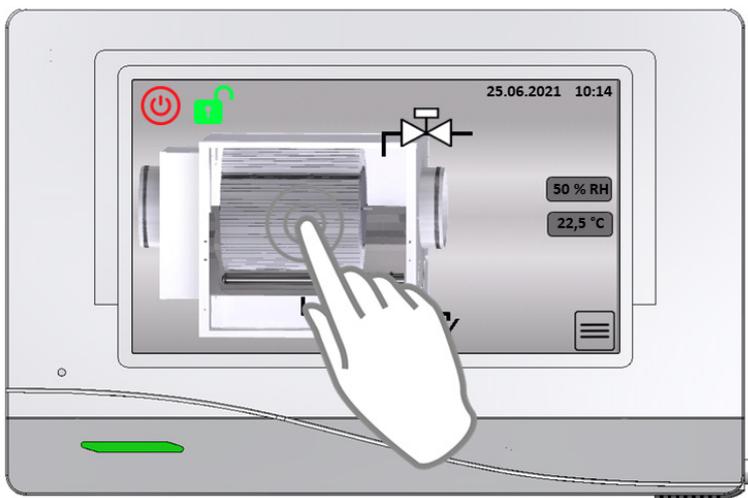
The unit is delivered with preprogrammed features. After having completed the assembly and after having established all air, water and electrical connections (see *Chapter 12*), information on the water hardness must be entered (see commissioning), then the unit is ready for operation.

9.1 Control unit (display) / basic settings

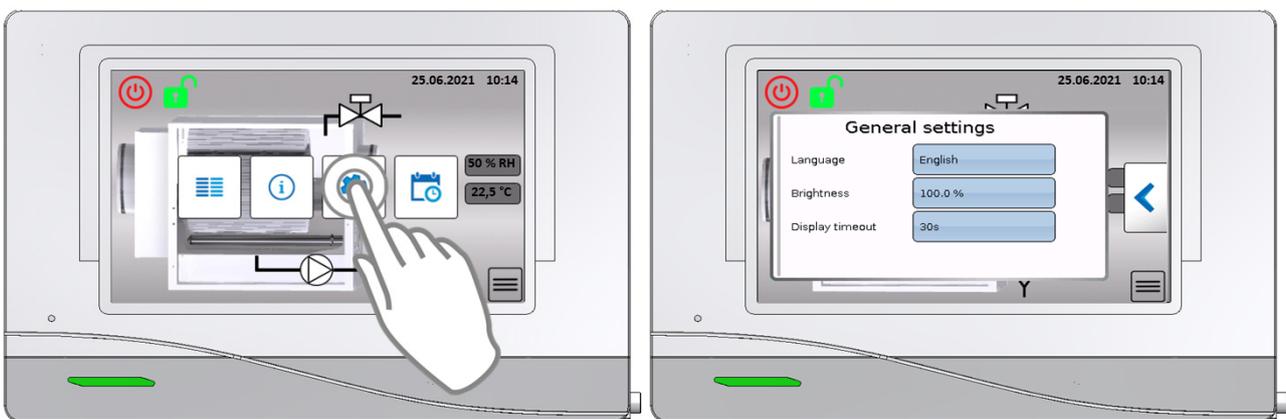


The LBE 250A/LBE 500A air humidification unit comes with a 4.3" touch display. The unit offers easy and intuitive operation directly on the screen.

By briefly touching the display, the standby mode is interrupted and the main overview is shown.

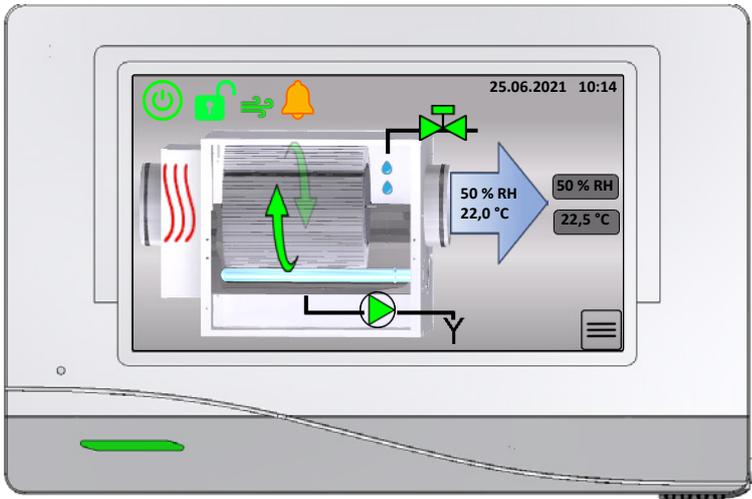


Touching the screen again for approximately five seconds allows for navigation to a submenu in which the basic settings can be carried out. In the submenu, different languages, the display brightness and the display time-out period (=period after which the display changes to the standby mode again when no action is carried out on the screen) for operation can be selected.



9.2 Main overview (home)

In the main overview (home), all important operating information is represented at a glance.



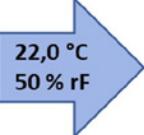
Meaning of the symbols

	Air humidification "Off"	The air humidification unit is inhibited manually and can be enabled by pressing this button.
	Air humidification "Standby"	The air humidification unit is in the Standby mode. If the relative humidity set is lower by more than 5 %, the air humidification unit switches on, if it is enabled.
	Air humidification "On"	The LBE is in the operating mode, i.e. there is a unit enable and a system deviation. The LBE carries out regulation to the air humidity set and the air temperature set. If the measured air humidity is in a range of +/- 2 % of the air humidity set, and the water valve merely opens sporadically within 12 hours, the LBE changes to standby operation.
	Air humidification enabled Externally: Digital input or Modbus Internally: Volume flow	Depending on the configuration, a unit enable can either only be effected via an airflow detection or additionally via a digital enabling contact or enable via Modbus.
	Air humidification not enabled Externally: Digital input not closed or Modbus enable inactive Internally: Volume flow not detected	
	Airflow available	The flow sensor integrated at the outlet of the LBE automatically detects a present air volume flow. This is always a prerequisite for a unit enable.
	Airflow not available	
	Message active	This message is shown when faults or warnings are pending. Touching the symbol will lead you to the message overview.
		With this parameter, the desired air humidity at the LBE outlet with a relative humidity between 40 % and 60 % is set. A factory default value of 50 % RH is preset.
		With this parameter, the desired air temperature at the LBE outlet is set between 15 °C and 25 °C. A factory default value of 21 °C is preset.



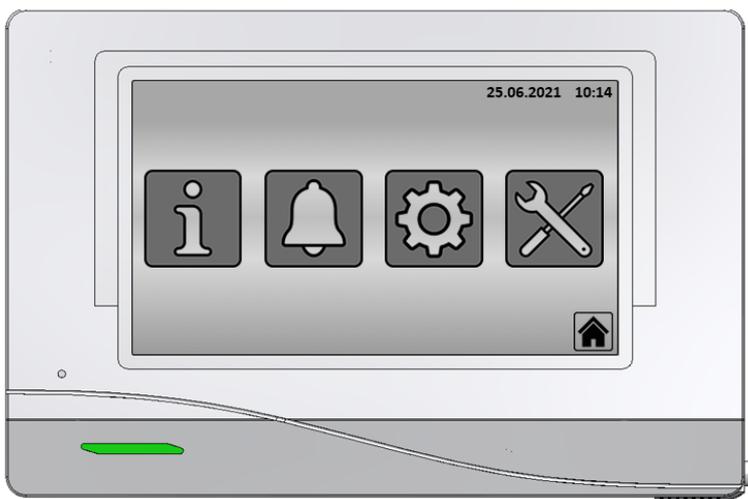
GENERAL

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	<p>The blue arrow indicates an airflow through the LBE.</p> <p>Indication of the currently measured relative humidity and air temperature at the outlet of the LBE.</p>
<p>25/06/2021 10:14</p>	<p>Date / time: Can be changed directly by touching the display.</p> <p>Activation / deactivation of the summertime can be carried out.</p> <p>When the power supply is interrupted for a longer period of time, the settings must be checked and updated, if necessary.</p>
 Water valve On  Water valve Off	<p>Indicates the current status of the water valve. In the humidification mode, the humidifier tank is continually filled with fresh drinking water.</p>
 Drain pump On  Drain pump Off	<p>Indicates the current status of the drain pump. It is active in each starting sequence, switch-off sequence, change to the standby mode as well as humidification mode, if the water level in the humidifier tank is too high.</p>
 UVC tube On  UVC tube Off	<p>Indicates the current status of the UVC tube. It is always switched on with active air humidification and during the switch-off sequence.</p>
 Rotor rotating	<p>Indicates the current operating status of the rotor. It rotates in the humidification mode and during the switch-off sequence.</p>
 Heating On	<p>Indicates the current operating status of the heater battery. It is only active during active humidification.</p>

9.3 Main menu

By pressing the  button in the main overview, you reach the main menu of the control unit. From there, you can navigate to the individual submenu items.



-  **Operating values and unit information**
-  **Errors**
-  **Settings**
-  **Service / maintenance**

 button leads back to the main overview.

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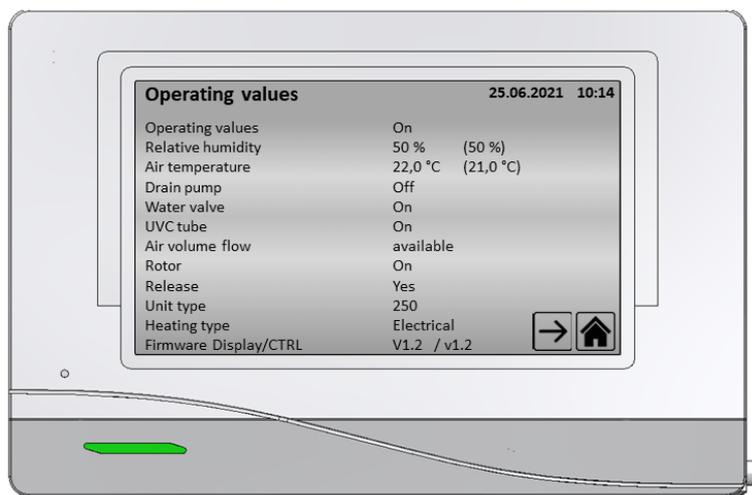


9.4 Operating values and unit information



In this menu item, the relevant current operating values and unit information are shown. The values in brackets indicate the target values currently set.

By pressing the arrow button , the operating times of the individual wear and maintenance parts are shown.



Note! Observing the maximum operating times is vital for ensuring long-term and trouble-free operation of your air humidification unit. Therefore, replace the UVC tube, the water filter and the osmosis filter at regular intervals and within the time intervals recommended.

9.4.1 MAXIMUM OPERATING HOURS

When the maximally recommended operating hours have elapsed, the respective components must be replaced and the corresponding operating hours meters must be reset.



Please note! Only use original spare parts when carrying out repair and replacement work.

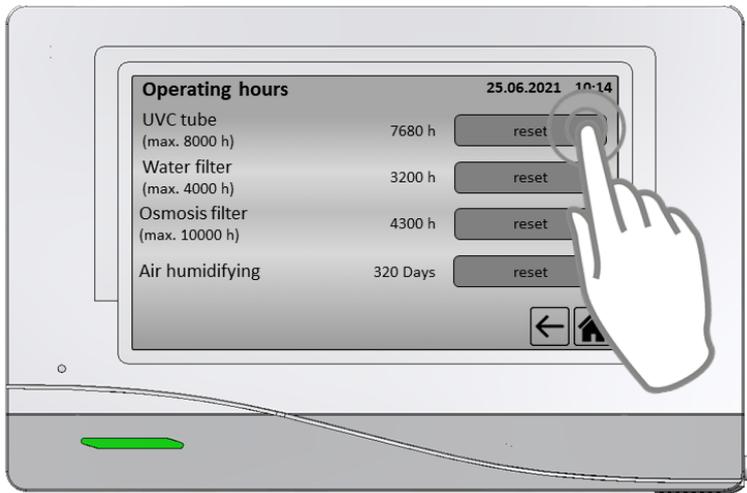


9.4.2 OPERATING HOURS OF THE UVC TUBE



Please note! The UVC tube has a guaranteed radiated power of at least **85 %** over a period of **8000 operating hours**. Never reset the hours meters without inserting a new UVC tube! A reduced radiated power can cause an insufficient UVC water disinfection (*see Chapter 8.3*)

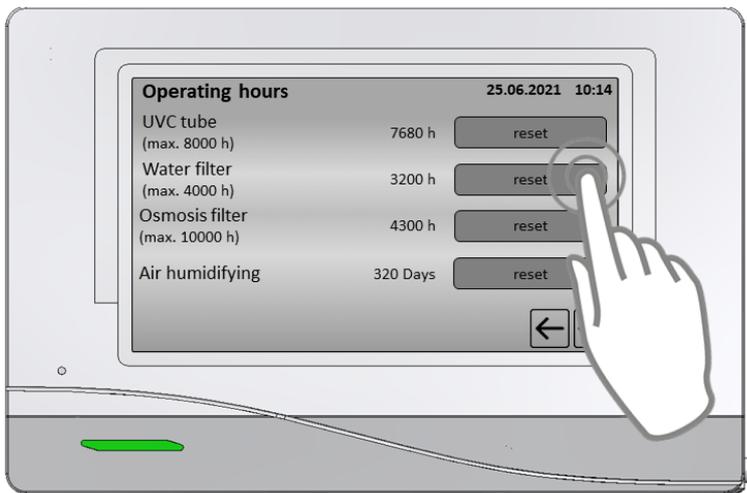
Instructions for the UVC tube replacement (*see Chapter 16.1*)



9.4.3 OPERATING HOURS OF THE WATER FILTER

For reasons of operational safety and for hygienic reasons, the water filter should be replaced when its maximally recommended operating hours are reached, however, once every 2 years at the latest.

Instructions for replacing the water filter (*see Chapter 16.3*)

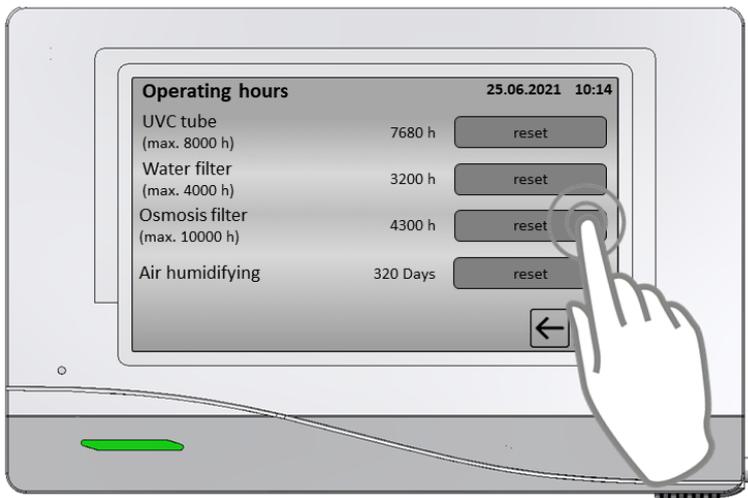


9.4.4 OPERATING HOURS OF THE OSMOSIS FILTER

Over time, the osmosis membrane is blocked by small particles, impeding the passage of the pure water. For reasons of operational safety and for hygienic reasons, the osmosis filters should therefore be replaced when its maximally recommended operating hours are reached, however, once every 2 years at the latest.

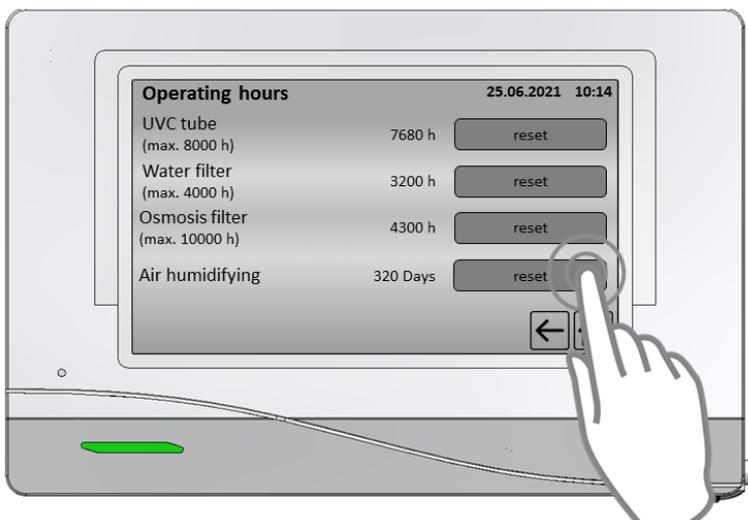
In the course of the osmosis filter replacement, the rotation lamellae and the humidifier tank should also be cleaned.

Maintenance instructions (see Chapter 16.2)



9.4.5 OPERATING HOURS OF THE AIR HUMIDIFIER

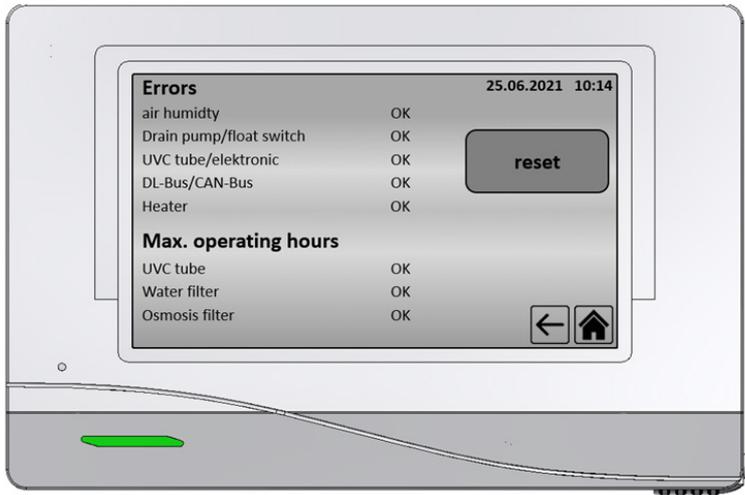
The total time during which the air humidification unit has carried out active humidification is counted in hours and shown in days. The time can be reset if required, for instance if more extensive repair and maintenance work is carried out.



9.5 Errors



In the error overview, the status of the individual wear and maintenance parts is shown. In fault-free regular operation, the status indicated is "OK".

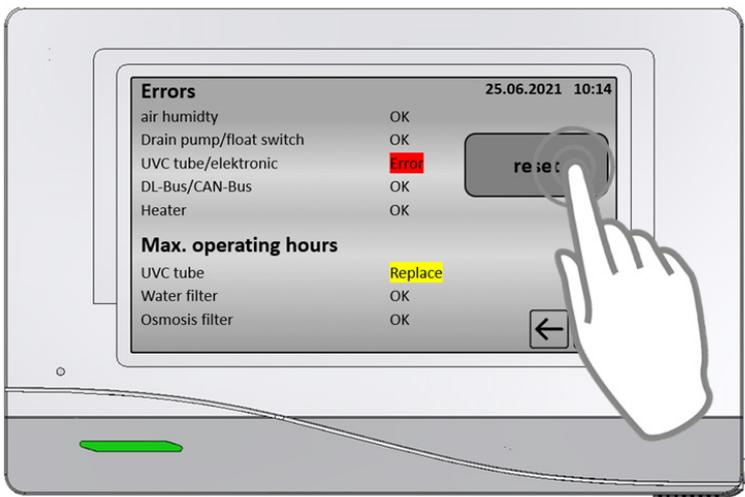


9.5.1 FAULT MESSAGES

If the control detects an error, a red message is output and the air humidification unit switches off in a controlled manner (*Controlled switch-off, see Chapter 8.7*). The same applies for reaching the maximum operating hours of the UVC tube.

In order to be able to recommission the air humidification unit, an error must first be eliminated, then the fault message must be reset.

Detailed error description (*see Chapter 14.*)



9.5.2 WARNING MESSAGE OPERATING TIMES

When the maximum operating hours of the water filter or osmosis filter are reached, a yellow warning message is output. For the UVC tube, such a warning message is already output shortly before the maximum operating hours are reached.

The air humidification unit, however, remains active when warning messages occur.



9.6 Settings



In this menu item, the operator can carry out the basic settings for the operation of the air humidification system.



9.6.1 TARGET HUMIDITY

The air humidity can be set between 40 % RH and 60 % RH. The humidification that can be actually attained depends on the inlet conditions of the air (see Chapter 8.6.2).

9.6.2 TARGET TEMPERATURE

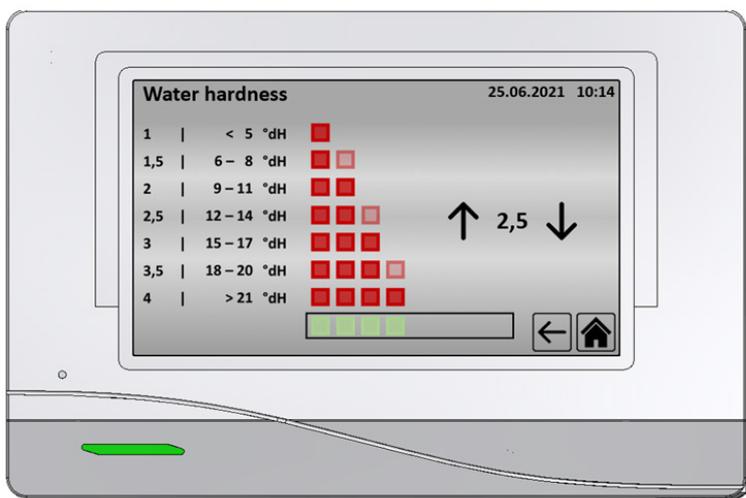
The air temperature can be set between 15 °C and 25 °C. The air temperature that can be actually attained depends on the inlet conditions of the air and, in the case of water heater batteries, additionally on the inlet temperature (see Chapter 8.6.3).

9.6.3 DAILY WATER CHANGE

The time for the daily water change (see Chapter 8.8) can be set here.

9.6.4 WATER HARDNESS

In this menu item the water hardness can be entered. Primarily it has an impact on the maximum operating time of the osmosis filter. The water hardness is determined using the test strip supplied. Dip it into the drinking water for 2 seconds, after one minute you can read off the test result. Compare it with the scale shown on the display and set the corresponding value by means of the arrow buttons.

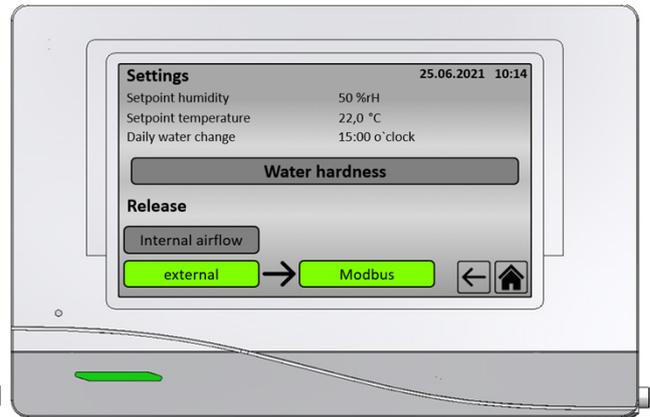
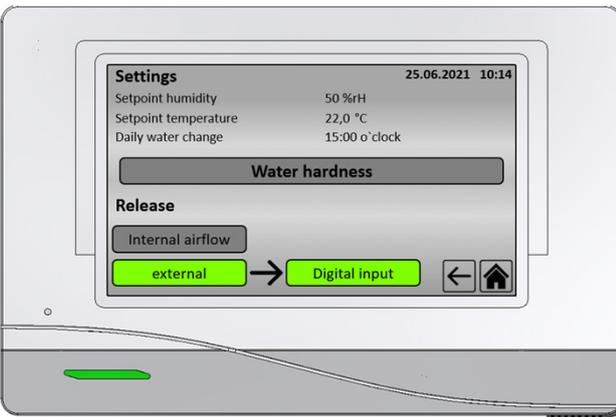


9.6.5 RELEASE

In this menu item the unit enable can be configured. By default, the enable is preset via the automatic airflow detection.



As an alternative you can enable the unit via an additional external command. In this process, you can choose between a digital input signal or an external Modbus connection *see Electrical Connection: Chapter 13*.



 **Note!** The humidification mode always requires an airflow and recognition by the internal sensor.



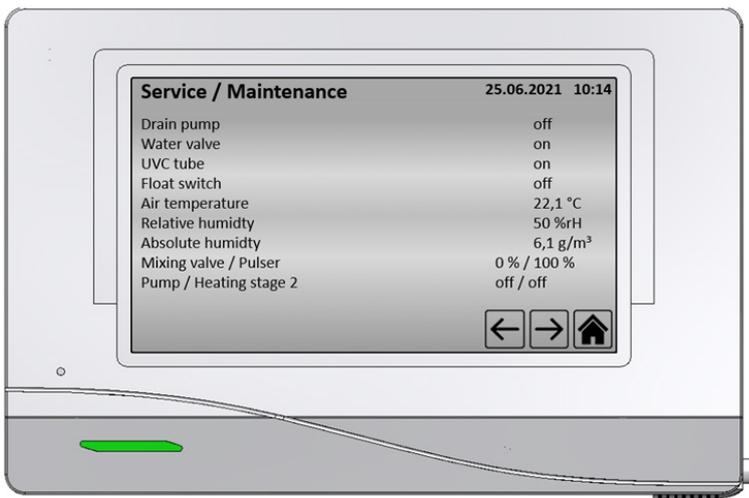
9.7 Service / maintenance



In order to reach the service and maintenance menu, the expert password must be entered first.



In the overview, the operating states of the different installation components as well as the air conditions measured are represented.



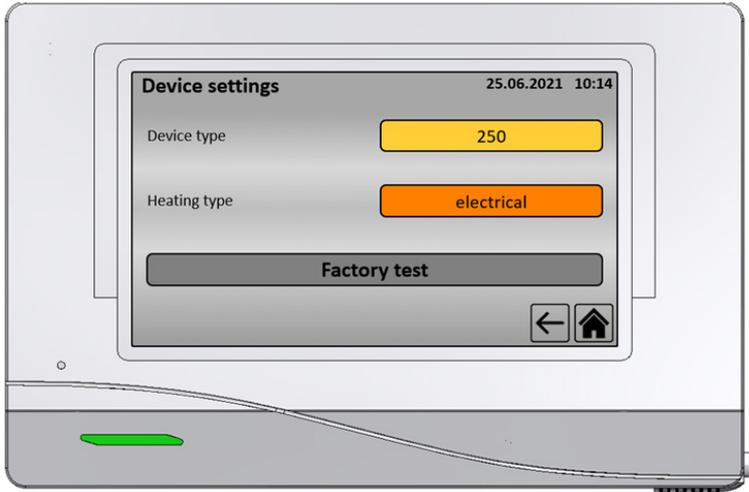
GENERAL

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When you press the arrow button , the unit settings are shown.



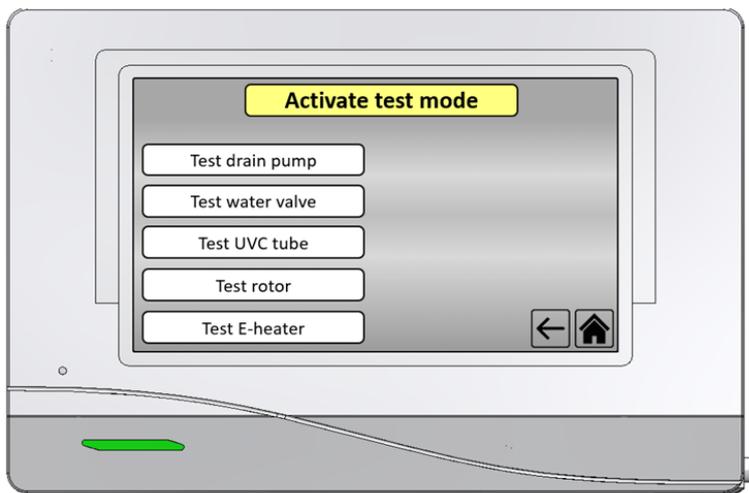
Note! The air humidification unit is pre-parameterised correctly by the factory. A selection of the unit type (LBE 250A / LBE 500A) and of the type of heater battery (electric / hot water) is only to be carried out when the control is replaced.



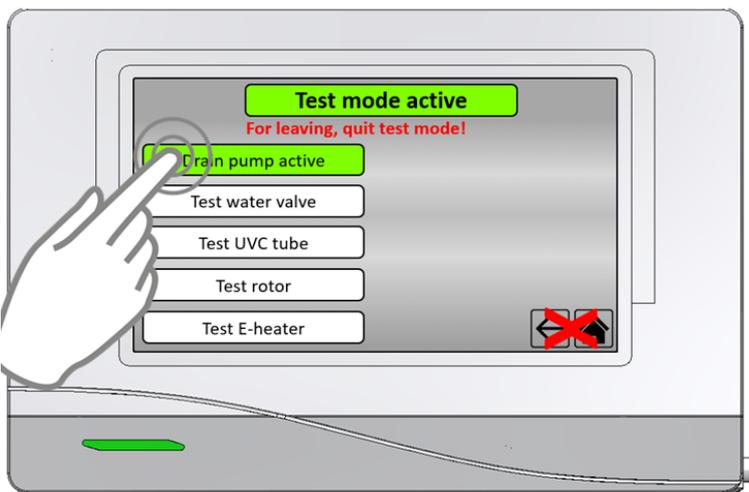
9.8 Test mode

In the "Factory test" menu item, the various electrical components can be checked with regard to their operability. For this purpose, the LBE must first be in the "Off" operating status, then the test mode can be activated.

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The components can be switched active by selection for a period of max. 10 seconds. By pressing the button again, operation can be stopped again immediately.



To exit the test mode, it has to be deactivated again first.



10. Technical specifications

UNIT TYPE	LBE 250 A	LBE 500 A
Air volume flow [m ³ /h]	Max. 350	Max. 500
Air humidity adjustable [%]	40 to 60	40 to 60
Air temperature adjustable [°C]	15 to 25	15 to 25
Evaporation performance [l/h]	Max. 2.5	Max. 3.6
Tank content [l]	Max. 2.5	Max. 6
Pressure loss [Pa]	See diagram	See diagram
Mains connection [V/Hz]	1~230/50	1~230/50
Power consumption [W] (version with a water heater battery)	Max. 100	Max. 100
Power consumption [W] (version with an electric heater battery)	Max. 1450	Max. 2850
Air connection [mm]	ø 160	ø 250
Water connection [inches]	ø ¾	ø ¾
Outlet connection [mm]	ø 40	ø 40
Siphon	On site	On site
Water inlet pressure [MPa]	Min/max. 0.35/0.7	Min/max. 0.35/0.7
Water temperature [°C]	Min/max. 8/30	Min/max. 8/30
Weight (without/with water) [kg]	25/28	47/53
Protection class [IP]	20	20
Installation type	Wall mounting	Wall mounting

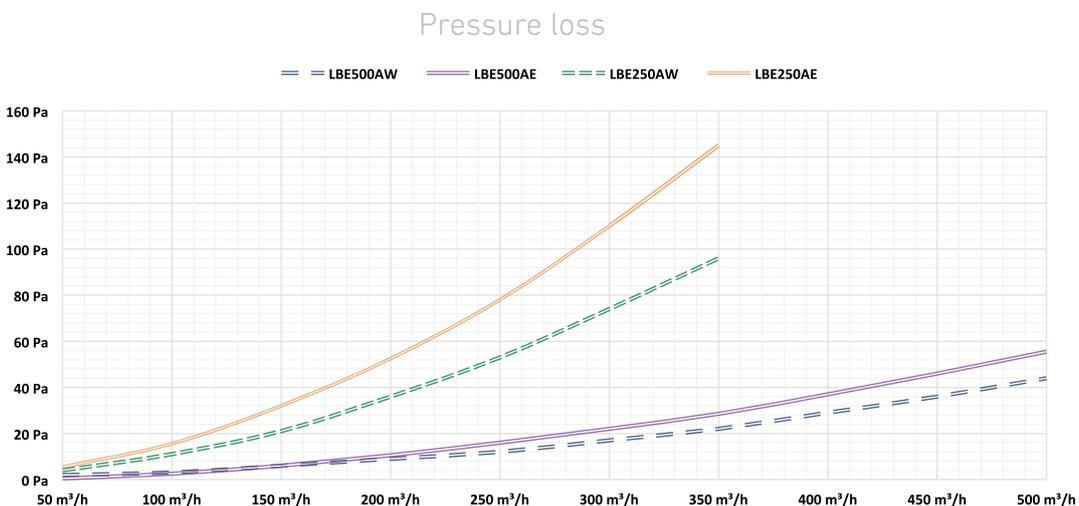
PTC ELECTRIC HEATER BATTERY		
Heating capacity of PTC element [W]	1400	2 x 1400

HOT WATER HEATER BATTERY		
Medium	Water	Water
Temperature flow, return flow* [°C]	40/35	40/35
Air inlet [°C]	15	15
Air outlet [°C]	25	25
Water volume [m ³ /h]	0,24	0,48
Connection (copper pipe) [mm]	ø 10	ø 22
Water pressure [MPa]	Max. 1	Max. 1
Water temperature [°C]	Max. 60	Max. 60

*) Heating water flow temperature for the full humidification performance must be at least 15 Kelvin higher than the desired air outlet temperature

10.1 Pressure loss characteristics

In the diagram shown in the following, the pressure loss values of the different unit types are listed.

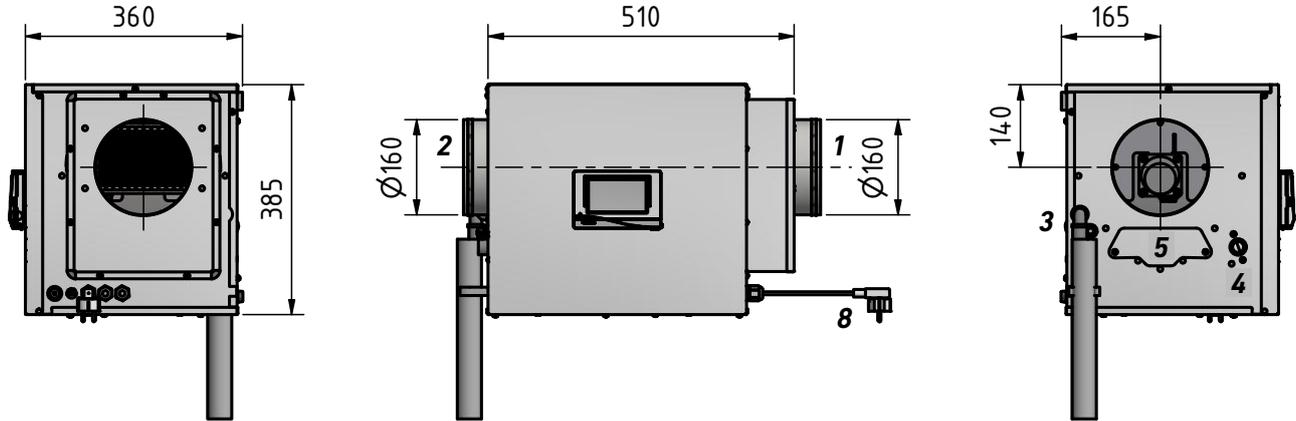


11. Layout sketches

11.1 Layout sketch for the LBE 250A (WALL INSTALLATION)

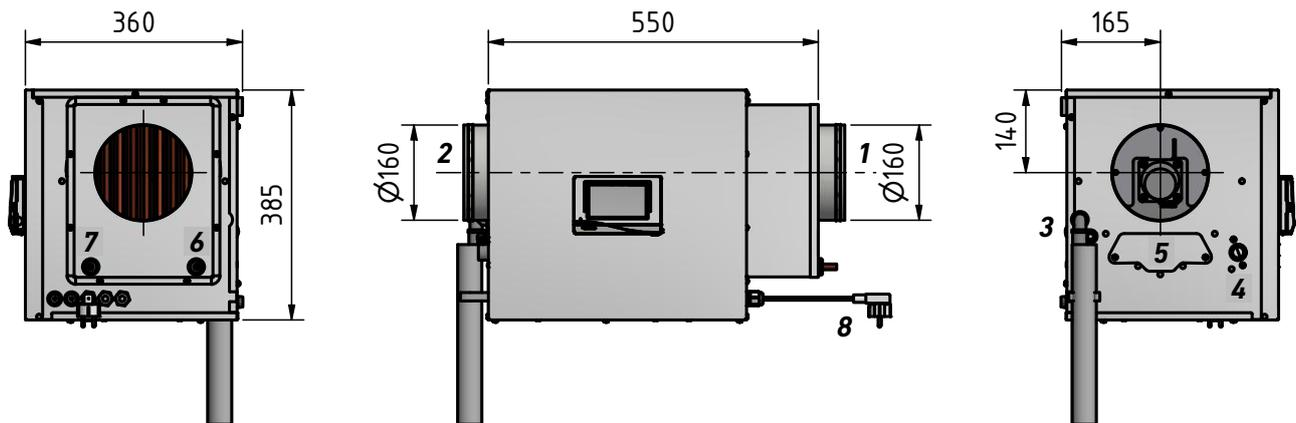
Air humidification unit LBE with PTC electric heater battery

Type 08LBE250ARE / 08LBE250ALE (dimensions: W x H x D = 510 x 385 x 360 mm)



Air humidification unit LBE with hot water heater battery

Type 08LBE250ARW / 08LBE250ALW (dimensions: W x H x D = 550 x 385 x 360 mm)



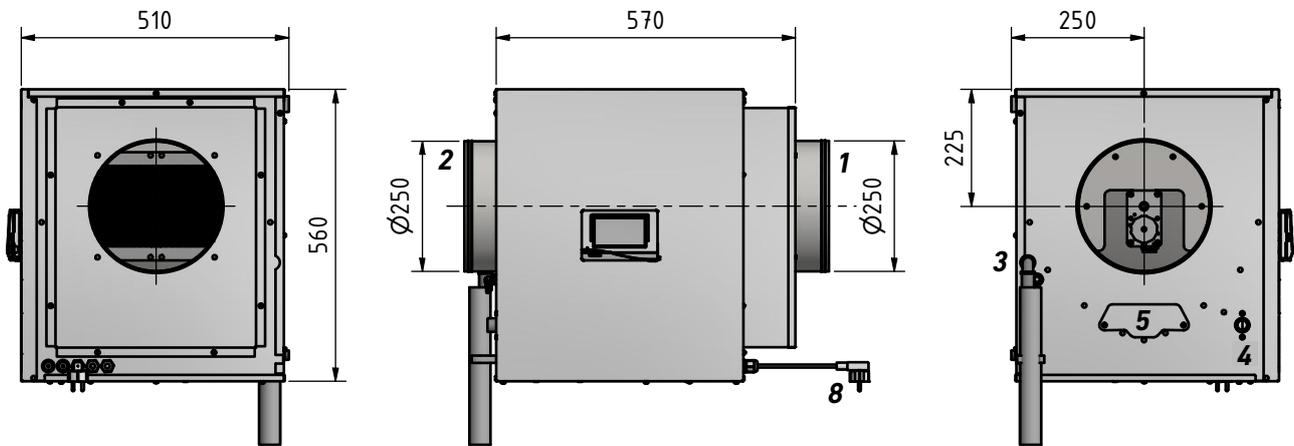
- 1 Air inlet (supply air from the ventilation unit) \varnothing 160 mm
- 2 Air outlet (supply air to the living area) \varnothing 160 mm
- 3 Drain (water drain) \varnothing 40/50 mm
- 4 Water supply (drinking water connection) $\frac{3}{4}$ "
- 5 UVC tube (cover for UVC tube replacement)
- 6 Return flow heating \varnothing 10 mm
- 7 Flow heating \varnothing 10 mm
- 8 Mains connection 230 V/50 Hz



11.2 Layout sketch for the LBE 500A (WALL INSTALLATION)

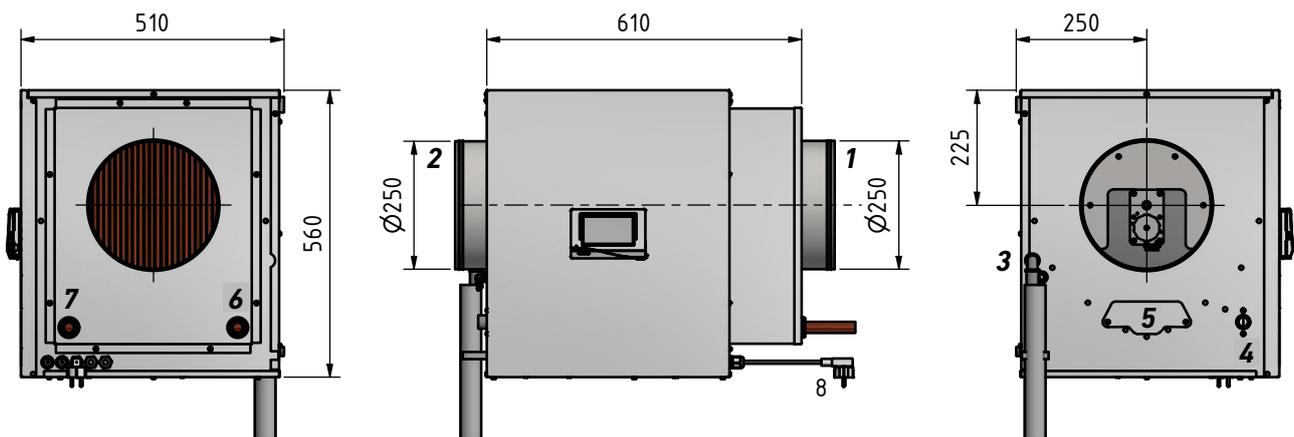
Air humidification unit LBE with PTC electric heater battery

Type 08LBE500ARE / 08LBE500ALE (dimensions: W x H x D = 570 x 560 x 510 mm)



Air humidification unit LBE with hot water heater battery

Type 08LBE500ARW / 08LBE500ALW (dimensions: W x H x D = 610 x 560 x 510 mm)



- 1 Air inlet (supply air from the ventilation unit) $\varnothing 250$ mm
- 2 Air outlet (supply air to the living area) $\varnothing 250$ mm
- 3 Drain (water drain) $\varnothing 40/50$ mm
- 4 Water supply (drinking water connection) $\frac{3}{4}$ "
- 5 UVC tube (cover for UVC tube replacement)
- 6 Return flow heating $\varnothing 22$ mm
- 7 Flow heating $\varnothing 22$ mm
- 8 Mains connection 230 V/50 Hz

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12. Mounting

12.1 Prerequisites for the unit installation

The national and local regulations must be heeded when installing and setting up the unit. The unit may only be installed in compliance with national installation regulations.

The unit may only be installed in frost-free and dry rooms. The temperature at the place of installation must be between +5 °C min. and +35 °C max. The unit is intended for horizontal mounting. It must be mounted on a massive, load-bearing wall with a maximum permissible deviation of +/- 1° from the horizontal position. The net operating weight of the humidification unit must be taken into consideration for the suspension. The unit must not be exposed to vibration of any kind.



The air humidification unit may only be installed in rooms where a water drain is available.



In the place of installation, safety measures are to be provided for, automatically and reliably shutting off the water supply to the air humidification unit in the event of an uncontrolled water discharge (water stop).



Air ducts of the ventilation system that are not installed in heated areas must be designed with suitable thermal insulation, in order to prevent potential condensation when the temperature falls below the dew point temperature.

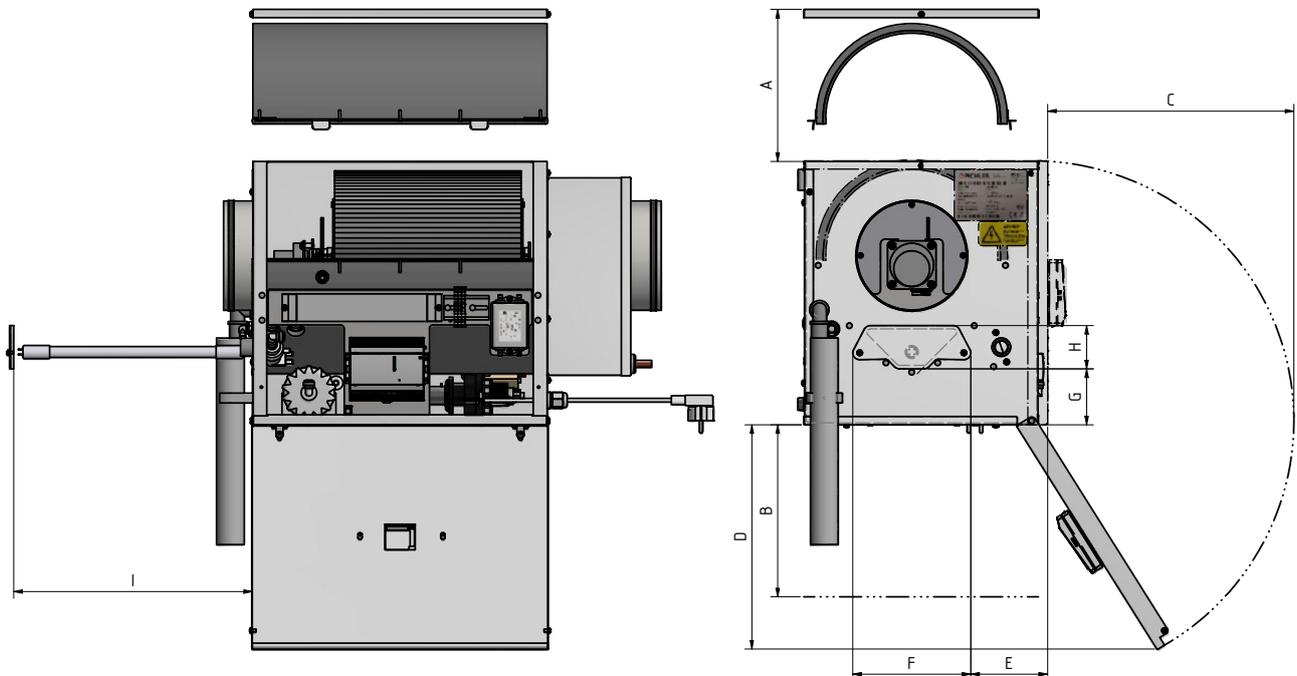


The place of installation for the air humidification unit must be readily accessible for maintenance and repair work. The specified maintenance clearances with regard to the unit must be strictly observed.

The warranty will be void for potential damage due to non-compliance with this note!

12.2 Minimum clearances to be observed

Minimum clearances with regard to the unit must be adhered to for the assembly, in order to enable the maintenance work required.



Maintenance clearances for the LBE250:

- A. ... 200 mm at the top
- B. ... 250 mm at the bottom
- C. ... 360 mm front lid front
- D. ... 330 mm front lid - bottom
- E. ... 110 mm UV tube maintenance front
- F. ... 170 mm UV tube maintenance length
- G. ... 80 mm UV tube maintenance floor
- H. ... 65 mm UV tube maintenance height
- I. ... 350 mm UV tube maintenance extension

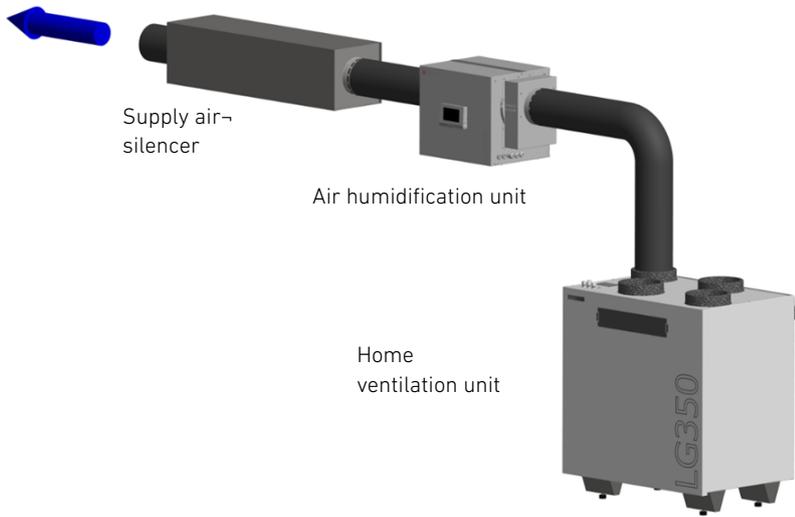
Maintenance clearances for the LBE500:

- A. ... 250 mm at the top
- B. ... 250 mm at the bottom
- C. ... 530 mm front lid front
- D. ... 470 mm front lid - bottom
- E. ... 170 mm UV tube maintenance front
- F. ... 170 mm UV tube maintenance length
- G. ... 80 mm UV tube maintenance floor
- H. ... 65 mm UV tube maintenance height
- I. ... 350 mm UV tube maintenance extension



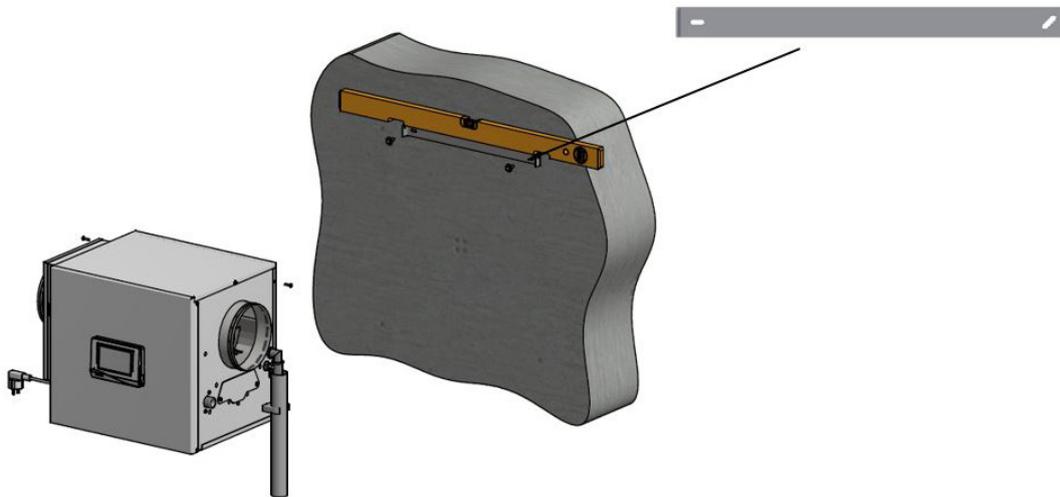
12.3 Assembly of the air humidification unit

The air humidification unit is installed in the supply air duct downstream of the living space ventilation unit.

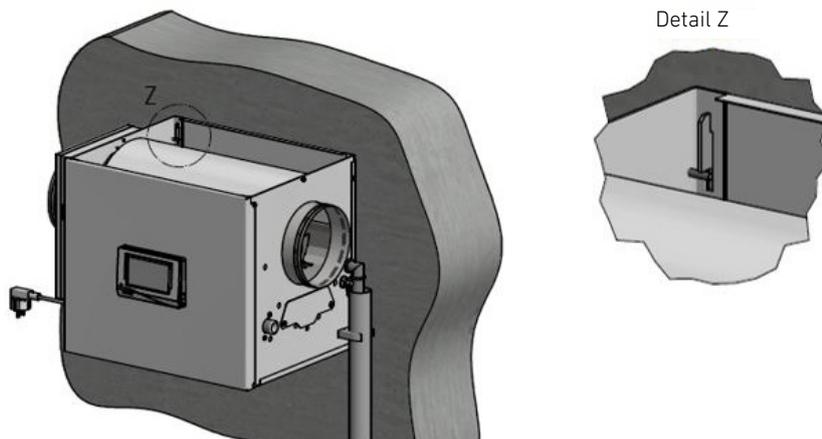


The silencer must be installed downstream of the air humidification unit to dampen any operating noise.

First, the mounting bracket supplied is mounted horizontally (max. deviation +/- 1°) on a massive and load-bearing wall.



Then the air humidification unit is fit into the wall mounting bracket and secured against being unhinged unintentionally, using the two securing screws at the sides on the bracket.



12.4 Air duct connections

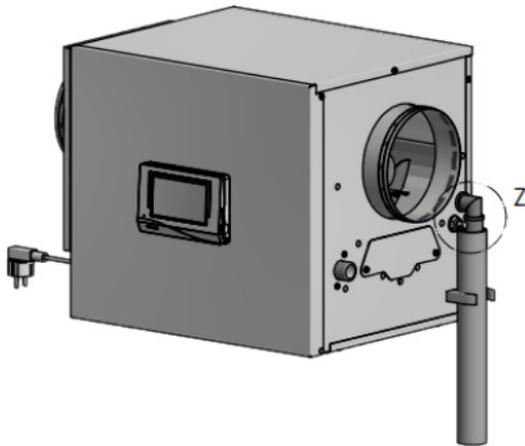


When installing the air duct connections, you must ensure that no metal chips enter the air humidification unit (they may cause spots of corrosion in the water tank). Upon completion of the assembly work, the air ducts must be cleaned thoroughly.

12.5 Sewage connection

The two sewage connections (1 x from the reverse osmosis unit and 1 x from the drain pump) must protrude freely approx. 3 cm into the sewage connection pipe supplied (HT- pipe DN 40 mm).

An odour seal (siphon) must be established on site.



Detail Z



Let the two sewage connections freely run into the sewage connection pipe approx. 3 cm.



No tubes must be connected directly to the drain.



The tank content of 2.5 litres of water is drained within approx. 10 seconds.

12.6 Drinking water connection

Only drinking water complying with the Drinking Water Ordinance may be used for the water supply. For connection to the water supply only the original connection tubes supplied may be used. The respective limit values, namely a minimum operating pressure of 0.35 MPa and a maximum operating pressure of 0.7 MPa as well as a minimum water temperature of 8 °C and a maximum water temperature of 30 °C, must neither be underrun nor exceeded.



With a chlorine content of more than 0.1 mg/l, the standard water filter (5 µm) must be replaced by a dual filter (5 µm / carbon).



If the iron content of the water exceeds a value of 0.1 mg/l, an additional iron filter must be mounted in the water supply line upstream of the fine filter. The unit is suited for operation with a maximum water hardness of 26 °dH.



Exceeding the limit values specified substantially reduces the lifetime of the osmosis membrane!

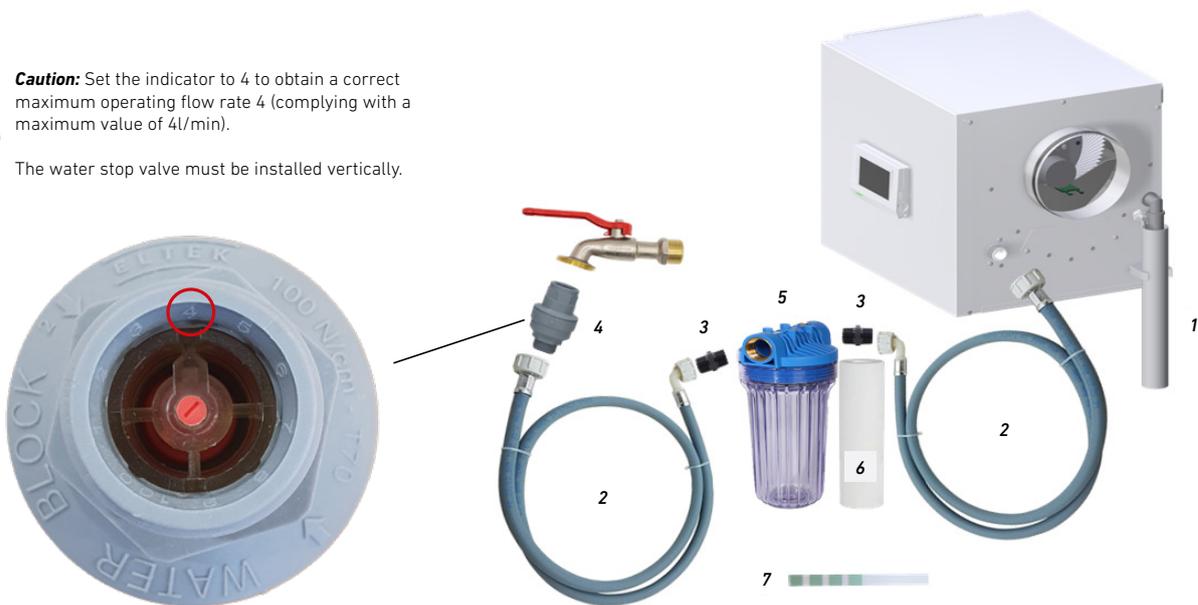


The water connection set (accessories) included in the scope of supply comprises the following parts:



Caution: Set the indicator to 4 to obtain a correct maximum operating flow rate 4 (complying with a maximum value of 4l/min).

The water stop valve must be installed vertically.



- 1 1 item sewage connection pipe HT pipe DN 40
- 2 2 items connecting tubes with 1.5 m, 3/4" each
- 3 2 items plastic fittings 3/4"
- 4 1 item water stop (water block) 1/2" to 3/4"
- 5 1 item filter housing
- 6 1 item water filter
- 7 1 item test strip for determining the water hardness

Water stop function

In the event of a serious defect (loose hose connection, broken water filter housing, etc.), the water stop automatically closes if a pressure drop of a sufficient amount is detected. This can prevent uncontrolled water leakage.

For restoring the function:

1. Close water tap
2. Remove hose
3. Unscrew water stop
4. Press red button on the valve outlet side.



A water stop device does not offer 100 % protection against water damage. The tightness of the water connection must therefore be checked at regular intervals.

12.7 Connection of the water heater battery

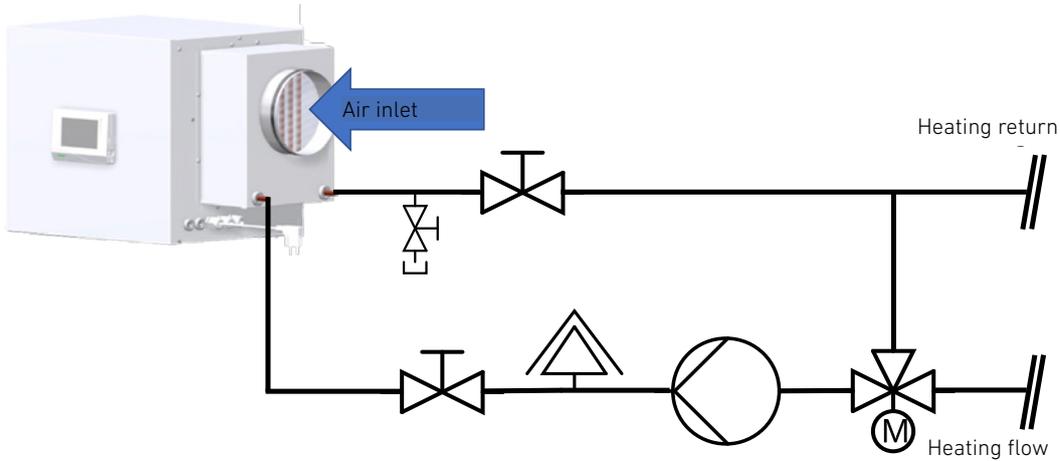
For versions with the hot water heater battery, the flow and return flow is integrated into the heating system. The circulating pump and a 3-way mixing valve (available as accessory part) are connected on site. For a full humidification performance, the inlet temperature must be at least 15 Kelvin higher than the desired air outlet temperature and must be constantly provided during the humidification period.



With too low heating water temperatures, the humidity and air temperatures set may possibly not be reached.



Hydraulic connection diagram



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The electrical connection work of the circulating pump and the 3-way mixing valve is to be implemented in compliance with the connection diagram (see Chapter 13).

The following hydraulic components available as accessories (see Chapter 16) are required for the installation into the heating system:

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	<p>3-way mixing valve with continuous rotary drive Drive LR24A-SR Supply voltage 24V AC/DC Control signal 2 – 10V Ball valve R3015 Cv: 0.63 m³/h</p>	<p>LBE 250A</p>
	<p>3-Way mixing valve with continuous rotary drive Drive LR24A-SR Supply voltage 24V AC/DC Control signal 2 – 10V Ball valve R3015 Cv: 1.6 m³/h</p>	<p>LBE 500A</p>
	<p>High-efficiency pump Alpha1.1 15-40 130 Supply voltage 230V AC Power consumption: 3 - 18 W Delivery height: 4 m Threaded connection: G 1" Installation length: 130 mm</p>	<p>LBE 250A / LBE 500A</p>
	<p>2 screw connections (optional) R 1/2a / 15 mm (brass)</p>	<p>LBE 250A / LBE 500A</p>

12.8 Connection of the low-temperature heating

With inlet temperatures below 35 °C and very cold outdoor temperatures, the humidification performance noticeably decreases, since the amount of evaporation energy provided is too small. Furthermore, the desired air temperature can possibly no longer be achieved either.



If the set air temperature at the outlet of the air humidification unit is underrun by more than 3 Kelvin for 15 min, the unit will switch off with a fault message for reasons of safety (see Chapter 14). If this fault is due to a too low inlet temperature, the target value for the air outlet temperature must be set to a lower value.



12.9 Removing the transport securing device



After having established all connections (in terms of air, water and electrics), the cover must be unscrewed and the transport securing device must be removed.



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GENERAL

13. Electrical connection

The air humidification unit is delivered with a mains plug and is already operable in the unit version with an electric heater battery.

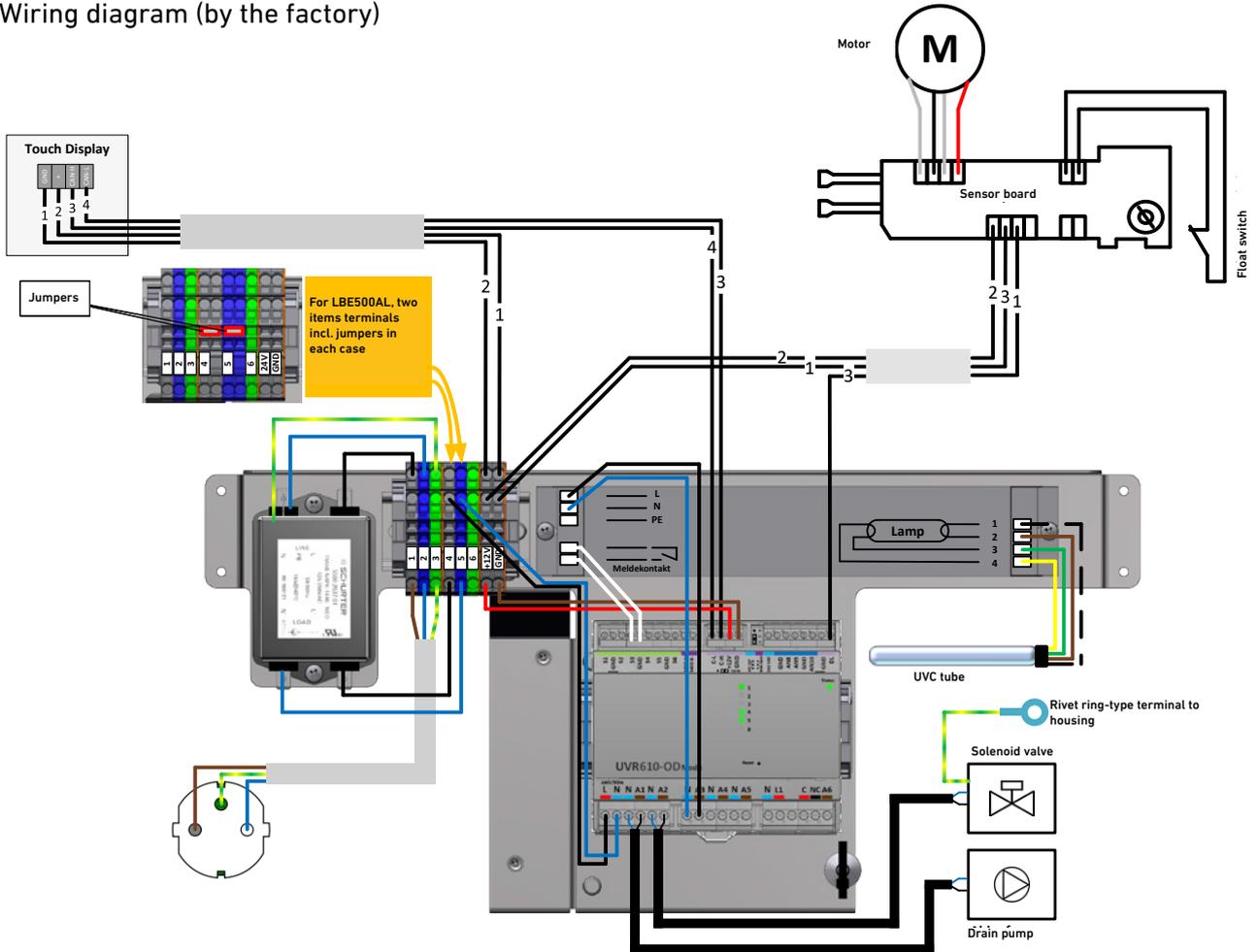


When performing any electrical work, the safety instructions *in Chapter 4* must be observed. The electrical connection and work on electrical components may only be carried out by authorised electricians.



The relevant national and local regulations and standards must be complied with during assembly and electrical installation.

Wiring diagram (by the factory)



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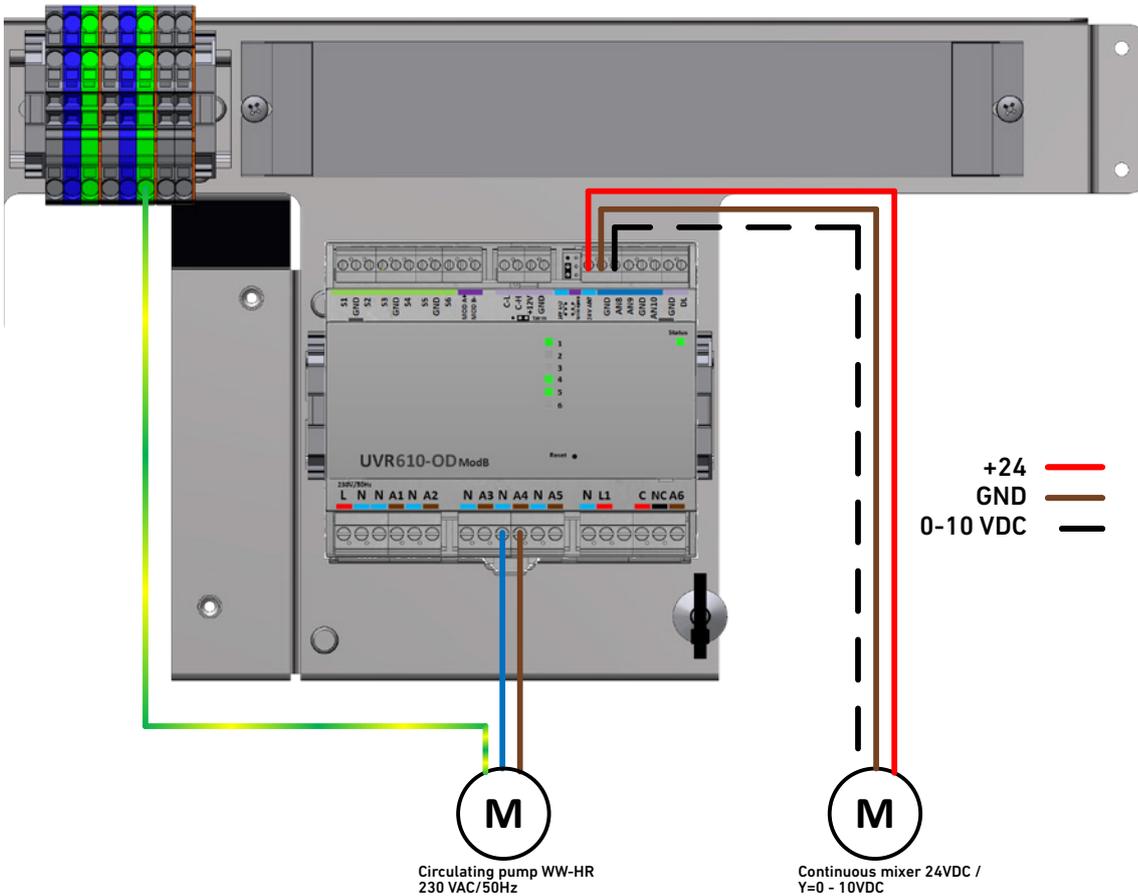


GENERAL

13.2 LBE with water heater battery (on site)

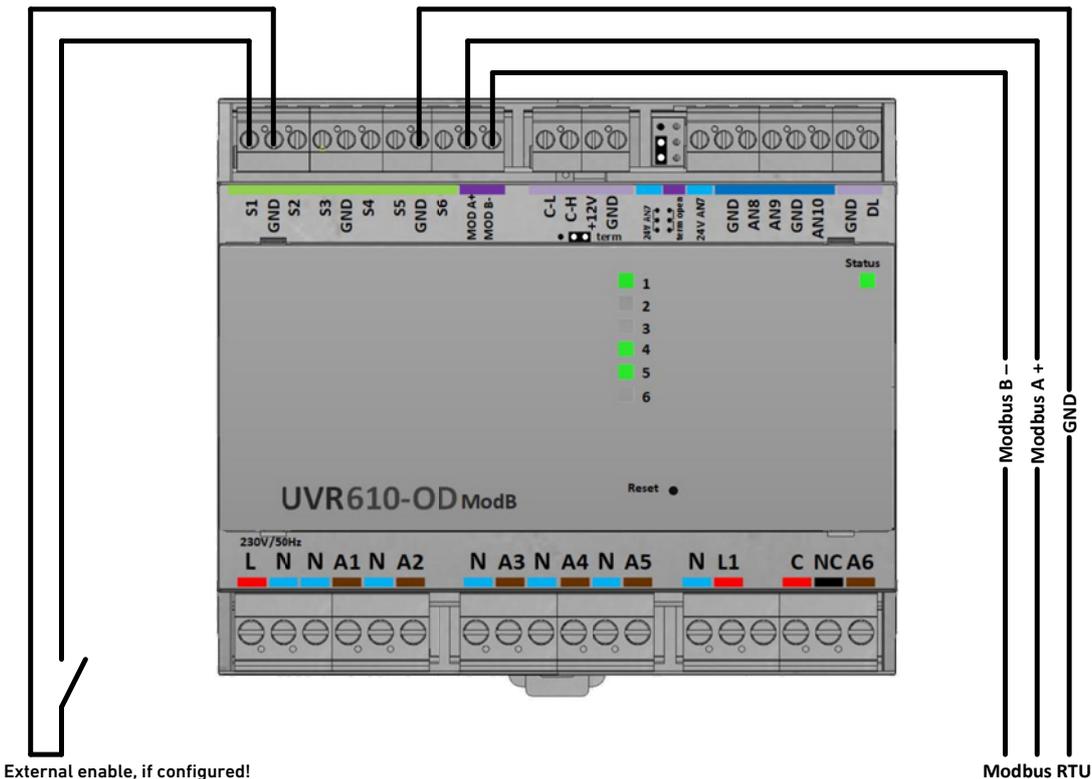
The design variants LBE250ALW and LBE250ARW as well as LBE500ALW and LBE500ARW are provided with water heater batteries. The circulating pump and the mixing valve must be connected on site in compliance with the electrical connection diagram.

USER



13.3 External connection (enable / Modbus)

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External enable, if configured!

Modbus RTU



13.3.1 MODBUS CONNECTION

CAUTION: Modbus settings can only be changed with the service password!

Mode:	RTU	Default
Baud rate	1200, 4800, 9600, 19200, 38400, 57600, 115200	19200
Start bit	1	1
Data bits	8	8
Stop bit	1 stop bit for even or odd / 2 stop bits for "None"	1
Parity	None, even, odd	Even
Address	Modbus address (1-247)	31

Modbus target values		Modbus write/read holding register (4x)				
Name	Description	Address	Min	Max	Decimal-points	Data type
Target temperature	Target value air outlet temperature (°C)	0	15	25	0	signed
Target humidity	Target value relative humidity (% RH)	2	40	60	0	signed
Enable via Modbus	Enable (0=inhibited; 1=enabled)	6	0	1	0	bit

Modbus release		Modbus Coil status register (5x)				
Name	Description	Address	Min	Max	Decimal-points	Data type
Enable via Modbus	Enable (0=inhibited; 1=enabled)	6	0	1	0	bit

Modbus data points		Read input register (3x)		
Name	Description	Address	Decimal points	Data type
T_supply air	Current air outlet temperature (°C)	0	1	unsigned
rF_supply air	Current relative humidity (%)	2	1	signed
aF_supply air	Current absolute humidity (g/m ³)	4	1	unsigned
Dew point_supply air	Dew point(°C)	6	1	signed
Float switch	Float switch (0=inactive; 1=active)	4	0	bit
Air flow measurement	Volume flow detection (<1800 volume flow detected)	10	0	signed
Water valve	Water valve (0=off; 1=on)	9	0	bit
UVC_ballast	UVC ballast (0=off; 1=on)	10	0	bit
Drain pump	Drain pump (0=off; 1=on)	11	0	bit
Motor_rotor	Motor rotor (0=off; 1=on)	12	0	bit
Heating_ON	Electric heater battery level 1 (0=off; 1=on)	38	0	unsigned
Level2_heater battery	Only for LBE500A*E: Electric heater battery level 2 (0=off; 1=on)	20	0	bit
Heating circuit pump	Only for LBE***A*W: Heating circuit pump (0=off; 1=on)	24	0	bit
0_10V_mixer_heating circuit	Only for LBE***A*W: Control signal mixer for hot water heater battery (0 - 10 V)	50	1	unsigned
UVC_lamp_DEFECTIVE	Error UVC tube (0=no; 1=yes)	29	0	bit
UVC_lifetime_end	UVC tube maximum operating hours (0=no; 1=yes)	30	0	bit
Drain pump_DEFECTIVE	Error: Drain pump (0=no; 1=yes)	31	0	bit
Humidity_too_high	Error: Relative air humidity too high for more than 4 hours (0=no; 1=yes)	32	0	bit
Humidity_too_low	Error: Relative air humidity too low for more than 6 hours (0=no; 1=yes)	33	0	bit
Change_osmosis filter	Osmosis filter maximum operating hours (0=no; 1=yes)	34	0	bit
Operating status	Operating status (0=off; 1=on; 2=standby)	12	0	unsigned
Accumulative fault message	Accumulative fault message (0=no; 1=yes)	35	0	bit
Bus error	Bus error (0=no; 1=yes)	36	0	bit
Operating hours_water filter	Operating hours water filter (0 - 10000 h)	78	0	unsigned
Operating hours_UVC tube	Operating hours UVC tube (0 - 10000 h)	80	0	unsigned
Operating hours_water filter	Operating hours osmosis filter (0 - 10000 h)	82	0	unsigned
Operating hours_active_humidity control	Operating hours active_humidity control (0 - 10000 days)	84	0	unsigned



14. Error messages and max. operating periods

Error message	Description	Possible causes
Humidity too low	Air humidity at the outlet of the LBE with active humidity control over a period of 6 hours is at least 20 % below the target value set.	Water filter clogged. Osmosis filter clogged. Water supply interrupted. Water valve defective (closed permanently). Switching output A2 (water valve) defective. Rotor does not rotate. Sensor board defective. Air flow volume too high.
Humidity too high	Air humidity at the outlet of the LBE with active humidity control over a period of 4 hours is at least 20 % above the target value set.	Water valve defective (permanently open). Switching output A2 (water valve) defective Sensor board defective.
Drain pump/float switch	Float switch triggered permanently for more than one hour.	Float switch defective / jammed. Float switch not connected. Drain pump defective. Switching output A1 (drain pump) defective. Sensor board defective.
UVC tube/electronic system	Fault message contact of the UVC ballast open for 10 s.	UVC tube defective. UVC tube not connected correctly. UVC ballast defective. Switching output A3 (UVC ballast) defective.
DL bus/CAN bus	No bus communication between the controller and the sensor board.	DL bus cable defective / damaged. DL bus cable not connected correctly. Sensor board defective.
Heater battery	Air temperature at the outlet of the LBE is not reached whilst humidity control is active. Temperature is below the target value by at least 3 Kelvin for 15 minutes.	Sensor board defective. With an electric heater battery: Heater battery defective / no function. SSR (solid state relay) defective. Analog output A9 (0-10 V) defective Switching output A6 (heater battery) defective. With a hot water heater battery: Heater battery defective / no function. Switching output A4 (pump) defective Analog output A8 (0-10 V) for mixer defective Hot water pump defective Mixing valve defective Heating water temperature too low

Max. operating times	Description	Possible causes
UVC tube	UVC tube has reached its maximally recommended operating time. Advance warning and warning by operating hours.	Maximally recommended operating time reached soon or reached already.
Water filter	Water filter has reached its maximally recommended operating time. Advance warning and warning by operating hours.	Maximally recommended operating time reached soon or reached already.
Osmosis filter	Osmosis filter has reached its maximally recommended operating time. Advance warning and warning by operating hours.	Maximally recommended operating time reached soon or reached already.



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15. FAQ

FAQ	Reply
How accurate is the humidity sensor of the LBE?	The accuracy of the humidity sensor is subject to tolerances and, in the measuring range of 10 – 90 % RH, it is typically +/- 2 % to +/- 3.5 %.
Can the LBE also be used for cooling the supply air?	No, the heater battery only serves to compensate the temperature due to the air cooling caused by the humidification.
Can the LBE also be used for cooling the supply air?	By the humidification process, the air temperature is reduced, but in turn, the increase in humidity has the effect that the temperature seems warmer.
What is the amount of electrical energy required annually by the LBE with an electric heater battery?	This depends on many factors, so that there is no general answer to this question. The evaporation of 1 kg of water requires the supply of 0.68 kWh of thermal energy. Since the room climate is considerably more pleasant, the room temperature can also be slightly reduced.



16. Maintenance (specialist)

16.1 UVC tube replacement



Please note! The UVC tube replacement must only be carried out by specialists.

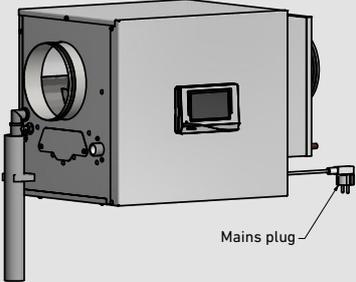
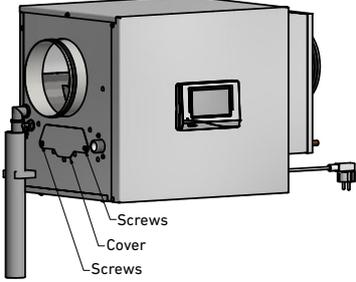
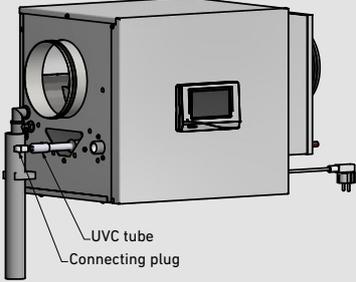
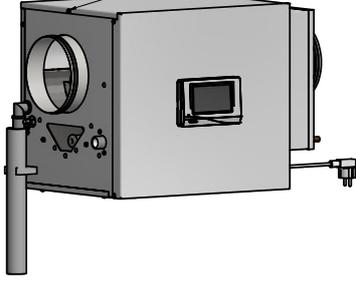
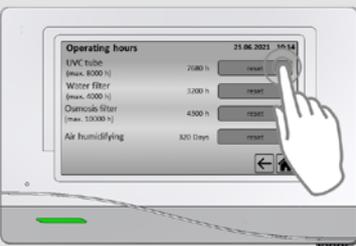
After the display message "UVC – end of service life reached", the following worksteps must be carried out:

Only original spare parts may be used (see Chapter 16).

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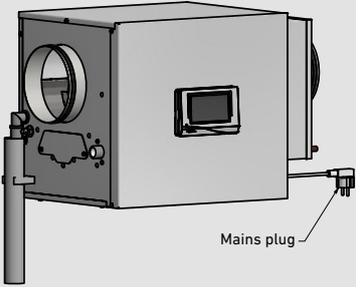
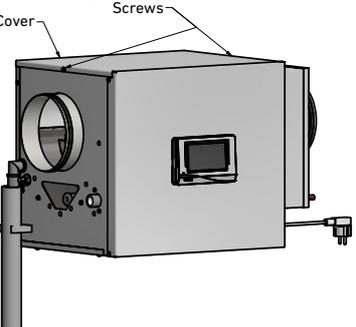
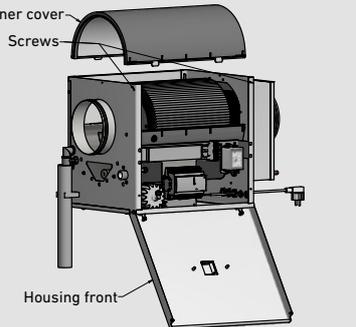
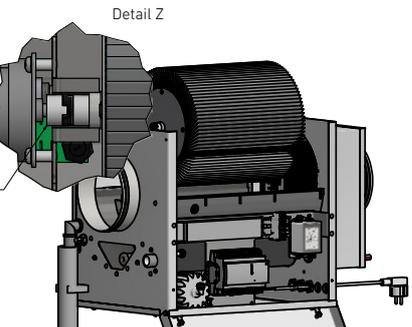
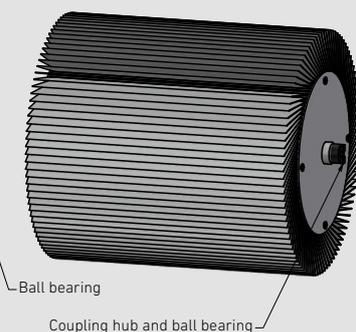
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 <p>Mains plug</p>	 <p>Before opening the unit, disconnect the mains plug and protect the unit against restart!</p> <p>Never look into the illuminated UVC tube without eye protection!</p>
 <p>Screws Cover Screws</p>	<p>Remove the two screws of the cover and remove the cover.</p>  <p>Sharp sheet edges (risk of injury).</p>
 <p>UVC tube Connecting plug</p>	<p>Draw out the UVC tube with the rubber grommet 5 cm, remove the connecting plug and dispose of the UVC tube in an environmentally sound fashion.</p>
	<p>Insert the new UVC tube into the dip tube, fasten the connecting plug and seal the dip tube tight again with the rubber grommet. Then fix the cover again and re-establish the power supply.</p>  <p>Sharp sheet edges (risk of injury).</p>
	<p>Reset the operating time of the UVC tube (see Chapter 9.4.1).</p>



16.2 Maintenance of the reverse osmosis unit and rotor lamellae

Only original spare parts may be used (see Chapter 16).

 <p>Mains plug</p>	<p>⚠ Before opening the unit, disconnect the mains plug and protect the unit against restart!</p> <p>Never look into the illuminated UVC tube without eye protection!</p>
 <p>Cover Screws</p>	<p>Remove the two screws on the unit cover and lift the cover.</p>
 <p>Inner cover Screws Housing front</p>	<p>Fold down the housing front and lift the rotor cover.</p>
 <p>Detail Z Position</p>	<p>Bring the rotor to the position in which the coupling hub is vertical – see detail Z.</p> <p>Carefully lift the rotor out upwards.</p> <p>⚠ Only touch the rotor when you are wearing gloves, there are sharp edges on the lamellae (risk of injury).</p>
 <p>Ball bearing Coupling hub and ball bearing</p>	<p>Cleaning the rotor lamellae</p> <p>Remove the ball bearing from the rotor shaft and keep it in a safe place during the cleaning process.</p> <p>Place the rotor with the lamellae into a larger vessel vertically with the coupling hub pointing towards the top.</p>

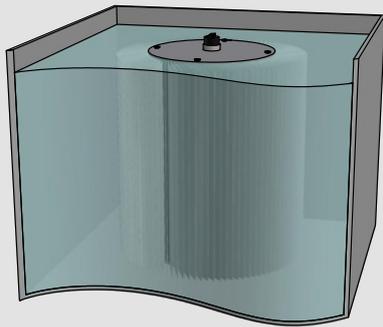
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Add some cleaning agent into the vessel and fill it up with warm water until the lamellae are completely covered.



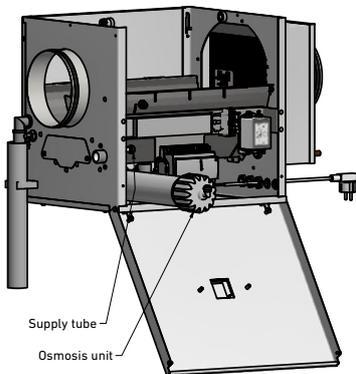
**Only use biologically-based cleaning agents!
Observe the safety instructions!**



The coupling hub and the ball bearing must not be covered by the water.

Depending on how dirty the lamellae are, it is advisable to keep the rotor lamellae in the detergent solution between 3 and 6 hours. Afterwards, rinse the rotor lamellae with warm water.

USER



Replacing the osmosis membrane



When you carry out this workstep, water may leak from the osmosis unit!

Two black plastic tubes are connected to the osmosis unit. One tube (supply tube) leads from the water valve to the osmosis unit, and one tube leads from the osmosis unit to the tank inlet.

First the supply tube from the osmosis unit must be disconnected. For this purpose, press the clamp ring at the valve connector backwards and at the same time remove the tube.



The LBE 500A type contains two osmosis units. You must always replace both osmosis membranes at the same time!

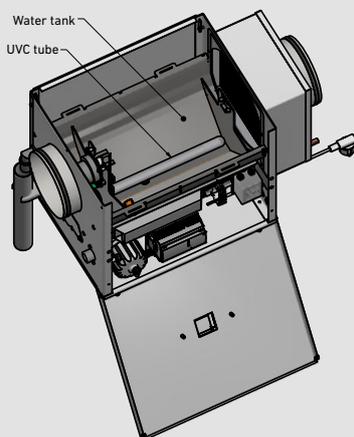
Then unscrew the cover from the osmosis unit and draw the osmosis membrane out of the housing.

After having replaced the osmosis membrane, screw on the cover again and insert the tubes into the valve connectors.



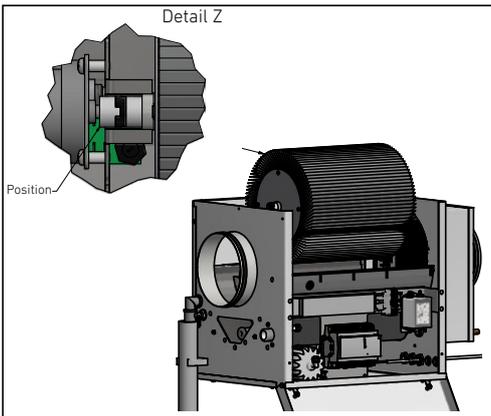
Exert tensile force to ensure that the tubes are firmly fit and that the connection is tight!

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Clean the water tank of the air humidifier with a damp cloth.



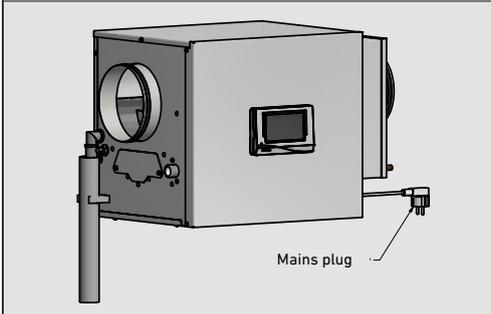


Fit the ball bearing on the rotor shaft again and carefully reinsert the rotor into the unit.

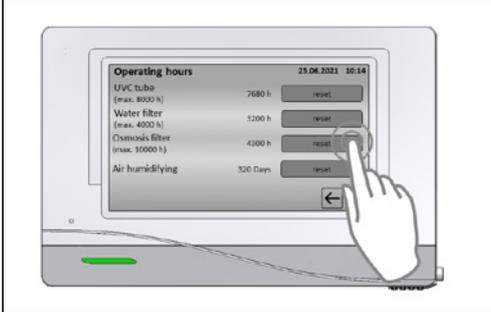
Make sure that the coupling hub is standing vertically – see detail Z.



Only touch the rotor when you are wearing gloves, there are sharp edges on the lamellae (risk of injury).



Re-assemble the unit and re-establish the power supply.



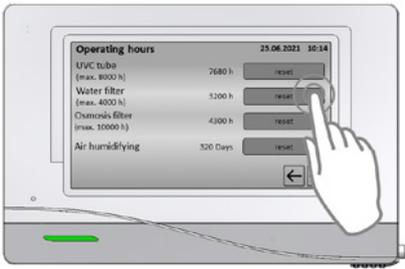
Reset the operating time of the osmosis filter (see Chapter 9).



16.3 Maintenance of the water filter

The water filter in the water supply line must be replaced periodically. The filter change is automatically indicated by a message that is output on the humidification unit.

Only original spare parts may be used (*see Chapter 16*).

	<ol style="list-style-type: none"> 1) Switch off the humidification unit 2) Interrupt the water supply line upstream of the filter unit 3) Hold the container underneath the filter housing (water may leak) 4) Screw off the filter housing 5) Remove the filter and replace it by a new one 6) Close the filter housing and re-establish the water supply
	<p>Resetting the operating time of the water filter (<i>see Chapter 9</i>).</p>

17. Accessories and spare parts



Only original spare parts may be installed or used for replacements and repairs.

ACCESSORIES FOR THE HOT WATER HEATER BATTERY

Item	Description	Item number
Circulating pump for the heater battery	Alpha.1 15-40 130; 230 V	08UPUMPE3
Actuator for the mixing valve	LR24A-SR ; AC/DC 24 V; 2 – 10 V; 5 Nm	07LR24ASR
3-way mixing valve incl. drive for LBE 250A	3-way valve 3015-P63-S1	07R3015P6LR24ASR
3-way mixing valve incl. drive for LBE 500A	3-way valve 3015-1P6-S1	07R30151PLR24ASR
2 screw connections (optional)	R 1/2a / 15 mm (brass)	08HOVER2

SPARE PARTS FOR THE AIR HUMIDIFICATION UNIT

Item	Description	Item number
Water filter cartridge	Polypropylene fleece 5µm	40E0003A
Water filter housing incl. filter cartridge	¾" connection	40B0062B
Water hardness test strip	Sotin hardness indicator dipstick	40I0028A
UVC tube	TUV 16W 4P-SE	40I0023A
Osmosis membrane	(LBE 250Ax1 / LBE 500Ax2)	40C0029C
Cleaning agent	Sotin 212	40I0014A

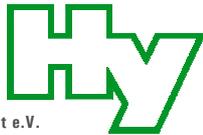


18. Firmware update

To carry out an update of the firmware, functional data and functional overview, please use the following QR code to download the latest version from the Internet and follow the instructions.



19. Hygiene certificate

Hygiene-Institut des Ruhrgebiets Institut für Umwelthygiene und Toxikologie Director: Dr. Thomas-Benjamin Seiler Legal Entity: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.			
Hygiene-Institut · PO Box 10 12 55 · DE 45812 Gelsenkirchen · Germany		Address: Rotthauer Str. 21, DE 45879 Gelsenkirchen Switchboard +49 (0)209 9242-0 Telefax +49 (0)209 9242-222 Internet www.hyg.de Our reference: W-351037e-21-JRoll Contact person: Dipl.-Ing. (FH) S. Horn B. Zeidler Gelsenkirchen, 15.10.2021	
<h3>Test - certificate</h3> <p>hygiene–conformity check to the design requirements of selected regulations</p>			
Test institute:	Hygiene Institut des Ruhrgebiets Institut für Umwelthygiene und Toxikologie Rotthauer Straße 21 45879 Gelsenkirchen		
Test object:	Air humidification unit size "LBE 250A" / "LBE 500A"		
Manufacturer:	J.Pichler Lufttechnik Gesellschaft m. b. H. Karlweg 5 A-9021 Klagenfurt		
Basis of the examination:	<ul style="list-style-type: none"> ✓ VDI 6022, Blatt 1 (01/2018) ✓ SWKI VA104-01 (01/2019) ✓ VDI 3803, Blatt 1 (05/2020) ✓ ÖNORM H 6021 (08/2016) 		
Validity period:	5 years 10/2021 – 10/2026		
Test report:	W-351037-21-JRoll		
In conclusion it can be stated that the examined Air humidification unit size "LBE 250A" / "LBE 500A", as specified in the test report W-351037-21-JRoll, is in compliance with the above mentioned regulations.			
 (B. Zeidler) clerk of the Department hygienic building technology		 (J. Rolle B. Eng.) clerk of the Department hygienic building technology	
issued 15.10.2021, Gelsenkirchen			
Within the framework of the conformity check the hygiene-relevant requirements of the above mentions regulations was examined. Requirements of other regulations that refer to the above mentioned regulations were not part of the examination. Additionally, the conformity check does not include a toxicological or sensory testing of the introduced materials.			
Legal Entity: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Register: VR 519 Local Court Gelsenkirchen (Germany); VAT ID: DE125018356 Directorate: Prof. Dr. Jürgen Kretschmann (Head), Dr. Emanuel Grün, Dr. Dirk Waider, Joachim Löchte, Dr. Thomas-Benjamin Seiler (Executive Member).			



20. EG-Konformitätserklärung / EC Declaration of Conformity

GENERAL

Hersteller/Manufacturer:	J. Pichler Gesellschaft m. b. H.
Anschrift/Address:	Karlweg 5 9021 Klagenfurt am Wörthersee Österreich / Austria
Bezeichnung/Product description:	LBE 250A / LBE 500A
Ausführungen/Type:	LBE 250ARE / LBE 250ALE / LBE 250ARW / LBE 250ALW LBE 500ARE / LBE 500ALE / LBE 500ARW / LBE 500ALW

USER

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender europäischen Richtlinien überein:

The products described above in the form as delivered are in conformity with the provisions of the following European Directives:

2014/35/EU	Zur Harmonisierung der Rechtsvorschriften der Mitgliedsstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt <i>On the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits</i>
2014/30/EG	Zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit <i>On the harmonisation of the laws of the Member States relating to electromagnetic compatibility</i>

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen und Verordnungen:

Conformity to the Directives is assured through the application of the following standards and regulations:

ÖVE / ÖNORM EN 60335-1:2020-09-01	ÖVE / ÖNORM EN 55014-2:2016-02-01
ÖVE / ÖNORM EN 60335-2-88:2003-11-01	ÖVE / ÖNORM EN 61000-3-2:2019
ÖVE / ÖNORM EN 62233:2009-01-01	ÖVE / ÖNORM EN 61000-3-3:2013 + A1:2019
ÖVE / ÖNORM EN 55014-1:2018-09-01	ÖVE / ÖNORM EN 61000-6-1:2019
	ÖVE / ÖNORM EN 61000-6-3:2007+A1:2011

Eine vom Lieferzustand abweichende Veränderung des Gerätes führt zum Verlust der Konformität.

Product modifications after delivery may result in a loss of conformity.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitsinformationen der mitgelieferten Produktdokumentation sind zu beachten.

This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

SPECIALIST PERSONNEL

J. Pichler Gesellschaft m. B. H.

Klagenfurt am Wörthersee, 01 October 2021



SERVICE TABLE

In order to document maintenance works, this table must be completed after performance of works:

System commissioned by:			Date
No.	Maintenance work (e.g. filter change)	Performed by Signature	Date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

GENERAL

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klimaaktiv
Partner

PASSIVHAUS
Austria

Mitglied
NETZWERK
PASSIVHAUS
www.passivhaus.at

Author: J. Pichler Gesellschaft m.b.H. |
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PICHLER

Systematic ventilation.

J. PICHLER
Gesellschaft m.b.H.

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