

# AIR HUMIDIFICATION UNIT LBE 250 / LBE 500

COMFORT  
VENTILATION



**OPICHLER**

*Systematic ventilation.*

## Importance of indoor air humidity

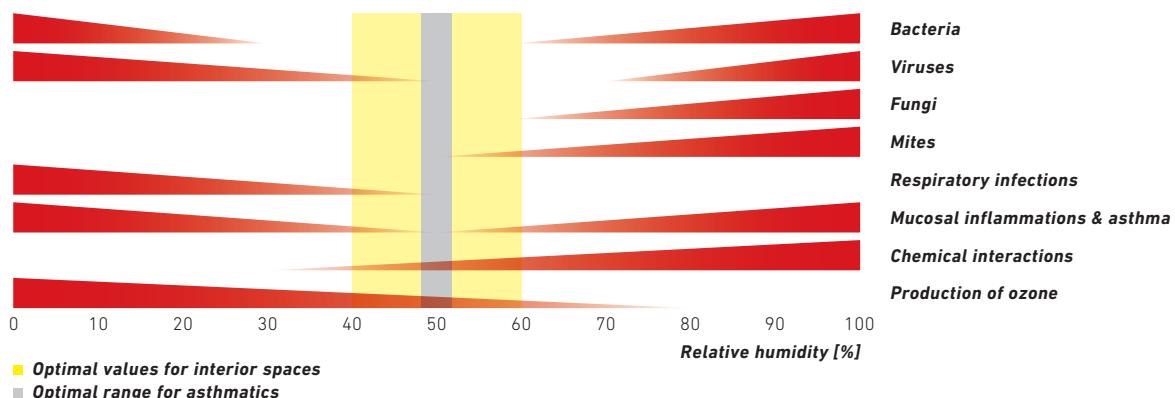
**For the benefit of our health, the optimal level of relative indoor air humidity lies in the range between 40 % and 60 %.**

It is a known fact that a relative humidity level below 40 % can lead to the drying up of mucous membranes, thus increasing the susceptibility to infectious colds, as dry air has a negative impact on the cleaning function of the inner surfaces of the airways.

A higher level of relative humidity, in the range between 40 % and 60 %, has a positive influence on the comfort of the indoor climate for several reasons: It reduces the concentration of respirable dust in the air, activates the skin's defences against microbes, lowers the life expectancy of bacteria and viruses, reduces unpleasant odours and prevents the troublesome build-up of electrostatic charges in the room.

However, humidity exceeding 70 % is usually perceived as uncomfortable, presumably because the absorption of oxygen in the blood is reduced in warm, humid conditions. Cold, damp air appears to increase the incidence of rheumatic disorders. It is of particular concern that levels of humidity above 70 % can lead to the rapid growth of mildew in closed rooms.

### EFFECTS OF LOW OR HIGH RELATIVE HUMIDITY IN INTERIOR SPACES



## Adverse effects due to excessively dry indoor air

### with regard to comfort

- A decline in performance capacity and in our sense of well-being
- A greater exposure to dust and micro-organisms

### with regard to health

- Problems with throat and pharynx
- Dry eyes and skin (itchiness)
- Nosebleeds and headaches

### with regard to aspects of building physics

- Cracks in parquet flooring, furniture, etc.
- Damage to antiques and out-of-tune musical instruments

**During the cold season, particularly in the winter months, the indoor humidity can drop to uncomfortable levels below 30 per cent!**



## Why humidify actively?

Humans spend most of their lives in interior spaces. An indoor climate that is compatible with health is essential for a healthy sense of well-being and optimum performance capacity. In this regard, not only the temperature of the living space but also the humidity plays a significant part, amongst other things.

### PHYSICAL TERMS

It is a principle of physics that the rate at which air absorbs water depends on the temperature. The colder the air is, the less water it can absorb; the warmer the air is, the more water it can absorb. A distinction is made between "absolute" and "relative" humidity.

### ABSOLUTE HUMIDITY

Absolute humidity states the actual moisture content in the air at a specific temperature. The saturation point is said to have been reached, when the maximum amount of water has been absorbed into the air.

### RELATIVE HUMIDITY

Relative humidity describes the relation between the actual and the maximum water vapour content in the air at a specific temperature. This is measured with the use of a hygrometer.

### OPTIMAL MOISTURE CONTENT

The optimal moisture content of indoor air lies approximately at 9.2 g water per m<sup>3</sup> air. At a room temperature of 21 °C

this corresponds to a relative humidity level of 50 %. As a general rule, the supply air coming into a single family house, given an outdoor air temperature of -5 °C and a target indoor temperature of 21 °C at 50 % relative humidity, would require an additional 1.2 litres of water per hour.

Saturation values of absolute humidity = 100 % rel. humidity	
- 10 °C	2.3 g water/m <sup>3</sup> air
- 5 °C	3.4 g water/m <sup>3</sup> air
0 °C	4.8 g water/m <sup>3</sup> air
+ 5 °C	6.8 g water/m <sup>3</sup> air
+ 10 °C	9.4 g water/m <sup>3</sup> air
+ 15 °C	12.9 g water/m <sup>3</sup> air
+ 21 °C	18.4 g water/m <sup>3</sup> air
+ 25 °C	23.1 g water/m <sup>3</sup> air

### AVERAGE HUMIDIFICATION REQUIREMENT USING THE EXAMPLE OF THE LOCATION AMSTETTEN

Operational air volume flow 190 m<sup>3</sup>/h; room temperature 21 °C; indoor air humidity 50 %

Month	Outdoor air conditions (location Amstetten) average values from 2003 to 2008 wetter.amstetten.at			Ventilation temperature 21 °C 50 % rel. hum. ≈ 9.2 g/m <sup>3</sup>		
	Temperature in °C	Rel. hum. in %	Abs. hum. exterior by g/m <sup>3</sup>	Insufficient amount of water by g/m <sup>3</sup>	Rate of evaporation by l/h	Rate of evaporation by l/day
January	0.1	86	4.2	- 5.0	- 0.95	- 22.8
February	0.9	80	3.8	- 5.4	- 1.03	- 24.6
March	4.5	75	4.8	- 4.4	- 0.84	- 20.1
April	10.7	66	6.2	- 3.0	- 0.57	- 13.7
May	14.8	69	8.3	- 0.9	- 0.17	- 4.1
June	18.0	71	10.9	1.7	0.32	7.8
July	20.3	73	12.6	3.4	0.65	15.5
August	19.0	76	12.4	3.2	0.61	14.6
September	15.2	80	10.3	1.1	0.21	5.0
October	9.4	86	7.6	- 1.6	- 0.30	- 7.3
November	4.4	90	5.7	- 3.5	- 0.67	- 16.0
December	0.2	90	4.4	- 4.8	- 0.91	- 21.9

The average temperature in January is +0.1 °C with a humidity level of 86 %. This equates to an outdoor air moisture content of 4.2 g/m<sup>3</sup>. The optimal moisture content of indoor air in the living space should be around 9.2 g/m<sup>3</sup>.

The moisture content of the indoor air is 5 g/m<sup>3</sup> below the level required to achieve these optimal air conditions. At a continuous air volume flow of 190 m<sup>3</sup>/h, the average missing water volume can be calculated at 0.95 litres per hour.

Extrapolated to a full day we can calculate that approximately 23 additional litres of water would be required in the indoor air, in order to maintain the optimal target values.



## Product description

Air treatment unit for the active humidification of indoor air and for auxiliary heating of air in living spaces, patented and tested system, suitable for installation or retrofitting in ventilation and air conditioning systems. Patented and tested system, suitable for the installation in the central ventilation

system, also suitable for retrofitting. The compact air humidification unit operates according to the principle of natural evaporation (prevents excessive humidification) and ensures a constant and optimal living space humidity level – adjustable within the range of 40 % to 60 % relative humidity. Proven safety

of use from a hygiene perspective, with expert hygiene report. Simple operation with low operational costs, evaporation energy can be produced by the existing heating system. Low maintenance effort Suitable in conjunction with our compact ventilation units, type LG.

## Mode of operation

The heating of the air required to provide the evaporation energy is carried out with the use of an integrated water heater battery or by type LBE 250 with an optional integrated PTC Electric Heater Battery.

The water tank into which the bladed rotary evaporator is immersed, is supplied with water from the drinking water network. A floating switch and an ancillary mechanical overflow automatically control the liquid level.

The continuous and automatically monitored UVC-disinfection process, as well as the time-controlled replacement of the water, prevents the build-up of germs and bacteria most effectively. To protect the unit from the accumulation of lime-scale, a reverse osmosis unit has been integrated in the water inlet pipe. The necessary water replacement

is carried out automatically and depends on the preset water hardness and the evaporative power.

The bladed rotary evaporator is manufactured from aluminium, the water tank is made of high-grade steel, material number 1.4571, and the compact housing is constructed from zinc-coated steel plate, with a powdercoated exterior surface using RAL 9010.

### EXTERNAL INSPECTION

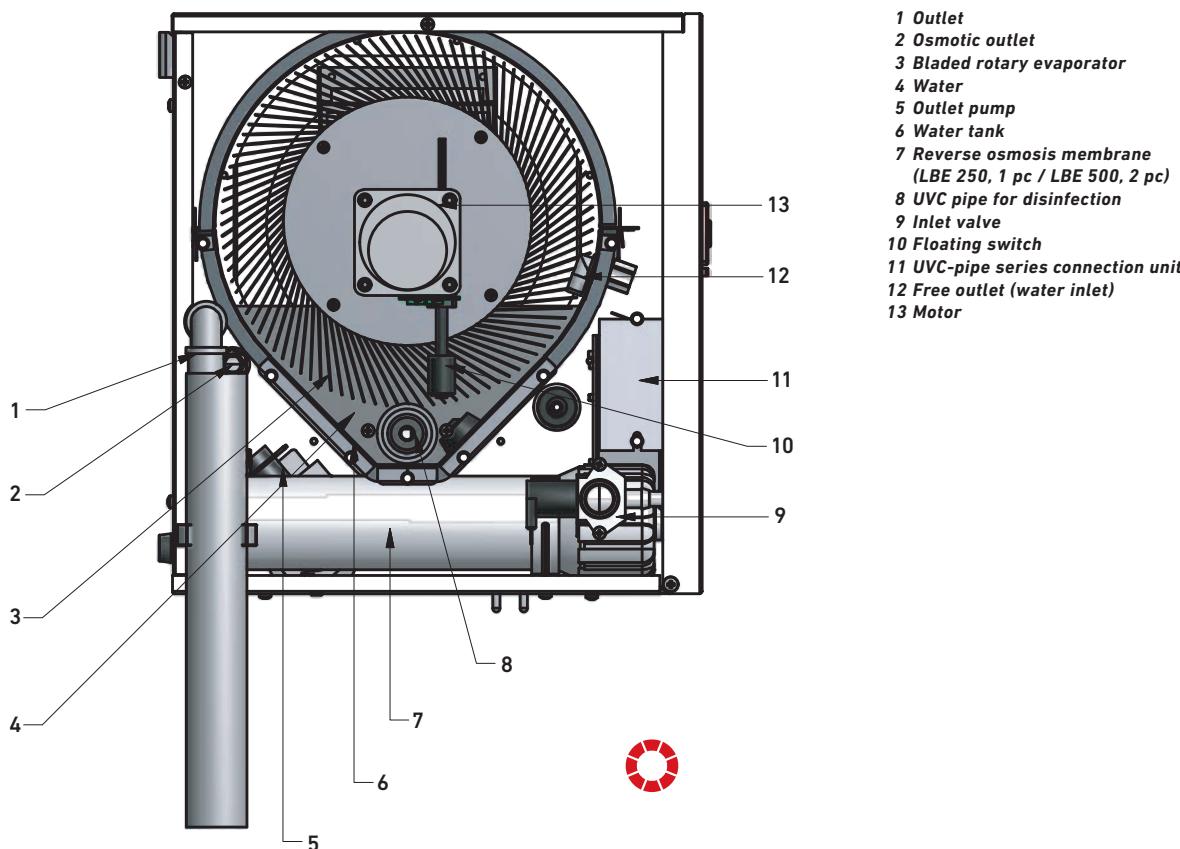
The construction design complies with hygiene requirements as stipulated in the guidelines contained in VDI 6022, VDI 3803, SWKI VA104-01 and ÖNORM H 6021, and is in accordance with performed expert appraisals on hygiene. Safety-related testing with ÖVE-identification marking according to test report.

### HUMIDITY CONTROL

The air humidity is controlled through the water moistened surface of the bladed rotor and the water level in the tank, respectively. As the water level rises, the rotor blades are submerged more deeply into the water, leading to a greater wet surface area across the blades. The passing airflow absorbs moisture from the wet blades, in accordance with a specific reference value that is set as a constant.

### TEMPERATURE CONTROL

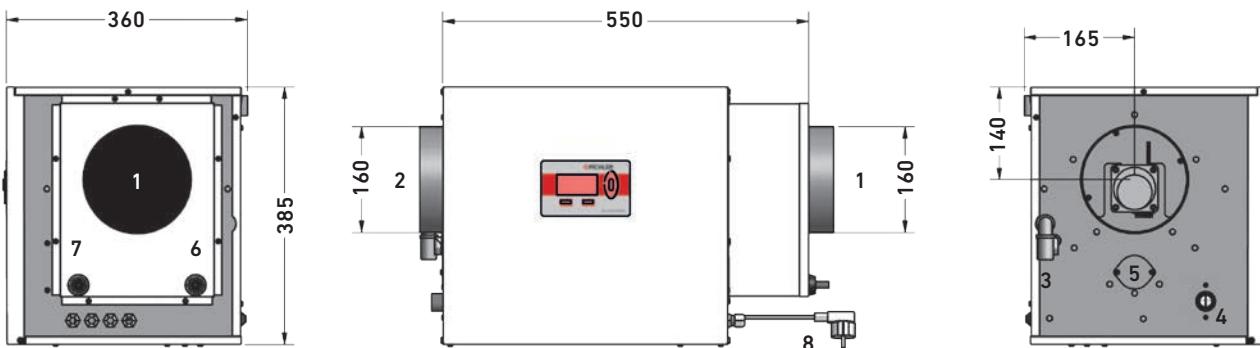
The air outlet temperature of the humidification unit is governed either by the sensor built into the device or by an external sensor – where one has been attached.



## Layout sketch LBE 250 (wall-mounted)

### AIR HUMIDIFICATION UNIT LBE WITH WARM WATER HEATER BATTERY

Type 08LBE250RW / 08LBE250LW (Dimensions: W x H x D = 550 x 385 x 360 mm)



1 Inlet (supply air from ventilation device) ø 160 mm

2 Outlet (supply air into the living space) ø 160 mm

3 Outlet (water drain) ø 40/50 mm

4 Water inlet (Drinking water connection) ¾"

5 UV pipe (covering for UVC pipe exchange)

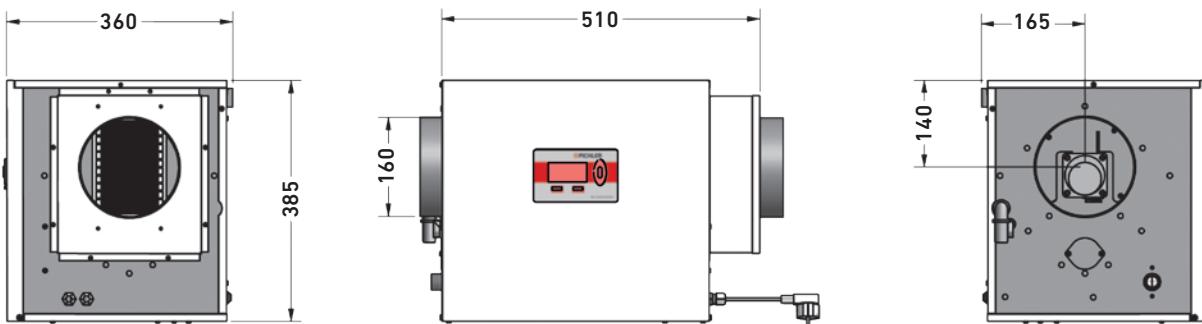
6 Return line heating system ø 10 mm

7 Feed line heating system ø 10 mm

8 Power supply 230 V/50 Hz

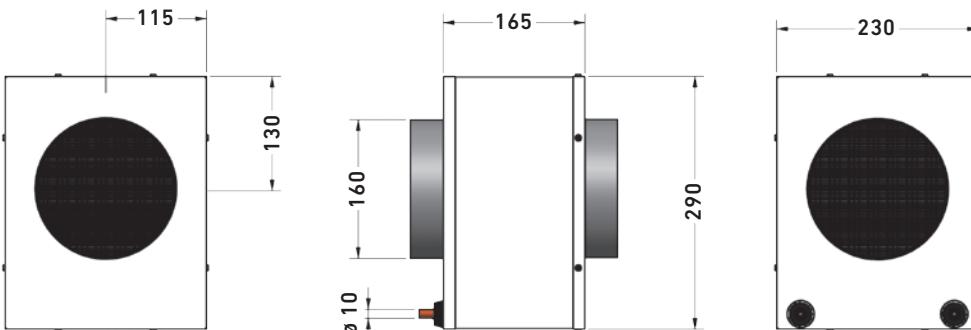
### AIR HUMIDIFICATION UNIT LBE WITH PTC ELECTRIC HEATER BATTERY

Type 08LBE250RE / 08LBE250LE (Dimensions: W x H x D = 510 x 385 x 360 mm)



### ACCESSORIES PTC ELECTRIC HEATER BATTERY

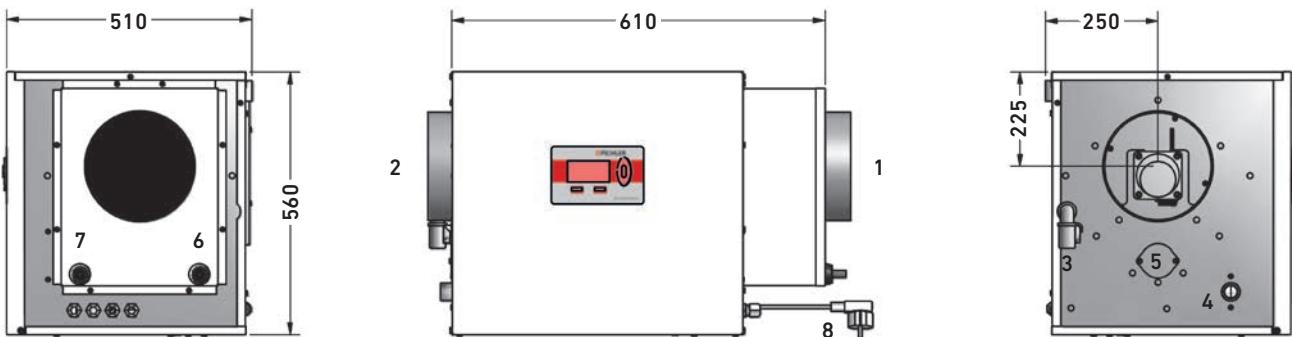
Type 08PWW250



## Layout sketch LBE 500 (wall-mounted)

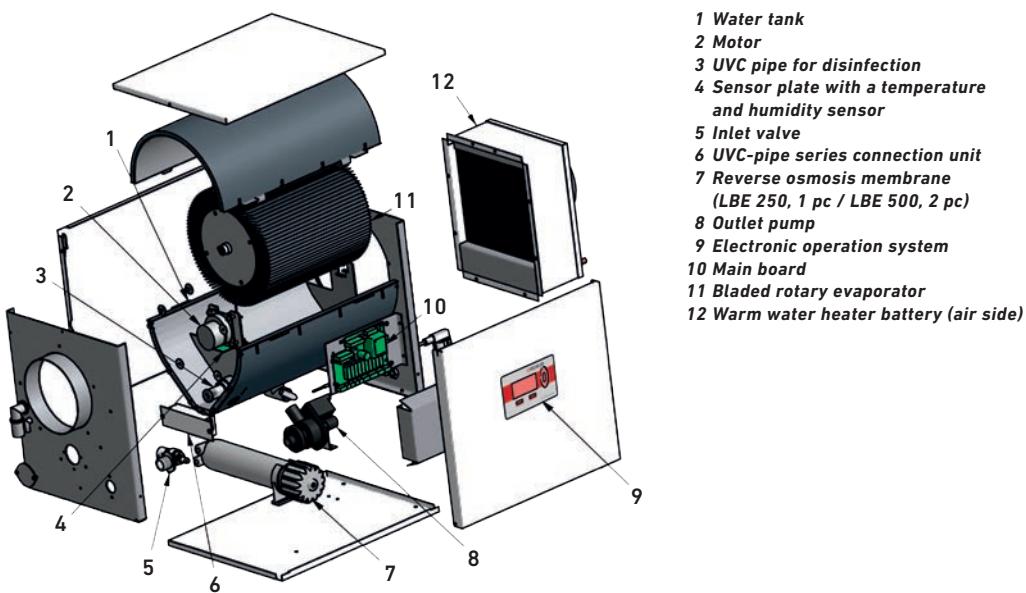
### AIR HUMIDIFICATION UNIT LBE WITH WARM WATER HEATER BATTERY

Type 08LBE500RW / 08LBE500LW (Dimensions: W x H x D = 610 x 560 x 510 mm)



- 1 Inlet (supply air from ventilation device) ø 250 mm
- 2 Outlet (supply air into the living space) ø 250 mm
- 3 Outlet (water drain) ø 40/50 mm
- 4 Water inlet (Drinking water connection) ¾"
- 5 UV pipe (covering for UVC pipe exchange)
- 6 Return line heating system ø 22 mm
- 7 Feed line heating system ø 22 mm
- 8 Power supply 230 V/50 Hz

## Exploded view



## Versions

THE AIR HUMIDIFICATION UNIT IS AVAILABLE IN THE FOLLOWING DESIGN OPTIONS



**LBE with warm water heater battery  
(for connection on the left)**  
Item number: 08LBE250LW, 08LBE500LW



**LBE with warm water heater battery  
(for connection on the right)**  
Item number: 08LBE250RW, 08LBE500RW

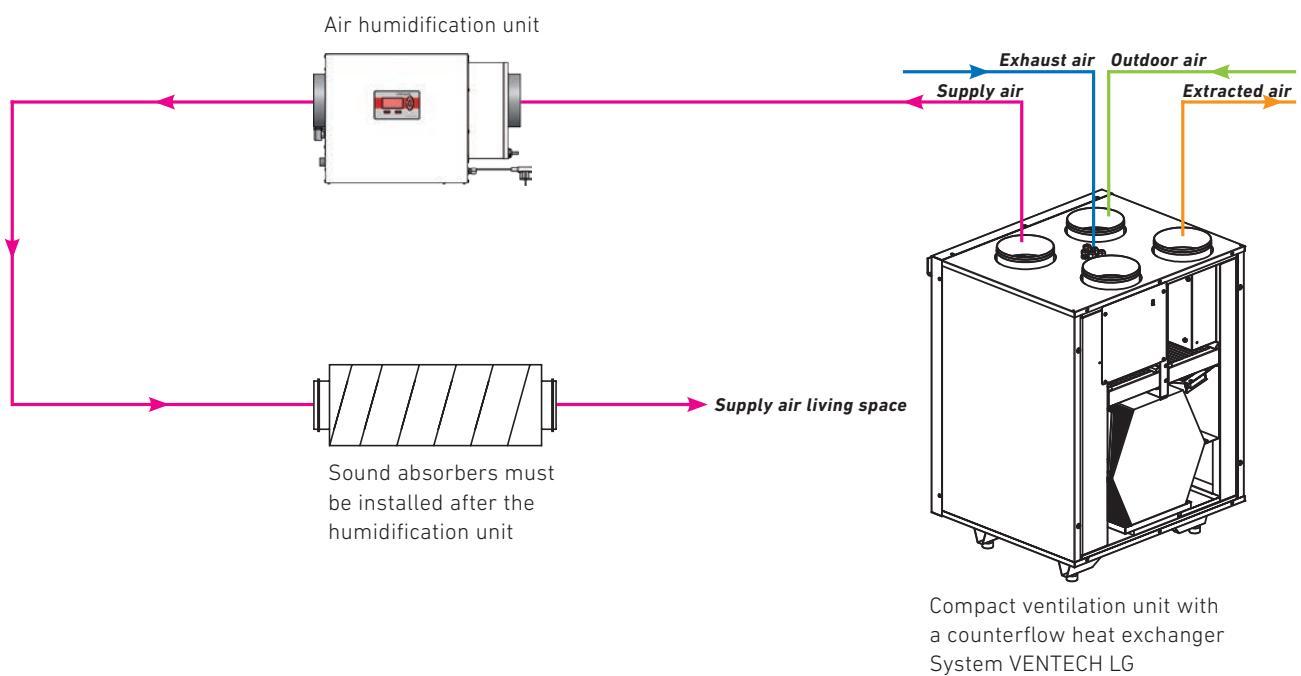


**LBE with PTC electric heater battery  
(for connection on the left)**  
Item number: 08LBE250LE



**LBE with PTC electric heater battery  
(for connection on the right)**  
Item number: 08LBE250RE

## Layout design



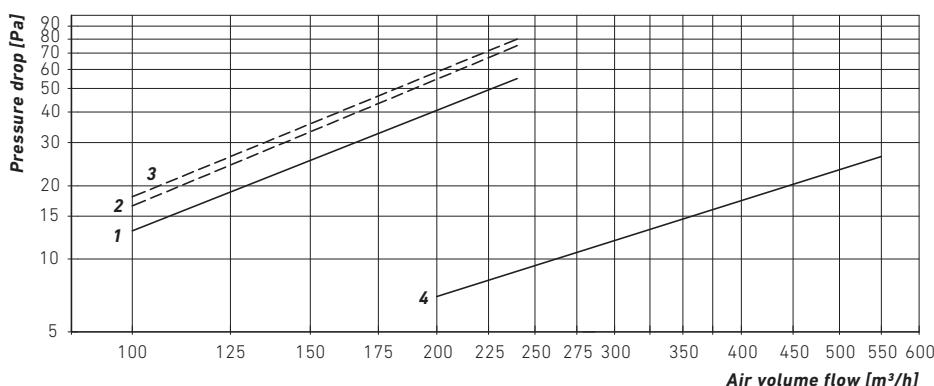
## Technical specifications

Version	LBE 250	LBE 500
Air volume flow [m³/h]	max. 250	max. 500
Humidity, adjustable [%]	40 to 60	40 to 60
Temperature, adjustable [°C]	15 to 25	15 to 25
Evaporative power [l/h]	max. 2	max. 4
Water replacement [l/day] (depends on water hardness and evaporative power)	1 to 10	2 to 30
Pressure drop [Pa]	max. 80	max. 30
Power consumption [W]	max. 100	max. 100
on average [W] (design option with water heater batteries)	23	23
Power consumption [W] (design option with electric heater batteries)	max. 1400	–
Power supply [V/Hz]	230/50	230/50
Connection to air supply [mm]	ø 160	ø 250
Connection to water supply [Zoll]	ø ¾	ø ¾
Connection to drain [mm]	ø 40	ø 40
Siphon	provided by client	provided by client
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	46/61
Protection rating for [IP]	20	20
Installation	wall mounting	wall mounting
Hygiene – Type Examination (Hygiene-Institut des Ruhrgebiets)		

PTC Electric Heater Battery		
Heat output PTC element [W]	1300	–

Water heater battery		
Medium	water	water
Temperature supply line, return line [°C]	55/45	55/45
Performance [W]	2000	4200
Air inlet [°C]	15	15
Air outlet [°C]	40	40
Water quantity [l/s]	0,05	0,13
Connection (copper pipe) [mm]	ø 10	ø 22
Water pressure [MPa]	max. 1	max. 1
Water temperature [°C]	max. 95	max. 95

## Pressure drop



- 1 LBE 250 with water heater battery
- 1 LBE 250 with electric heater battery and PTC
- 1 LBE 250 with water heater battery and low temperature auxiliary heating unit with integrated water battery
- 1 LBE 500 with water heater battery

## Controls

The appliance is delivered pre-programmed and ready to use. Once all connections have been established (air, water and mains power) it is simple to operate.

The integrated electronic control and adjustment unit is continually monitored with regard to functionality and

operational safety and any system status messages are displayed. Individual user settings are entered using the control panel located at the front of the housing. The humidification unit is preconfigured and immediately ready to plug in upon delivery.

The first two lines of the display show

the operational menu, the third line shows the operational status. The display illumination automatically turns off 10 minutes after the last operational entry and can be re-activated by turning the scroll wheel (energy-saving mode).

## TEMPERATURE

The parameter temperature is used to set the air temperature at the outlet of the humidification unit between 15 °C and 25 °C in intervals measuring one degree each. The factory setting is preset at 21 °C.

## HUMIDITY

The parameter humidity is used to set the target outlet air humidity at a level between 40 % and 60 % of relative humidity, in intervals of five per cent each. The factory setting is preset at a relative humidity of 50 %.

## SERVICE

The menu item service displays information about the operational status.

## Accessories

### WATER CONNECTION SET (INCLUDED IN THE STANDARD SCOPE OF DELIVERY)

*consisting of:*

- 1 pc waste water connection pipe
- 2 pcs connection hoses a 1.5 m
- 1 pc safety valve
- 2 pcs plastic screw connections
- 1 pc filter housing
- 1 pc wall mounting bracket
- 1 pc water filter
- 1 pc test strip for determining the hardness of water

### PUMPS/MIXER CONNECTION SET (OPTIONAL)

*consisting of:*

- 1 pc circulation pump 230 V  
(Item number: 08UPUMPE2)
- 2 pcs screw connections, ½" / 15 mm, brass (Item number: 08HOVER2)
- 1 pc 3-way-mixer valve with actuator 230 V, ½", DN 15, runtime 120 s  
(Item number: 08MISCHER (LBE250) / 08MISCHER500 (LBE500))

### FOR SERVICE AND MAINTENANCE (OPTIONAL)

*consisting of:*

- 1 pc water filter  
(Item number: 40E0003A)
- 1 pc UVC pipe  
(Item number: 40I0023A)
- 1 pc osmosis membrane (LBE 250)  
(Item number: 40C0029C)
- 2 pcs osmosis membrane (LBE 500)  
(Item number: 40C0029C)

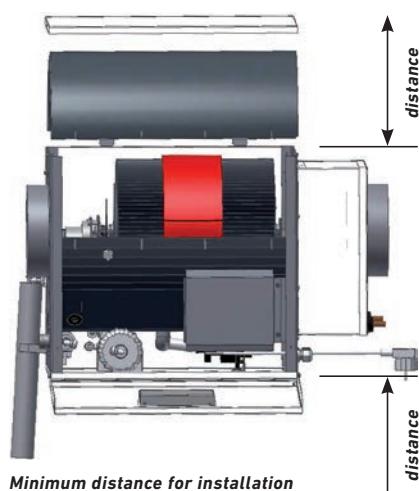
## Installation

The appliance may only be installed in frost-free and dry rooms with a room temperature between +5 °C and max. +40 °C.

The device is intended for horizontal installation. The maximum deviation from the horizontal position may not exceed +/- 1° and the appliance must be mounted onto a wall that can bear the load. For the purpose of suspension, the operational net weight of the humidification unit must be taken into consideration. The appliance must not be subjected to any kind of jolting or vibration.

The installation of the air humidification unit may only be carried out in rooms that have a working water drain. Furthermore, certain safety measures must be put into place in the room to ensure automatic

safe closure in the case of any leakage in the water supply leading to the humidification device (e.g. safety valve / water connection set). Those supply air lines of the ventilation system that have not been installed in heated areas (when falling below the dew point value), must be adequately insulated, in order to prevent the possibility of condensate water formation. The installation site for the humidification unit must be easy to reach in order to allow servicing and maintenance works. Assembly and installation must be performed in accordance with national and local regulations. The device may only be installed in compliance with national installation regulations. Please refer to the operation and installation instructions for further details.



**Minimum distance for installation with the closed unit:**

**20 cm distance LBE 250, top**

**25 cm distance LBE 250, bottom**

**25 cm distance LBE 500, top and bottom**



## Hygiene – Type Examination from the Hygiene-Institut des Ruhrgebiets

**Test Institute:** Hygiene-Institut des Ruhrgebiets, Institute for Environmental Hygiene and Toxicology

**Head of the Department of Water Hygiene and Environmental Microbiology:** Priv.-Doz. Dr. G.-J. Tuschewitzki

**Department of Water Hygiene and Environmental Microbiology:** Dipl.-Ing. (FH) S. Horn

**Basis of the examination:** VDI 6022,1 (07/2011); VDI 3803,1 (02/2010); SWKI VA104-01 (04/2006); ÖNORM H 6021 (09/2003)

### Extract from the Hygienic Report

[...] In conclusion it can be stated that the examined humidification unit frame size "LBE 250 / LBE 500", as specified in the test report W-206903kk-11Ho, is in compliance with the above mentioned regulations. Our test results show that as long as the humidification unit "LBE 250 / LBE 500" is operated as intended, no hygienic problems are to be expected. [...]

**Hygiene-Institut  
des Ruhrgebiets**  
Institut für Umwelt hygiene und Toxikologie  
Direktor: Prof. Dr. rer. nat. L. Dunemann  
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.

Hygiene-Institut, UMWELT Postfach 10 12 55 - 45812 Gelsenkirchen

Rotthauer Str. 21  
45879 Gelsenkirchen

Telefon (0209) 9242-0  
Telefax (0209) 9242-22  
Internet www.hyg.de

Unser Zeichen: W-269068-16-Ho  
Ansprechpartnerin: Dipl.-Ing. (FH) S. Horn




### Prüfzeugnis

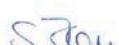
zur Hygiene – Konformitätsprüfung zu den konstruktiven Anforderungen  
ausgewählter Regelwerke

Prüfstelle:	Hygiene Institut des Ruhrgebiets Institut für Umwelt hygiene und Toxikologie Rotthauer Straße 21 45879 Gelsenkirchen
Prüfgegenstand:	Luftbefeuchtungseinheit Baugröße „LBE 250“ / „LBE 500“
Hersteller:	J.Pichler Lufttechnik Gesellschaft m. b. H. Karlweg 5 A-9021 Klagenfurt
Grundlage der Prüfung:	<input checked="" type="checkbox"/> VDI 6022, Blatt 1 (07/2011)* <input checked="" type="checkbox"/> SWKI VA104-01 (04/2006)* <input checked="" type="checkbox"/> VDI 3803, Blatt 1 (02/2010)* <input checked="" type="checkbox"/> ÖNORM H 6021 (09/2003)
Gültigkeitszeitraum:	5 Jahre 04/2016 – 04/2021
Gutachten:	W-269068-16-Ho

Zusammenfassend kann festgehalten werden, dass die Luftbefeuchtungseinheit Baugröße „LBE 250“ / „LBE 500“, soweit im Gutachten W-269068-16-Ho dargestellt, mit den an das Bautell gestellten konstruktiven Anforderungen der o.g. Regelwerke konform ist.



(Priv.-Doz. Dr. G.-J. Tuschewitzki)  
Leiter der Abteilung Wasserhygiene  
und Umweltmikrobiologie



(Dipl.-Ing. (FH) S. Horn)  
Bereichsleiterin Raumlufttechnik  
Abteilung Wasserhygiene  
und Umweltmikrobiologie

ausgestellt am 07.04.2016, Gelsenkirchen

Im Rahmen der Hygiene-Konformitätsprüfung wurden die hygienerichtrelevanten Anforderungen der o.g. Regelwerke geprüft. Anforderungen anderer Regelwerke, auf welche die o.g. Regelwerke verwiesen wurden nicht geprüft. Ferner umfasst die Hygiene-Konformitätsprüfung keine toxikologischen und sensorischen Prüfungen der eingesetzten Materialien.  
\* - Gerät besitzt kein Schauglas, jedoch ist das Gerät leicht zugänglich

Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V., Vereinsregister: VR 519 Amtsgericht Gelsenkirchen, USt-ID: DE125018356  
Vorstand: Prof. Dr. Werner Schlike (Vors.), Prof. Dr. Jürgen Kretschmann, Dr. Emanuel Gron, Volker Vollmann, Prof. Dr. Lothar Dunemann (geschäftsführer, Vorstand)



## Hygienic Evaluation dated 31st March 2008

**Univ.-Prof. Dr. Helmut Mittermayer,  
Specialist Medical Consultant for  
Hygiene and Microbiology**

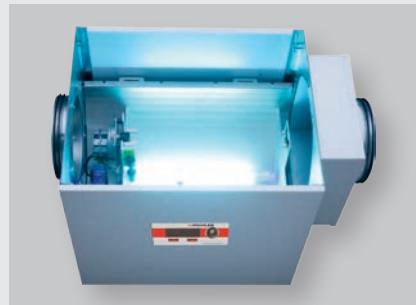
- Director of the Institute for Hygiene, Microbiology and Tropical Medicine at the General Hospital (Elisabethinen) in Linz.
- State-certified, publicly appointed and sworn expert für Hygiene und Microbiology.

- Chairman of the Federal Section for Hygiene und Microbiology of the Austrian Medical Association.

## Extract from the Hygienic Report

### 2.3 SAMPLING OF THE WATER IN THE WATER TANK [...]

The disinfecting performance of the UVC-lamp was tested.



#### THE FOLLOWING RESULTS WERE ACHIEVED

*Initial bacterial count for pseudomonas aeruginosa:*

Culture result after 24 h at 37 °C 1.000.000 cfu/ml  
Culture result after 48 h at 37 °C 1.000.000 cfu/ml

*Water after 1 minute of UVC-irradiation:*

Culture result after 24 h at 37 °C 0 cfu/ml  
Culture result after 48 h at 37 °C 0 cfu/ml

### 2.4 SAMPLING OF AIR IN THE SUPPLY AIR LINE [...]

Tests were carried out regarding the transmission of germs into the air duct system. The tank was filled with germ-contaminated water. [...] Agar plates were inserted into the air ducts, which were exposed to the air flowing past them and which collected any germs present in the air current. A trial was carried out with the UV lamp turned off. [...]



#### THE FOLLOWING RESULTS WERE ACHIEVED

*Initial bacterial count for pseudomonas aeruginosa:*

Culture result after 24 h at 37 °C 100.000.000 cfu/ml  
Culture result after 48 h at 37 °C 100.000.000 cfu/ml

*Plate after 5 minutes without UVC-irradiation at an air volume flow of approx. 150 -230 m³/h:*

Culture result after 24 h at 37 °C 0 cfu/ml  
Culture result after 48 h at 37 °C 0 cfu/ml

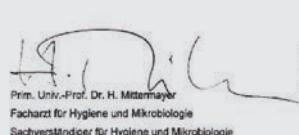
### [...] VISUAL TESTING

The equipment was subjected to a thorough visual examination. They were found to be in a hygienically safe condition and fully complied with the hygiene requirements. The equipment is safe in accordance with the stipulations of ÖNORM H6021 (Ventilation Technology Systems – Purification and Cleaning) and of VDI 6022, as the water is continuously exposed to UVC light and aerosol formation is effectively prevented.

### HYGIENE ASSESSMENT

The humidification modules [...] demonstrated faultless hygienic function, both in practical testing and in a test arrangement under laboratory conditions. No flaws were observed in the disinfection performance of the UVC lamp during operational testing. [...]

**The humidification module complies with hygiene regulations, and thus there are no objections to the use of this appliance from a hygiene perspective. Adverse impacts on health arising from the operation of the humidification unit are not to be expected.**

  
 Prim. Univ.-Prof. Dr. H. Mittermayer  
 Facharzt für Hygiene und Mikrobiologie  
 Sachverständiger für Hygiene und Mikrobiologie  
  
 LINZ



## Findings and Experts' Report

### ISSUING ORGANISATION:

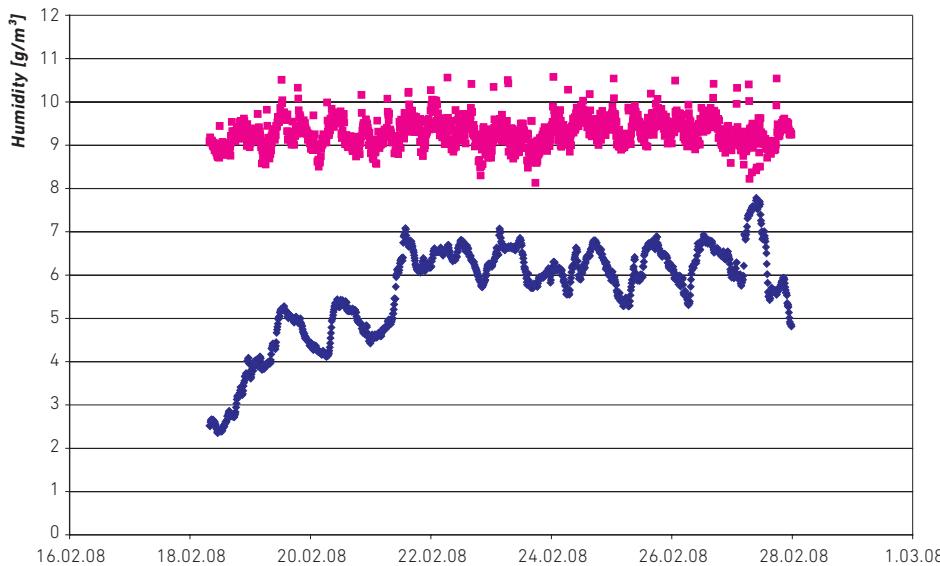
Innenraum Mess- & Beratungsservice  
Österreichisches Institut für Baubiologie  
und -ökologie GmbH  
A-1090 Wien, Alserbachstraße 5/8

### ANALYTICAL EXAMINATION:

IBO Innenraumanalytik OG  
Chemisches Laboratorium –  
Ingenieurbüro für Technische Physik  
A-1150 Wien, Stutterheimstraße 16-18/2

### ASSOCIATES:

Dipl.-Ing. Peter Tappler  
Dipl.-Ing. Bernhard Damberger  
Dipl.-Ing. Felix Twrdik  
Dipl.-Ing. Marie Jansson



The illustration shows the absolute humidity before and after the humidification module.

- before humidification
- after humidification

## Extract from the findings and report

[...] The measured total germ count for mesophilic microorganisms in the supply air duct after the air humidification module can be described as unremarkable, no thermophilic micro-organisms (total germ count) could be detected. The requirements of ÖNORM H 6021, stating that humidification must not adversely impact the microbiological quality of the air, were adhered to.

Random sample testing of the surfaces in the area of the humidification module [...] and the supply air area after the appliance showed that the hygienic-microbiological condition of the tested

surfaces could be classified as good or very good in accordance with VDI 6022 or respectively with the classification 0 or 1 (highest hygiene level of testing analogous to surfaces in food processing establishments) according to DIN 10113-3. At the time of testing the examined surfaces thus easily complied with the minimum hygiene requirements for surfaces in systems for ventilation and air conditioning.

With regard to the germ count for microorganisms, the water in the tank of the air humidification unit showed no detectable contamination through mi-

croorganisms. The total germ count for microorganisms was significantly lower than the allowed value according to VDI 6022-2, which is set at 1000 cfu per millilitre ( $10^3$  cfu/ml).

Both the system and the rooms were tested in the interval mode of the humidification unit and also during continuous operation to check the resulting humidity levels. During operation of the system, the supply air after the humidification device [...] showed a humidity value (on average  $9.1 \text{ g/m}^3$ ), that was virtually an exact match with the preset value of  $9.2 \text{ g/m}^3$ .

Dipl. Ing. Peter Tappler



Befundaufnahme  
Allgemein beidseiter und gerichtlich zertifizierter  
Sachverständiger



## Invitation to tender text Air Treatment Unit LBE 250 with Warm Water Heater Battery

Air treatment device for the active humidification of indoor air and for auxiliary heating of air in living spaces, patented and tested system, suitable for installation or retrofitting in ventilation and air conditioning systems.

The compact air humidification unit operates according to the principle of natural evaporation and ensures a constant and optimal living space humidity level – adjustable within the range of 40 % to 60 % relative humidity.

The integrated electronic control and adjustment unit is continually monitored with regard to functionality and operational safety and any system status messages are displayed. Individual user settings are entered using the control panel located at the front of the housing. The humidification unit is preconfigured

and immediately ready for use upon delivery.

The heating of the air required to provide the evaporation energy is carried out with the use of an integrated water heater battery.

The water tank into which the bladed rotary evaporator is immersed, is supplied with water from the drinking water network. A floating switch and an ancillary mechanical overflow automatically control the liquid level.

The continuous and automatically monitored UVC-disinfection process, as well as the time-controlled replacement of the water, prevents the build-up of germs and bacteria most effectively. To protect the unit from the accumulation of lime-scale, a reverse osmosis unit has been integrated in the water inlet

pipe. The necessary water replacement is carried out automatically and depends on the preset water hardness and the evaporative power.

The bladed rotary evaporator is manufactured from aluminium, the water tank is made of high-grade steel, material number 1.4571, and the compact housing is constructed from zinc-coated steel plate, with a powder-coated exterior surface using RAL 9010.

The construction design complies with hygiene requirements as stipulated in the guidelines contained in VDI 6022, VDI 3803, SWKI VA104-01 and ÖNORM H 6021, and is in accordance with performed expert appraisals on hygiene. Safety-related testing with ÖVE-identification marking according to test report.

### TECHNICAL SPECIFICATIONS

**Air volume flow:** max. 250 m<sup>3</sup>/h

**Humidity:** 40 to 60 % r. H. adjustable

**Temperature:** 15 to 25 °C adjustable

**Pressure drop:** max. 60 Pa

**Evaporative power:** max. 2.0 l/h

**Water replacement:** 1 to 10 l/day  
(depends on water hardness and evaporative power)

**Water inlet pressure:**

min./max. 0.35/0.7 MPa

**Water temperature:** 8 to 30 °C

**Type of heater battery:**

Warm water heater battery

**Thermal output water heater battery:**

max. 2000 W

**Medium supply line/return line:** 55/45 °C

**Water quantity heater battery:** 0.05 l/s

**Water pressure drop:** 0.4 kPa

**Voltage:** 230 V

**Frequency:** 50 Hz

**Capacity rating:** max. 100 W

**Dimensions:**

(W x H x D) 550 x 385 x 360 mm

**Connection to air supply:** ø 160 mm

**Connection to water supply:** ø ¾"

**Connection to drain:** ø 40 to 50 mm

**Siphon:** provided by client

**Net weight/operational weight:** 25/28 kg

**Direction of air flow:** selectable right/left

**Installation:** for wall mounting

**Product:** PICHLER

**Type:** LBE 250 RW –

for connection on the right

**LBE 250 LW –**

for connection on the left

### ACCESSORIES FOR CONNECTION TO WATER

- 1 set filter unit consisting of filter housing, water filter (Item number: 40E0003A), safety valve, wall mounting bracket and screw connections ¾"
- 2 pcs connection hose ¾" with a length of 1.5 m
- 1 pc waste water connection pipe
- 1 pc test strip for determining the hardness of water

### OPTIONAL ACCESSORIES

- 1 pc circulation pump 230 V with screw connections (Item number: 08UPUMPE2 + 08HOVER2)
- 1 pc 3-way-mixer valve with actuator ½", DN 15, runtime 120 seconds (Item number: 08MISCHER)
- 1 pc low temperature auxiliary heating unit with integrated water battery (Item number: 08PWW 250)
- 1 pc Cable temperature sensor, length 2 m (Item number: 40I0020A)
- 1 pc water filter (Item number: 40E0003A)



## Invitation to tender text Air Treatment Unit LBE 250 with PTC Electric Heater Battery

Air treatment device for the active humidification of indoor air and for auxiliary heating of air in living spaces, patented and tested system, suitable for installation or retrofitting in ventilation and air conditioning systems.

The compact air humidification unit operates according to the principle of natural evaporation and ensures a constant and optimal living space humidity level – adjustable within the range of 40 % to 60 % relative humidity.

The integrated electronic control and adjustment unit is continually monitored with regard to functionality and operational safety and any system status messages are displayed. Individual user settings are entered using the control panel located at the front of the housing. The humidification unit is preconfigured

and immediately ready for use upon delivery.

The heating of the air required to provide the evaporation energy is carried out with the use of an integrated PTC Electric Heater Battery.

The water tank into which the bladed rotary evaporator is immersed, is supplied with water from the drinking water network. A floating switch and an ancillary mechanical overflow automatically control the liquid level.

The continuous and automatically monitored UVC-disinfection process, as well as the time-controlled replacement of the water, prevents the build-up of germs and bacteria most effectively. To protect the unit from the accumulation of lime-scale, a reverse osmosis unit has been integrated in the water inlet

pipe. The necessary water replacement is carried out automatically and depends on the preset water hardness and the evaporative power.

The bladed rotary evaporator is manufactured from aluminium, the water tank is made of high-grade steel, material number 1.4571, and the compact housing is constructed from zinc-coated steel plate, with a powder-coated exterior surface using RAL 9010.

The construction design complies with hygiene requirements as stipulated in the guidelines contained in VDI 6022, VDI 3803, SWKI VA104-01 and ÖNORM H 6021, and is in accordance with performed expert appraisals on hygiene. Safety-related testing with ÖVE-identification marking according to test report.

### TECHNICAL SPECIFICATIONS

**Air volume flow:** max. 250 m<sup>3</sup>/h

**Humidity:** 40 to 60 % r. H. adjustable

**Temperature:** 15 to 25 °C adjustable

**Pressure drop:** max. 80 Pa

**Evaporative power:** max. 2.0 l/h

**Water replacement:** 1 to 10 l/day  
(depends on water hardness and evaporative power)

**Water inlet pressure:**

min./max. 0.35/0.7 MPa

**Water temperature:** 8 to 30 °C

**Type of heater battery:**

PTC Electric Heater Battery

**Thermal output PTC battery:**

max. 1300 W

**Voltage:** 230 V

**Frequency:** 50 Hz

**Capacity rating:** max. 1400 W

**Dimensions:**

(W x H x D) 510 x 385 x 360 mm

**Connection to air supply:** ø 160 mm

**Connection to water supply:** ø ¾"

**Connection to drain:** ø 40 to 50 mm

**Siphon:** provided by client

**Net weight/operational weight:** 25/28 kg

**Direction of air flow:** selectable right/left

**Installation:** for wall mounting

**Product:** PICHLER

**Type: LBE 250 RE –**

for connection on the right

**LBE 250 LE –**

for connection on the left

### ACCESSORIES FOR CONNECTION TO WATER

1 set filter unit consisting of filter housing, water filter (item number: 40E0003A), safety valve, wall mounting bracket and screw connections ¾"

2 pcs connection hose ¾" with a length of 1.5 m

1 pc waste water connection pipe

1 pc test strip for determining the hardness of water



## Invitation to tender text Air Treatment Unit LBE 500 with Warm Water Heater Battery

Air treatment device for the active humidification of indoor air and for auxiliary heating of air in living spaces, patented and tested system, suitable for installation or retrofitting in ventilation and air conditioning systems.

The compact air humidification unit operates according to the principle of natural evaporation and ensures a constant and optimal living space humidity level – adjustable within the range of 40 % to 60 % relative humidity.

The integrated electronic control and adjustment unit is continually monitored with regard to functionality and operational safety and any system status messages are displayed. Individual user settings are entered using the control panel located at the front of the housing. The humidification unit is preconfigured

and immediately ready for use upon delivery.

The heating of the air required to provide the evaporation energy is carried out with the use of an integrated water heater battery.

The water tank into which the bladed rotary evaporator is immersed, is supplied with water from the drinking water network. A floating switch and an ancillary mechanical overflow automatically control the liquid level.

The continuous and automatically monitored UVC-disinfection process, as well as the time-controlled replacement of the water, prevents the build-up of germs and bacteria most effectively. To protect the unit from the accumulation of lime-scale, a reverse osmosis unit has been integrated in the water inlet

pipe. The necessary water replacement is carried out automatically and depends on the preset water hardness and the evaporative power.

The bladed rotary evaporator is manufactured from aluminium, the water tank is made of high-grade steel, material number 1.4571, and the compact housing is constructed from zinc-coated steel plate, with a powder-coated exterior surface using RAL 9010.

The construction design complies with hygiene requirements as stipulated in the guidelines contained in VDI 6022, VDI 3803, SWKI VA104-01 and ÖNORM H 6021, and is in accordance with performed expert appraisals on hygiene. Safety-related testing with ÖVE-identification marking according to test report.

### TECHNICAL SPECIFICATIONS

**Air volume flow:** max. 500 m<sup>3</sup>/h

**Humidity:** 40 to 60 % r. H. adjustable

**Temperature:** 15 to 25 °C adjustable

**Pressure drop:** max. 30 Pa

**Evaporative power:** max. 4 l/h

**Water replacement:** 2 to 30 l/day  
(depends on water hardness and evaporative power)

**Water inlet pressure:**

min./max. 0.35/0.7 MPa

**Water temperature:** 8 to 30 °C

**Type of heater battery:**

Warm water heater battery

**Thermal output water heater battery:**

max. 4200 W

**Medium supply line/return line:** 55/45 °C

**Water quantity heater battery:** 0.13 l/s

**Water pressure drop:** 0.4 kPa

**Voltage:** 230 V

**Frequency:** 50 Hz

**Capacity rating:** max. 100 W

**Dimensions:**

(W x H x D) 610 x 560 x 510 mm

**Connection to air supply:** ø 250 mm

**Connection to water supply:** ø ¾"

**Connection to drain:** ø 40 to 50 mm

**Siphon:** provided by client

**Net weight/operational weight:** 46/61 kg

**Direction of air flow:** selectable right/left

**Installation:** for wall mounting

**Product:** PICHLER

**Type:** LBE 500 RW –

for connection on the right

**LBE 500 LW –**

for connection on the left

### ACCESSORIES FOR CONNECTION TO WATER

- 1 set filter unit consisting of filter housing, water filter (Item number: 40E0003A), safety valve, wall mounting bracket and screw connections ¾"
- 2 pcs connection hose ¾" with a length of 1.5 m
- 1 pc waste water connection pipe
- 1 pc test strip for determining the hardness of water

### OPTIONAL ACCESSORIES

- 1 pc circulation pump 230 V with screw connections (Item number: 08UPUMPE2 + 08HOVER2)
- 1 pc 3-way-mixer valve with actuator ½", DN 15, runtime 120 seconds (Item number: 08MISCHER500)
- 1 pc low temperature auxiliary heating unit with integrated water battery (Item number: 08PWW500250)
- 1 pc Cable temperature sensor, length 2 m (Item number: 40I0020A)
- 1 pc water filter (Item number: 40E0003A)





Your partner/installer: