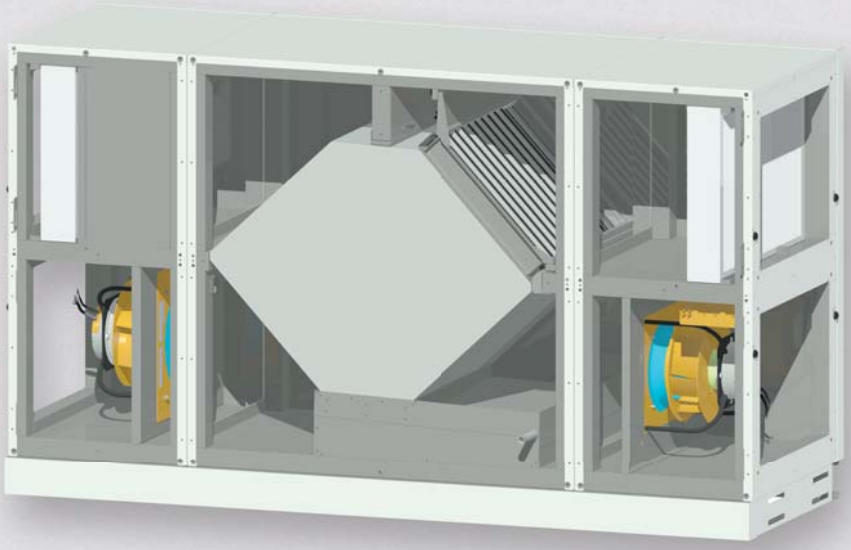
OPERATING AND INSTALLATION INSTRUCTIONS LG 750 - LG 6000

COMFORT VENTILATION



CERTIFIED COMPONENT
Passive House Institute

for residential buildings
for non-residential buildings

EN13141-7:2010

ErP 2018
EU Regulation 1253/2014

PICHLER

Systematic ventilation.

Contents

Unit card:
Please refer to the unit card for details on your ventilation unit!

Introduction

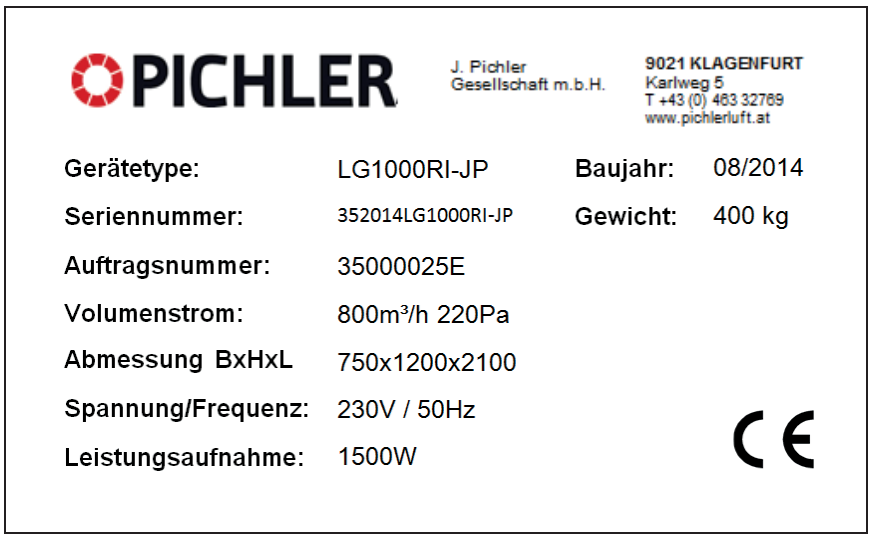
Dear Customer, thank you for purchasing a **Series LG 750 – LG 6000 ventilation unit**.

Series LG ventilation units are state-of-the-art. They are convincing by their high cost effectiveness, ease of use and reliable operation.

Please read this manual carefully and follow the instructions to ensure the safe, reliable and economic operation of your ventilation system.

Do not use your ventilation system unless in perfect condition and use only as designated; be aware of safety issues and any hazards and familiarise yourself with the notes and information contained in this Manual.

Please always keep the model and serial number (see nameplate on unit) at hand, in case of queries or when ordering spare parts.



Illus.: nameplate

In case of further questions or lost documentation, please contact:
J. Pichler Gesellschaft m.b.H., Karlweg 5, 9021 Klagenfurt – T +43 (0)463 32 7 69 – office@pichlerluft.at

1 General

PLEASE READ THIS MANUAL CAREFULLY PRIOR TO COMMISSIONING AND HEED THE SAFETY INSTRUCTIONS!

This Manual contains notes and information on safe operation and proper installation of the **Series LG ventilation unit** and on its use and servicing. Reference this Manual during servicing to ensure proper execution of the tasks. Keep this Operating Manual in a safe place and readily available at all times.
Any interventions and remedial actions on the ventilation unit shall be done by a specialised installation company. These units are subject to ongoing improvement and further development. Your unit may therefore vary slightly from the description in this Manual.

Changes reserved
Although this Manual has been compiled with the utmost care, this does not imply any guarantees. We constantly strive to improve and optimise our products technically and we reserve the right to modify our units or technical data fully or in part and without prior notification. Our “General Terms and Conditions” as amended shall apply to the Series LG 750 – LG 6000 ventilation units.

1.1 Designated use

The ventilation unit's applications and designated use are limited to the deployment and operation for mechanical ventilation and extraction of air in residential and non-residential buildings. The ventilation unit may not be used for drying, since the unit is not designed for dehumidifying. The conveyed air at minimum and maximum temperatures of -16°C to + 35°C resp. must be free of aggressive vapours and substances causing wear.

Any other use shall be deemed contrary to designated use. The manufacturer shall accept no responsibility for damages or consequential damages arising from improper use. Designated use shall also include compliance with our prescribed Operating and Installation Manual.

This unit is available to the general public and is intended for installation in residential or industrial buildings. The unit is used for mechanical aeration and ventilation of ambient air and, combined with a heating and cooling battery, also for re-heating/cooling of the air.

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.

Series LG ventilation units are not ready-to-use products. They shall not be started up unless after proper installation and connection in the ventilation and air conditioning system. Only qualified and instructed persons may work on and with the unit.

Persons transporting or working on the unit must have read and understood the Operating Manual, especially **Chapter 2 "Safety"**. The end user must be informed of potential hazards.

1.2 Liability

Designated use is described **in Section 1.1** of this Manual.

Any other use shall be deemed improper and may cause personal injury or damage to the ventilation unit, for which the manufacturer shall accept no liability. The manufacturer shall accept no liability for any damages due to:

- non-observance of the Safety, Operating and Servicing notes in this Operating and Installation Manual
- installation of spare parts other than parts supplied by the manufacturer
- normal wear and tear

1.3 Warranty

The warranty period shall commence after commissioning, but no later than one month after delivery. The warranty shall cover exclusively the replacement of basic material and exclude claims based on services. The warranty shall be subject to proof of services performed to our instructions by a specialised licensed installation company.

1.4 Warranty provisions

Warranty claims shall be accepted for a period of 24 months after installation of the ventilation unit, but limited to 30 months from date of manufacture.

Warranty claims shall be limited to material and/or constructional defects occurring during the warranty period. In the event of a warranty claim, the ventilation unit shall not be uninstalled without prior written consent of the manufacturer. The manufacturer's liability shall be limited to spare parts installed by an installation company approved by the manufacturer.

The warranty shall lapse automatically

- at the end of the warranty period
- following improper operation such as operation without filter, if parts other than parts from the original manufacturer are installed
- if unauthorised changes or modifications were made to the plant
- if this Operating and Installation Manual is ignored.

2 Safety

READ THIS OPERATING AND INSTALLATION MANUAL CAREFULLY AND HEED THE NOTES ON SAFETY DURING INSTALLATION, COMMISSIONING, SERVICING OR GENERAL WORK ON THE VENTILATION UNIT!

Keep the Operating and Installation Manual near the unit for its entire service life. Non-observance of the Safety regulations, warnings, instructions and remarks in this Operating Manual may cause personal injury or damage the ventilation unit.

The specifications given in this document must not be changed.

The conclusion of a service contract is recommended to ensure that the unit will be checked and serviced at regular intervals. Your supplier will provide you with the names of approved installation companies in your area.

2.1 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.

Symbole	
	**Attention/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.

2.2 Safety regulations

2.2.1 General

Installation, commissioning, service and repair must be carried out by an authorised specialist (specialised heating company/installer).

Over and above this Operating and Installation Manual, the national regulations and standards shall also be applicable to the operation of this unit without limitation. When installation is complete, please request the installer of the plant to instruct you on the unit and its control. The ventilation unit may only be used as described under “**Designated use**” as per **Section 1.1**.

All Safety and Danger stickers affixed to the unit must be observed. In case of malfunctioning, switch off the unit immediately and secure against accidental switch-on. Faults must be remedied immediately.

After repairs, qualified staff must verify that the unit is safe to operate.

No additional equipment shall be added on or installed. Changes to the ventilation unit are prohibited and shall discharge the manufacturer from all warranties and liabilities. Exclusively original spare parts shall be used.

It must be ensured that persons, including children, with limited physical, sensory or mental capacities or lacking experience and/or knowledge will not handle the unit.

2.2.2 Setting up the unit

All 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. Assembly and installation shall be carried out in accordance with general local building, safety and installation regulations applicable in the community or mandated by the water and electricity department or other bodies.

The ventilation unit is designed for upright installation and may only be set up on a suitable, load-bearing floor. The unit may not be subjected to vibrations and the customer shall provide suitable structural acoustic decoupling between unit and building.

Permissible reasonable maximum lifting capacities of persons and lifting equipment must be noted when transporting the ventilation unit.

Suitable permanent drainage of condensate arising during operation of the ventilation unit will be required, including effective odour blocking traps (siphon). Ensure adequate spacing between the base of the unit and the floor.

Positioning, electrical connections and installation and connection of water, heating and condensate lines shall be performed by specialists only. To prevent damage to the building, competent connections, tightness of connecting lines and condensate discharge, including effective drainage and siphoning must be ensured. Effective condensate drainage must be tested on site prior to commissioning and after servicing the unit.

Components of the ventilation plant, e.g. air ducts with fitted components, optional heating batteries with accessories which may need to be installed in unheated areas, must be suitably insulated to prevent heat loss or condensate formation (for temperatures under dewpoint). Suitable measures must be taken to ensure automatic, reliable and frost-free operation if a risk of frost exists in assemblies and components.

Local building, safety and fire protection provisions, including statutory regulations and standards, must be complied with. If necessary, appropriate measures should be taken when installing the units on site, e.g. by including fire shutters in air ducts, etc.

2.2.3 Electrical connections

- Warning: dangerous electrical voltages!
- Failure to observe this risk can lead to death, injury or damage to property.
- Before carrying out any work on live parts, the unit must always be disconnected completely from the power supply (all poles) and secured against being switched back on.

Electrical connections and work carried out on electrical components of the unit and its accessories may only be carried out by authorised electricians in compliance with the applicable laws, requirements, standards and directives.

The ventilation units are designed for a 230 V/50 Hz or 400 V/50 Hz supply (as shown on the nameplate, among other). Potentially unsafe operations are prohibited. To ensure safe operation, never remove or bypass safety devices.

The electrical systems of the unit, including their warning and protective functions, shall be regularly checked for perfect operation. The unit must be shut down immediately in the event of malfunctions or defects such as loose connections or overheated cables. Only original fuses with the prescribed rated current and dimensions may be used.

Damaged or faulty power supply cables to the unit must be repaired immediately, to avert potential danger.

The unit may not be operated unless safe operational conditions have been restored.

Fault finding and immediate remediation of electrical defects and malfunctions shall be carried out by authorised electricians only. All protective systems must be checked (e.g. earth resistance etc.) after completion of electrical work on the unit.

2.2.4 Plant operation

The ventilation unit may only be operated provided all the requisite connections associated with the planned and provided external subassemblies and components such as pre-heating battery with air filter, re-heating battery, acoustic damping etc. have been properly made and are ready for operation.

The ventilation unit must be shut down immediately and isolated from mains in the event of faults, defects or damage holding a potential hazard to persons or components. Further operation of the plant must be effectively prevented until repairs have been made. Measures must be taken to prevent accidental switch-on!

Be aware of your safety and hazards when opening the front covers or removing cover plates. Any potentially unsafe operation is prohibited.

The units may only be operated with connected air ducts and installed system components such as acoustic dampeners and with minimum duct lengths of 1 000 mm to ensure, for instance, that the fans cannot be touched.

The ventilation units shall only be operated in accordance with the project documentation which shall comply with the Equipment and Product Safety Act and the pertinent provisions of the EC Directives and Standards.

Consider environmental impacts and refrain from installing the ventilation units in the vicinity of flammable liquids or gases, in swimming pools or in areas exposed to chemicals or hazardous substances.

Never operate the ventilation unit without air filters. Air filters must be checked regularly for dirt and damage and replaced, if necessary. The control unit will warn of the need to replace filters. Use only original replacement filters. If the plant is not used for an extended period (e.g. in summer), the air filters must for hygienic reasons be replaced prior to re-commissioning.

3 Ventilation system functionality

3.1 System description

Centralised ventilation extracts air from rooms such as bedroom, lounge, bathroom, toilet and kitchen and replaces this air with filtered outside air.

Large savings in energy may be achieved in plants which are in constant operation, thanks to highly efficient heat exchangers recovering heat from the extract air and energy efficient fans with state of the art EC technology for controlled airflow.

This technology is particularly cost effective when buildings have air-tight shells and are effectively thermally insulated. Efficient heat exchangers will allow substantial energy savings. Demands for economical and energy efficient operation may be satisfied using variable volume air flow systems for comfort zone ambient air, especially through on-demand fan control in coordination with, for instance, electronic control of volume flow. The Pichler Air2 system will control these complex processes.

3.2 System extensions for heat exchanger frost protection

Depending on extract air temperature and humidity, a danger of freezing will exist at the heat exchanger exhaust air side, particularly under frost conditions in winter. The heat exchanger must be protected against ice formation during low outside air temperatures of ca. -3°C or less, using suitable measures.

Various strategies may be followed to protect the heat exchanger from freezing:

- Frost protection via heat exchanger bypass
- Frost protection by means of waterpreheater battery (glycol)
- Frost protection via pre-heater coils – electric version

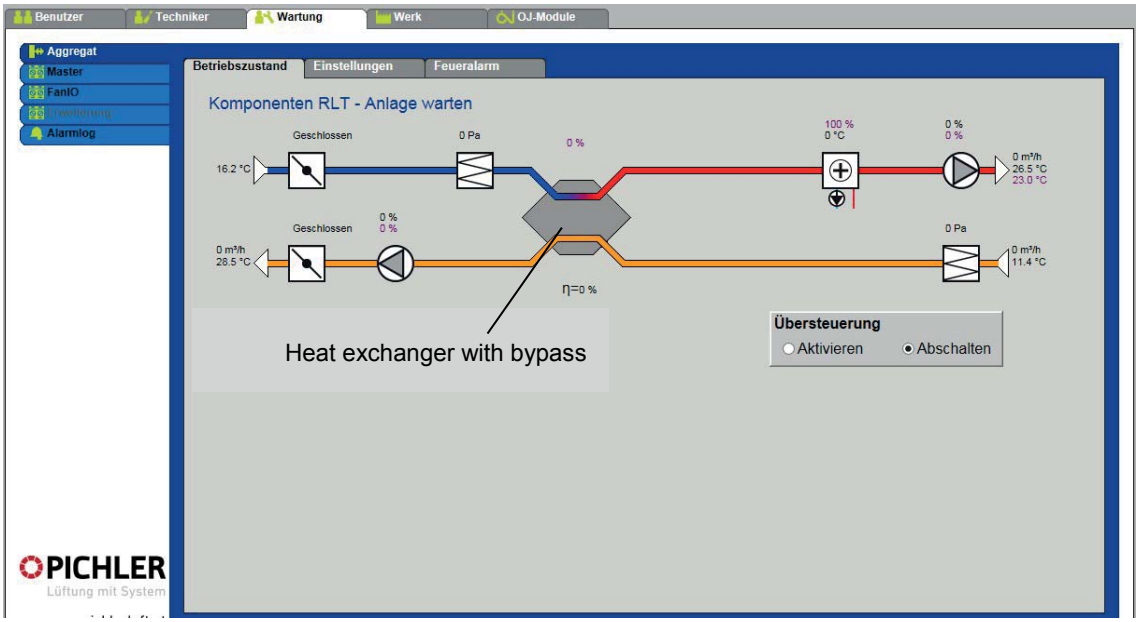
A frost protection alarm will trigger if none of these measures produce an effect after 5 minutes, i.e. if exhaust air temperature remains below minimum level despite fully open bypass damper and PWW pre-heating exchanger or electrical pre-heater on full power.

3.2.1 Frost protection via heat exchanger bypass

If the ventilation unit has no pre-heating exchanger, a bypass may be used to protect the heat exchanger from freezing. Cold outside air will in this case bypass the heat exchanger via a duct and the warm extract air will be used to protect the exchanger from freezing.

With this arrangement, a re-heater exchanger is recommended, in order to maintain a minimum supply air temperature.

Damper actuators are controlled via a 0-10 V signal.

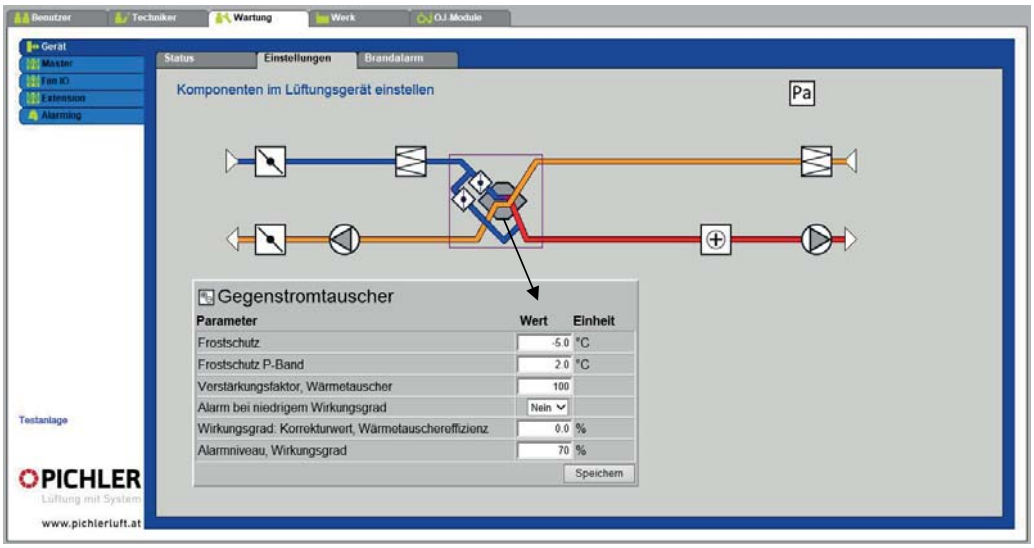


Description of the control system:

The bypass arrangement will protect the heat exchanger from freezing. The temperature sensor must be positioned in the exhaust air directly after the heat exchanger.

To protect the heat exchanger from freezing, the frost protection temperature (factory setting -5°C) and frost protection P-band (factory setting 2°C) parameters must be set. This means that the bypass damper will remain closed down to a frost protection temperature plus frost protection P-band. Starting from this temperature, the bypass damper will steadily open and will be fully open when the frost protection temperature is reached.

Primary parameters:



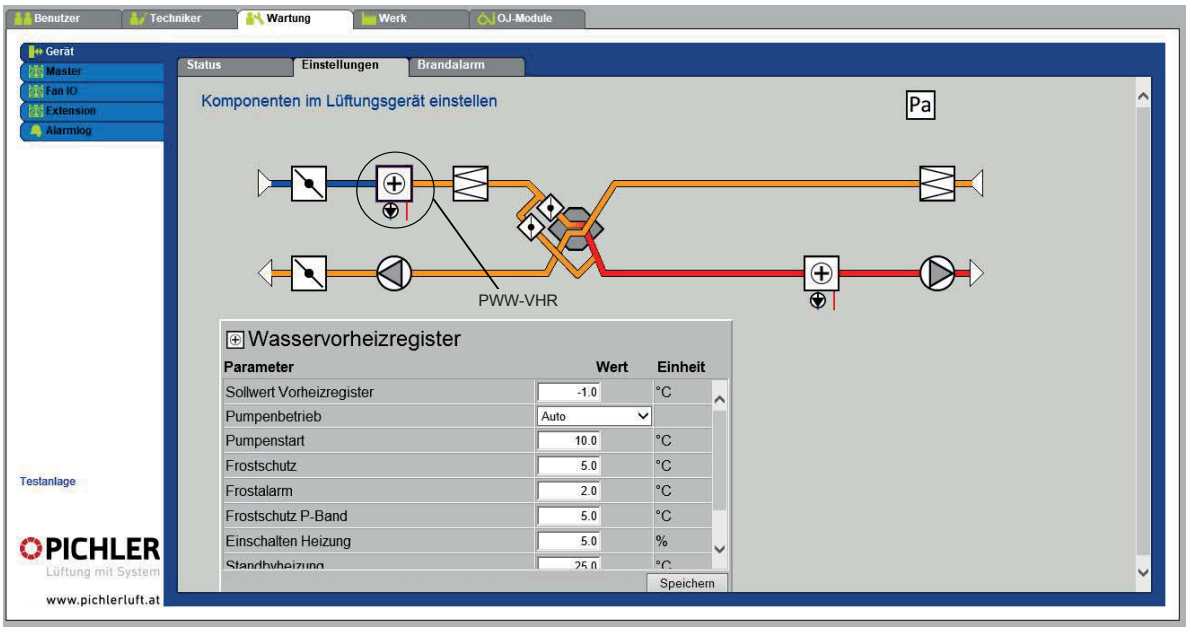
Primary parameters:	
Frost protection	✓ The bypass damper will open fully controlled at temperatures below the frost protection temperature and frost protection P-band. This means that the outside air will bypass the heat exchanger and the room extract air will continue passing through the heat exchanger.
Frost protection P-band	✓ At temperatures below the set frost protection P band plus the set frost protection, the bypass damper will be linearly controlled up to fully open.
Amplification factor, heat exchanger	✓ Set the heat exchanger's amplification factor.
Alarm at low efficiencies	✓ Determine whether an alarm will trigger when efficiency is too low.
Efficiency: Correction factor for efficiency calculation	✓ Set correction factor for efficiency calculation.
Efficiency alarm level	✓ Set low efficiency alarm limit. ✓ To trigger the alarm, the system must be ‘running’, the efficiency must be less than the set value and the "alarm at low efficiency" parameter must be set to "Yes".

3.2.2 Frost protection via water pre-heating exchanger (optional)

The Series LG 700 and LG 6000 ventilation unit may optionally be fitted with a water pre-heating exchanger to protect the heat exchanger from freezing. The cold outside air will to this end be pre-heated in an optional heating exchanger integrated in the air duct. The pre-heating exchanger will maintain the temperature before the heat exchanger above a set minimum to counter freezing of the heat exchanger.

The water-glycol mixture is regulated via a 0-10 V mixer controller with heating circuit, including a circulating pump.

The heating circuit **must** operate with antifreeze. (Glycol)



Description of the control systems:

The pre-heating exchanger will maintain the temperature before the heat exchanger at a set minimum. The sensor must be fitted directly after the pre-heating exchanger. Always operate the pre-heating exchanger with antifreeze.

Primary parameters:

Primary parameters:	✓ Desired air-temperature set-point after pre-heating exchanger
Set-point, preheater **Pump operation**	✓ “Constant”. The circulating pump in the PWW heater will run continuously when power to the Air2Master is on. ✓ “Auto”. The circulating pump in the PWW heater will run when heating is required (valve setting >0.1%) ✓ “Outside temperature”. The circulating pump in the PWW heater will run when heat is required or when the outside temperature drops below the value set in the “Pump start” parameter.
Pump start	✓ The pump will start when the outside temperature falls below the set value. ✓ “Pump operation” must be set to “Outside temperature”.
Frost protection	✓ The set value gives the PWW heater return flow temperature at which the ventilator should be fully controlled. ✓ The heating valve control will be activated at set value plus “Frost-P-band” (see graphic)

Frost alarm	✓ The set value gives the PWW heater return flow temperature at which the compact ventilation unit will stop and a frost alarm will be triggered
Frost-P-band	✓ PWW heater frost protection sets in at the set value plus the “Frost protection” parameter value
Start-up heating	✓ Initial heating in %. Heating power when switching from standby to operation.
Stand-by heat	✓ When stopping the ventilation system, the heating valve will ensure that the return flow from the water battery does not get below the set value.
Water temperature	✓ Read actual return temperature.
P-Band	✓ P-band for the pre-heater PI controller
I-time	✓ I-time for the pre-heater PI controller
Motor-driven valve	✓ Set the control range of the motor-driven valve (0-10 V/2-10 V)

3.2.3 Frost protection via electric pre-heating exchanger (optional)

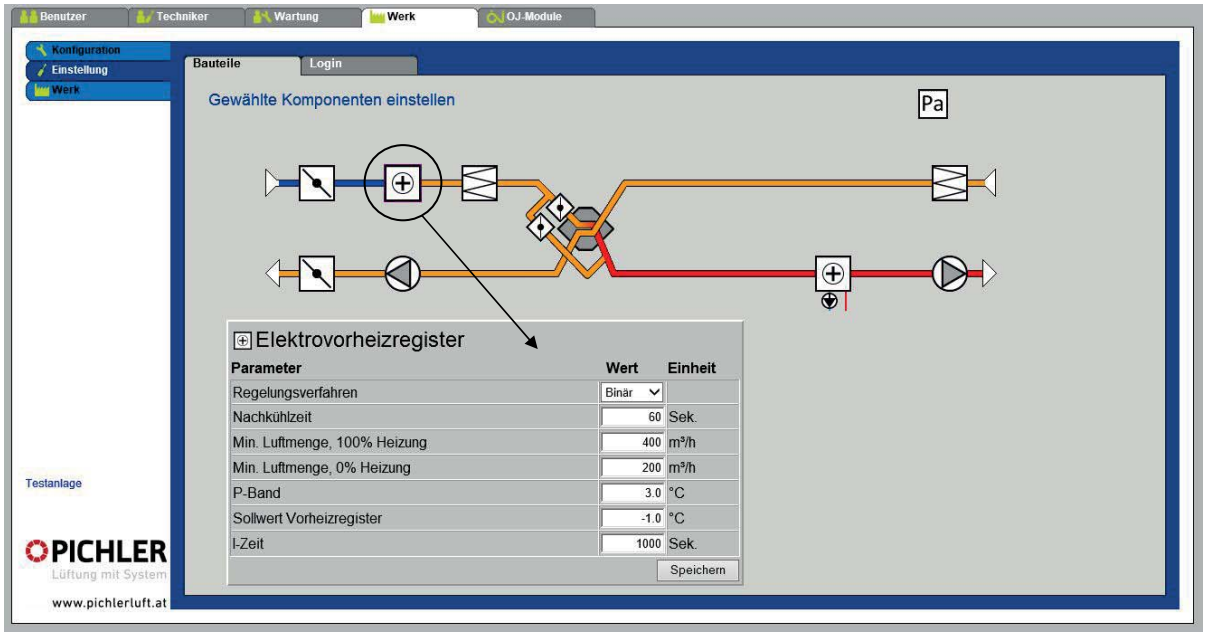
The Series LG 1400 and LG 3200 ventilating unit may optionally be fitted with an electric pre-heating exchanger to protect the heat exchanger from freezing. The cold outside air will to this end be pre-heated via a shell and tube heat exchanger mounted directly in the outside air duct to counter freezing of the heat exchanger.

To reduce the consumption of primary energy, the frost protection strategies mentioned in Point 3.2.1 are recommended instead of the electrical versions.

Description of the control system:

The pre-heating exchanger will maintain a minimum required temperature before a heat exchanger. The temperature sensor must be fitted directly after the pre-heating exchanger.
A PI control algorithm is implemented here. The 0-10 V controller output signal regulates the pre-heating exchanger’s power consumption via a Triac controller.

Primary parameters:



Primary parameters:	
Regulation form	✓ "0-10 V". Analogue heater control via a 0-10 V analogue output (e.g. EFS-9XXX) ✓ "single stage". Electric preheater is On/Off controlled ✓ "two-stage". Electric preheater is controlled in two stages (On/Off). As more heat is required, "Electric preheater relay 1" is first switched on, then "Electric preheater relay 2" and in reverse sequence switched off for less heat. ✓ "Binary". The electrical heater is digitally controlled in three stages (On/Off). The heating elements in the heating battery must be sized in 1/3 - 2/3. <u>By increasing heat requirements:</u> • Activate "Electric preheater relay 1" • Activate "Electric preheater relay 2" and disconnect "Electric preheater relay 1" • Activate "Electric preheater relay 1" and "Electric preheater relay 2" <u>By decreasing heat requirements:</u> • Disconnect "Electric preheater relay 1" • Disconnect "Electric preheater relay 2" and activate "Electric preheater relay 1" • Disconnect "Electric preheater relay 1" and "Electric preheater relay 2"
Post cooling time	✓ The electrical heater elements may overheat should air flow be reduced or stopped. The heating elements will be disconnected during post cooling and the ventilation units will continue to run as per the set air volume set-point. The set value defines the period required to ensure cooling of the electrical heating exchanger.
Min. flow, 100% heat	✓ Set value informs at which minimum volume (m^3/h) in the inlet, the heating should be 100% on.
Min. flow, 0% varme	✓ Set value informs at which minimum volume (m^3/h) in the inlet, the heating should be off (0%).
P-Band	✓ P-band for PI controller pre-heater
Set-point, preheating	✓ Desired air-temperature set-point after pre-heating exchanger P-band
I-time	✓ I-time for PI controller pre-heater

3.3 Optional: System extension for external auxiliary heating

The supply air exit temperature may be increased using one or two optional heating exchangers in the air duct system, operating using hot water or electrical power.

The integrated controller will control individual components such as the circulating pump, mixing valve etc.

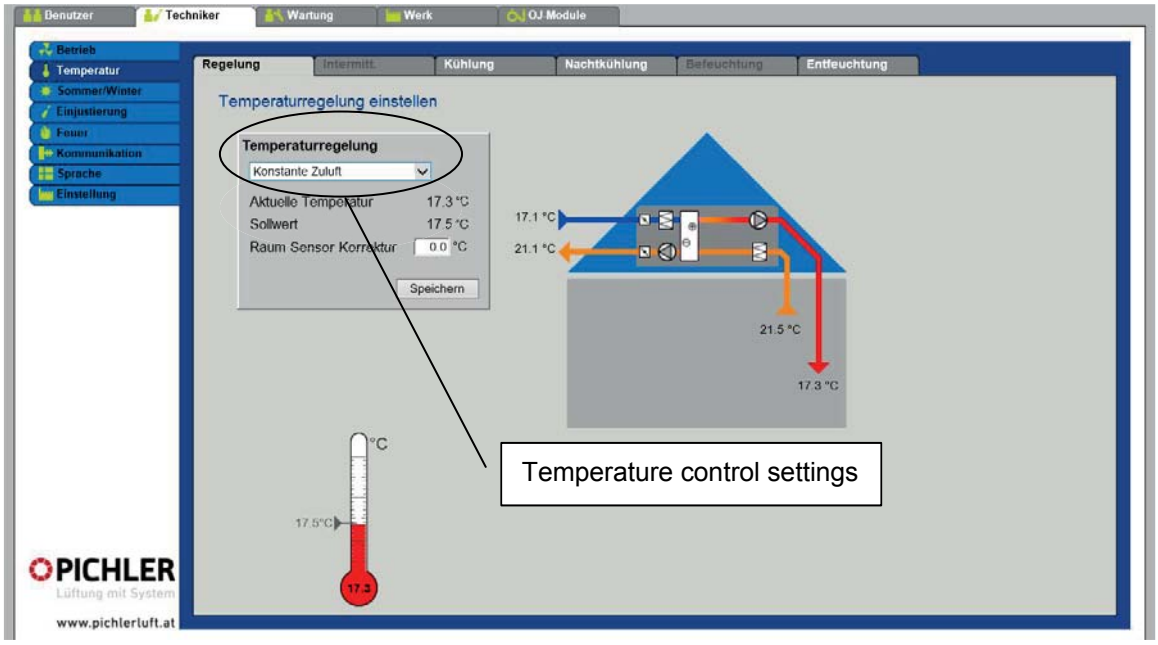
3.3.1 Post heating via pumped hot water re-heating exchanger (PWW-NHR)

The pumped hot water re-heating exchanger (PWW-NHR) mixer valves are controlled via 0-10 V signals (continuous). The circulating pumps will also be activated on demand.

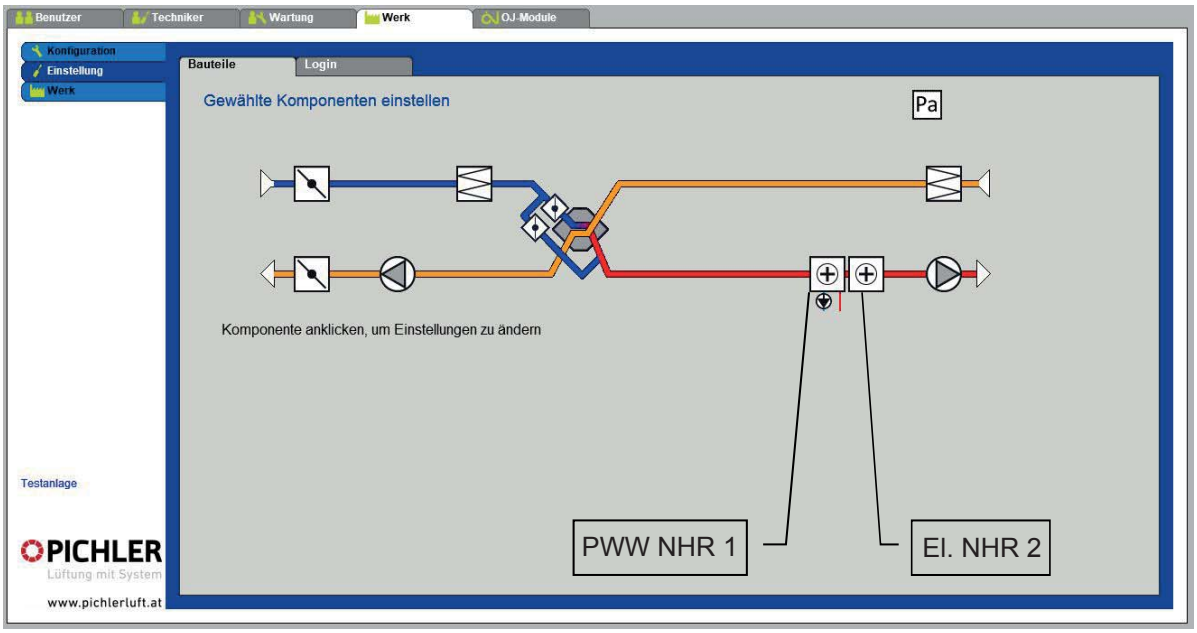
The following temperatures may be used as control parameters:

- Constant supply air temperature
- Constant extract air temperature
- Constant ambient air temperature
- Constant supply/extract air difference

The frost protection strategy for water-dependent heating/cooling batteries must always be checked against the local system requirements and on-site conditions , and modified if necessary It may sometimes be necessary to install an additional safety assembly (e.g. frost protection thermostat, heat exchanger). In case of risk of frost we recommend to always use a glycol filling. Outdoor heating circuits **must** always be operated with antifreeze (glycol)!



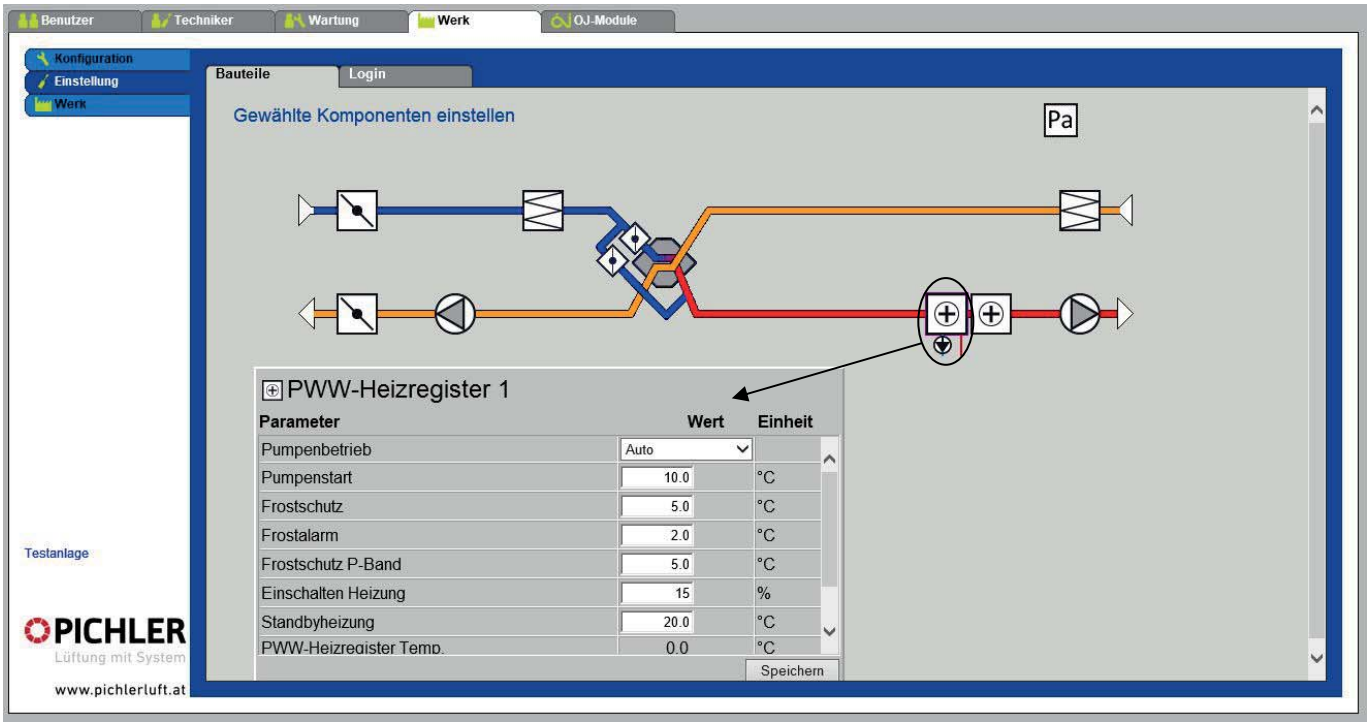
A return flow sensor (immersion sleeve or strap-on sensor) must be installed for frost protection of PWW-NHR. The heating circuit of the supply air re-heating exchanger may also be operated with antifreeze. The fans will stop when a frost alarm triggers.



A return flow sensor (immersion sleeve or strap-on sensor) must be installed for frost protection of PWW-NHR. The heating circuit of the supply air re-heating exchanger may also be operated with antifreeze. The fans will stop when a frost alarm triggers.

With room temperature control configured, the room temperature controller determines a set point supply air temperature based on the difference between set point temperature and actual temperature, which is then regulated by a downstream supply air temperature controller. With supply air temperature control configured, the higher level room temperature control falls away and the supply air temperature is regulated directly via a set point supply air temperature.

Primary parameters:



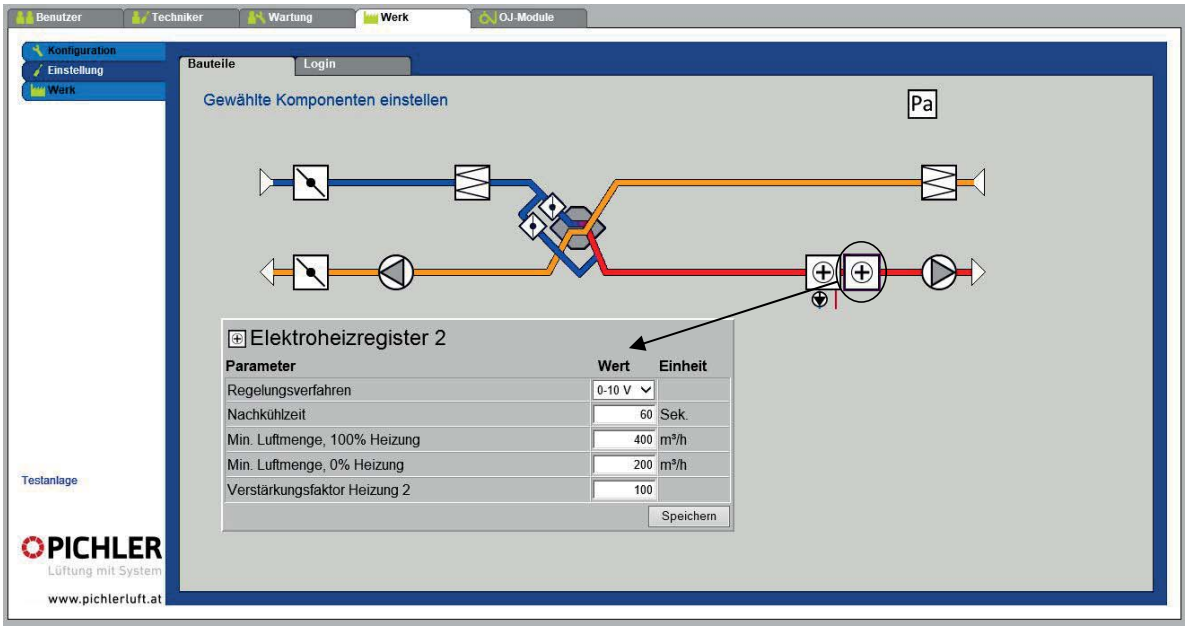
Primary parameters:	
Pump operation	✓ "Constant". The circulating pump in the PWW heater will run continuously when the Pichler Air2 Master is switched on. ✓ "Auto". The circulating pump in the PWW heater will run when heating is required (valve setting >0.1%) ✓ "Outside temperature". The circulating pump in the PWW heater will run when heat is required or when the outside temperature drops below the value set in the "Pump start" parameter.
Pump start	✓ The pump will start when the outside temperature falls below the set value. ✓ "Pump operation" must be set to "Outside temperature".
Frost protection	✓ The set value gives the PWW heater return flow temperature at which the ventilator should be fully controlled. ✓ The heating valve control will be activated at set value plus "Frost-P-band"
Frost alarm	✓ The set value gives the PWW heater return flow temperature at which the compact ventilation unit will stop and a frost alarm will be triggered
Frost-P-band	✓ PWW heater frost protection sets in at the set value plus the "Frost protection" parameter value (see graphic Page 12)
P-band	✓ P-band for PI controller heating
I-time	✓ I-time for PI controller heating
Start-up heating	✓ Initial heating in %. Heating power when switching from standby to operation.
Stand-by heat	✓ When stopping the ventilation system, the heating valve will ensure that the return flow from the water battery does not get below the set value.
Water temperature	✓ Read actual return temperature.
Gainfactor, heat 1	✓ Set gain factor for heating battery
Motor-driven valve	✓ Set the control range of the motor-driven valve (0-10 V/2-10 V)

3.3.2 Re-heating using electrical heating

The electrical heater may be controlled either via 0-10 V analogue signal or via digital relay outputs.
To maintain an adjustable set-point temperature, the electrical re-heating exchanger, optionally fitted to the connecting flange for supply air, is controlled via a 0 –10 V signal to a Triac controller.
When controlled via one or two digital outputs, the heater may be controlled as follows:

- Single stage
- Two-stage
- Binary via 2 relay outputs

Primary parameters:



Primary parameters:	
Regulation form	✓ "0-10 V". Analogue heater control via a 0-10 V analogue output (e.g. EFS-9XXX) ✓ "single stage". Electric heating battery is On/Off controlled ✓ "two-stage". Electric heating batteryr is controlled in two stages (On/Off). As more heat is required, "Heating relay 1" is first switched on, then "Heating relay 2" and in reverse sequence switched off for less heat. ✓ "Binary". The electrical heater is digitally controlled in three stages (On/Off). The heating elements in the heating battery must be sized in 1/3 - 2/3. <u>By increasing heat requirements:</u> • Activate "Heating relay 1" • Activate "Heating relay 2" and disconnect "Heating relay 1" • Activate "Heating relay 1" and "Heating relay 2" <u>By decreasing heat requirements:</u> • Disconnect "Heating relay 1" • Disconnect "Heating relay 2" and activate "Heating relay 1" • Disconnect "Heating relay 1" and "Heating relay 2"
Post cooling time	✓ The electrical heater elements may overheat should air flow be reduced or stopped. The heating elements will be disconnected during post cooling and the ventilation units will continue to run as per the set air volume set-point. The set value defines the period required to ensure cooling of the electrical heating exchanger.
Min. flow, 100% heat	✓ Set value informs at which minimum volume (m^3/h) in the inlet, the heating should be 100% on.
Min. flow, 0% varme	✓ Set value informs at which minimum volume (m^3/h) in the inlet, the heating should be off (0%).
Gainfactor, heat 2	✓ Set gain factor for heating battery

3.4 Optional: System extension for cooling

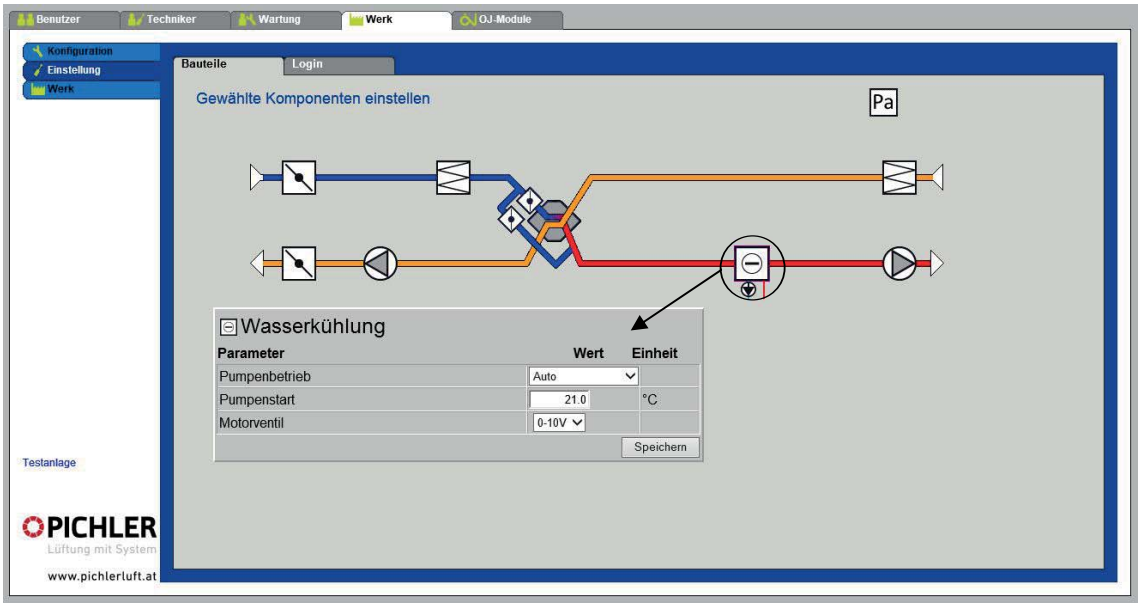
The supply air may be cooled using an optional cooling exchanger fitted in the supply air ducting. The integrated controller will control the individual components such as circulating pump, mixing valves etc..

3.4.1 Cooling with water cooling exchanger

A 0-10 V signal controls the cold water cooling valve. Start/Stop of the circulating pump in the cooling circuit via digital output. The alarm output of the pump may be connected to the “Cooling fault” digital input. This will trigger an alarm when the contact opens.

The heating circuit **must** operate with antifreeze. (Glycol) In water-based cooling batteries and cooling circuits no frost protection monitoring is carried out by the control system!
The glycol filling may only be dispensed with in exceptional cases, in indoor areas and if there is absolutely no risk of frost (e.g. if the cooling battery is installed downstream of a frost-monitored heater battery).

Primary parameters:



Primary parameters:	
Pump operation	✓ “Constant”. The circulating pump for the cooling exchanger will run continuously when the Pichler Air2 Master is switched on. ✓ “Auto”. The circulating pump for the cooling exchanger will run when cooling is needed (valve setting >0.1%). ✓ “Outside temperature”. The circulating pump for the cooling exchanger will run when cooling is required or when the outside temperature exceeds the “Pump start” parameter set value.
Pump start	✓ The pump will start when the outside temperature exceeds the set value. ✓ “Pump operation” must be set to “Outside temperature”
Motor-driven valve	✓ Set the control range of the motor-driven valve (0-10 V/2-10 V)
P-band cooling	✓ Controller parameter setting: P-band “Cooling”
I-time cooling	✓ Regulator parameter setting: I-time “Cooling”

3.4.2 DX cooling (cooling unit)

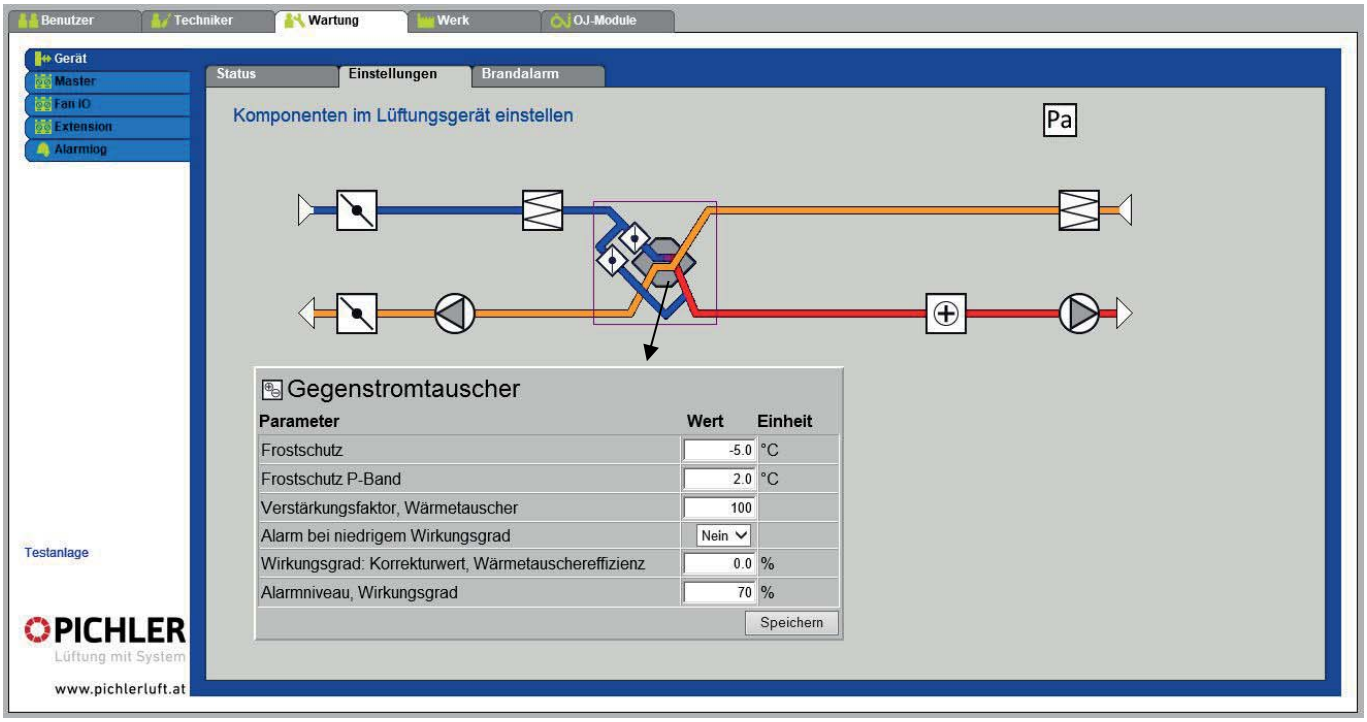
DX cooling may be configured for controlling compressors or cooling stages. The Air2 system will start and stop the compressors as required and will trigger alarm in case of errors in the cooling circuits. The compressors are started/stopped via 4 digital outputs.

3.5 Heat exchanger

The Air2 system may use various heat exchangers for heat recovery (WRG).

Bypass dampers in the heat exchangers will be controlled via a 0-10 V signal from the Air2 system. The exhaust air temperature is measured after the extract air has passed the heat exchanger to protect the heat exchanger from freezing up.

Primary parameters:



Primary parameters:	
Protection from frost and freezing	✓ At temperatures below the set value plus P-band, the bypass damper will be controlled up to 100% open. The warm extract air will in this way protect the heat exchanger from freezing.

3.6 Optional: Demand-driven plant operation

The Pichler Air2 system can offer several options for demand-driven air flow control:

- Constant CO_2 / RH value
- Fan optimiser
- GreenZone
- PI zone module / PI optimiser

3.6.1 Constant CO_2 value

- ✓ The plant must be configured with a CO_2 sensor.
- ✓ The CO_2 sensor may be fitted either as a room sensor or as a duct sensor in the extract air duct.

3.6.2 Fan optimiser

- ✓ Supply air and extract air fans are controlled by fan optimiser signals from the supply and extract air ducts.
- ✓ The fan optimiser signal (0-10 V) is connected to the analogue input.
- ✓ The plant must be fitted with 2 separate fan optimisers – one each in the supply and extract air ducts.

3.6.3 GreenZone/PI zone modules, PI optimisers

- ✓ GreenZone modules control demand-driven ventilation (CO_2, RH%, temperature) of the individual zones (rooms)
- ✓ GreenZone Master will optimise the air flow based on real time required air volumes in the individual zones
- ✓ Plug and Play system

PI zone modules (in rooms/zones) and PI optimisers together with flow regulators will adjust fan speeds as required to save energy. This will guarantee optimal plant operating points. Fan speeds may also be controlled depending on CO_2-/ RH content. This will require a relevant sensor in either the ambient or extract air ducts.

3.7 Optional: Building automation - networking

The Pichler Air2 system offers several options for networking into a higher level building automation system.

- Integrated Web server
- Modbus RTU
- Modbus TCP/IP
- BACnet
- LON

The corresponding bus connection will be activated/parameterised ex factory on customer request.

4 Ventilation unit

4.1 Description

The **energy efficient Series LG 750 to LG 6000 ventilation units** are specially developed and optimised ventilation units with integrated Pichler-Air2 controller customised to meet individual demands. The ventilation units are deployed for controlled mechanical aeration and ventilation with heat recovery from several dwelling units in multi-storey residential buildings, student quarters and old age homes, commercial/hotel/office buildings or similar applications.

- A flat roof (unit height + 60 mm) is standard Unit height will change depending on its roof.

- Standard base height for units integrated in roof: 600 mm. The base height may on request be adapted to the roof structure

Unit housing
The unit housing is a compact, thermally insulated galvanised sheet steel frame construction enclosure with minimal thermal bridges. The panels are double-walled, made of galvanised sheet steel with respectively 50 mm and 100 mm thick insulation for interior and exterior installation.

Heat recovery
Energy efficient heat recovery is achieved through the adequately dimensioned, highly efficient, corrosion-resistant aluminium air/air counterflow heat exchanger. The integrated 100% automatic bypass is used to bypass the heat exchanger (summer use, frost protection etc.. It is fitted with an internal bypass for continuous heat transfer control.

Fans
The units are fitted with energy-saving and quiet high performance EC technology radial fans. Compared to conventional drives, the potential for saving energy is up to 60%, especially when operating on partial load. The fans are maintenance-free.

Outdoor air/extract air filters
The units are supplied with Quality Class F7 outdoor air filters and Quality Class M5 extract air filters. For higher demands on air filter quality they may also be supplied with higher quality class air filters. The air filters are easy to replace after opening the inspection doors.

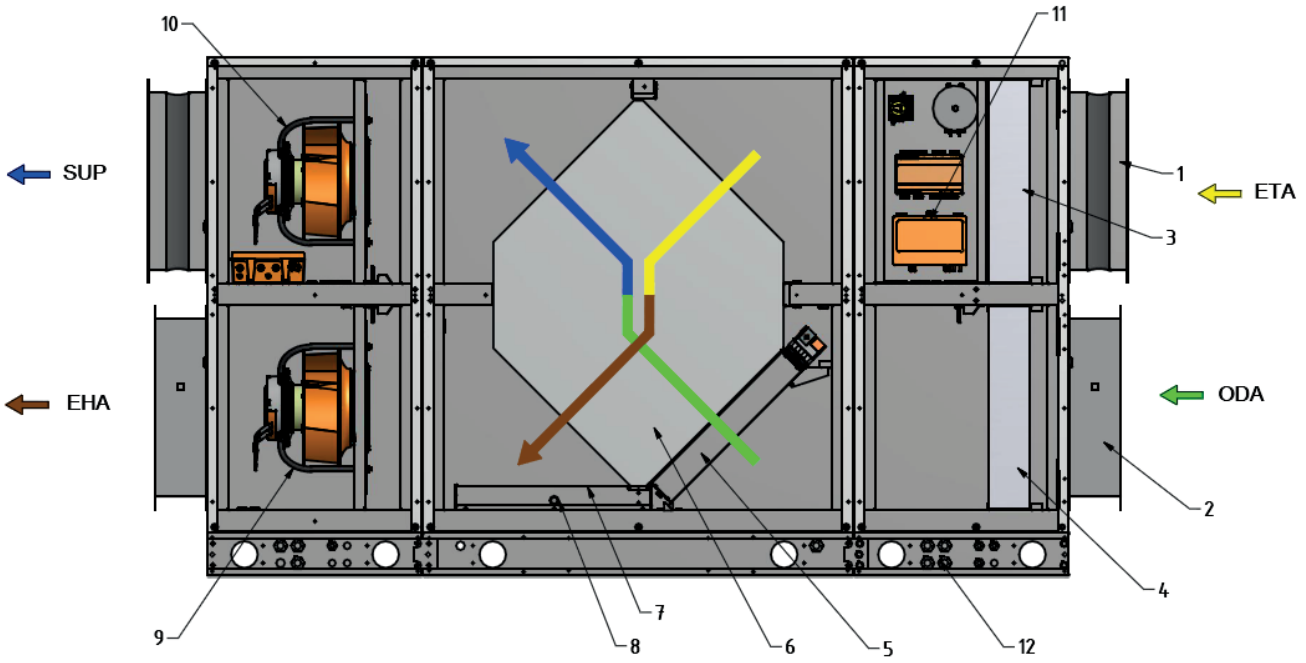
Integrated control and regulation
The VENTECH system LG 750 to LG 6000 ventilation units are equipped with an integrated control and regulation system as a standard feature. Either an operator control unit is used to operate the unit, which can be optionally installed directly on the unit. Software is used to program the individual parameters for regulation and control. The possible settings and the procedure for operating or alternatively for adjusting the different parameters are given in sections 5 and 6 of this guide. More detailed descriptions of controlling the unit and the parameters are available separately for specialists.

System operation can be programmed in accordance with the individual requirements using an integrated daily and weekly program. The volume flow is set using a 0 - 10 V control signal, which can also be used to incorporate external pressure control systems such as a fan optimiser, for example.

For protection against the counter-current heat exchanger freezing in the event of low outside temperatures, different frost strategies can be taken into consideration, for example by using bypass control with a re-heater battery. The set system parameters and also the current values of temperature, volume flow or pressure that are currently in operation can be read on the operator control unit. Fault messages are output on the control panel as a collective fault message or alternatively as a fault message.

4.2 Unit configuration with subassemblies Series LG 750 – LG 6000

LG 1000 …LV for interior installation (illustration left-hand version, with vertical heat exchanger)



Legende:

1 Flexible connection
2 Shut-off valve
3 Outdoor air filter with push-pull device
4 Extract air filter with push-pull device
5 Bypass flap with actuator
6 Counterflow heat exchanger
7 Condensate cup
8 Condensate drainage
9 Exhaust air fan
10 Supply air fan
11 Electrical connection

4.3 Technical data Series LG 750 to LG 6000

Unit card:
Please refer to the unit card for details on your ventilation unit!

4.4 Series LG 750 – LG 6000 versions

The Series LG 750 to LG 6000 ventilation units are available in different versions:

4.4.1 Modular units series

ITEM KEYS

08 10 I R H VW

Built-in parts
VE ... preheater battery electrical
VW ... preheater battery water
NE ... reheater battery electrical
NW ... reheater battery water
KW ... cooling battery water
KDX ... cooling battery direct evaporator
S1 ... sound suppressor in outdoor and exhaust air ducts
S2 ... sound suppressor in supply and extract air ducts
S3 ... sound suppressor in outdoor, exhaust, supply and extract air ducts
B ... humidifier

Heat exchanger arrangement
V ... vertical (standard for weather-resistant and roof-integrated ventilation units)
H ... horizontal (standard for indoor installation units)

Version (depending on position of supply air connection)
L ... left
R ... right

Place of installation
I ... inside
W ... weatherproof
D ... integrated in roof

Unit versions
07 ... LG750
10 ... LG1000
25 ... LG2500
40 ... LG4000
60 ... LG6000

Catalogue group

4.4.2 Compact units series System Mono-Case

ITEM KEYS

08 10 K W R V VW

Built-in parts
VE ... preheater battery electrical
VW ... preheater battery water
NE ... reheater battery electrical
NW ... reheater battery water

Heat exchanger arrangement
V ... vertical

Version (depending on position of supply air connection)
L ... left
R ... right

Place of installation
W ... weatherproof
D ... integrated in roof

Variant
K ... compact

Unit versions
07... LG750
10 ... LG1000

Catalogue group

Optional:

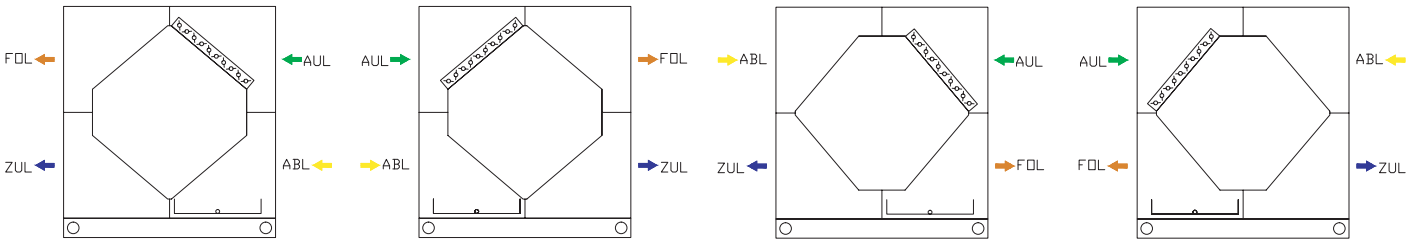
- Demand-optimised ventilation control with Green-Zone/PI zone module, PI-Optimizer
- Pressure sensors for flow volume or constant pressure functionality
- Demand-driven ventilation via CO_2 and/or VOC sensor

HEAT EXCHANGER ARRANGEMENT

The heat exchanger positions shown are the preferred ones, in each case in left-hand and right-hand versions for the different inspection sides and with airflow arrows. Standard ventilation units are available in the following designs: Ventilation units for indoor installation are fitted with horizontal heat exchangers; weather-resistant and roof-integrated ventilation units are fitted with vertical heat exchangers. Prices and delivery times for other versions are available on request.

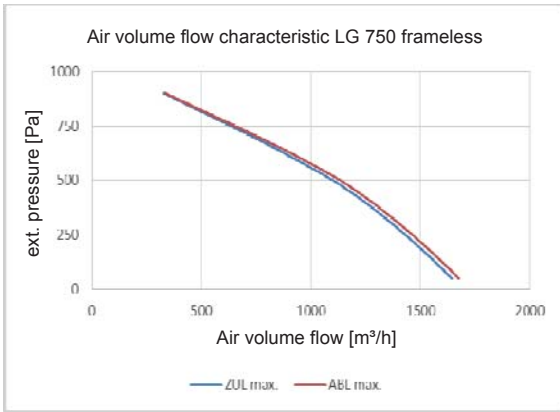
Standard ventilation units with weather-resistant or roof-integrated design:

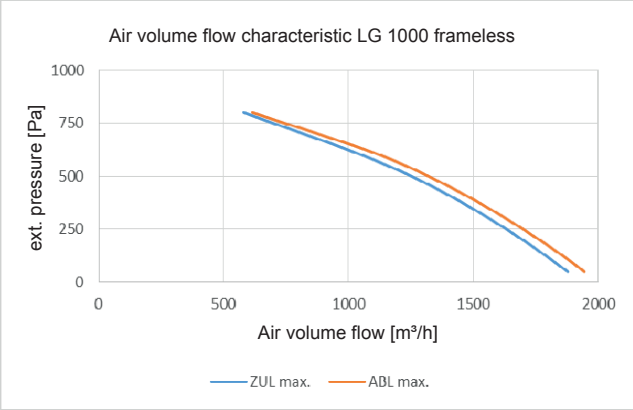
Standard ventilation units for indoor installation:

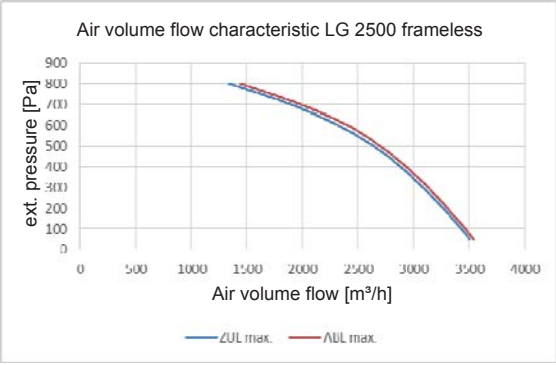


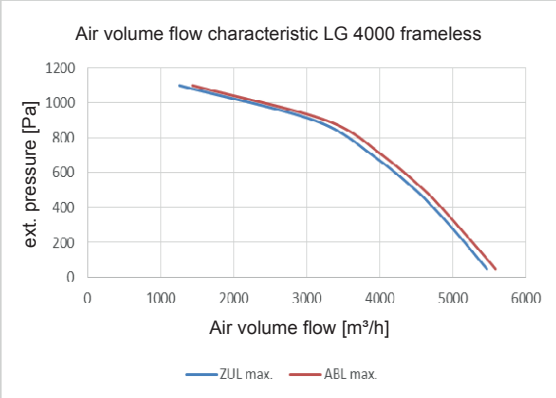
WT vertical left ***WT vertical right*** ***WT horizontal left*** ***WT horizontal right***

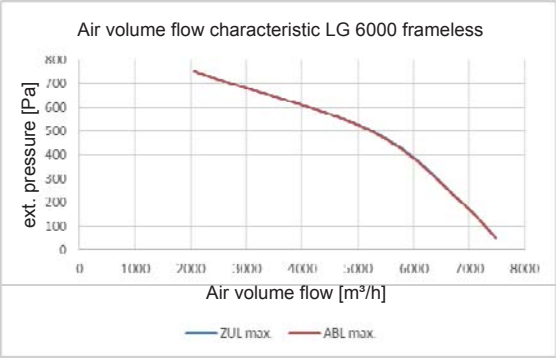
4.5 Air volume flow characteristics – external pressure increase: Without constant flow volume function











The characteristics shown are applicable to unit type with supply air filter quality class F7 and extract air filter quality class M5. Additional subassemblies will shift the curve at the lower end.

5 Control units

5.1 General information

The settings on the ventilation unit are made using the operator control unit "PI-HMI" or "Pichler handheld terminal".

The control unit is usually installed near the ventilation unit.

5.2 Operator control unit PI-HMI

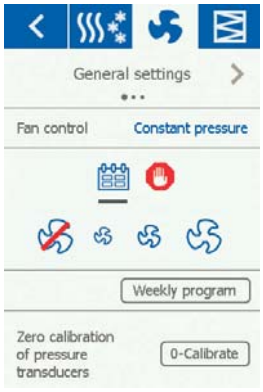
PI-HMI is a touchscreen panel with user-friendly graphical user interface specially developed for controlling ventilation systems. The panel communicates with the PI Air2 system via a Modbus interface, ensuring easy installation.

Product: PI-HMI
Type: 3,5“ touchscreen panel

5.2.1 Operation

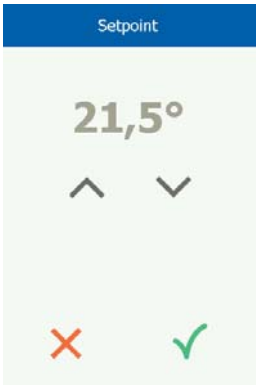
This quick start guide only de-scribes basic settings. If the screen saver is active, simply touch the screen once to open the home screen.
This screen provides access to elementary functions such as fan speed, temperature and setup. The time and day of the week are shown in the top line of the screen. Below these, an alarm bell is visible if an alarm has been activated. The house in the middle section of the screen provides access to a simple overview of temperatures, air volumes and filter pressures. The temperature shown to the right of the house is the temperature setpoint. The icons shown in the lower part of the screen can be changed and may therefore differ from those shown in these instructions.

5.2.2 Fan speed



To set fan speed, press the fan in the lower part of the home screen. You can choose between six predefined fan speeds. Off, Auto, Low, Medium, High and Service Stop. If you choose Auto, PI-HMI will follow a predefined program. If you choose Low, the predefined program is overridden and the fan operates at low speed. If you choose Medium, the predefined program is overridden and the fan operates at medium speed. If you choose High, the predefined program is overridden and the fan operates at high speed. If you choose Off, the fan comes to a complete standstill until fan speed is again changed. If you choose Service Stop, the system shuts down and can only be restarted locally from the control panel.

5.2.3 Temperature

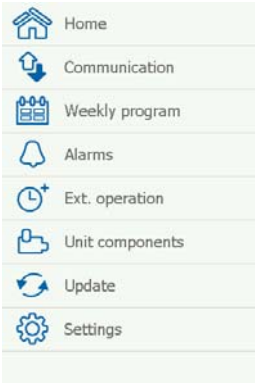


To change the temperature setpoint for the selected control mode, press the temperature on the panel's home screen. Change the temperature using the arrows and confirm with the green button.

5.2.4 Settings

PI-HMI is used together with an PI Air2 Master, and all communication is via the master. Some settings can be made via the menu icon in the upper right corner of the home screen. Begin by pressing the menu icon in the upper right corner of the home screen.

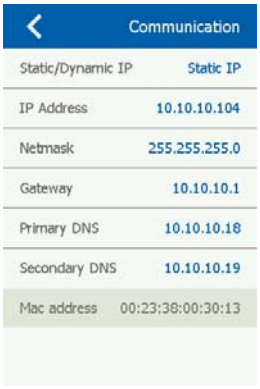
The following screen is then displayed:



Home

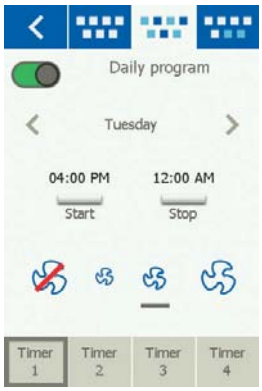
Press this icon to return to the home screen.

Communication

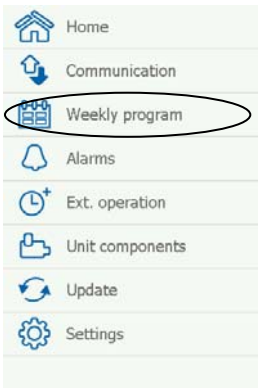


Here you can configure LAN settings such as static/dynamic IP and associated addresses.

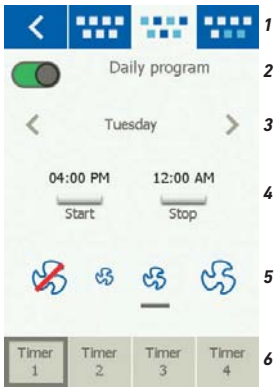
Weekly programm



Here you can enter times and modes for the built-in 7-day clock.



To set a weekly program for the ventilation unit, *weekly program* must be selected under *menu*.



Then you can choose among *three different modes:*

„Whole week“ – A ventilation setting for the whole week

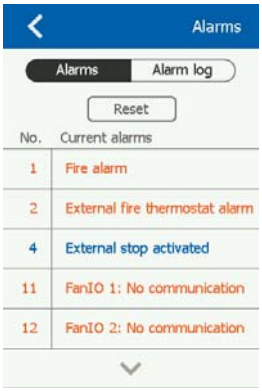
„Daily program“ – For each day different ventilation settings can be parameterized

„Weekday / weekend“ – Ventilation settings on weekdays and weekends are set

By pressing the button, the mode is turned on or off

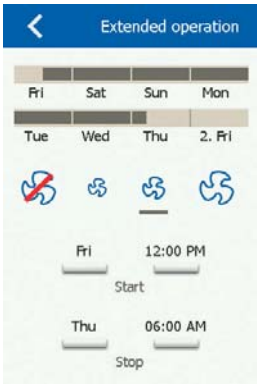
1 Switching between the different modes
2 Mode
3 Weekday
4 Time to start and stop the system
5 Fan speed
6 Timer: A fan speed can be selected for a certain period (e.g. in the morning). Up to four timers can be programmed.

Alarms



Here you can view active alarms and an alarm log. In case of an alarm, this screen can also be accessed via the bell icon on the home screen.

Extended operation

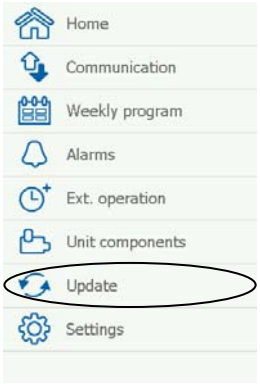


If a different pattern of operation is required for a short period of time, the weekly program can be overridden. The override period can last up to a week at most. Once the period has elapsed, the system returns to standard clock-controlled operation.

Unit components

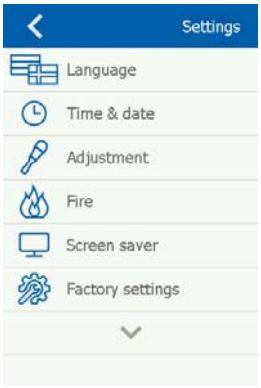
Here you can make general settings for the various components that are installed.

Software update



Here you can check if an SD card inserted into the PI Air2 Master contains a new software version.
Then select update in the settings and follow the instructions on the display.

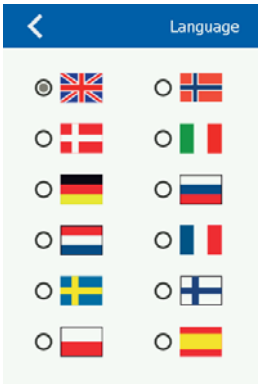
Settings



The following can be set/viewed:

- Language
- Time & date
- Locking of fan speed during adjust-ment.
- Setting of fan speed in case of fire/smoke extraction
- Setting of screen saver
- Restoration of factory settings
- Setting up the lower part of the screen
- Software version

Language



Here you can choose the language to be used on the screen.

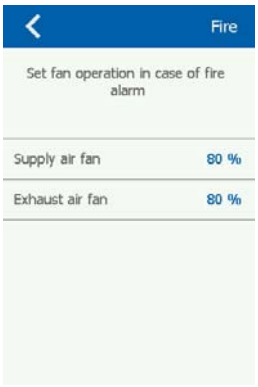
Time & date

Here you can set the time and date for the system.

Adjustment

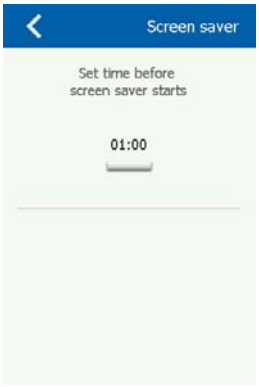
Here you can lock fan speed during system adjustment. Once the required air volume has been reached, the fan is locked at its current speed. This gives the installer the opportunity to adjust the system, ensuring the right amount of air in the individual rooms without interference from ventilation system regulation.

Fire



Here you can set the required fan speed in case of fire/smoke.

Screen saver

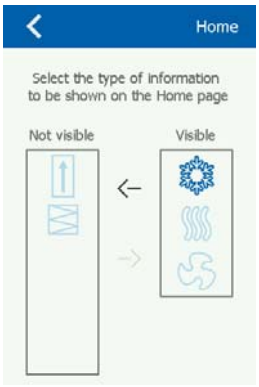


Here you can set the screen saver timeout period.

Factory reset (PIN required)

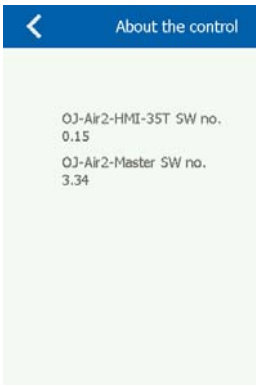
Here you can restore factory settings.

Home (PIN required)



Here you can configure the icons shown in the lower part of the home screen.

About the control



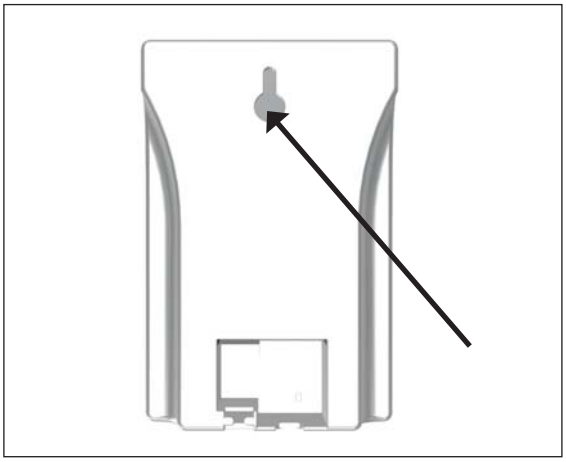
Here you can view information on software versions.

5.2.5 Installation on flat surface

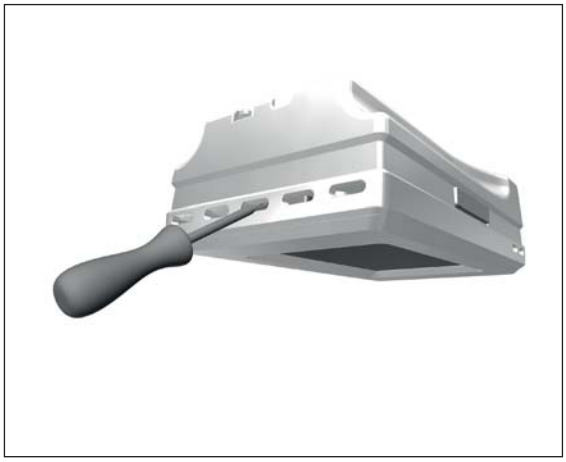
PI-HMI can be installed in two ways: either in a wall box/panel front or directly on a flat surface.The back cover of the PI-HMI is equipped with a keyhole-shaped opening which can be used to hang the unit on a flat surface (see illus. 1). Use a screw that is max. 3.5 mm in diameter with a head no larger than 9 mm.

5.2.6 Installation in wall box/panel front

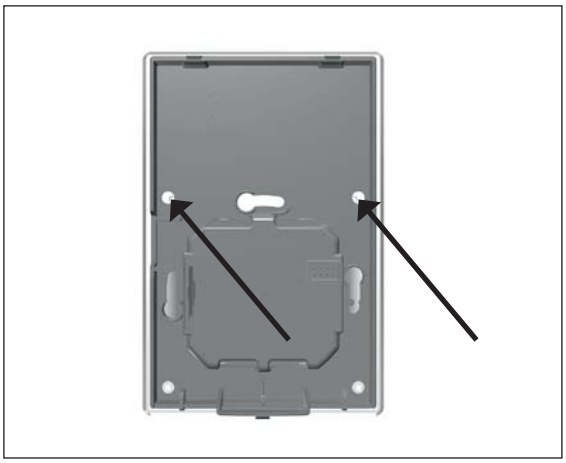
If PI-HMI is to be installed in a wall box or panel front, the back cover must be removed. Firstly, the front cover must be detached by gently releasing the catch on the bottom of the unit with a flat screwdriver and then tipping the cover outwards (see illus. 2).
Once the front cover has been detached, the two screws holding the back cover in place can be removed (see illus. 3). The back cover can now be detached and the front cover refitted. The baseplate is equipped with several screw holes. The dimensioned drawing (see illus. 4) can be used as a drilling template. The baseplate should be secured with at least two screws tightened to a torque of max. 0.8 Nm. Installation depth is 20 mm.



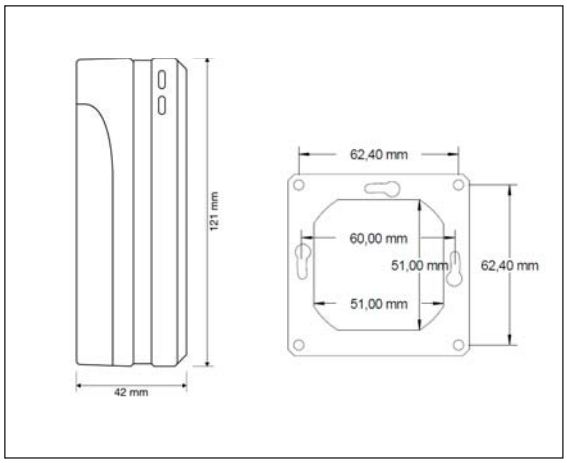
Illus. 1: Installation on flat surface



Illus. 2: Removing the front cover



Illus. 3: Removing the back cover

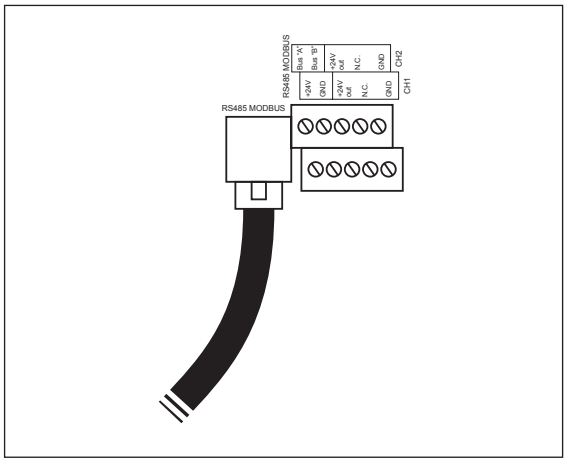


Illus. 4: Dimensioned drawing to facilitate installation in wall box or panel front

5.2.7 Modbus connection

PI-HMI is connected to the PI Air2 Master by means of a Modbus cable. The Modbus cable can be connected to the PI-HMI by means of the RJ12 6P4C port or four single-wire screw terminals. Whether the RJ12 6P4C port or screw terminals are used does not influence the available functions or operation.

5.2.8 Modbus RJ12 6P4C



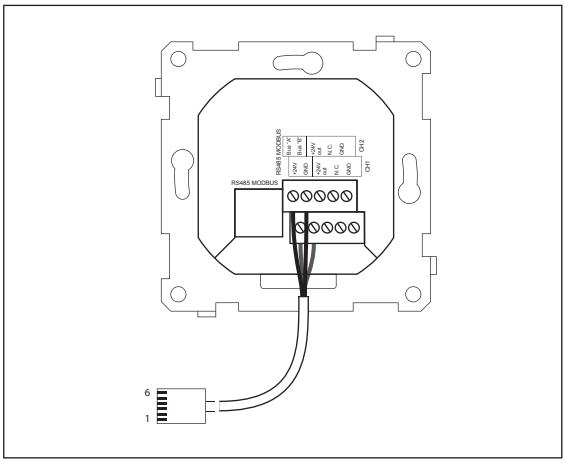
Illus. 5: Connecting Modbus via the RJ12 6P4C port

Connect the Modbus cable to the Modbus port for the operator control unit on the PI Air2 Master and to the RJ12 6P4C port on the PI-HMI (see illus. 5).

5.2.9 Modbus screw terminals

Connect the Modbus cable to the Modbus port for the operator control unit on the PI Air2 Master and to the corresponding screw terminals on the PI-HMI (see illus. 6).

RJ12	Screw terminals
1	+24 V
2	GND (earth)
3	Bus „B“
4	Bus „A“
5	+24 V
6	GND (earth)



Illus. 6: Connecting Modbus via the screw terminals

5.2.10 Technical data

Supply voltage ..... 24 V DC +/-10%
Cable dimensions ..... 10 x max. 0.75 mm²
Relative humidity ..... 0-95% (non-condensing)
Operating temperature .....-10/+40°C
Enclosure rating.....IP21 (EN 60529)
Port .....1 × RJ12 6P4C
.....10 x screw terminals
Dimensions ..... 80x121x42 mm (see illus. 4)
Installation depth ..... 22 mm
Max. power consumption ..... 900 mW
Standby power consumption ..... 600 mW

5.2.11 Service and maintenance

The PI-HMI touch panel is maintenance-free. Please contact us if you have any further queries.

PICHLER
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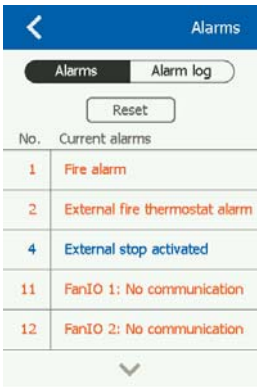
6 Alarms / malfunctions

Pichler Air2 system malfunctions will be shown as alarms. This display may differ, depending on the control unit or internal Web server.

6.1 Operator control unit „PI-HMI“



Alarm display: The bell icon flashes on the home screen. The operator control unit „PI-HMI“ will display active alarms and an alarm log in the ALARM submenu. In case of an alarm, this screen can also be accessed via the bell icon on the home screen.

6.2 Optional: Alarm log in the web server

The log of the most recent 16 active alarms is shown in the user menu.

Zeit	Datum	Nr.	Alarmlog
10:18	1.08.2014	47	Frequenzumrichteralarm Abluftventilator
10:18	1.08.2014	37	Frequenzumrichteralarm Zuluftventilator
10:17	1.08.2014	26	Temperaturfühlerstörung: Wärmerückgewinnung
10:12	1.08.2014	93	Druckfühlerdefekt: Hochdruck 2. Kältemaschine
10:12	1.08.2014	92	Druckfühlerdefekt: Niederdruck 2. Kältemaschine
10:12	1.08.2014	91	Druckfühlerdefekt: Hochdruck 1. Kältemaschine
10:12	1.08.2014	90	Druckfühlerdefekt: Niederdruck 1. Kältemaschine
10:31	31.07.2014	26	Temperaturfühlerstörung: Wärmerückgewinnung
15:33	30.07.2014	93	Druckfühlerdefekt: Hochdruck 2. Kältemaschine
15:33	30.07.2014	92	Druckfühlerdefekt: Niederdruck 2. Kältemaschine
15:33	30.07.2014	91	Druckfühlerdefekt: Hochdruck 1. Kältemaschine
15:33	30.07.2014	90	Druckfühlerdefekt: Niederdruck 1. Kältemaschine
11:02	30.07.2014	25	Temperaturfühlerstörung: PWW-Erhitzer 1
10:57	30.07.2014	25	Temperaturfühlerstörung: PWW-Erhitzer 1
16:04	15.07.2014	47	Frequenzumrichteralarm Abluftventilator
16:04	15.07.2014	37	Frequenzumrichteralarm Zuluftventilator

7 Scope of supply, transport, storage and disposal

7.1 Scope of supply

- The ventilation unit comprising several units
- The operator control unit colour touch display PI-HMI
- The Operating and Installation Manual (enclosed with ventilation unit)
- The unit card (enclosed with ventilation unit)
- Key for inspection doors
- Siphon
- Trace heating (in exterior installation type)
- Miscellaneous installation materials (bolts, sealing strips, etc.)

On delivery of the unit, check that the type and serial number on the nameplate correspond to the information on the order and delivery documents, that the equipment is complete, including any optional accessories, and that all parts have been delivered in perfect condition.

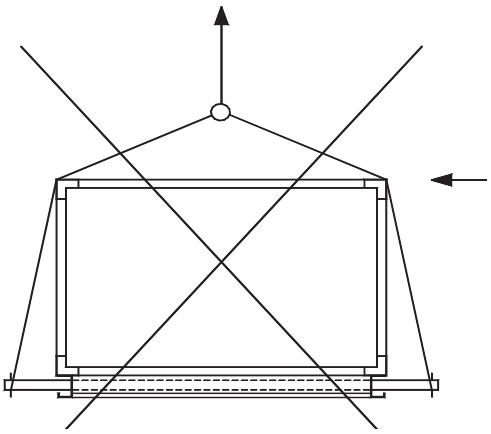
Note: Any transport damage and/or missing parts must be immediately reported to the forwarder or supplier in writing.

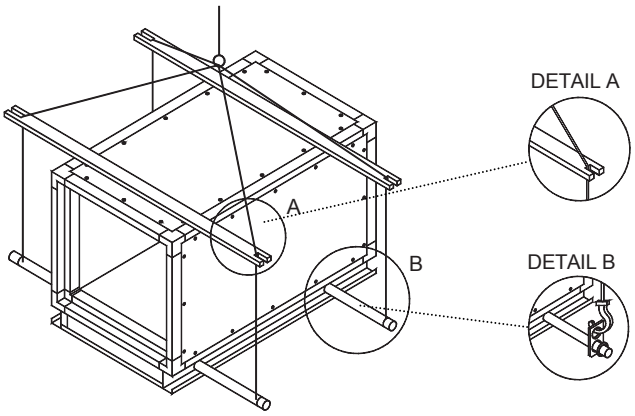
Note: Connection of individual modules and wiring is not included in the scope of supply and must be done on site!

7.2 Packaging & transport

The ventilation unit is supplied packaged. The safety markings on the packaging must absolutely be noted and observed during handling.
Ensure that the unit is not damaged through tipping or knocking over. The unit may be lifted with a forklift or using slings. Ensure that lifting bars have adequate capacity. Secure the bars against slipping, if possible (see Illustration). Prevent knocks and blows during transportation and do not twist equipment frames or housing components.

Applicable safety and accident regulations must be complied with during transport. Ensure that reasonable human lifting and carrying capacity exists for manual transport.





7.3 Storage

The unit must be stored in its packaging in suitable, dry and dust-free rooms. Avoid excessive storage times.

7.4 Disposal

Dispose of the packaging material and protective packaging in an environmentally friendly way. The packaging material must be disposed of compliant with local regulations.

- Recycle wooden pallets or cartons, for instance

Units that are no longer in working order must be dismantled by a specialised company and properly disposed of via suitable collection centres in accordance with the Waste Electrical and Electronic Equipment Ordinance (WEEE), which provides for the implementation of community law, Directive 202/95/EC (RoHS) and Directive 2002/96/EC (WEEE Directive).

8 Installation

8.1 Prerequisites for installation of the unit / interior installation

The LG ventilation unit must be installed in accordance with the general and locally applicable safety and installation regulations and to the specifications in this Manual. Erection and installation work may only be carried out by authorised competent staff.

Place of interior installation: The ventilation unit may only be installed in a frost-free room, e.g. in a cellar or loft, with ambient temperatures ranging between +5°C to +40°C. Accumulating condensate must be discharged frost-free and safely via a gradient and with an effective trap (siphon) to block odours.

Place of weatherproof installation: Units integrated in the roof and weatherproof units, also side by side, must be installed on a base and above snow height. Accumulating condensate must be discharged frost-free and safely via a gradient and with an effective trap (siphon) to block odours.

The installation position for the unit must be selected to allow sufficient space for air ducts, electrical connections, condensate connection and for maintenance and inspection. Leave at **least 1 m** space in front of the unit to allow for operation and maintenance.

The ventilation unit must be set up on an even and sufficiently firm base.

Connection facilities: The following connection facilities in accordance with the unit card must be available in the installation area:

- Air duct connections for supply, extract, outdoor and exhaust air
- Electrical mains connection in accordance with the unit card
- Condensate drainage line with an effective trap to block odours

All on-site work (drainage, floor structure etc.) must be completed ***before installing*** the ventilation unit. The ventilation unit will be firmly in position once the air ducts have been connected and cannot be moved. The air ducts must be sufficiently insulated to conserve energy and to prevent condensation. No condensate must be allowed to form on the air ducts and roof cladding.

To ensure proper and functional plant operation, suitable thermal and sound insulation and installation materials as per the planning documentation and technical data, such as adequately sized acoustic absorbers, supply air and extract air valves, overflow openings etc. should be ensured.
All equipment connectors should in principle be fitted with sound absorbers to ensure appropriate acoustic damping. Air duct feed-throughs through walls or ceilings must be isolated from structural vibrations.

Protection against dirt: To protect the plant from coarse soling such as foliage, leaves or insects, a fine wire mesh grating must be provided as a pre-filter directly at the central intake of outdoor air. The protective grating must be checked and cleaned at regular intervals, if necessary, especially in spring and autumn. Inspection openings should be provided in the air duct system to facilitate cleaning and maintenance if necessary.

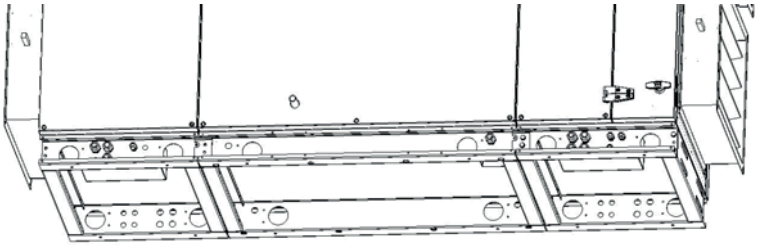
To prevent condensation inside the unit, the ventilation unit must be commissioned immediately after proper installation; failing this, the connections for supply and extract air must be sealed airtight until commissioned. Condensation may permanently damage the ventilation unit, especially the integrated electronic controller. It may, for instance, suffice to use an EPS disc and adhesive tape to seal the supply and extract air connections airtight. Strictly ensure that condensation inside the unit will be reliably prevented should the unit not run for extended periods, e.g. by installing airtight shut-off valves in the ducting system to prevent undesirable natural circulation of air.

Seal: All sealing required during assembly must be performed using neutral-curing and non-corrosive sealants. For example: Sikaflex®-221, silicone-free (item no. 12DMAUSSEN).

8.2 Unit installation – free-standing installation

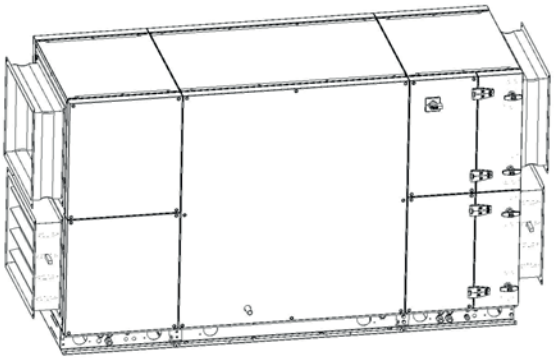
The **Safety notes** under **Section 3.2** of this Manual must be heeded at all times when performing any work!

- The ventilation unit will be supplied as parts. Sufficient space must be allowed for fitting of air duct connections, electrical connections and the condensate connection and for maintenance and inspections.
- After placing the unit in its position, it must be aligned.

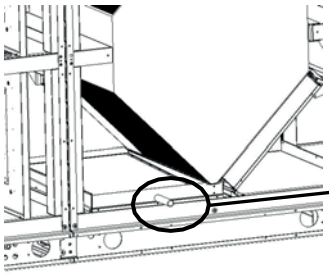


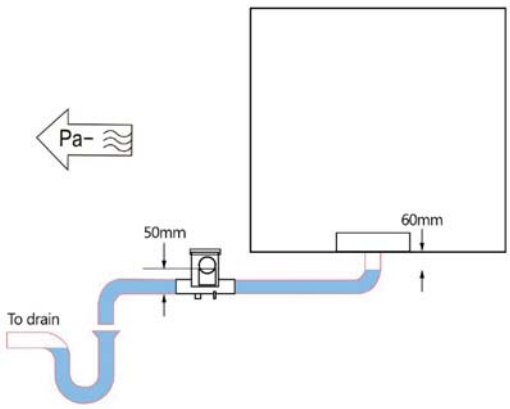
- To guarantee good discharge of condensate, ensure adequate space between floor and underside of the unit.

8.2.1 Making the condensate water connection



- Cut the siphon to length and connect to the valve connection on the inspection side of the condensate tray.
- An adequate gradient (at least 5%) is required for reliable draining of water. Fill the siphon with water to effectively block odours and avoid leakage.





- We recommend using a ball siphon, since all ventilation units operate at underpressure
- For exterior installations the siphon should be equipped with trace heating on site.

8.3 Electrical connection

- Warning: dangerous electrical voltages!
- Failure to observe this risk can lead to death, injury or damage to property.
- Before carrying out any work on live parts, the unit must always be disconnected completely from the power supply (all poles) and secured against being switched back on.

Electrical connection work and work on the system's electrical components may only be carried out by authorised electricians, in compliance with national and local regulations. Final responsibility for the electrical installation, cabling, etc. lies with the electrical contractor which performed them. Under normal power supply conditions, the terminals and connections of the EC fans are constantly live!
The Safety notes under Section **2.2.3 – Electrical connections** must be heeded when performing any electrical work.

- The electrical connection must accord with the electrical switching plan!
- The cable cross-sections indicated are minimum cross-sections for copper lines and do not take cable length or site conditions into account.
- Cable type, cable cross-section and laying must be determined by an authorised electrician.
- Low-voltage cables must be laid separately from mains cables; alternatively, screened cables must be used.
- The inlet fuse on the power supply line must be an isolation type!
- The cable glands are only suitable for rounded cable and lines. The permissible clamping areas can be found in the electrical switching plan.
- A separate cable inlet must be used for each cable!
- Unused cable inlets must be hermetically sealed!
- All cable entries must be strain-relieved!
- Potential equalisation must be put in place between the unit and the air duct system!
- All safety measures must be tested following electrical connection! (Earth resistance, etc.)

8.3.1 Control lines

All lines for sensors, actuators, pumps, etc. must be connected in accordance with the wiring plan.
Lines must be dimensioned by an electrician. Low-voltage cables must be laid separately from mains cables; alternatively, screened cables must be used. Refer to the electrical switching plan for the max. permissible load from potential-free outputs.

8.3.2 Circulating pumps

Pumps connected to the control system must be intrinsically safe and stallproof. Electrical connection with U = 230 VAC and Imax = 2A.

8.3.3 Internal control fuse: 2 x glass tube fuses, 2.5 A ø 5 x 20 mm, slow-blow.

Only original fuses with the prescribed amperage and dimensions may be used.

8.3.4 Mains connection

The ventilation unit is not supplied ready to plug in. The mains connection is provided by the customer and – depending on unit size and sub-assemblies – must comply with the rated voltage specified on the nameplate. Before working on the electrical power unit, the equipment must be isolated from mains and protected against renewed switch-on.

The power connection must be connected in accordance with the specifications in the electrical diagram. The cross-section of the power supply line must be determined by authorised specialist personnel based on the nominal output of the equipment, the supply line fuse, the length of the cable from the distributor to the unit and the installation type, taking into account the regulatory requirements. An appropriate inlet fuse with an isolation function must be provided in accordance with the provisions of the electrical switching plan.

Only AC/DC sensitive earth leakage circuit breakers (type B) are permitted. As with frequency converters, earth leakage circuit breakers will not protect persons when the unit operates. To ensure as high as possible operating safety, we recommend earth leakage circuit breakers with a 300 mA trigger level.

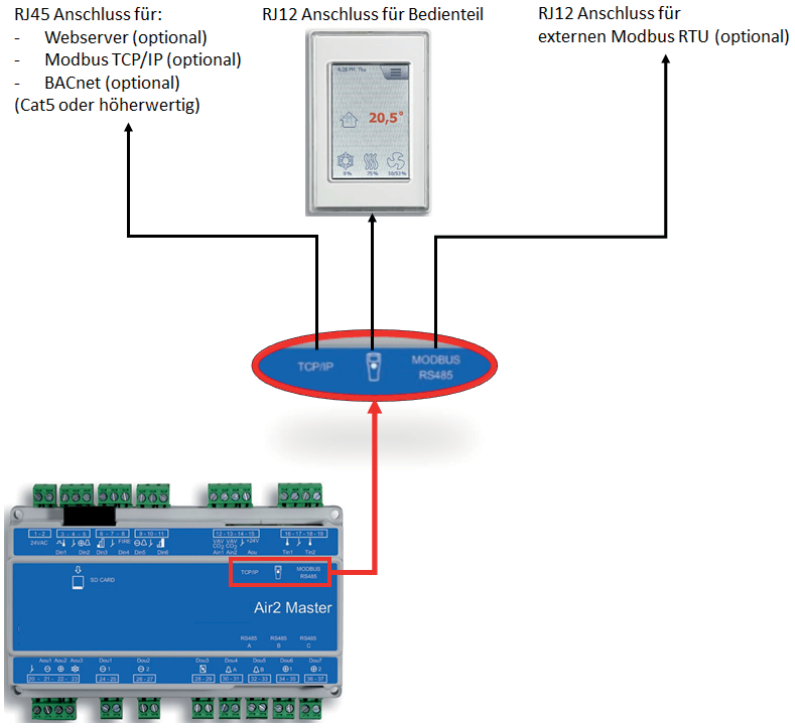
8.3.5 Connecting the operating unit

The operating unit is connected to the ventilation unit control system by means of the supplied Modbus cable. To this end, the control unit has a corresponding RJ-12 jack directly at the “PI-Air2 Master” (see graphic) in order to connect the operating unit. On the control unit itself, the Modbus cable is plugged into the rear of the unit, in the RJ12 port. Alternatively, the screw glands on the control unit can also be used to connect a Modbus cable. Please refer to the appropriate connection images and diagrams in sections 5.2.7 - 5.2.9.

An adequately long RJ-12 Modbus cable (max. 50 m.) must be supplied for separate installation of the operating unit. We recommend using an LIYY 6x0,14 mm² electric cable or a flat ribbon cable AWG28/6C (e.g.: MFK6SW, MPFK6S). The required RJ-12 plugs are supplied together with the ventilation unit. Suitable crimping pliers are required to crimp on the plugs! When installing the control unit separately, a standard telephone cable or appropriately designed Modbus cable up to a max. length of 50 m can be used.

8.3.6 Connection to Web server (Optional!)

The control component of the ventilation unit contains an "-X4" RJ45 jack (see switching plan) which is used to communicate with a TCP/IP network.



9 Commissioning

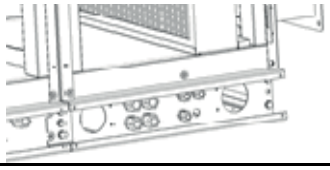
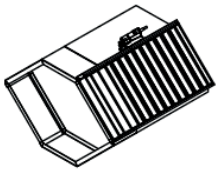
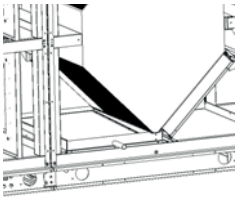
IMPORTANT! Note the following before commissioning the equipment:

1. All connections must comply with the local EVU [electricity board] provisions.
2. Check that all connecting and contact screws and unused connections are intact (these may loosen during transport).
3. Compare the mains voltage with the plant's connection voltage. The nominal connection voltage is 400 V/50 Hz (three phase) or 230 V/50 Hz (single phase).

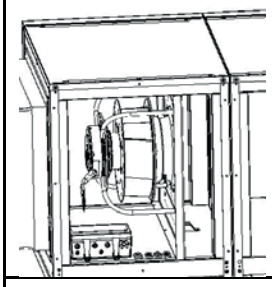
The ventilation system must be completed with all electrical, hydraulic and air duct connections in place before commissioning the unit. Commissioning or system settings can only be performed once all work on the plant is complete.

The factory settings on the control unit may only be changed by the specialised installer. An incorrect setting can result in the unit malfunctioning.

9.1 Basic procedure for commissioning by a specialist:

9.1.1 Checking prior to commissioning	✓ Are all air ducts and subassemblies fully installed? ✓ Are all system components fitted and electrically connected? ✓ Is the electric wiring complete and the control unit fitted? ✓ Is the condensate connection in place and functional? ✓ Are the air vents, inlet and outlet valves (grating) properly installed and open? ✓ Are the air filters in the ventilation unit correctly installed and clean? ✓ Are the air filters in the geothermal heat exchanger correctly installed and clean? ✓ Are any installed fire shutters in open position?
9.1.2 Setting the system parameters	✓ Check the system components and correct the setting if applicable. ✓ Set the system parameters, for example adjust the air volume flow/fan speed. ✓ Set the system time. ✓ Program the time of day program in accordance with requirements.
9.1.3 Cable feed-throughs 	✓ To connect the mains cable, optional system components or external sensors, feed the cable through the PG feed-throughs at the back of the controller housing into the ventilation unit.
9.1.4 Counter-current plate heat exchanger 	✓ If there is a servo motor for the bypass flap, check to see whether it turns in the right direction.
9.1.5 Condensate tray 	✓ The siphon provided with delivery must be fitted properly. An adequate gradient (at least 5%) is required to reliably drain the water. ✓ During commissioning, check proper drainage of the water and tightness of all connections.

9.1.6 Fans



✓ The fans must run smoothly without any grinding noises.

9.1.7 Housing front/door

✓ The housing front/door must be firmly closed after commissioning and secured against unauthorised opening, using the supplied key.

9.2 Connecting air ducts and components

- When connecting the air ducts, ensure that they are airtight and are suitably vibration dampened.
- The air ducts and add-on parts such as sound absorbers etc. may only be attached to the ventilation unit using adequately dimensioned fastening elements to suitable, solid wall or ceiling structural elements.
- When making connections, ensure in particular that no tools or assembly material will fall into the connections to the unit or onto the unit itself. This may damage components such as fan blades.
- Project specifications require that air duct and installation components be suitably and adequately insulated.

- Remove all tools and assembly materials from the unit when work is complete. Ensure that no tools or assembly materials remain in the unit, since these may damage or destroy the unit when starting up.
- Ensure that the housing seals well and reliably against the closing front door, to guarantee airtight and condensate- tight sealing.

10 Decommissioning / servicing / cleaning

- When performing any cleaning or servicing work on the ventilation unit, always fully isolate the ventilation unit from mains! Rotating components may otherwise pose a hazard in case of accidental switch-on.
- All fans or rotating parts must be stationary before opening the door. The underpressure in the unit may draw in loose parts, possibly damaging the fan or posing a threat to life and limb.
- Other existing plant components and system subassemblies such as geothermal heat exchanger, pre- and re-heater battery, acoustic dampening etc. must be serviced and cleaned according to the regulations and instructions.
- If possible, use a vacuum cleaner to remove dirt and dust. Applying force or using compressed air for cleaning may damage components and surfaces.
- Never use aggressive or solvent-containing cleaning agents.
- The electrical components must not be exposed to moisture or wet conditions.
- The **Safety notes in Section 2.2**, especially **Section 2.2.3 – Electrical connections** must be heeded when performing any electrical work.

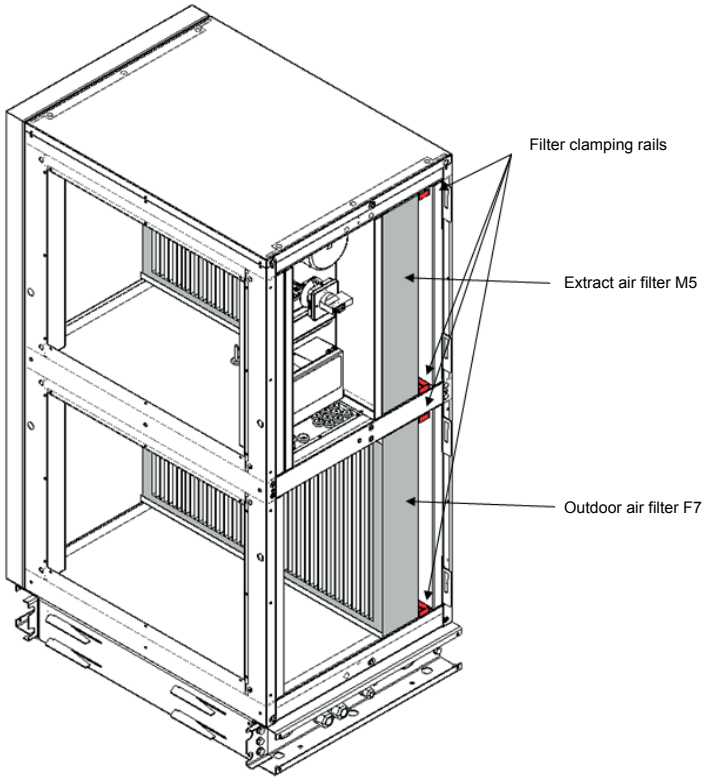
10.1 Customer service

Please contact the installer of your ventilation and air conditioning system or contact us directly for any questions pertaining to the supplied **Series LG 750 – LG 6000 ventilation unit**.

10.2 Service instructions for the specialist company

Only specialists are allowed to carry out the work specified below on the ventilation unit. Any defects detected during servicing must be remedied immediately to ensure safe plant operation.
Only original spare parts may be used for repairs and replacements.

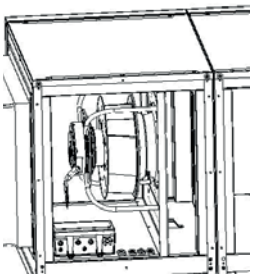
10.2.1 Outdoor and extract air compact filters



✓ Outside air/supply air filter: Cartridge filter quality class F7
✓ Extract air filter cartridge filter quality class M5

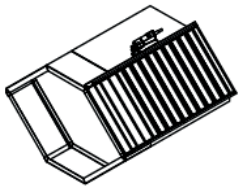
- ✓ The condition of the air filters must be checked regularly. Very dirty filters must be replaced immediately; depending on outdoor air pollution, filtersgenerally need replacing bi-annually.
- ✓ Only original replacement filters of the specified quality class may be used.
- ✓ Never operate the ventilation unit without air filters for the outdoor and extract air!
- ✓ If ventilation units are shut down for extended periods, air filters should be replaced for hygienic reasons prior to starting up again!
- ✓ Before removing the air filters from the unit, release the filter stentering frames by pulling forward. Only then may the air filters be gently lifted out and replaced.
- ✓ When inserting the new filters, ensure they seal well and that clamping between air filter and filter stentering frame is adequate, in order to avoid high filter bypass leakage.
- ✓ When replacing the air filters, avoid soiling the unit and its components. Dirty air filters must be immediately and suitably disposed of. It is advisable to package the air filters in an airtight container immediately after removal to avoid contamination of the ventilation system and the unit.
- ✓ Observe air direction indicated on the air filter!

10.2.2 Fans



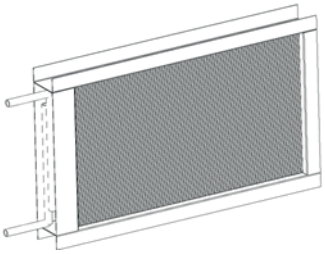
- ✓ Use a soft brush to clean the fan blades and the fan housing. Use a vacuum cleaner to remove the dust under the fan.
- ✓ Avoid damaging the fan blades. Do not remove or damage existing balancing weights, since this may unbalance the fan, increasing noise and vibrations.
- ✓ A fan with this kind of damage must be replaced with a new, original fan.

10.2.3 Counter flow plate heat exchanger with bypass plate



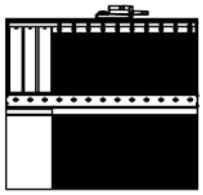
- ✓ Annual cleaning is recommended at the least, depending on the degree of soiling of the heat exchanger.
- ✓ Rinse the heat exchanger with warm water and conventional cleaning agents (soap suds).
- ✓ Never clean the heat exchanger with compressed air, steam jets or high pressure cleaners. It may be ruined!

10.2.4 Pre- and re-heating battery

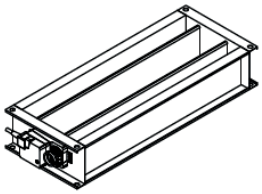


- ✓ Annual cleaning is recommended at the least, depending on the degree of soiling of the unit.
- ✓ The battery blades may not be damaged during cleaning.
- ✓ Use a vacuum cleaner or a soft brush to remove dust.
- ✓ An irreparable defect in the pre- or re-heating battery shall require replacement with an original heating battery.

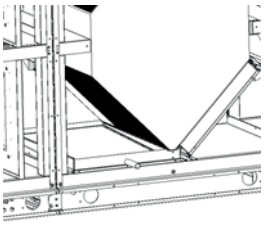
10.2.5 Bypass plate, exhaust air plate, outdoor air plates



- ✓ Check the plates for free movement.
- ✓ Use a soft brush and soap suds to clean the plates.
- ✓ Do not oil the plates, since the plastics used may be destroyed, impairing their functionality.

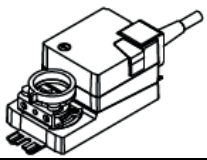


10.2.6 Condensate tray



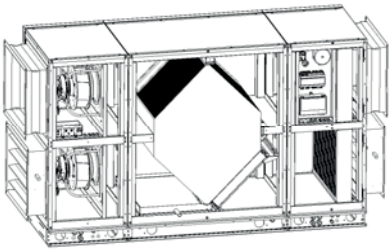
- ✓ Regularly check the condensate tray for soiling.
- ✓ Depending on the degree of soiling and the temperatures, it is recommended to clean the condensate drainage, drainage line and siphon at least once a year.
- ✓ The siphon must be filled with water before switching the plant on again.

10.2.7 Servo motors



- ✓ Check the connection between the servo motor and the flap drive regularly to make sure it is firm.
- ✓ Otherwise the motors are maintenance-free.

10.2.8 Cleaning the inside of the unit



- ✓ Annual cleaning at least of the inside of the unit housing is recommended, depending on the degree of dirt.
- ✓ Handle the housing surfaces with care during cleaning.
- ✓ Use a vacuum cleaner to remove dust.
- ✓ Electrical components may not be exposed to moisture or wet conditions. Be particularly careful not to damage the electrical wiring.

11 Service table

		Task	Action	Monthly	3 months	6 months	12 months	24 months	Hygiene, inspection
1		**Outdoor and exhaust air outlets**							
	1.1	Check for dirt, damage and corrosion	Clean and repair				x		
2		**Room control/Unit housing**							
	2.1	Check for dirt, damage and corrosion of the air ducts	Clean and repair				x		
	2.2	Check for water accumulation	Clean, determine cause			x			
3		**Air filter**							
	3.1	Check for dirt and damage (leakages)	Replace the affected air filters		x				
	3.2	Check filters and replace after servicing message	Check and replace air filters	As required					
4		**Heat exchanger**							
	4.1	Check for dirt, damage and corrosion	Clean and repair		x				
	4.2	Check sealing between exhaust air and outdoor air	Repair		x				
	4.3	Check wet cooler, condensate tray and moisture eliminator for dirt, corrosion and functionality	Repair		x				
	4.4	Check siphon functionality	Repair		x				
	4.5	Clean wet cooler, moisture eliminator and condensate tray				x			
	4.6	Check hygiene condition							x
5		**Fan**							
	5.1	Check for dirt, damage and corrosion	Clean and repair			x			
	5.2	Clean the parts of the fan in contact with air and clean water drainage, to ensure functionality					x		
6		**Air ducts and sound dampening**							
	6.1	Check accessible air duct sections for damage	Repair				x		
	6.2	Perform two to three spot checks for dirt and corrosion at representative interior air duct positions	Determine cause, clean relevant air duct sections				x		
	6.3	Check sound dampeners for dirt, damage and corrosion	Clean and repair				x		
	6.4	Spot check the hygienic condition in the air duct at a representative position	Determine cause, clean relevant air duct sections						x
7		**Air apertures**							
	7.1	Spot check installed perforated plates, wire mesh or sieves for dirt					x		
	7.2	Replace woven filter medium for:							
		Filter class < F9					x		
		Filter class > F9						x	
	7.3	Check air apertures with room air flow and extract air inlets for solids residues	Clean	As required					
	7.4	Cleaning of components in contact with secondary air flow	Clean				x		
8		**Terminal devices**							
	8.1	Check terminal devices with outdoor air filter for dirt	Replace air filter, clean unit		x				
	8.2	Check terminal devices with circulating air filter for dirt	Replace air filter, clean unit				x		
	8.3	Check heat exchanger in terminal devices without air filter for dirt	Clean (vacuum cleaner)			x			
	8.4	Cleaning of components exposed to flow of secondary air (without air filter)	Clean				x		
	8.5	Replace air filters						x	

Complete this table (for documentation) when plant servicing is complete:

Plant installed by			**Date**
No.	**Servicing** (e.g. replacing filters)	**Executed by Signature**	**Date**
1			
2			
3			
4			
5			
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26			

12 Spare parts and accessories – see unit card

Only original spare parts may be installed or used for replacements and repairs. Reliable operation is ensured only if original spare parts are used!

Unit card:
Refer to the unit card for details on your ventilation unit!

13 Overview of PI-Air-2 functions

Function	Description	Standard	Optional	Accessories necessary
Filter monitoring	Filter timer monitors filter runtime		●	
	Pressure switch for monitoring static pressure loss		●	●
	Continuous pressure sensors for monitoring static pressure loss	●		●
	Continuous pressure sensors for monitoring dynamic pressure loss		●	●
Temperature control	Regulation of constant supply air temperature		●	
	Regulation of constant extract air temperature	●		
	Regulation of constant room air temperature		●	● (room air temperature sensor)
	Regulation of constant supply air/extract air temperature differential		●	
	Temperature compensation guided by outside air temperature setpoint value		●	
Summer/winter changeover	Changes temperature control type for winter and summer modes.		●	
Night time cooling	If the temperature conditions are approved during the summer, the cooler outside air is used to cool down rooms at night. This can be controlled over a period of time or within a temperature window.		●	
Active cooling	Cooling performance can be managed continuously by installing a cooler battery.		●	● (PWW cooler)
	DX cooling battery – digital or continuous refrigerating machine power control		●	● (DX cooler)
Active heating/cooling	By using a combination battery, the user can control heating and cooling via a continuous 0-10 V and a 230 V pump outlet.		●	● (Combi battery)
	Requirement for heating or cooling demand		●	● (Signal relay)
Approve cooling	Digital input when using a combi battery. Facility for external control of whether coolant is provided in the event of demand for cooling		●	
Approve heating	Digital input when using a combi battery. Facility for external control of whether heating medium is provided in the event of demand for heating		●	
Preheating	Control signal for an electrical pre-heater battery or digital switch output		●	● (electric heater)
	Control signal for a PWW/glycol/brine pre-heater battery 0 – 10 V mixer valve and 230 V pump control		●	● (PWW heater)
	Heat requirement in the event of heating demand		●	● (Signal relay)
Reheating	Control signal for an electrical re-heater battery or digital switch output		●	● (electric heater)
	Control signal for a PWW reheater battery 0-10 V mixer valve and 230 V pump control		●	● (PWW heater)
	Heat requirement in the event of heating demand		●	● (Signal relay)
Temperature sensor	Outside air temperature sensor	●		
	Supply air temperature sensor	●		
	Exhaust air temperature sensor	●		
	Room temperature sensor		●	● (room air temperature sensor)
	Extract air temperature sensor	●		
Heat recovery bypass per- formance control	Continuous bypass control for optimal energy recovery	●		
Bypass frost protection	Protection of the heat exchanger by opening the bypass duct.	●		
Fan protection	In the event of a fault in the fans, an alarm is triggered and the unit is shut down.	●		
Fire alarm system	Alarm signal from central fire alarm system can be connected (digital input).An active alarm stops the unit.		●	
Smoke alarm	An active smoke alarm (digital input) triggers a smoke detector alarm in the unit and a defined, adjustable fan speed.		●	
Web operation	Integration into a LAN network. Unit operation and remove control via integrated web server		●	

Function	Description	Standard	Optional	Accessories necessary
Communication	Connection to a building´s automation system via Modbus RTU interface		●	
	Connection to a building´s automation system via Modbus TCP/IP interface		●	
	Connection to a building´s automation system via BACnet interface		●	
	Connection to a building´s automation system via LON interface		●	● (LON module)
Shut-off valve	Outside air valve closes automatically when the unit stops.		●	● (valve with actuator)
	Exhaust air valve closes automatically when the unit stops.		●	● (valve with actuator)
Cold recovery	When extract air is cool and outside air is too warm, the warm outside air is used to cool down the outside air.	●		
Weekly programme	Time-controlled ventilation regulation. Up to 4 start and stop times may be defined per 24 hour period.	●		
Shock ventilation (party function)	By activating a digital input, the unit is operated at a high ventilation level. The unit can run for a definable period of time after the contact is opened.		●	
External start/stop	The unit is started or stopped by activating a digital input.		●	
A alarm	Fault message resulting in unit shutdown. (potential-free output)	●		
B alarm	Warning message requiring maintenance e. g. filter change (potential-free output)		●	
Ventilation control	Constant ducting pressure control		●	● (pressure sensors)
	Constant air volume control	●		
	Constant supply air duct pressure control		●	● (pressure sensors)
	Constant extract air duct pressure control		●	● (pressure sensors)
	VOC/CO_2 bedarfsgeführte Regelung		●	● (CO_2/VOC sensor)
	0-10 V demand-controlled supply air and extract air separated		●	● (e. g. Belimo Fan-optimiser)
	GreenZone/PI Optimizer – demand optimised control		●	● (Pi-optimiser/zone module)
	Constant fan speed		●	
Dehumidification	Dehumidification of extract room air (only possible in combination with cooling and heater batteries)		●	● humidity sensor, cooling/heater battery)
Humifidication	0-10 V signal and switch output to control an external humidification unit for supply air		●	● (External humidifier, humidity sensor)
Control unit	Pichler 3,5‘‘ colour touch screen control unit	●		
Language package	The following languages are currently available: German, English, Italian, French, Danish, Finnish, Swedish, Norwegian, Spanish, Polish, Russian, Dutch	●		
Heater battery protection	An alarm is triggered in the event of a heater battery fault.	●		
Combi battery protection	An alarm is triggered in the event of a combi battery fault.		●	
Summer operation	Signalling of summer operation		●	
Operating message	Signalling of system operation status		●	

14 Changes reserved

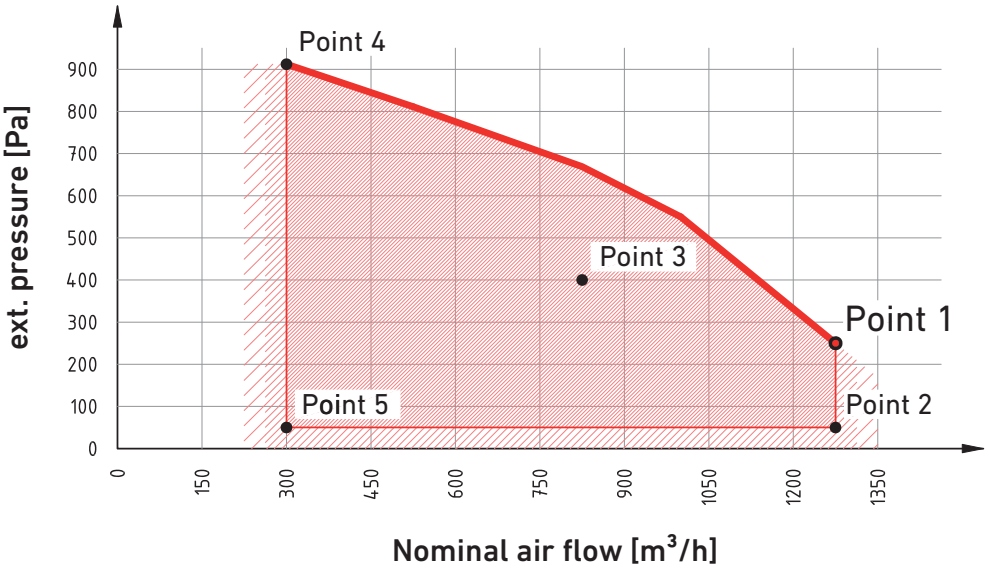
It is our constant endeavour to technically improve and optimise our products and we reserve the right to change the design of the units or the technical specifications without prior notice.

15 Product fiches

15.1 Product fiche LG 750

Model ID	PICHLER System Ventech LG 750
Type	Two-way ventilation plant for non-residential use
Drive type	Speed control
Type of heat recovery *	Other heat recovery system counterfl w heat exchanger

Area of application



The apparatus complies with the Eco-design Directive inside the cross-hatched area.
The diagram applies to the reference configuration (fans, filters, heat exchangers) without assemblies not for ventilation (e.g. heating coils, louvre flaps, etc.). Additional loss of pressure must be taken into account when installing assemblies not for ventilation.

Point 1			
Internal specific fan power	SVL_{int}	1045	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	75,30%	[-]
Enclosure sound power level	L_{WA}	68	[dB(A)]
Nominal airfl w	q_{nom}	0,347	[m³/s]
		1250	[m³/h]
actual electrical input power	$P_{el,ges}$	0,74	[kW]
Airf ow speed	v_{nom}	1,41	[m/s]
Nominal outside pressure ZUL	$°p_{s,ext\ ZUL}$	250	[Pa]
Nominal outside pressure ABL	$°p_{s,ext\ ABL}$	250	[Pa]
Internal pressure drop across ventilation components, ZUL	$°p_{s,int\ ZUL}$	303	[Pa]
Internal pressure drop across ventilation components, ABL	$°p_{s,int\ ABL}$	260	[Pa]
Internal pressure drop across non-ventilation components, ZUL	$°p_{s,add\ ZUL}$	0	[Pa]
Internal pressure drop across non-ventilation components, ABL	$°p_{s,add\ ABL}$	0	[Pa]
Fan e¸ciency, ZUL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ZUL}$	53,67	[%]
Fan e¸ciency, ABL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ABL}$	54,20	[%]
External air leakage (at ±400 Pa)		< 1	[%]
Internal air leakage (at 250 Pa)		< 1	[%]
Energy class, ZUL-filter (F7) **		731,1	[kWh]
Energy class, ABL-filter (G4) **		603,3	[kWh]

ZUL = supply air
ABL = extract air

Point 2			
Internal specific fan power	SVL_{int}	1022	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	75,30%	[-]
Enclosure sound power level	L_{WA}	63	[dB(A)]
Nominal airfl w	q_{nom}	0,347	[m³/s]
		1250	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]
Point 3			
Internal specific fan power	SVL_{int}	514	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	77,00%	[-]
Enclosure sound power level	L_{WA}	71	[dB(A)]
Nominal airfl w	q_{nom}	0,215	[m³/s]
		775	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	400	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	400	[Pa]
Point 4			
Internal specific fan power	SVL_{int}	219	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,90%	[-]
Enclosure sound power level	L_{WA}	78	[dB(A)]
Nominal airfl w	q_{nom}	0,083	[m³/s]
		300	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	912	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	912	[Pa]
Point 5			
Internal specific fan power	SVL_{int}	192	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,90%	[-]
Enclosure sound power level	L_{WA}	44	[dB(A)]
Nominal airfl w	q_{nom}	0,083	[m³/s]
		300	[m³/h]
Nominal outside pressure ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal outside pressure ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]

The ventilation unit complies with Eco-design Directive (EU Regulation 1253/2014) as required for 2018.

Visual filter warning

The ventilation unit has a visual warning to replace the filter. An error message will be displayed on the control panel when the set pressure di˝erence is exceeded.

WARNING: The plant will not work efficiently unless the filter is replaced regularly, causing power consumption to increase.

Disposal

Equipment that is no longer functional must be uninstalled by a specialist firm and properly disposed of at a suitable facility. The Electrical and Electronic Equipment Act (EAG-VO), implementing Community law Directives 202/95/EC (RoHS) and 2002/96/EC (WEEE Directive) applies.

* Types of heat recovery:	none
	Fluid circulation heat exchanger
	other heat recovery system

** The energy class is calculated based on the annual operating hours (8760 h) and average pressure loss (see table below for fin l pressure loss pursuant to ÖNORM EN 13053).

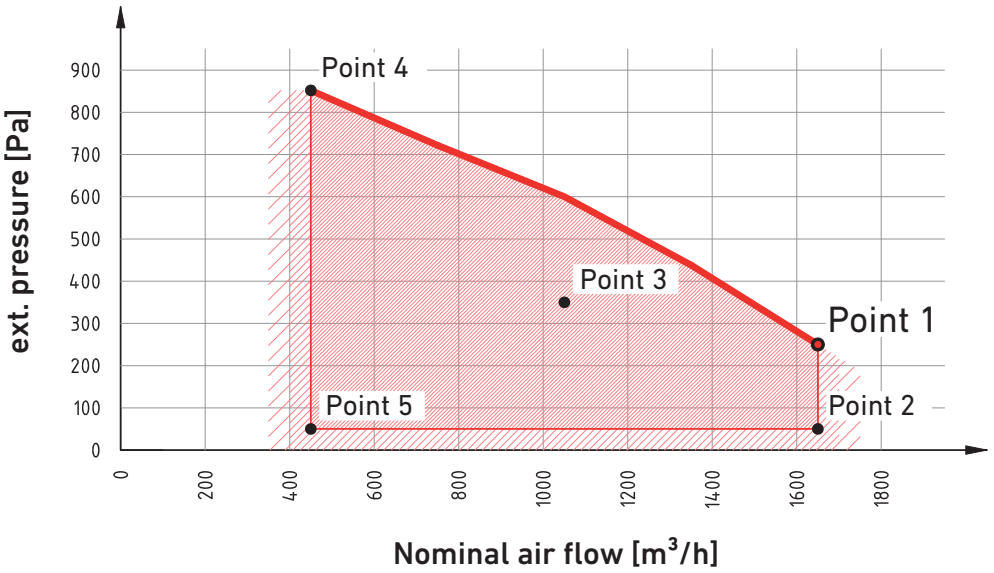
	Filter class	Final pressure di˝erence
Max. pressure drop across filter pursuant to ÖNORM EN 13053:	G1-G4	150 Pa
	M5-F7	200 Pa
	F8 - F9	300 Pa

Information based on the current state of knowledge of EU Regulation 1253/2014

15.2 Product fiche LG 1000

Model ID	PICHLER System Ventech LG 1000
Type	Two-way ventilation plant for non-residential use
Drive type	Speed control
Type of heat recovery *	Other heat recovery system counterfl w heat exchanger

Area of application



The apparatus complies with the Eco-design Directive inside the cross-hatched area.
The diagram applies to the reference configuration (fans, filters, heat exchangers) without assemblies not for ventilation (e.g. heating coils, louvre flaps, etc.). Additional loss of pressure must be taken into account when installing assemblies not for ventilation.

Point 1			
Internal specific fan power	SVL_{int}	1097	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	77,15%	[-]
Enclosure sound power level	L_{WA}	65	[dB(A)]
Nominal airfl w	q_{nom}	0,458	[m³/s]
		1650	[m³/h]
actual electrical input power	$P_{el,ges}$	0,99	[kW]
Airf ow speed	v_{nom}	1,49	[m/s]
Nominal outside pressure ZUL	$°p_{s,ext\ ZUL}$	250	[Pa]
Nominal outside pressure ABL	$°p_{s,ext\ ABL}$	250	[Pa]
Internal pressure drop across ventilation components, ZUL	$°p_{s,int\ ZUL}$	334	[Pa]
Internal pressure drop across ventilation components, ABL	$°p_{s,int\ ABL}$	290	[Pa]
Internal pressure drop across non-ventilation components, ZUL	$°p_{s,add\ ZUL}$	0	[Pa]
Internal pressure drop across non-ventilation components, ABL	$°p_{s,add\ ABL}$	0	[Pa]
Fan e¸ciency, ZUL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ZUL}$	56,47	[%]
Fan e¸ciency, ABL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ABL}$	57,40	[%]
External air leakage (at ±400 Pa)		< 1	[%]
Internal air leakage (at 250 Pa)		< 1	[%]
Energy class, ZUL-filter (F7) **		927,9	[kWh]
Energy class, ABL-filter (G4) **		758,9	[kWh]

ZUL = supply air
ABL = extract air

Point 2			
Internal specific fan power	SVL_{int}	1107	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	77,15%	[-]
Enclosure sound power level	L_{WA}	61	[dB(A)]
Nominal airfl w	q_{nom}	0,458	[m³/s]
		1650	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]
Point 3			
Internal specific fan power	SVL_{int}	479	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	80,00%	[-]
Enclosure sound power level	L_{WA}	61	[dB(A)]
Nominal airfl w	q_{nom}	0,292	[m³/s]
		1050	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	350	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	350	[Pa]
Point 4			
Internal specific fan power	SVL_{int}	212	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	85,25%	[-]
Enclosure sound power level	L_{WA}	73	[dB(A)]
Nominal airfl w	q_{nom}	0,125	[m³/s]
		450	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	852	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	852	[Pa]
Point 5			
Internal specific fan power	SVL_{int}	178	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	85,25%	[-]
Enclosure sound power level	L_{WA}	40	[dB(A)]
Nominal airfl w	q_{nom}	0,125	[m³/s]
		450	[m³/h]
Nominal outside pressure ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal outside pressure ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]

The ventilation unit complies with Eco-design Directive (EU Regulation 1253/2014) as required for 2018.

Visual filter warning

The ventilation unit has a visual warning to replace the filter. An error message will be displayed on the control panel when the set pressure di˝erence is exceeded.

WARNING: The plant will not work efficiently unless the filter is replaced regularly, causing power consumption to increase.

Disposal

Equipment that is no longer functional must be uninstalled by a specialist firm and properly disposed of at a suitable facility. The Electrical and Electronic Equipment Act (EAG-VO), implementing Community law Directives 202/95/EC (RoHS) and 2002/96/EC (WEEE Directive) applies.

* Types of heat recovery:	none
	Fluid circulation heat exchanger
	other heat recovery system

** The energy class is calculated based on the annual operating hours (8760 h) and average pressure loss (see table below for fin l pressure loss pursuant to ÖNORM EN 13053).

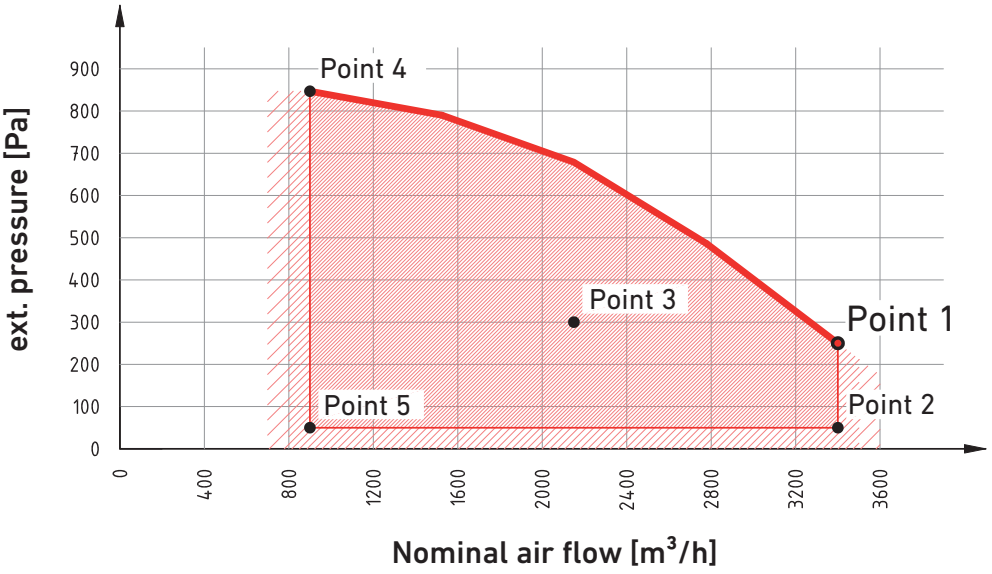
	Filter class	Final pressure di˝erence
Max. pressure drop across filter pursuant to ÖNORM EN 13053:	G1-G4	150 Pa
	M5-F7	200 Pa
	F8 - F9	300 Pa

Information based on the current state of knowledge of EU Regulation 1253/2014

15.3 Product fiche LG 2500

Model ID	PICHLER System Ventech LG 2500
Type	Two-way ventilation plant for non-residential use
Drive type	Speed control
Type of heat recovery *	Other heat recovery system counterfl w heat exchanger

Area of application



The apparatus complies with the Eco-design Directive inside the cross-hatched area.
The diagram applies to the reference configuration (fans, filters, heat exchangers) without assemblies not for ventilation (e.g. heating coils, louvre flaps, etc.). Additional loss of pressure must be taken into account when installing assemblies not for ventilation.

Point 1			
Internal specific fan power	SVL_{int}	1150	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,10%	[-]
Enclosure sound power level	L_{WA}	66	[dB(A)]
Nominal airfl w	q_{nom}	0,944	[m³/s]
		3400	[m³/h]
actual electrical input power	$P_{el,ges}$	2,03	[kW]
Airf ow speed	v_{nom}	1,56	[m/s]
Nominal outside pressure ZUL	$°p_{s,ext\ ZUL}$	250	[Pa]
Nominal outside pressure ABL	$°p_{s,ext\ ABL}$	250	[Pa]
Internal pressure drop across ventilation components, ZUL	$°p_{s,int\ ZUL}$	381	[Pa]
Internal pressure drop across ventilation components, ABL	$°p_{s,int\ ABL}$	335	[Pa]
Internal pressure drop across non-ventilation components, ZUL	$°p_{s,add\ ZUL}$	0	[Pa]
Internal pressure drop across non-ventilation components, ABL	$°p_{s,add\ ABL}$	0	[Pa]
Fan e¸ciency, ZUL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ZUL}$	62,53	[%]
Fan e¸ciency, ABL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ABL}$	62,05	[%]
External air leakage (at ±400 Pa)		< 1	[%]
Internal air leakage (at 250 Pa)		< 1	[%]
Energy class, ZUL-filter (F7) **		1746,5	[kWh]
Energy class, ABL-filter (G4) **		1453,3	[kWh]

ZUL = supply air
ABL = extract air

Point 2			
Internal specific fan power	SVL_{int}	1197	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,10%	[-]
Enclosure sound power level	L_{WA}	64	[dB(A)]
Nominal airfl w	q_{nom}	0,944	[m³/s]
		3400	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]
Point 3			
Internal specific fan power	SVL_{int}	470	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	83,65%	[-]
Enclosure sound power level	L_{WA}	60	[dB(A)]
Nominal airfl w	q_{nom}	0,597	[m³/s]
		2150	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	300	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	300	[Pa]
Point 4			
Internal specific fan power	SVL_{int}	180	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	87,55%	[-]
Enclosure sound power level	L_{WA}	70	[dB(A)]
Nominal airfl w	q_{nom}	0,250	[m³/s]
		900	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	847	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	847	[Pa]
Point 5			
Internal specific fan power	SVL_{int}	179	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	87,55%	[-]
Enclosure sound power level	L_{WA}	41	[dB(A)]
Nominal airfl w	q_{nom}	0,250	[m³/s]
		900	[m³/h]
Nominal outside pressure ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal outside pressure ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]

The ventilation unit complies with Eco-design Directive (EU Regulation 1253/2014) as required for 2018.

Visual filter warning

The ventilation unit has a visual warning to replace the filter. An error message will be displayed on the control panel when the set pressure di˝erence is exceeded.

WARNING: The plant will not work efficiently unless the filter is replaced regularly, causing power consumption to increase.

Disposal

Equipment that is no longer functional must be uninstalled by a specialist firm and properly disposed of at a suitable facility. The Electrical and Electronic Equipment Act (EAG-VO), implementing Community law Directives 202/95/EC (RoHS) and 2002/96/EC (WEEE Directive) applies.

* Types of heat recovery:	none
	Fluid circulation heat exchanger
	other heat recovery system

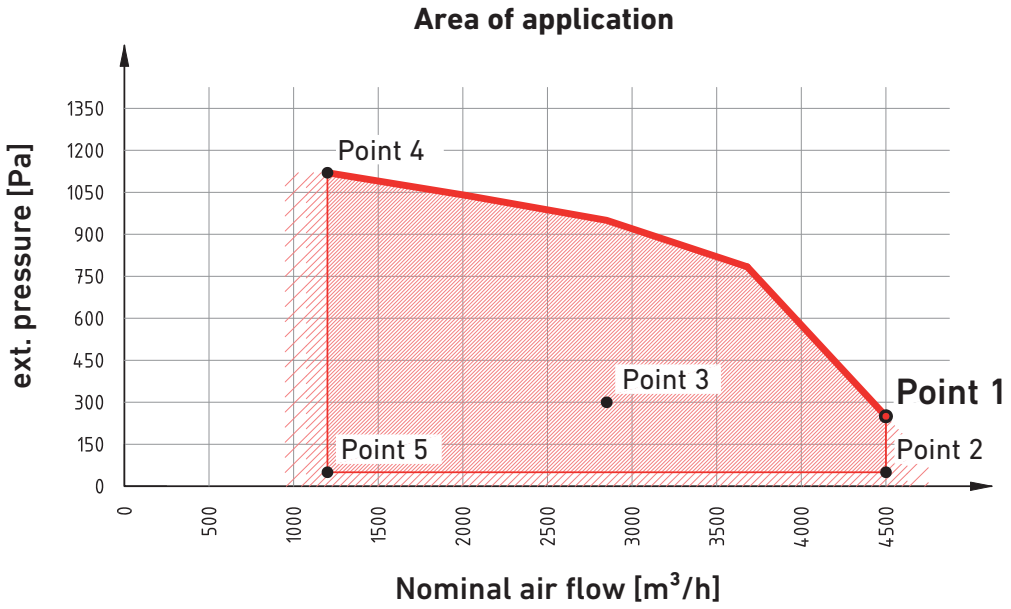
** The energy class is calculated based on the annual operating hours (8760 h) and average pressure loss (see table below for fin l pressure loss pursuant to ÖNORM EN 13053).

	Filter class	Final pressure di˜erence
Max. pressure drop across filter pursuant to ÖNORM EN 13053:	G1-G4	150 Pa
	M5-F7	200 Pa
	F8 - F9	300 Pa

Information based on the current state of knowledge of EU Regulation 1253/2014

15.4 Product fiche LG 4000

Model ID	PICHLER System Ventech LG 4000
Type	Two-way ventilation plant for non-residential use
Drive type	Speed control
Type of heat recovery *	Other heat recovery system counterfl w heat exchanger



The apparatus complies with the Eco-design Directive inside the cross-hatched area.
The diagram applies to the reference configuration (fans, filters, heat exchangers) without assemblies not for ventilation (e.g. heating coils, louvre flaps, etc.). Additional loss of pressure must be taken into account when installing assemblies not for ventilation.

Point 1			
Internal specific fan power	SVL_{int}	945	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	76,85%	[-]
Enclosure sound power level	L_{WA}	69	[dB(A)]
Nominal airfl w	q_{nom}	1,250	[m³/s]
		4500	[m³/h]
actual electrical input power	$P_{el,ges}$	2,4	[kW]
Airf ow speed	v_{nom}	1,43	[m/s]
Nominal outside pressure ZUL	$^{\circ}p_{s,ext\ ZUL}$	250	[Pa]
Nominal outside pressure ABL	$^{\circ}p_{s,ext\ ABL}$	250	[Pa]
Internal pressure drop across ventilation components, ZUL	$^{\circ}p_{s,int\ ZUL}$	326	[Pa]
Internal pressure drop across ventilation components, ABL	$^{\circ}p_{s,int\ ABL}$	283	[Pa]
Internal pressure drop across non-ventilation components, ZUL	$^{\circ}p_{s,add\ ZUL}$	0	[Pa]
Internal pressure drop across non-ventilation components, ABL	$^{\circ}p_{s,add\ ABL}$	0	[Pa]
Fan e˛ciency, ZUL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ZUL}$	64,85	[%]
Fan e˛ciency, ABL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ABL}$	64,07	[%]
External air leakage (at ±400 Pa)		< 1	[%]
Internal air leakage (at 250 Pa)		< 1	[%]
Energy class, ZUL-filter (F7) **		2178,2	[kWh]
Energy class, ABL-filter (G4) **		1837,2	[kWh]

ZUL = supply air
ABL = extract air

Point 2			
Internal specific fan power	SVL_{int}	1016	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	76,85%	[-]
Enclosure sound power level	L_{WA}	64	[dB(A)]
Nominal airfl w	q_{nom}	1,250	[m³/s]
		4500	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]
Point 3			
Internal specific fan power	SVL_{int}	386	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	78,75%	[-]
Enclosure sound power level	L_{WA}	63	[dB(A)]
Nominal airfl w	q_{nom}	0,792	[m³/s]
		2850	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	300	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	300	[Pa]
Point 4			
Internal specific fan power	SVL_{int}	159	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	83,40%	[-]
Enclosure sound power level	L_{WA}	77	[dB(A)]
Nominal airfl w	q_{nom}	0,333	[m³/s]
		1200	[m³/h]
Nominal external pressure, ZUL	$^{\circ}p_{s,ext\ ZUL}$	1120	[Pa]
Nominal external pressure, ABL	$^{\circ}p_{s,ext\ ABL}$	1120	[Pa]
Point 5			
Internal specific fan power	SVL_{int}	153	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	83,40%	[-]
Enclosure sound power level	L_{WA}	44	[dB(A)]
Nominal airfl w	q_{nom}	0,333	[m³/s]
		1200	[m³/h]
Nominal outside pressure ZUL	$^{\circ}p_{s,ext\ ZUL}$	50	[Pa]
Nominal outside pressure ABL	$^{\circ}p_{s,ext\ ABL}$	50	[Pa]

The ventilation unit complies with Eco-design Directive (EU Regulation 1253/2014) as required for 2018.

Visual filter warning

The ventilation unit has a visual warning to replace the filter. An error message will be displayed on the control panel when the set pressure di˝erence is exceeded.

WARNING: The plant will not work efficiently unless the filter is replaced regularly, causing power consumption to increase.

Disposal

Equipment that is no longer functional must be uninstalled by a specialist firm and properly disposed of at a suitable facility. The Electrical and Electronic Equipment Act (EAG-VO), implementing Community law Directives 202/95/EC (RoHS) and 2002/96/EC (WEEE Directive) applies.

* Types of heat recovery:	none
	Fluid circulation heat exchanger
	other heat recovery system

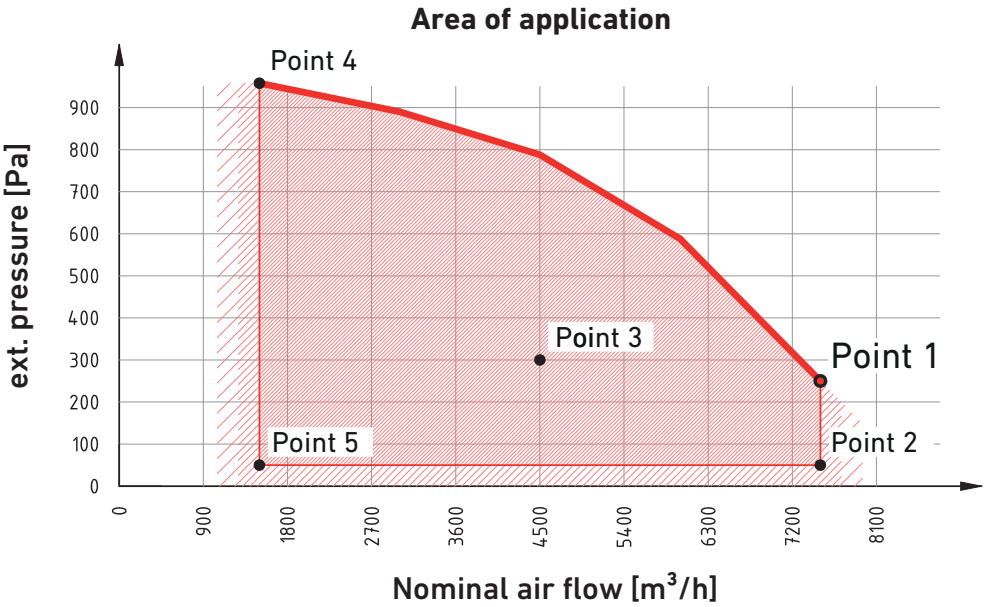
** The energy class is calculated based on the annual operating hours (8760 h) and average pressure loss (see table below for fin l pressure loss pursuant to ÖNORM EN 13053).

	Filter class	Final pressure di˝erence
Max. pressure drop across filter pursuant to ÖNORM EN 13053:	G1-G4	150 Pa
	M5-F7	200 Pa
	F8 - F9	300 Pa

Information based on the current state of knowledge of EU Regulation 1253/2014

15.5 Product fiche LG 6000

Model ID	PICHLER System Ventech LG 6000
Type	Two-way ventilation plant for non-residential use
Drive type	Speed control
Type of heat recovery *	Other heat recovery system counterfl w heat exchanger



The apparatus complies with the Eco-design Directive inside the cross-hatched area.
The diagram applies to the reference configuration (fans, filters, heat exchangers) without assemblies not for ventilation (e.g. heating coils, louvre flaps, etc.). Additional loss of pressure must be taken into account when installing assemblies not for ventilation.

Point 1			
Internal specific fan power	SVL_{int}	683	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,45%	[-]
Enclosure sound power level	L_{WA}	76	[dB(A)]
Nominal airfl w	q_{nom}	2,083	[m³/s]
		7500	[m³/h]
actual electrical input power	$P_{el,ges}$	3,61	[kW]
Airf ow speed	v_{nom}	1,20	[m/s]
Nominal outside pressure ZUL	$°p_{s,ext\ ZUL}$	250	[Pa]
Nominal outside pressure ABL	$°p_{s,ext\ ABL}$	250	[Pa]
Internal pressure drop across ventilation components, ZUL	$°p_{s,int\ ZUL}$	222	[Pa]
Internal pressure drop across ventilation components, ABL	$°p_{s,int\ ABL}$	187	[Pa]
Internal pressure drop across non-ventilation components, ZUL	$°p_{s,add\ ZUL}$	0	[Pa]
Internal pressure drop across non-ventilation components, ABL	$°p_{s,add\ ABL}$	16	[Pa]
Fan e˛ciency, ZUL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ZUL}$	62,5	[%]
Fan e˛ciency, ABL, at nominal external pressure loss and internal pressure loss across ventilation components	$\eta_{fan\ ABL}$	62	[%]
External air leakage (at ±400 Pa)		< 1	[%]
Internal air leakage (at 250 Pa)		< 1	[%]
Energy class, ZUL-filter (F7) **		3606,2	[kWh]
Energy class, ABL-filter (G4) **		3120,2	[kWh]

ZUL = supply air
ABL = extract air

Point 2			
Internal specific fan power	SVL_{int}	785	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	82,45%	[-]
Enclosure sound power level	L_{WA}	64	[dB(A)]
Nominal airfl w	q_{nom}	2,083	[m³/s]
		7500	[m³/h]
Nominal external pressure, ZUL	$°p_{s,ext\ ZUL}$	50	[Pa]
Nominal external pressure, ABL	$°p_{s,ext\ ABL}$	50	[Pa]
Point 3			
Internal specific fan power	SVL_{int}	380	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	84,35%	[-]
Enclosure sound power level	L_{WA}	65	[dB(A)]
Nominal airfl w	q_{nom}	1,250	[m³/s]
		4500	[m³/h]
Nominal external pressure, ZUL	$°p_{s,ext\ ZUL}$	300	[Pa]
Nominal external pressure, ABL	$°p_{s,ext\ ABL}$	300	[Pa]
Point 4			
Internal specific fan power	SVL_{int}	179	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	89,80%	[-]
Enclosure sound power level	L_{WA}	78	[dB(A)]
Nominal airfl w	q_{nom}	0,417	[m³/s]
		1500	[m³/h]
Nominal external pressure, ZUL	$°p_{s,ext\ ZUL}$	958	[Pa]
Nominal external pressure, ABL	$°p_{s,ext\ ABL}$	958	[Pa]
Point 5			
Internal specific fan power	SVL_{int}	134	[W/(m³/s)]
Thermal transmission	η_{t_nwla}	89,80%	[-]
Enclosure sound power level	L_{WA}	45	[dB(A)]
Nominal airfl w	q_{nom}	0,417	[m³/s]
		1500	[m³/h]
Nominal outside pressure ZUL	$°p_{s,ext\ ZUL}$	50	[Pa]
Nominal outside pressure ABL	$°p_{s,ext\ ABL}$	50	[Pa]

The ventilation unit complies with Eco-design Directive (EU Regulation 1253/2014) as required for 2018.

Visual filter warning

The ventilation unit has a visual warning to replace the filter. An error message will be displayed on the control panel when the set pressure di˝erence is exceeded.

WARNING: The plant will not work efficiently unless the filter is replaced regularly, causing power consumption to increase.

Disposal

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* Types of heat recovery:	none
	Fluid circulation heat exchanger
	other heat recovery system

** The energy class is calculated based on the annual operating hours (8760 h) and average pressure loss (see table below for fin l pressure loss pursuant to ÖNORM EN 13053).

	Filter class	Final pressure di˜erence
Max. pressure drop across filter pursuant to ÖNORM EN 13053:	G1-G4	150 Pa
	M5-F7	200 Pa
	F8 - F9	300 Pa

Information based on the current state of knowledge of EU Regulation 1253/2014

Notes

Notes

Notes

ErP 2018

ErP 2018
Fulfils the requirements of the Ecodesign Directive,
in accordance with EU Regulation 1253/2014.

klimaaktiv Partner
PASSIVHAUS Austria
Mitglied NETZWERK PASSIVHAUS www.passivhaus.at

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