OPERATING AND INSTALLATION INSTRUCTIONS LG 150

LG 150 A,
LG 150 AF

LG 150 A,
LG 150 AF

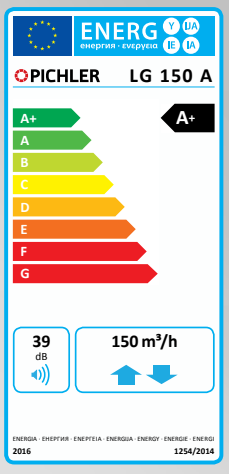
EN 13141-7:2011-01

LG 150 A,
LG 150 AF

ErP 2018

EU-regulation
1253/2014

EPREL



The specified energy efficiency is applicable when controlled to local requirements and is valid up to the specified maximum air flow volume.

COMFORT VENTILATION

Optional

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PICHLER

Systematic Ventilation.

GENERAL

USER

SPECIALIST PERSONNEL

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1. Introduction

Dear customer, thank you for choosing the LG 150 compact ventilation unit range.

The LG 150 range of compact ventilation units employs state-of-the-art technology. It is characterised by cost effectiveness, ease of use and reliability.

To operate your compact ventilation unit safely, properly and economically, please read this manual carefully and follow the instructions provided. Keep this operating manual in a safe place and readily available at all times.

Troubleshooting and procedures may be performed by an installation company (specialist company) only.

These units are subject to ongoing improvement and further development. Your unit may therefore vary slightly from the description in this manual.

Nameplate:
Should you have any queries or wish to order spare parts, please have the unit mode and serial number (see nameplate on unit) to hand.

Example of nameplate

Please contact: us if you have any further questions or if you lose your documentation.

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The LG 150 range of compact ventilation units has been safety-tested and inspected, along with all of the optional system components listed in this guide, by TÜV-AUSTRIA Services GmbH, a testing, inspection and certification authority based in Vienna, in accordance with product requirements, standards and guidelines.

The applicable inspection points, along with optional system accessories, have been certified as compliant in reports PS2015-002 and M/EMV-15/115 under the conditions of compliance with and adherence to all of the requirements described in this guide.

TÜV AUSTRIA
TYPEN GEPRÜFT
TÜV AUSTRIA SERVICES GMBH

2. Symbols used in this document

Please familiarise yourself with the following safety symbols. They highlight text containing warnings in respect of danger and potential hazards.

Attention/Note!

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

Attention: hazardous electrical voltage! Ignoring this warning may result in injury or threat to life and limb.

3. Designated use

INTENDED USE

The LG 150 range of compact ventilation units is suitable for installation in air-conditioning systems for controlled mechanical ventilation and deaeration of spaces and dwellings with purposes similar, for example, to seminar rooms and small offices at an adjustable air flow volume of up to 150 m^3/h (LG 150 A) or approx. 200 m^3/h for up to 160 m^2 (LG 150 B with high air capacity).

Installation of a mechanical, controlled domestic ventilation system provides supply air and exhaust air ventilation for the entire living area. Controlled air supply with purified and filtered outdoor air is provided in supply air areas. Odours and damp ambient extract air are conducted away in the extract air area.

The purpose of controlled mechanical ventilation and deaeration of domestic areas is to improve air quality, reduce heating energy demand through use of a highly efficient heat recovery system, and to influence indoor air humidity.

The unit's scope and designated use is limited to use in ventilation and air conditioning systems for the extraction of used air and the supply of fresh, temperature-controlled outdoor air at maximum conveyed media temperatures of -15°C to + 35°C. In addition, the air conveyed must be free of aggressive vapours and abrasive material. 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 also includes adherence to 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, when combined with an external heater battery, is also used to reheat 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.

The unit is not suitable for outdoor installation and may be installed in suitable and temperature-controlled interior areas only. The ventilation unit is not suitable for drying new buildings. The compact ventilation unit from the LG 150 range is not a ready-to-use product. It must not be put into operation until it has been properly installed and connected to the ventilation system. Only qualified and instructed personnel may work on and with the unit.

Personnel transporting, installing or working on the unit must have read and understood the operating instructions, in particular ***Section 4: "Safety"***. The end user must also be instructed on potential hazards.

STIPULATIONS FOR OPERATION WITH FIREPLACES

Local requirements in terms of standards, laws and directives, must be taken into account .

The central air conditioners with heat recovery should not be installed in comparably sized rooms, apartments or facilities with room air dependent heating apparatus unless:

- safety systems are in place to prevent simultaneous operation of room air dependent heating apparatus and units extracting air, or
- special safety systems will monitor waste gas extraction of a heating apparatus dependent on room air. Heating apparatus running on liquid or gaseous fuels and drawing in room air, or air conditioning systems, must switch off should a safety system trigger. The air conditioning system must switch off should the safety system trigger in case of solid fuel heating apparatus drawing in room air.

Central air conditioning equipment for controlled ventilation and extraction of air in an apartment or similar facility shall not be installed if the facility has room air dependent heating apparatus connected to waste gas units with multiple infeeds.

For normal operation of central air conditioning systems, it must be possible to close any ducts for combustion air or waste gas systems from heating apparatus dependent on room air. Shut-off systems for waste gas from solid fuel heating apparatus must be manual. The position of the operating lever must indicate the status of the shut-off device. This is deemed complied with if a shut-off system is used to block soot (soot shut-off).

Fire protection requirements
The regional regulatory provisions, especially the fire protection regulations for air conditioning of buildings, as amended, must be taken into consideration when installing the air conditioning system in accordance with the instructions for fire protection.

STIPULATIONS FOR OPERATION WITH EXTRACTOR HOODS

Due to heavy load and irregular operation, extract air from any kitchen extractor hoods that may be present must not be integrated into the dwelling's air-conditioning system.

Extract air from such extractor hoods must be conducted separately to the outdoors by means of an exhaust air pipe.

Exhaust air extractor hoods must be operated via separate air pipes with suitable air replenishment e.g. by means of window ventilation or in air recirculation mode. If an extractor hood is operated without separate introduction of supply air, air volume in the dwelling becomes unbalanced. Proper functioning of the domestic air-conditioning system cannot be guaranteed in such instances (odour carryover etc.)

Another option is to operate the extractor hood in recirculation mode.

LIABILITY

The LG 150 compact ventilation unit range has been developed and manufactured for controlled mechanical ventilation and de-aeration of spaces with purposes similar, for example, to seminar rooms and small offices.

For proper operation of the central air conditioning systems, it must be possible to close any ducts for combustion air and flue gas systems of fireplaces drawing in room air.

Any other use shall be deemed improper use and may result in personal injury or damage to the LG 150 compact ventilation unit range, for which the manufacturer cannot be held liable.

The manufacturer accepts no responsibility for any damages due to:

- Failure to observe the safety, operating and maintenance instructions provided in this operating and installation manual.
- Installation of spare parts that have not been supplied by the manufacturer, whereby the responsibility for use of such spare parts lies wholly with the system's constructor/installer.
- Normal wear and tear.

WARRANTY

The warranty period shall commence after the unit is put into operation, but no later than one month after delivery. You can find details on the warrantee in our "General terms and conditions" in the current version and the dealer conditions in your country. The warranty shall be subject to proof of services performed as per our instructions and executed by a licensed installer/specialised company.

Warranty claims shall be limited to material and/or constructional defects occurring during the warranty period. In the event of a warranty claim, the LG 150 compact ventilation unit must not be dismantled without prior written authorisation from the manufacturer. The manufacturer's liability shall be limited to spare parts installed by an installation company approved by the manufacturer.

The warranty shall automatically lapse at the end of the warranty period, following improper operation such as operation without a filter, if parts other than original manufacturer-supplied parts are installed, or if unauthorised changes or modifications are made to the unit.

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

4. Safety

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

Keep the operating and installation manual in the vicinity of the unit. The specifications given in this document must not be altered.

All safety and danger notices attached to the unit must be observed. Ensure that children do not play with the unit!

Failure to observe these safety requirements, warning notices, notes and instructions during installation and maintenance works, as well as commissioning, may result in bodily injury or damage to the compact ventilation unit.

Modifications and alterations to the ventilation unit are prohibited and absolve the manufacturer from all warranties and liability.

Be aware of your safety and of hazards when opening the front covers or removing cover plates.

Installation, initial start-up,- maintenance and repairs must be carried out by an authorised specialist company (specialised heating company/installer). Over and above this operating and installation manual, local and national regulations and standards shall also apply to the operation of this unit without limitation.
Take instruction from your installer on the unit and on its control unit following installation. The ventilation unit may be used only in accordance with the information provided in Section 3 "Designated Use".

Work practices that could potentially damage the unit are prohibited! To ensure safe operation, safety devices must not be removed or bypassed.

UNIT SET-UP

Instructions:

National and local regulations must be observed during installation and setup. The unit must be installed in accordance with national installation regulations as well as with the general, locally applicable building, safety and installation regulations of the relevant community or water and electricity utilities and other bodies.

Observe all locally-applicable construction and fire protection guidelines, regulations and standards. If necessary, appropriate suitable measures should be taken when installing the unit e.g. installation of fire dampers in air ducts, etc..

Condensate drainage connection:
Installation for water, heating and condensate connections may be performed by a specialist only. The unit must be installed and executed appropriately so as to ensure seal-tightness and effective condensate drainage in order to exclude the possibility of building damage. Effective condensate drainage must be verified on-site prior to initial start-up and after servicing the unit. *For details, see Section 16: "Installation"*

Work practices that could potentially damage the unit are prohibited. To ensure safe operation, safety devices must not be removed or bypassed.

ELECTRICAL CONNECTION WORK

- Warning: hazardous electrical voltage!
- Disregarding the hazard may result in death, injury or material damage.

- 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 be carried out by authorised electricians only, in compliance with national and local regulations.

Before opening the unit and when carrying out work on the unit e.g. maintenance work and repairs, the unit must be isolated from the mains (all poles disconnected) and secured against being switched back on for the duration of the work.

Work practices that could compromise the unit's safety are prohibited. To ensure safe operation, safety devices must not be removed or bypassed.

Electrical equipment and the unit's warning and protective devices must be inspected regularly to ensure that they are in perfect working order. In the event of faults in the electrical power supply or identification of defects e.g. loose connections or burnt cables, the unit must be switched off immediately.

Damaged or faulty power supply cables to the unit must be repaired immediately to avoid hazards.

The unit may not be operated until safe operational conditions are restored.

Fault finding and immediate remediation of electrical defects and malfunctions shall be carried out by authorised electricians only. All protective measures must be inspected (e.g. earth resistance etc.) after completion of electrical work on the unit. *For details, see Section 17: "Electrical Connections".*

PLANT OPERATION

To ensure safe operation of the system, safety devices and covers must not be rendered inoperative; nor may measures be taken to bypass or dismantle them.

Malfunctions:

In the event of malfunctions, occurrence of errors or damage to the ventilation system that may be hazardous to persons or property, isolate all power supply poles from mains immediately and secure against being switched back on.

Further operation must be actively prevented until the unit is fully repaired. Faults must be remedied immediately.

After repairs and maintenance work, qualified personnel must verify that the unit is safe to operate.

Operation of the ventilation unit is permitted only if all built-in parts provided e.g. silencers etc., have been properly connected to ensure that fans or other electrical components cannot be touched by hand.

In the event of any malfunctions, error messages or damage that can cause harm to persons or property, the system must be put out of operation immediately. Further use must be actively prevented until the unit is fully repaired.

The ventilation unit may be operated only in accordance with the project documentation. This must comply with the German Equipment and Product Safety act and with the relevant stipulations of EC directives and standards. Influencing environmental factors must be taken into account. Do not install the ventilation unit in the vicinity of combustible liquids or gases, in swimming pools or in areas subject to chemical influences.

Maintenance:

A service contract is recommended to ensure that the unit is inspected and serviced at regular intervals. Ask your supplier about approved specialised companies/installers in your area.

Spare parts

Attachment or installation of additional parts and components is not permitted. All modifications to the LG 150 range of compact ventilation units are prohibited. Only original spare parts may be used.

Filter changing:

If a filter needs to be changed for the LG 150 compact ventilation unit range, the part of the unit's covering that can only be opened with tools must not be opened. The ventilation unit's fans and electrical system are positioned behind this screwed covering.

Never operate the ventilation unit without an air filter. Air filters must be checked regularly for dirt and damage and cleaned or replaced if necessary. The air filters must be changed at least every six months or when the "Change Filter" message appears on the control unit. Use original replacement filters only. If the plant is not used in summer, the air filters must, for hygienic reasons, be replaced prior to restarting.

Comply with safety requirements and standards when operating the ventilation unit simultaneously with ambient air-dependent fireplaces or extractor hoods. *See Section 3: "Designated Use".*

User Guide

5. Customer service

Please contact the installer of your ventilation and air conditioning system or contact us directly for any questions relating to the LG 150 compact ventilation unit supplied.

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6. Ventilation unit assembly

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The LG 150 compact ventilation unit range is suitable for ceiling installation or wall mounting in areas free of frost.

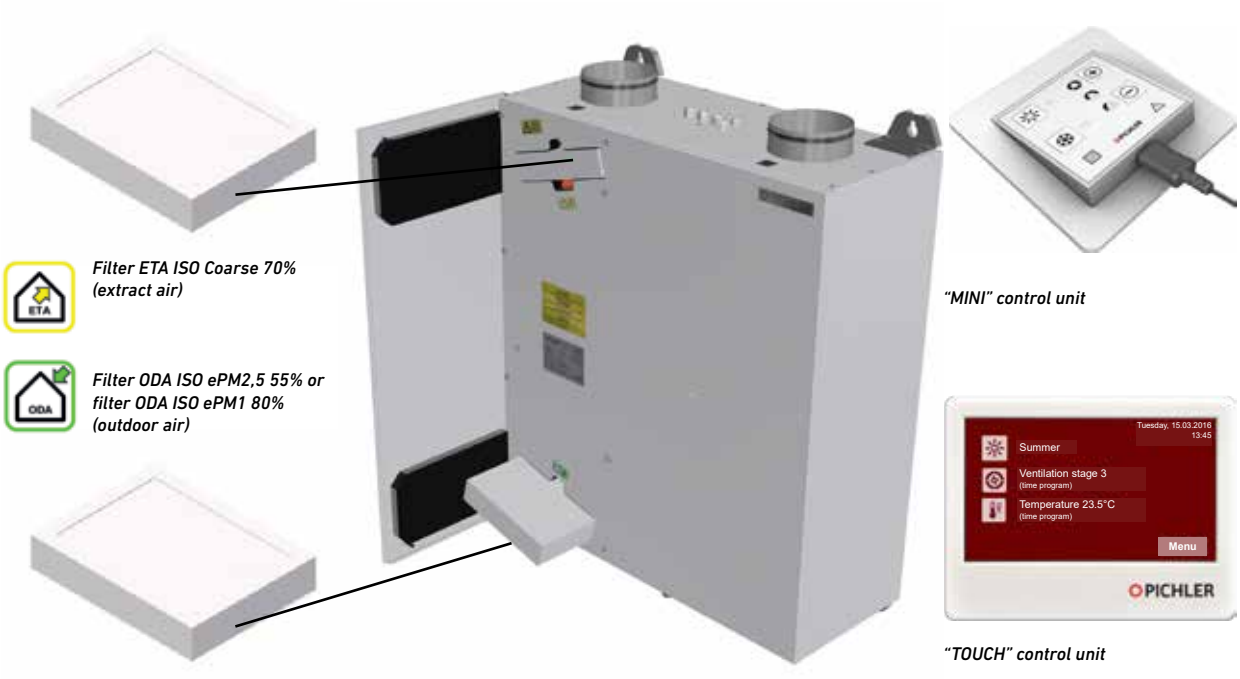
The unit's scope and designated use is limited to use in ventilation and air conditioning systems for the extraction of used air and the supply of fresh, temperature-controlled outdoor air in order to improve air quality.

Operation is simple and intuitive and, with use of a gateway can also be carried out via the Pichlerluft app. *For details, see section 9. "Pichler-App & Pichler Connect".*

The gateway communicates via the Modbus RTU connection of the building control system (BCS). Therefore only either the gateway or the Modbus RTU can be used for the BCS, and not the two options at the same time.

The components accessible to the user are:

- Compact, heat-insulated unit housing, exterior powder-coated in RAL 9003
- Filter ODA ISO ePM2,5 55% or filter ODA ISO ePM1 80% in outdoor air and filter ETA ISO Coarse 70% in extract air
- "MINI" control unit
- **Optional** "TOUCH" control unit



Filter ETA ISO Coarse 70% (extract air)

Filter ODA ISO ePM2,5 55% or filter ODA ISO ePM1 80% (outdoor air)

"MINI" control unit

"TOUCH" control unit

7. Control units

"MINI" CONTROL UNIT

The following compact ventilation unit functions can be configured with the "MINI" control unit.

- Unit's ventilation level
- Switch between summer and winter mode
- Display of filter change messages
- Display of possible fault messages with the LEDs provided.
- Air flow volume for levels I to III can be adjusted in certain areas using a combination of buttons.
- In addition, the unit can be switched to Standby mode or Basic Ventilation mode.

BUTTONS AND LEDS

4 buttons
The ventilation unit is operated by means of 4 buttons.

Summer/Winter mode:

The two buttons on the left-hand side are used to switch between summer and winter mode.

Summer or bypass modes support cooling of the living area. The bypass circumvents the heat exchanger and the cold outdoor air is blown directly or via a ground collector into the living area at nighttime.

Changing ventilation level:

The two buttons on the right-hand side change the unit's ventilation level. Pressing the [+] button increases the ventilation level until level III is reached which corresponds to boost ventilation. After 1 hour operating time in the highest ventilation level, normal ventilation mode is automatically reset to Level 2. The boost ventilation may, alternatively, also be stopped manually after one hour. Pressing the [-] button reduces the ventilation level.

Basic Ventilation operating mode:
If the ventilation level is less than I, the unit switches into Standby mode or into *Basic Ventilation operating mode*.
A minimum volume flow of 30 m^3/h is configured.

7 LEDs:
The ventilation unit's various statuses are signalled via a total of 7 LEDs. Three LEDs display the current ventilation level.

If the unit has *"Basic Ventilation"* status, this is recognisable by ventilation level I flashing gently.

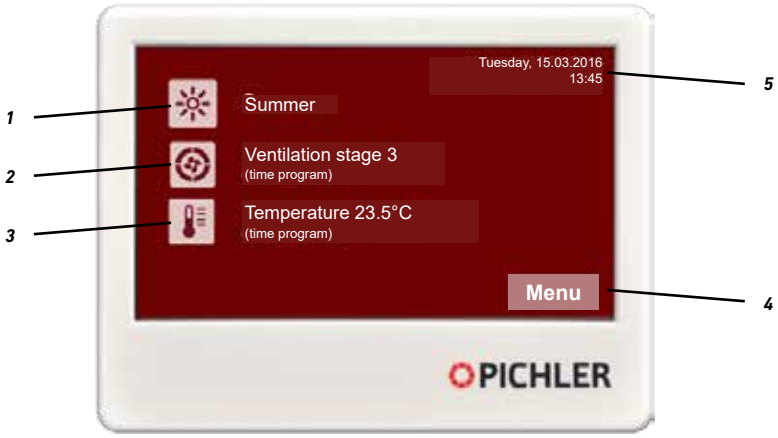
The LEDs for summer and winter mode are located on the left-hand side, arranged next to the corresponding buttons.

Filter change required:
The potential need to change the filter is signalled by the LED on the bottom left.

See Section 10 for details on filter changing

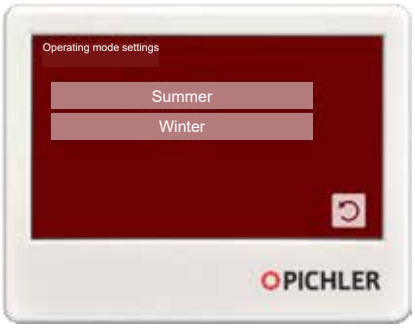
Error messages
The LED for error messages is located on the bottom right-hand side. *Please contact your installer!*

"TOUCH" CONTROL UNIT



1 Current operating mode
2 Ventilation level
3 Temperature (indoor air, supply air, extract air)
4 Menu
5 Date and time

OPERATING MODE



The currently active operating mode is displayed by various buttons. The operating mode can be changed by pressing the button. The following operating modes are available:

Summer:
Summer or bypass mode supports cooling of the living area. The bypass circumvents the heat exchanger and the cold outdoor air is blown directly or via a ground collector into the living area at night time.

Winter:
The outdoor air is always conveyed via the heat exchanger in winter operation. An auxiliary heater is given clearance only in winter mode.

VENTILATION LEVEL

The currently active ventilation level is displayed by various buttons. The selected ventilation level can be changed by pressing the buttons. The following selection options are available:

Time program:
The system runs at the ventilation level that is currently programmed. The time program can be programmed in the "Menu" under "Settings".

Off*:
The unit is switched off

Basic ventilation*:
The unit runs with basic ventilation

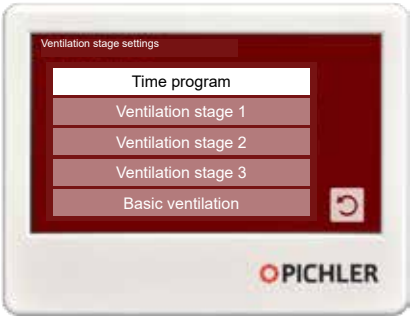
Ventilation level 1:
The unit runs at ventilation level 1

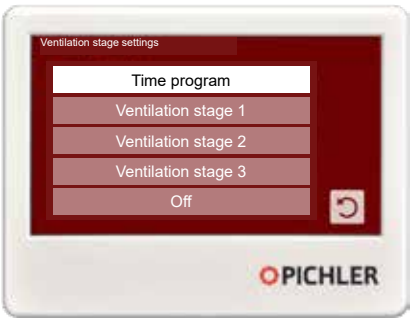
Ventilation level 2:
The unit runs at ventilation level 2

Ventilation level 3:
The unit runs at ventilation level 3

The two buttons on the right-hand side change the unit's ventilation level. Pressing the [+] button increases the ventilation level until level III is reached which corresponds to boost ventilation. After 1 hour operating time in the highest ventilation level, normal ventilation mode is automatically reset to Level 2. The boost ventilation may, alternatively, also be stopped manually after one hour. Pressing the [-] button reduces the ventilation level.

*Depending on unit configuration!:





Basic ventilation activated:
The user cannot switch off the unit.

Basic ventilation deactivated:
The user can switch off the unit.

Basic ventilation can only be activated and deactivated by service engineers!

In principle: "Ventilate as much as is necessary"

Adjustment of air volume requires relevant expertise and is performed by a specialist during initial start-up.

If ventilation is too low, poor ambient air quality or mould formation may result in living areas.

If ventilation is too high, ambient air may become too dry - particularly in the colder months.

Superior air volume control
There are various configurations and operating modes that result in your ventilation unit being operated with air volumes other than those set.

These include:

CO_2 concentration-based control (Figure1)
Acceptable room air should not exceed a CO_2 value of 1000 ppm, meaning that active ventilation should take place every 1 to 2 hours. A living room ventilation unit with CO_2 concentration-based control (CO_2 sensor module available as part of the accessories) automatically ensures that a defined CO_2 value of 900 ppm is not exceeded.

Humidity concentration-based control (Figure2)
The relative humidity is a factor that also contributes significantly to a comfortable living climate. Acceptable humidity is defined by a comfort window.

In the case of a ventilation unit with humidity concentration-based control (RH sensor module available as part of the accessories), a permanently defined *relative humidity* setpoint of *65 %* is stored. If this value is exceeded, the ventilation unit switches to the *highest fan stage for 60 minutes.*

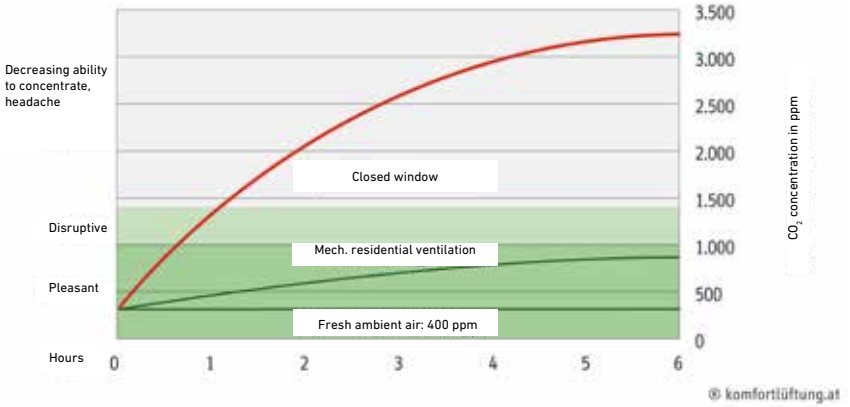


Figure 1: Schematic diagram showing the increase in CO_2 concentration in a flat/room with occupants with and without mechanical ventilation.

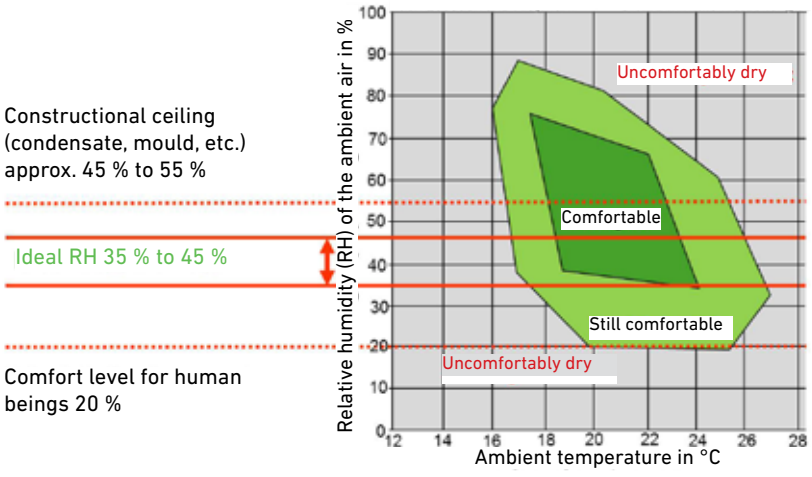
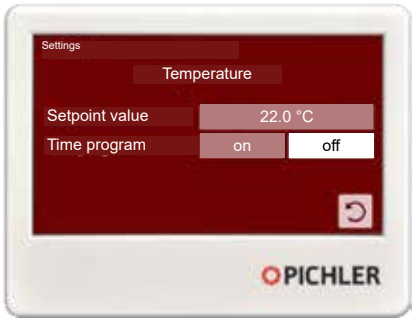


Figure 2: Representation of the comfort window as a function of the air temperature and relative humidity.

TEMPERATURE



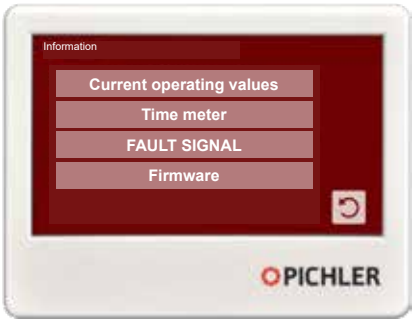
- Set the required temperature in standard mode
- Activate/deactivate the time program
- Ambient air, extract air or supply air is controlled, depending on the control setting configured by the specialist

Menü MAIN MENU

The main menu is opened by pressing the Menu button. Information on the ventilation unit is displayed here, and various settings can be made and actions performed.

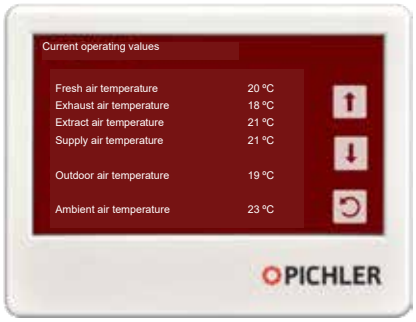
The user is returned to the Start menu by pressing the Home button.

INFORMATION

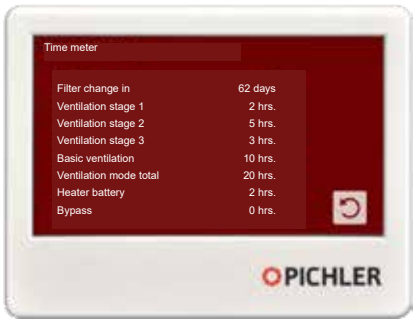


Current operating values, operating hours, messages and firmware versions can be retrieved under the "Information" menu item.

Current operating values

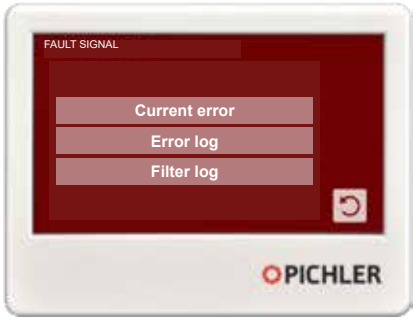


Time meter



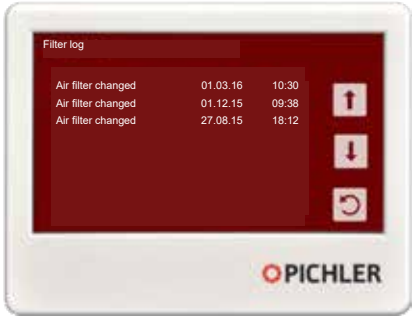
Fault signal

Current errors and error and filter logs can be displayed here.

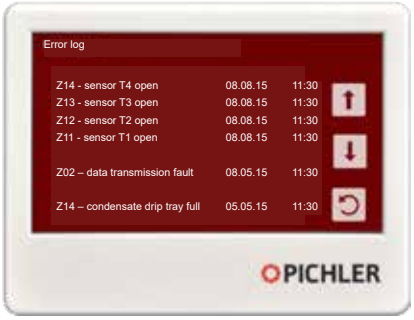


Current error

Filter log

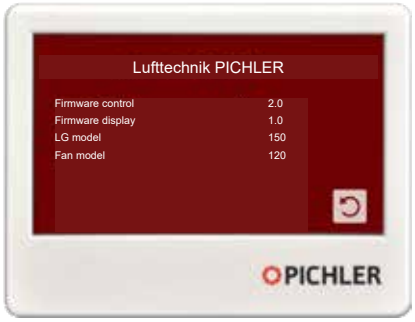


Error log

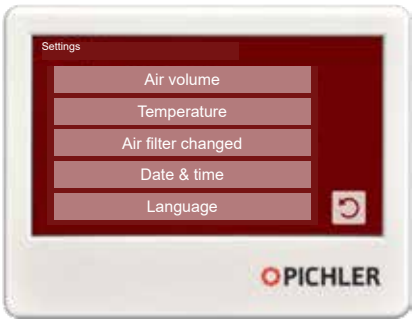


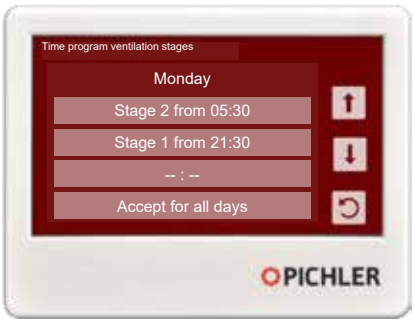
Firmware

Firmware versions for control and display are displayed here, as well as ventilation unit model and ventilator model.



SETTINGS

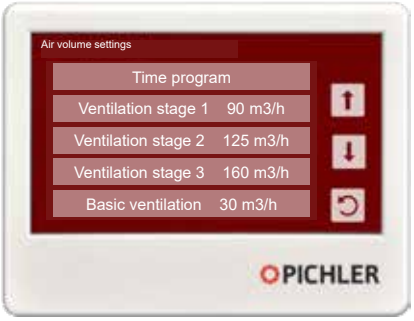


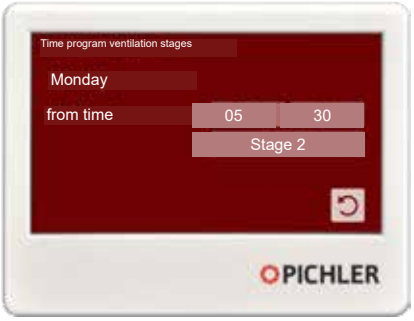


Air volume

Volume flow can be adjusted for each individual ventilation level here (min. and max. are preset).

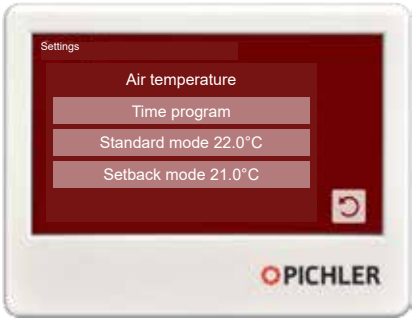
Three times can be specified for each day using the time program. These times determine the time at which a particular ventilation level is activated.

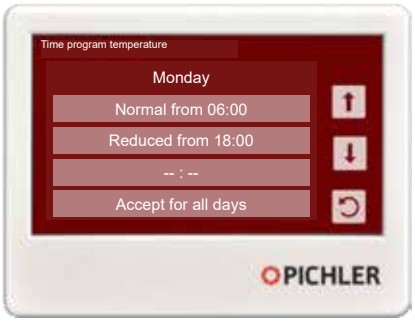


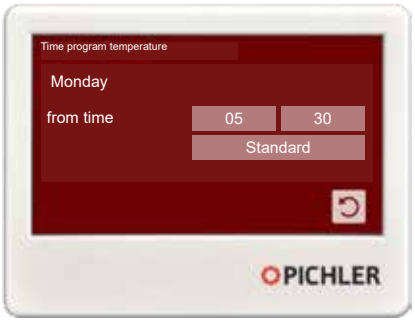


Temperature

Temperatures for standard mode and setback mode can be configured here. In addition, three times can be specified for room temperature each day. These times determine the time at which a particular ventilation level is activated.

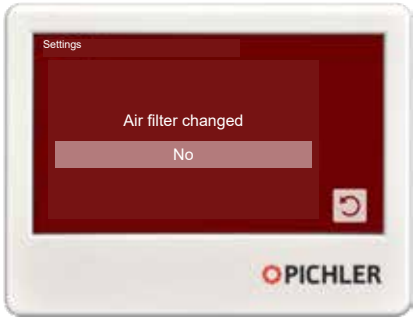




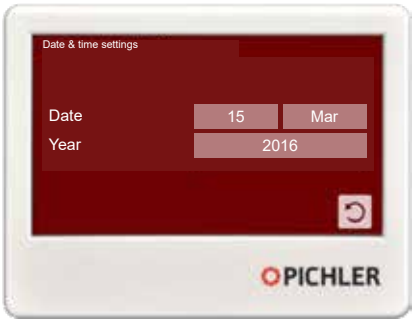


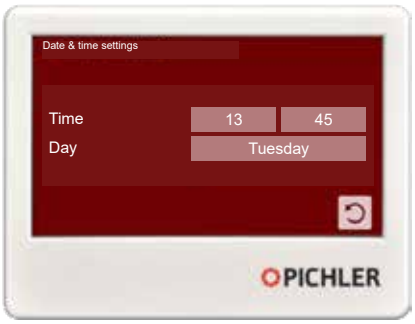
Air filter changed

If the air filter has been changed, the filter service time can be reset here so that a filter warning no longer appears on the display.



Date & time



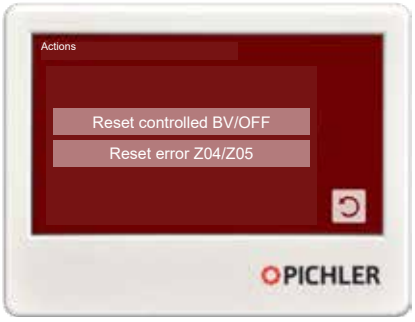


Language

The user can switch between different languages, like German, English, French.

ACTIONS

The following errors can be reset under "Actions".



Reset controlled BV (basic ventilation)/ OFF
The [+] and [-] options are displayed by pressing the "No" button. The error is reset by selecting "Yes" and confirming with "OK".

System monitoring:
Both fans' rotational speeds are constantly monitored. If there are discrepancies, the procedures described below are employed.

Level 1:
If the outdoor air fan's rotational speed exceeds the extract air fan's rotational speed by a predefined value (rotational speed limit) for 10 minutes, the system switches back into basic ventilation mode regardless of which ventilation level was selected previously.

- This is signalled by the yellow (filter) LED flashing 6 times on the "MINI" control unit.
- The "Z19 controlled BV" error message is displayed on the Touch control unit.

If the rotational speed is not exceeded here, the system remains operational with basic ventilation.

If basic ventilation is activated by the unit's monitoring system, the user can switch to a different ventilation level at any time using the [+] button. The rotational speed continues to be monitored and, if another error occurs, the system reverts to basic ventilation after 10 minutes.

Level 2:
If the rotational speed is exceeded for 10 minutes in active basic ventilation mode, the system shuts down.

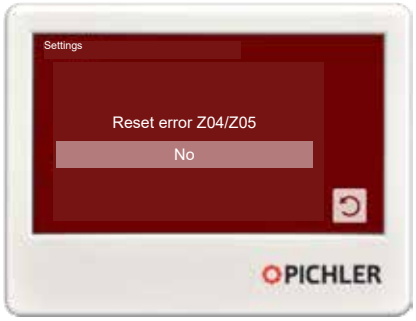
- The red and yellow LEDs on the "MINI" control unit flash 6 times.
- The "Z20 controlled BV/OFF" error message is displayed on the "TOUCH" control unit.

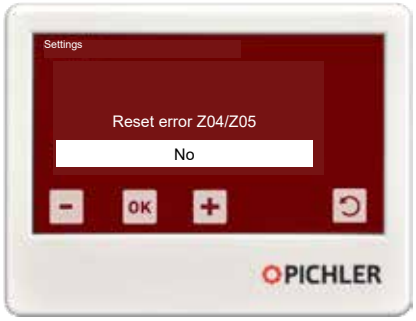
The system remains off until the error is reset manually. The error is reset by:

- keeping the [+] and [-] buttons on the "MINI" control unit pressed for 5 seconds.
- pressing the Menu button on the "TOUCH" control unit. Then press the "Reset Controlled BV/OFF" and, finally, confirm with "Yes".

If the rotational speed is exceeded again after switching the system back on, the process is repeated.

Reset error Z04/Z05 (Specialist Personnel)
The [+] and [-] options are displayed by pressing the "No" button. The error is reset by selecting "Yes" and confirming with "OK".





Error Z04/Z05 (Specialist Personnel)
One of the two fans is blocked or has no power supply, no control voltage signal or no tachometer feedback. Perform reset only after remedying the error.

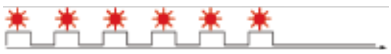
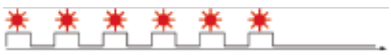
8. Messages/Faults

"MINI" CONTROL UNIT

From firmware version V.1.6 onwards, error statuses for the ventilation unit are signalled with flashing patterns on the error LEDs.

Please contact your installer.

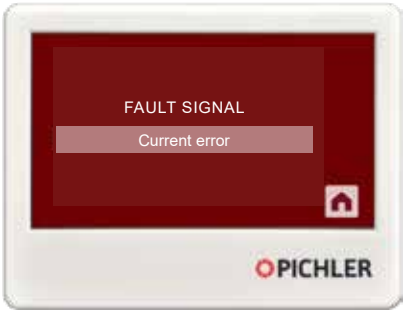
Error signal	Reason for error
	Supply air fan out of service The error LED flashes once, followed by a long pause
	Extract air fan out of service The error LED flashes briefly twice in succession, followed by a long pause
	Temperature sensor error The error LED flashes briefly three times in succession, followed by a long pause
	General fault The error LED flashes briefly four times in succession, followed by a long pause
	Communication between power section and control unit interrupted The error LED flashes briefly five times in succession, followed by a long pause

Note signal	Note reason
	Controlled basic ventilation – level 1 of system monitoring. The filter LED flashes briefly six times in succession, following by a long pause*
	Controlled system shutdown – level 2 of system monitoring. The error and filter LED flashes briefly six times in succession, following by a long pause*

See pages 18 for detailed error descriptions

"TOUCH" CONTROL UNIT

Please contact your installer.



9. Pichler-App & Pichler Connect

GATEWAY

When using the Pichler app as well as Pichler Connect a gateway is required.

The gateway communicates via the Modbus RTU connection of the building control system (BCS). Therefore only either the gateway or the Modbus RTU can be used for the BCS, and not the two options at the same time.

EASY OPERATION WITH THE PICHLER APP

User-friendly: the compact ventilation unit can be operated easily with our free smartphone app for Android and iOS, whe-ther you are at home or out and about.

GET IT ON Google Play

Download on the App Store

REMOTE ACCESS / PICHLER CONNECT

Operational safety: Remote access facilitates a prompt response with minimal effort for the Pichler customer service in the event of a malfunction.

PICHLER *connect.*

PRIVACY

A sticker for removal is attached to the LAN jack. As soon as you remove this and establish a cable-controlled Internet connection, we assume your agreement to the current data protection statement (see: http://www.pichlerluft.at/data-privacy-statement.html).

www.pichlerluft.at/datenschutz.html

www.pichlerluft.at/data-privacy-statement.html

10. Filter maintenance

MAINTENANCE INSTRUCTIONS (AIR FILTER)

These instructions relate exclusively to regular inspection, maintenance and replacement of air filters by the user.

Check the condition of the air filters regularly!

Filter change interval
Filters must be replaced immediately if very dirty. Otherwise, they should be replaced at least twice a year, depending on outdoor air pollution levels.

Filter ETA ISO Coarse 70% (extract air)

Filter ODA ISO ePM2,5 55% or filter ODA ISO ePM1 80% (outdoor air)

LG 150 with front doors opened for filter change (easy to open by undoing quick fasteners)

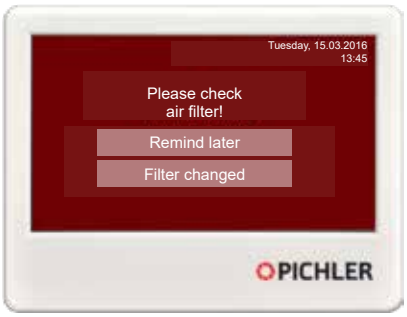
FILTER MESSAGE ON THE "MINI" CONTROL UNIT

When the filter service time has elapsed (factory setting: 2,900 hours), the control unit signals the need for a filter change through the LED provided for this purpose, which lights yellow continuously.

FILTER MESSAGE ON THE "TOUCH" CONTROL UNIT

The control unit reminds the user of filter maintenance at regular intervals (filter service time: 2,900 hours)

Reset the filter signal on the control unit after every filter change. The filter time can also be reset subsequently in the settings *(see page 17: "air filter changed")*.



FILTER REPLACEMENT

When replacing the air filters, avoid soiling the unit and its components. Dirty air filters must be suitably disposed of right away. 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.

Before working on live parts, always isolate the unit from mains (all poles) and protect against renewed switch-on!

1. Filter message on control unit
2. Undo the quick fasteners on the housing cover.
3. Open the front door.

4 Extract the filter.

Attention!: Never operate the ventilation unit without using air filters.

5. Insert the new filter. Please note: Only original replacement filters of the specified quality class may be used.

Note the direction of the air stream.

6. When inserting a new filter, ensure proper installation and close the filter clamping rail. This prevents major filter leakage.
7. Close the housing cover and secure it with the quick fasteners. When replacing the cover, ensure that it is completely closed and that there is sufficient seal-tightness between the frontcover and the unit housing.

Where can I order filters?
Use only original replacement filters of the filter quality class specified.

Symbol	Designation	Item no.:
ODA	**Filter ODA ISO ePM2,5 55% (outdoor air)**	40LG050230
ODA	**Filter ODA ISO ePM1 80% (outdoor air)**	40LG050250
ETA	**Filter ETA ISO Coarse 70% (extract air)**	40LG050240

PICHLER
J. Pichler Gesellschaft m.b.H.
9021 KLAGENFURT
Karlweg 5
T +43 (0)463 32769

CLEARING FILTER MESSAGES "MINI" CONTROL UNIT

Filter change required:
Reset the filter counter after changing the filter.

Press the [+] button and the [-] button at the same time for 5 seconds in order to do this. The filter message disappears after entering this combination.

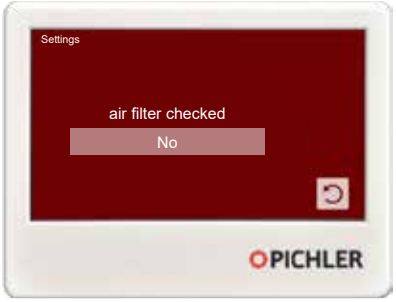
Premature filter changing:
If the air filters are replaced prematurely, the filter counter must be reset without a pending filter message.

Press the [+] button and the [-] button at the same time for 5 seconds in order to do this.

CLEARING FILTER MESSAGES "TOUCH" CONTROL UNIT

Reset the filter message on the control unit after each filter replacement. Filter time may also be reset later in the settings.

If the air filter was replaced, the filter time may be reset here.



Specialist Personnel - Mounting/Installation

11. Scope of supply, transport, storage and disposal

SCOPE OF SUPPLY

The scope of supply includes:

- the ventilation unit with the "MINI" or "TOUCH"control unit
- the operating and installation manual

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 reported immediately in writing to the forwarder or supplier.

TRANSPORT AND PACKAGING

The LG 150 ventilation unit range is supplied with transport packaging. The safety markings on the packaging must be observed.

The LG 150 compact ventilation unit must be handled with care in order to prevent possible damage due to forceful impact during transportation.

Ensure that the unit is not damaged from being toppled or overturned. Avoid knocks and blows during transportation.

Applicable safety and accident regulations must be complied with during transportation. If transported manually, ensure that necessary human lifting and carrying forces are reasonable.

STORAGE

The unit must be stored in its packaging in suitable dry, dust-free rooms and protected from frost. Avoid storing for more than one year.

DISPOSAL

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

Equipment that is no longer functional must be dismantled by a specialist company and disposed of appropriately at suitable collection centres. The waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive) apply.

12. Technical specifications

Unit type	**LG 150 A** (V)	**LG 150 AF** (V)	**LG 150 B** (V)	**LG 150 BF** (V)
Heat exchanger	Standard	Enthalpy exchanger	Standard	Enthalpy exchanger
Air volume flox min - max (adjustable in 5 m^3/h intervals)	30 - 150 m^3/h	30 - 150 m^3/h	30 - 200 m^3/h	30 - 200 m^3/h

Characteristic values as per EN13141-7:2010				
Temperature ratio $\eta_{\Theta,SU}$ [1]	92,4 %	84,2 %	92,5 %	83,4 %
Temperature ratio $\eta_{\Theta,EX}$ [1]	79,4 %	71,5 %	79,4 %	66,5 %
Specific power input SPI	0,25 Wh/m^3	0,24 Wh/m^3	0,41 Wh/m^3	0,36 Wh/m^3
External leakage	< 1,05 %	< 1,05 %	< 0,87 %	< 2,06 %
Internal leakage	< 0,86 %	< 0,76 %	< 0,71 %	< 0,63 %

Characteristic values based on PHI criteria				
Application range based on PHI	80 - 111 m^3/h			
Heat recovery efficiency $\eta_{eff,WRG}$ EApplication range based on PHI	86 %	83 %		
Moisture recovery 2	-	71 %		
Electricity efficiency η_{elek}	0,30 Wh/m^3			
Power consumption in standby mode	< 1,0 W			

Classification of air filters in accordance with EN ISO 16890	
ODA filter (outdoor air)	ISO ePM2,5 55 %
ETA filter (extract air)	ISO Coarse 70 %

Operating conditions	
Permissible ambient temperature (installation location)	+5 bis +40 °C
Permissible operating temperature (outdoor air)	-15 bis +35 °C

Electrical system		
Electrical connection	230 V / 1 ~ / 50 Hz / 13 A	
IP classification	IP20 with connected air ducts	
Max. power without preheater battery	168 W	232 W
Max. power with preheater battery	918 W	1132 W

Materials	
Inner part	EPP and galvanized sheet steel
Housing	Galvanised sheet steel powder-coated in RAL 9003
Heat exchanger	Polystyrene
Enthalpy exchanger	Polymer membrane

Housing	
Air line connections	4 x Ø 125 mm
Condensate drain	R 1/2" external thread below
Dimensions (W x H x D)	680 x 783 x 290 mm
Weight without optional accessories	approx. 30 kg

[1] *with 70 % of the max. volume flow*

EXTERNAL PRESSURE BOOST CHARACTERISTICS – AIR FLOW RATE

The characteristic curves shown are valid for the device version with outdoor air filter class ISO ePM2.5 55 % and extract air filter class ISO Coarse 70 %, as well as the design with the PTC preheater battery. The characteristic indicates the external pressure (pext.) available for the duct system. The specified total electrical output takes into account the power consumption for the two fans in the supply and extract air as well as the power consumption of the control.

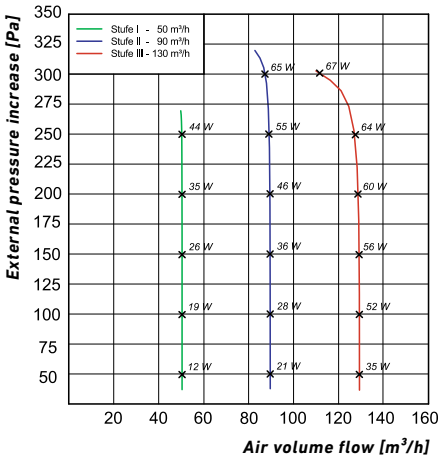
MAXIMUM OPERATING POINT

Volume flow: 150 m^3 / h
Ext. pressure: 200 Pa

CHARACTERISTICS ACCORDING TO EN 13141-7

Nominal air volume flow: 105 m^3 /h
Housing tightness: External leakage 0,6 %, internal leakage 0,7 %
Temperature ratio on the supply air side with standard exchanger: 92,4 %
Temperature ratio on the supply air side with enthalpy exchanger: 84,2 %
Humidity ratio on the supply air side with enthalpy exchanger: 61,7 %
Specific input power: 0,25 Wh /m^3

PRESSURE VOLUME FLOW CHARACTERISTIC CURVE FOR LG 150 A



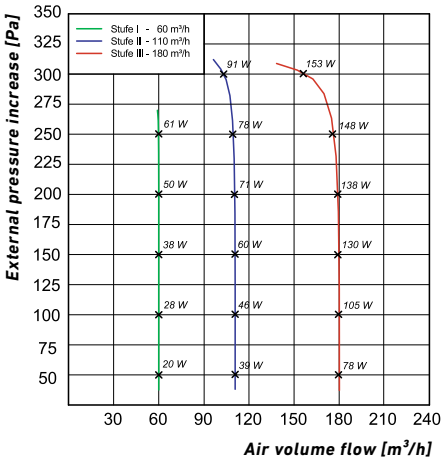
MAXIMUM OPERATING POINT

Volume flow: 200 m^3 / h
Ext. pressure: 200 Pa

CHARACTERISTICS ACCORDING TO EN 13141-7

Nominal air volume flow: 125 m^3 /h
Housing tightness: external leakage 1,3 %, internal leakage 0,4 %
Temperature ratio on the supply air side with standard exchanger: 90,9 %
Temperature ratio on the supply air side with enthalpy exchanger: 83,4 %
Humidity ratio on the supply air side with enthalpy exchanger: 56,9 %
Specific input power: 0,38 Wh /m^3

PRESSURE VOLUME FLOW CHARACTERISTIC CURVE FOR LG 150 B



ACOUSTIC SPECIFICATIONS

LG 150 A	Measuring point		Housing emission			Outdoor air connecting piece			Supply air connecting piece			Exhaust air connecting piece			Extract air connecting piece		
	Stufe		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
100 Pa	63 Hz	L_w in dB	51	48	47	62	64	66	64	66	68	62	64	66	63	65	67
	125 Hz		44	46	45	44	47	49	57	60	61	55	58	59	43	46	48
	250 Hz		41	42	43	43	46	48	57	60	61	58	61	62	48	51	52
	500 Hz		42	42	42	37	40	41	54	56	58	54	56	58	43	45	47
	1000 Hz		37	39	39	31	33	35	55	58	60	54	56	58	34	37	38
	2000 Hz		<20	22	37	23	26	28	47	50	52	45	48	49	25	28	29
	4000 Hz		<20	<20	21	15	17	19	39	42	43	36	39	41	16	18	20
	8000 Hz		<20	<20	<20	17	20	22	31	33	35	28	31	32	18	20	22
	Total L_{WA} in dB (A)		**42**	**43**	**44**	**41**	**43**	**45**	**58**	**61**	**62**	**57**	**60**	**61**	**44**	**47**	**48**
50 Pa	**Total L_{WA} in dB (A)**		**36**	**38**	**43**	**36**	**38**	**40**	**53**	**56**	**57**	**52**	**54**	**56**	**39**	**42**	**43**

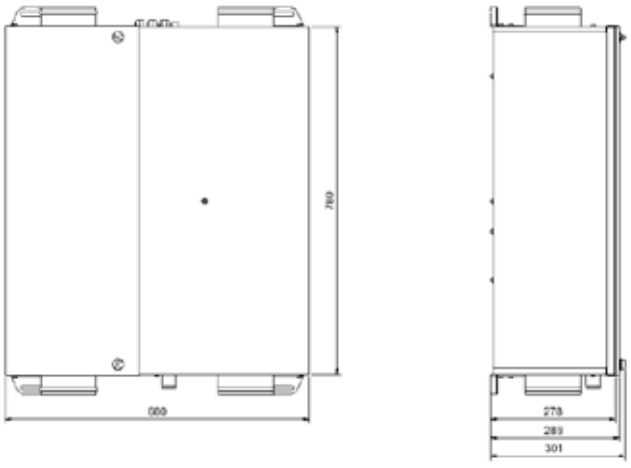
(with an external pressure increase of 100 Pa and 50 Pa) ***Remark: Tolerances ± 2 dB for acoustic data***

LG 150 B	Measuring point		Housing emission			Outdoor air connecting piece			Supply air connecting piece			Exhaust air connecting piece			Extract air connecting piece		
	Stufe		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
100 Pa	63 Hz	L_w in dB	55	56	56	77	78	77	82	83	84	80	82	83	75	79	78
	125 Hz		50	54	57	55	58	62	71	79	79	72	75	76	55	59	63
	250 Hz		37	44	52	55	56	60	67	70	73	65	68	70	55	56	59
	500 Hz		40	46	50	47	44	48	59	64	66	60	63	64	41	43	47
	1000 Hz		33	37	44	37	38	41	59	61	63	56	61	62	36	38	41
	2000 Hz		27	33	41	25	27	32	49	55	59	47	55	58	20	26	31
	4000 Hz		<20	23	30	17	18	24	42	50	54	41	50	53	18	19	24
	8000 Hz		<20	<20	<20	20	19	19	38	45	49	34	45	48	20	17	19
	Total L_{WA} in dB (A)		**40**	**46**	**51**	**53**	**54**	**55**	**65**	**69**	**70**	**64**	**68**	**69**	**52**	**55**	**56**
50 Pa	**Total L_{WA} in dB (A)**		**34**	**40**	**51**	**47**	**48**	**49**	**59**	**63**	**64**	**58**	**61**	**63**	**46**	**49**	**50**

(with an external pressure increase of 100 Pa and 50 Pa) ***Remark: Tolerances ± 2 dB for acoustic data***

DIMENSIONS

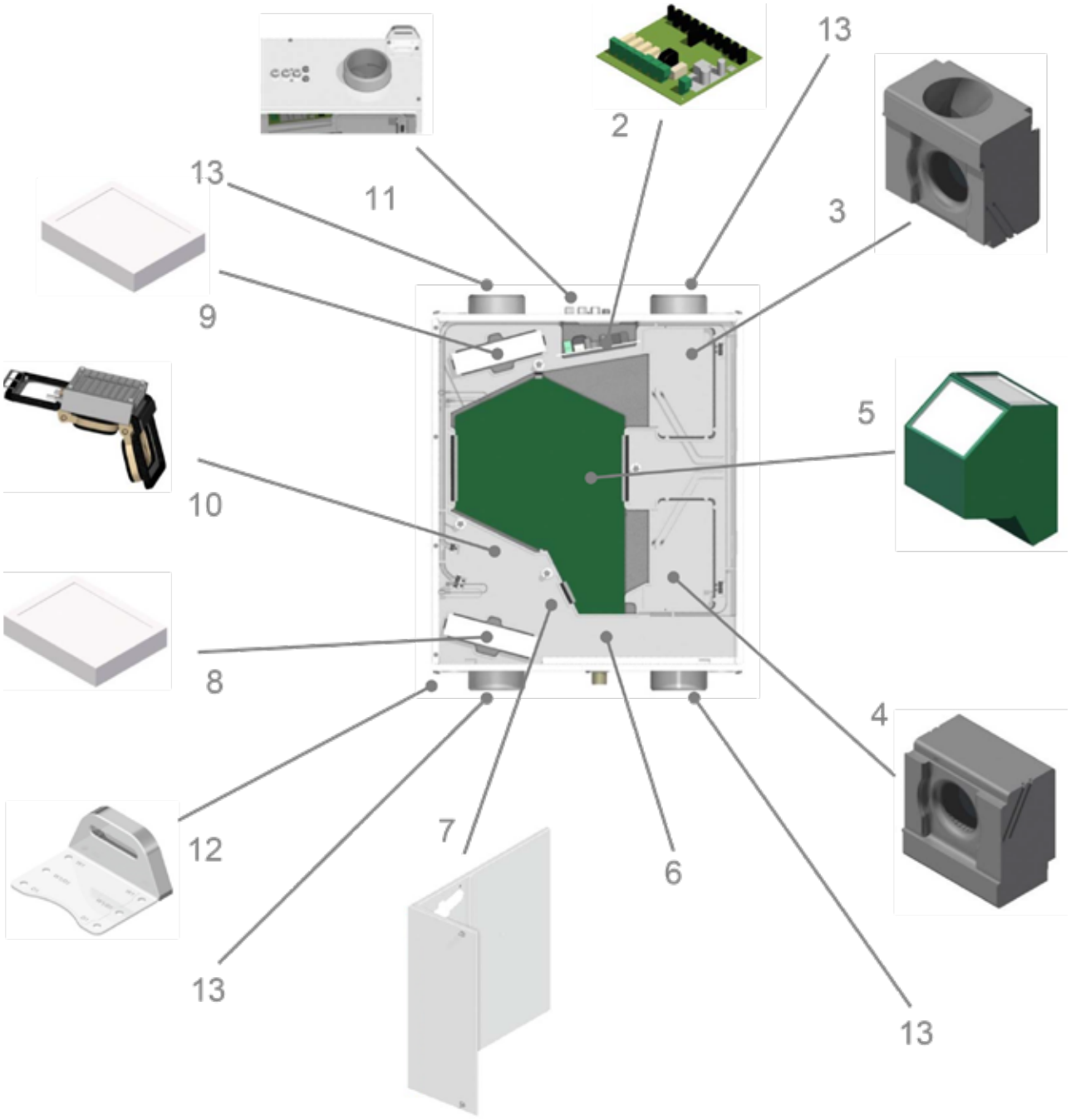
(W X H X D) 680 X 783 X 290 MM



CHANGES RESERVED.

This manual has been compiled with the utmost care. This does not, however, imply any rights. We constantly strive to improve and optimise our products technically and we reserve the right to change the design of the units or the technical specifications without prior notice.

13. Ventilation unit set-up for specialised personnel



1. "MINI" or "TOUCH" control unit (optional)
2. Control electronics
3. Supply air fan
4. Exhaust air fan
5. Counterflow heat exchanger (enthalpy exchanger optional)
6. Condensate drainage
7. Housing front panelling and inspection doors with handle screw top
8. Filter ODA ISO ePM2,5 55% (outdoor air) or filter ODA ISO ePM1 80% (optional)
9. Filter ETA ISO Coarse 70% (extract air)
10. Pre-heater battery bypass valve
11. Cable feed-throughs
12. Assembly bracket with vibration damper
13. Air duct connections
14. Connecting cable J-Y(ST) Y2X2X0.8

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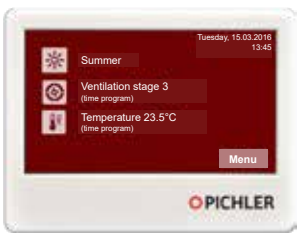


1. "MINI" control unit
The "MINI" control unit, installed in the living area, is used to easily control the ventilation unit. It is easy to operate and enables manual configuration of ventilation levels, switching between summer and winter mode, setting of basic volume flow, etc. In addition, the control unit displays operating status and any faults that may occur.

"TOUCH" control unit (optional)
The "TOUCH" control unit is easy to use and provides an overview via a TFT touch display. It should be installed at a central location in residential buildings so that users have access to control and an overview of messages at all times. The integrated temperature sensor records the current ambient temperature and ensures that supply air is regulated correctly.

2. Control electronics
Individual operating parameters are set by a specialist installer or service technician via the ventilation unit's built-in control electronics.

3. Supply air fan
(DC radial fan with constant volume flow technology)
Conveys the chosen, conditioned outdoor air flow volume to living areas.

4. Exhaust air fan
(DC radial fan with constant volume flow technology)
Conveys exhausted air flow volume out of living areas.

5. Counterflow heat exchanger
(enthalpy exchanger optional)
The efficient heat exchanger extracts heat energy from extract air in heat recovery mode and conveys it to the supply air. If an optional enthalpy exchanger is installed, air humidity is recovered in addition to heat energy.

6. Condensate drainage
The condensate generated in the heat exchanger during operation is captured in the condensate drip tray. The condensate must be discharged via the condensate drain connected by the customer towards the siphon connecting piece. The condensate drainage tray must be fitted with an active odour trap (siphon). *See Section 16: Installation.*

7. Housing front panelling and inspection doors with handle screw top
Open the inspection doors to change the filter by undoing the wing screws. When carrying out maintenance works, the inspection doors must be removed first, followed by the housing's front cover. When replacing the housing's front cover and inspection doors, ensure that they are completely closed and that there is a sufficient seal to the unit housing.

8. Filter ODA ISO ePM2,5 55% (outdoor air), filter ODA ISO ePM1 80% (optional)
Dust and impurities are filtered out of the outdoor air via the outdoor air filter.

9. Filter ETA ISO Coarse 70% (extract air)
Coarse contaminations are filtered out of the extract air via the extract air filter.

10. Pre-heater battery bypass valve
The bypass function bypasses outdoor air flow volume to the heat exchanger if the outdoor air temperature is lower than the extract air temperature in summer mode. The pre-heater battery function serves to protect condensate in the heat exchanger against freezing at outdoor air temperatures below 0°.

11. Cable feed-throughs
The cable feed-throughs are used to establish electrical connections to connect the control unit with optional accessories such as external outdoor air temperature sensors, CO2 sensors, etc. There are also two earthing leads on the inside for protective earthing of the control board to the unit enclosure.

12. Assembly bracket with vibration damper
The assembly bracket is already integrated into the ventilation unit for correct assembly. It is mounted to the ventilation unit for optimal wall mounting or ceiling installation, depending on the unit version.

13. Air pipe connections
Serve as a connection to the air pipe system. Correct connection to supply air, extract air, outdoor air and exhaust air must be ensured during assembly.

Low temperature PTC battery with protective cover and thermo-bimetal switch

Frost protection heating with low temperature PTC pre-heater battery (optional)

If an optional water or brine battery is used to protect the heat exchanger from frost, the battery must be protected appropriately from freezing when frost is present.

Overheating protection. A thermo-bimetal switch is built into the optional, built-in pre-heater battery to protect against overheating.

If a temperature of +50 °C is reached, power supply to the electric battery is interrupted and the anti-freeze heating is switched off.

Accessories (optional) - Cover element:
Used to disguise the ventilation unit's outdoor air and exhaust air connection or extract air and supply air connection to the wall.

14. Connecting cable J-Y(ST)Y2x2x0.8
A screened cable J-Y(ST)Y2x2x0.8 is required to establish a connection and for communication between the control unit and control board. The connecting cable is not included in the scope of supply. Cable length must not exceed 100 m. The plug is connected to the power section and to the control unit with a box header.

SYSTEM DESCRIPTION

The compact ventilation unit LG 150 is used for the controlled mechanical supply and exhaust air ventilation of apartments in multi-storey buildings, smaller residential units and similar applications.

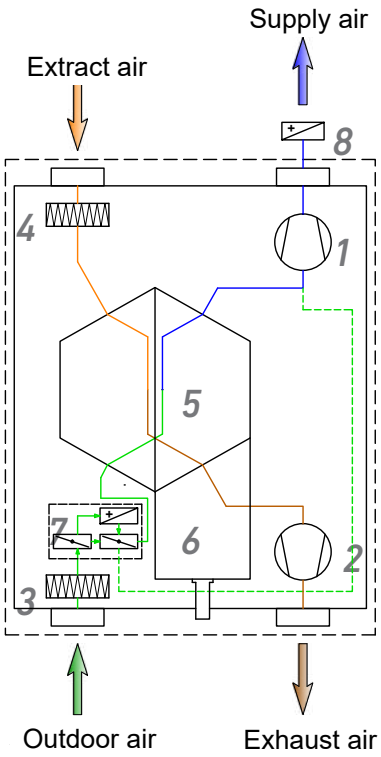
Regarding the LG 150 A the range of use extends fundamentally to residen-tial areas of 40 m^2 to approx. 120 m^2 that are designed as passive or low energy structures,with an adjustable air volume flow up to 150 m^3/h.

Regarding the LG 150 B with high ventilation system performance it extends fundamentally to residential areas to approx. 160 m^2 with an adjust-able air volume flow up to 200 m^3/h.

With mechanically-controlled residential ventilation, used, damp extract air is conducted away from wet domestic areas, e.g. bathroom, toilet and kitchen, and is replaced with fresh, processed and filtered outdoor air in lounge areas e.g. In living rooms and bedrooms.
Significant energy savings are achieved when the system is operated continuously thanks to highly efficient heat exchangers for heat recovery from extract air and use of energy-efficient fans with the latest EC technology for air flow control.

This technology is particularly effective in air-tight building shells and with active thermal insulation. An efficiency factor of up to 92 % heat recovery provides highly efficient energy savings.

It is important to note that the highly efficient heat exchanger is operated using a suitable controlled frost protection mechanism. Active condensate drainage with a suitable odour trap must also be provided for operation.



The basic design of a domestic ventilation system is illustrated in the pictorial schematic with optional additional system enhancements.

1 Supply air fan with EC technology
2 Extract air fan with EC technology
3 Filter ODA ISO ePM2,5 55% (outdoor air), optional filter ODA ISO ePM1 80%
4 Filter ETA ISO Coarse 70% (extract air)
5 Counterflow heat exchanger
6 Condensate drip tray with 1/2 inch connection and fill level monitor
7 Bypass valve for summer mode with optional pre-heater battery
8 External hot water re-heater battery

SYSTEM ENHANCEMENT OPTIONS FOR FROST PROTECTION

There is a risk of the heat exchanger freezing on the exhaust air side, particularly during winter months with moderate to severe frost, depending on the extract air temperature and air humidity. Appropriate measures must be taken to protect the heat exchanger against ice formation at low outdoor air temperatures of under approx. -4 °C. Various systems are available to monitor defrosting of the heat exchanger. Possible strategies to protect the heat exchanger against freezing are outlined below.

Geothermal heat exchanger

Optimal frost protection can be achieved with cold outdoor air temperatures by integrating a geothermal heat exchanger into the ventilation system. Additional components, such as a PTC pre-heater battery integrated in the ventilation unit, are not necessary.

In summer mode, the geothermal heat exchanger's cooling performance is determined by the low rate of air exchange, is very limited and is barely perceptible to the user.

The following information must be observed for execution of a geothermal heat exchanger:

- The heat exchanger is laid in the ground with waterproof pipes at a frost-free depth with due consideration of the system's cleanability options
- The manufacturer's guidelines for implementation must be observed
- Condensate drainage must be provided
- If the air pipe is routed through an external wall, effective sealing against moisture ingress must be ensured
- Sufficient distance from other parts, e.g. water pipes, foundations, etc. must be maintained during positioning in order to prevent frost damage
- In the event of soil pollution (e.g. radon exposure), it is preferable to employ the option of indirect pre-heating e.g. a circuit system with a frost-protected heat transfer medium Geothermal heat exchangers must be planned and executed carefully with regard to energy efficiency and air hygiene.

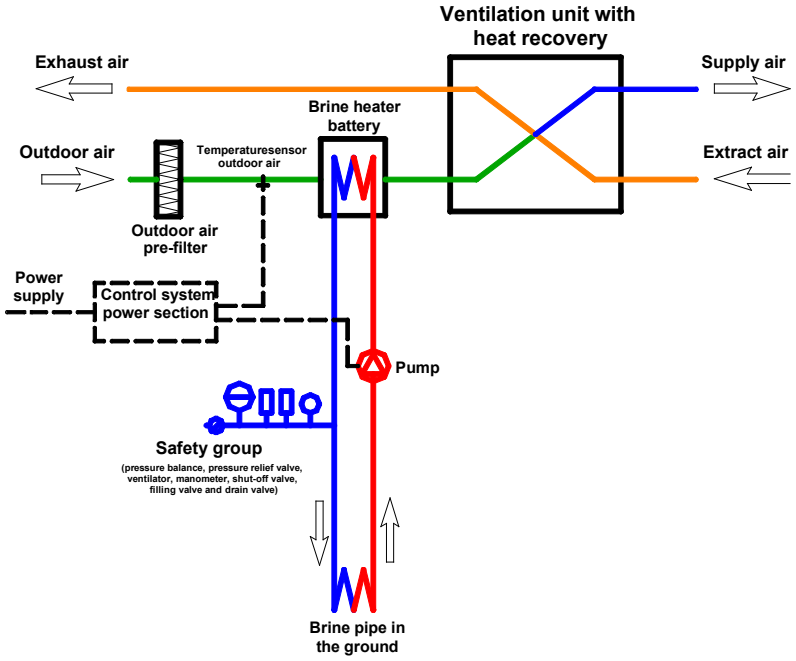
The relevant guidelines and standards must be observed. In particular, amongst other things, ease of cleaning and a suitable filter concept must be ensured.

Support of a geothermal heat exchanger with a changeover flap must be specifically activated in the ventilation unit. This is performed using PC software. Further information on PC software is available from certified partners upon request.

Geothermal heat exchanger winter mode
The geothermal heat exchanger is connected via the changeover flap when the outdoor air temperature falls below the geothermal heat exchanger's parametered winter threshold value. In this case, the outdoor air is drawn in via the geothermal heat exchanger and is thus preheated. If the outside temperature (optional T5 sensor required) falls below the geothermal heat exchanger's winter parameter, the K1 relay switches on the geothermal heat exchanger.

Geothermal heat exchanger summer mode
In summer, the geothermal heat exchanger is connected when the outside temperature exceeds the geothermal heat exchanger's parametered summer threshold value. In this case, the outdoor air is drawn in via the geothermal heat exchanger and is thus pre-cooled. If the outside temperature (optional T5 sensor required) exceeds the geothermal heat exchanger's summer parameter, the K1 relay switches on the geothermal heat exchanger.

Brine geothermal energy with optional cooling function



Basic system components are illustrated in the "Brine Geothermal Energy with Optional Cooling Function" pictorial schematic.

Brine geothermal systems extract energy from the earth in winter via a brine pipe. The system may also be used for cooling in summer. The heat or cold is transferred indirectly into the supply air via an external air register in the air duct system.

The advantage of brine geothermal systems over other frost protection mechanisms, such as electrical or hot water pre-heating batteries, is that little energy is required to operate them. Their advantages compared to the air duct geothermal heat exchanger comprise hygienic aspects, simple laying and good controllability.

Indirect pre-heating via a circulatory system with frost-protected heat carrier, for instance, should preferably be used in ground containing hazardous substances (e.g. radon contamination).

The manufacturer's guidelines for implementation must be observed. The brine heater battery must be protected against contamination by an air filter integrated into the air pipe system that has a filter quality class of at least ISO Coarse ≥60%.

The brine pump is activated automatically, depending on the outdoor air temperature. Support for a brine geothermal heating system must be activated in the ventila-

tion unit. PC software is used for this purpose. Further information on PC software is available from certified partners upon request.

Brine geothermal heat - winter mode
If the outdoor air temperature (optional T5 sensor required) falls below the geothermal heat exchanger's winter parameter, the K1 relay switches on the brine pump.

Brine geothermal heat - summer mode
If the outdoor air temperature (optional T5 sensor required) exceeds the geothermal heat exchanger's summer parameter, the K1 relay switches on the brine pump.

PTC low temperature pre-heater battery

The *LG 150* ventilation unit can be supplied with a built-in (not passive house-certified) or external electrical PTC pre-heater battery as optional. If an optional pre-heater battery is connected, cold outdoor air is pre-heated via the electrical PTC low temperature battery.

This operating mode provides guaranteed balanced air flow volume between supply air and extract air during defrosting.

Frost protection via pre-heater battery
- The pre-heater battery is enabled at outdoor air intake temperatures of less than -4 °C
- If the exhaust air temperature falls below the "Defrost On" parameter or if the difference in temperature between extract air and supply air exceeds the "Defrost Difference" parameter setting, the pre-heater battery is switched on and remains switched on for the duration of the defrosting period.
- If the exhaust air temperature exceeds the "Defrost On" parameter by 20 K, the pre-heater battery is switched off prematurely.
- If the pre-heater battery is switched off, a pause time ("Defrost Pause") parameter is loaded. The defrosting process is suspended during the pause period.
- If the unit is switched off and the pre-heater battery had been active beforehand, a fan run-on of 120 seconds is performed.

Frost protection through reduction of supply air flow volume

Attention!: This operating mode is not suitable for frost protection in low-energy houses and passive houses.

The *LG 150* compact ventilation unit range is equipped with automatic heat exchanger frost protection as standard. Frost protection is provided by switching off supply air flow volume with simultaneous constant extract air flow volume. The frost protection mechanism is an automatic safety device which pauses supply of cold outdoor air. There is a risk of the heat exchanger freezing during moderate to severe frost.

Problems can arise when this defrosting strategy is used in extremely cold outdoor air temperatures, even if the building envelope is leak-proof. Cold outdoor air cannot flow via the ventilation unit's outdoor air pipe due to the self-adjusting negative pressure in the room.

This operating mode does not guarantee balanced air flow volume between supply air and extract air during defrosting.

Frost protection by means of extract air defrosting
- The defrosting mechanism is activated only at outdoor air entry temperatures of less than -4 °C.
- If the exhaust air temperature falls below the "Defrost On" parameter value, the defrost function is started and the supply air fan is switched off. After the defrost period has elapsed, the rotational speed on the supply air fan is increased continuously.
- The difference in temperature between extract air and supply air is monitored. The defrost process starts when the "Defrost Differential" parameter setting is exceeded.
- If the heat exchanger is not defrosted after three successive attempts, the ventilation unit is switched off for eight hours. This function becomes active during extremely cold outside temperatures only. The ventilation unit returns to operation automatically after this time has elapsed.

SYSTEM EXPANSION FOR A SUPPLEMENTARY INTERNAL HEATING

In order to further increase the air-outlet temperature for the living space, a supplementary external heating system can be installed with the ventilation unit (air heating). For this purpose, an external hot water re-heater battery is integrated into the air duct system.The auxiliary heating mode is only active during winter operations!

With external hot water heater battery

An external, optional water reheater battery with 3-stage mixing motor which is inserted downstream into the supply air duct of the ventilation unit enables the supply air temperature to be increased.

Setting the temperature target value and determining the room temperature are achieved using the "TOUCH" operating unit, which incorporates the room temperature sensor. The room target temperature can be set in a range between +15°C and +35°C.

This function is not provided on the "MINI" operating unit.

The mixer runtime and mixer clock sequence parameters are provided to adjust the mixer on the control unit. The mixer operates according to a clocked control mode. The mixer is therefore only adjusted in the set clock sequence.

Where the hot water heater battery is set in the output component (factory setting), input "E2" is used as a potential-free contact. This contact is used to provide frost protection for the reheater battery.

Where this potential-free contact is fitted with an external temperature sensor which is set to an actuation temperature of +5°C, the ventilation unit switches to frost protection and a fault is reported.

This sensor is positioned immediately in front of the external heater battery in the air ducting system. In this fault state, the mixer is opened, and the circulation pump is enabled. The fans are switched off until the frost risk message is switched off.

In addition, the same frost protection strategy is used where the temperature on the integrated supply air sensor is below +5 °C.

14. Versions

The compact ventilation unit LG 150 is available in several different versions:

- right-hand or left-hand, depending on the location of the supply air connecting piece
- with or without an integrated PTC heater battery (frost protection for the counterflow heat exchanger)
- with a standard o an ethalpy exchanger for moisture recovery

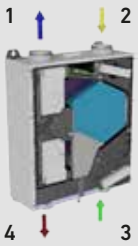
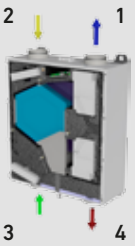
Advantages of the enthalpy exchanger:

Humidity-transferring counter flow enthalpy exchanger with selective polymer membrane for heat and moisture recovery.

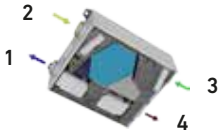
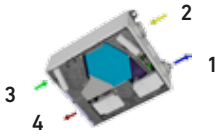
- Enthalpy exchangers ensure optimal comfort within your rooms.
- During normal operation, the generation of condensate is prevented as far as possible. In contrast to a standard heat exchanger, the enthalpy exchanger only stops at low temperatures.
- The enthalpy exchanger prevents your rooms from drying out in winter.

LG 150 A UND LG 150 B

Wall-mounted version LG 150 A	**Left-hand version**	**Right-hand version**
Item no. without an integrated PTC heater battery	08LG150AWL	08LG150AWR
Item no. with an integrated PTC preheater battery	08LG150AWLV	08LG150AWRV
Item no. without an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150AWLF	08LG150AWRF
Item no. with an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150AWLFV	08LG150AWRFV

Wall-mounted version LG 150 B	**Left-hand version**	**Right-hand version**
Item no. without an integrated PTC heater battery	08LG150BWL	08LG150BWR
Item no. with an integrated PTC preheater battery	08LG150BWLV	08LG150BWRV
Item no. without an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150BWLF	08LG150BWRF
Item no. with an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150BWLFV	08LG150BWRFV
Wall mounted		

Ceiling-mounted version LG 150 A (in final assembly min. 2 % inclined assembled)	**Left-hand version**	**Right-hand version**
Item no. without an integrated PTC heater battery	08LG150ADL	08LG150ADR
Item no. with an integrated PTC preheater battery	08LG150ADLV	08LG150ADRV
Item no. without an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150ADLF	08LG150ADRF
Item no. with an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150ADLFV	08LG150ADRFV

Ceiling-mounted version LG 150 B (in final installation min. 2 % inclined assembled)	**Left-hand version**	**Right-hand version**
Item no. without an integrated PTC heater battery	08LG150BDL	08LG150BDR
Item no. with an integrated PTC preheater battery	08LG150BDLV	08LG150BDRV
Item no. without an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150BDLF	08LG150BDRF
Item no. with an integrated PTC heater battery and with an enthalpy exchanger for moisture recovery	08LG150BDLFV	08LG150BDRFV
Ceiling mounted		

1 Supply air *2 Extract air* *3 Outdoor air* *4 Exhaust air*

15. Control units (valid from version 2.0)

"MINI" SPECIAL SETTINGS FOR SPECIALIST PERSONNEL

Basic functions for users, *see User Information, Section 7.*

Basic ventilation and volume flow can be configured by pressing certain combinations of buttons on the "MINI" control unit.

Switch basic ventilation on/off
By pressing the "Summer" and "Winter" buttons simultaneously for 3 seconds, the user is taken to the Settings menu. The setting is configured with the Plus and Minus buttons.

If no buttons are pressed for 5 seconds, the parametered value is stored and the control unit returns to the main menu.

If the LED of ventilation level I flashes, the Basic Ventilation is deactivated. It is possible to switch off the ventilation unit using the control unit.
The Basic Ventilation function is activated when the LED of ventilation level I is lit. It is **not** possible to switch off the ventilation unit via the control unit.

Setting air flow volume, ventilation level I
Users can access the menu for ventilation level I by pressing the "Summer" and [+] button buttons simultaneously for 3 seconds.

The volume flow is configured using the [+] and [-] buttons. If no buttons are pressed for 5 seconds, the parametered values are stored and the control unit switches to the main menu.

Configuration of ventilation level I begins with an air volume flow of 30 m^3/h (LG 150 A and LG 150 B) if no LED lights up. By respective flashing or lighting of the individual LEDs, the volume flow increases by 10 m^3/h up to a maximum of 90 m^3/h (LG 150 A) or 100m^3/h (LG 150 B).

Setting air flow volume, ventilation level II
Users can access the menu for ventilation level II by pressing the "Winter" and [-] button buttons simultaneously for 3 seconds. Ventilation level II can be configured from 60 m^3/h (LG 150 A) or from 70 m^3/h (LG 150 B) (no lighting LED) up to a maximum of 130 m^3/h (LG 150 A) or 150m^3/h (LG 150 B) in stages of 10 m^3/h.

Setting air flow volume, ventilation level III
Users can access the menu for ventilation level III by pressing the "Summer" and [-] button, buttons simultaneously for 3 seconds. Ventilation level III can be configured from 90 to 150 m^3/h (LG 150 A) or from 100 to 200 m^3/h (LG 150 B).

By respective flashing or lighting of the individual LEDs, the volume flow increases by 10 m^3/h. If no LED is lighting, the lowest air flow volume is set in ventilation level I, II or III.

Ventilation level	Air flow volume	
	LG 150 A	*LG 150 B*
Basic ventilation	30–60 m^3/h	30–60 m^3/h
I	30–90 m^3/h	30–100 m^3/h
II	60–130 m^3/h	70–150 m^3/h
III	90–150 m^3/h	100–200 m^3/h

For more Information about error signals and reasons, see Section 20 „Troubleshooting".

"TOUCH" SPECIAL SETTINGS FOR SPECIALIST PERSONNEL

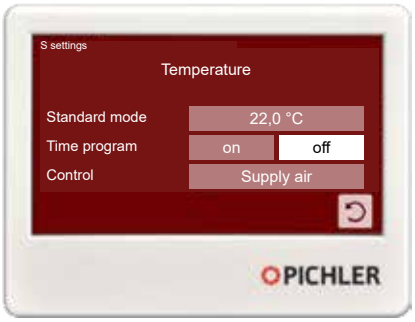
The Service menu is activated by pressing the Menu button for an extended period (min. 5 seconds) and entering the customer service password.

The Service menu is indicated with a "S" in the top left edge of the screen.

The technician can change the unit's parameters after activating the Service menu.

Change temperature control type

The "Control" menu item is accessed through the service menu in the home screen under temperature. There is a choice between "supply air", "extract air" and "room" temperature control.

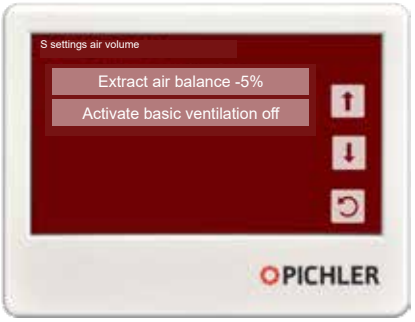


Current operating values

All of the unit's parameters can be checked in the main menu -> "Information" -> "Current Operating Values".

Activate extract air balance & basic ventilation

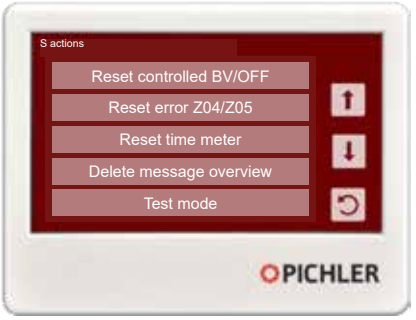
Extract air balance and basic ventilation settings can be adjusted under "Menu" -> "Air Volume" -> on the 2nd page.

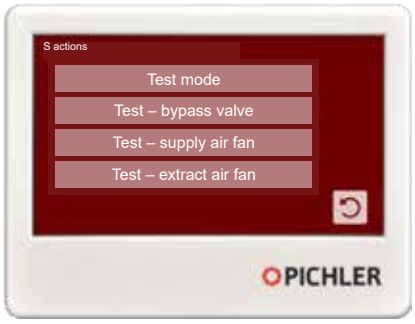


Actions

"Menu" -> "Actions" is extended with the following menu items.

- Reset Controlled BV/Off, *see page 18*
- Reset Error Z04/05, *see page 19*
- Reset time meter
- Delete message overview
- Update the system's firmware
- Test mode: Test the unit's basic functions

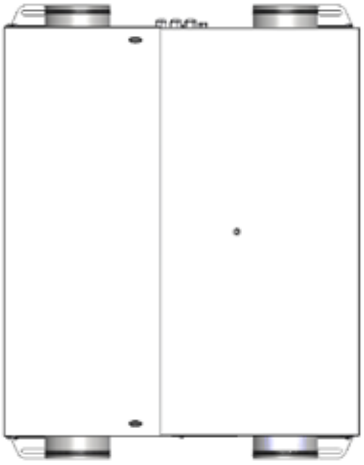




- Test mode: Test relays
- Test – bypass valve: Bypass valve control e.g. heat recovery (HR), bypass (open), pre-heater battery (PHB), error position (error), normal
- Test – supply air fan: The supply air fan can be regulated from 0 to 100 %.
- Test – extract air fan: The extract air fan can be regulated from 0 to 100 %.

16. Installation

PREREQUISITES FOR UNIT INSTALLATION



The LG 150 domestic ventilation unit may be installed and operated appropriately at a fixed electrical installation only, with a separating device for complete isolation in accordance with the conditions of overvoltage category III and the relevant regulations for installation.

Observe the safety instructions provided in *Section 4 when carrying out all work!*

The LG 150 compact ventilation unit must be installed in accordance with the generally and locally applicable safety and installation regulations and with the instructions provided in this manual. Mounting and installation work may be performed by authorised specialist personnel only.

Preliminary work:
The ventilation unit is supplied ready for use.

All on-site work (drainage, wall and ceiling openings, etc.) must be completed before installing the ventilation unit. The ventilation unit is fixed in place and can no longer be moved after completion of installation and connection of air pipes. The maximum permissible load must be observed when transporting the unit.

Installation site:
The ventilation unit may be installed in a frost-free location only, e.g. in a cellar, storeroom or loft, at ambient temperatures of between +5 °C (minimum) and +40°C (maximum). Accumulating condensate water must be discharged, frost-free and safely, via a gradient and using effective siphoning to block odours.

The unit's installation position must allow sufficient space for air ducts, electrical connections, condensate drain connection and maintenance and inspection.

Clearance of approx. 1 m must be provided in front of the unit for operating and maintenance works.

The following connection facilities must be available in the installation area:
- Air duct connections for supply, extract, outdoor and exhaust air
- Electrical mains connection 230 V/ 50 Hz, 13 A fuse
- Condensate drain pipe with active odour trap (siphon)

Protective grating:
To protect the unit 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 inlet point for outdoor air. Its level of contamination should be checked monthly and it should be cleaned if necessary.

The protective grating must be inspected 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 of the unit.

WALL MOUNTING

Condensate cup with R 1/2" AG condensate connection

Example of wall mounting

1. Solid wall:
Wall mounting: the ventilation unit is mounted to a suitable, level solid wall. The unit must not be exposed to vibration of any kind.

2. Horizontal positioning:
It must be ensured that the ventilation unit is aligned and positioned horizontally in relation to the condensate cup. Safe run-off of condensate water must be ensured.

3. Mounting:
The unit is mounted to the wall by means of four mounting straps which must bear against the wall. The fastening screws are screwed in via the drilled holes on the mounting straps by means of assembly dowels in the wall.

4. Condensate water connection (Standard heat exchangers only):
Requirements for cleaning and filling the condensate drain provided by the customer are outlined in *Section 18*.

The *condensate drainage* pipe from the unit outlet should preferably be laid with a continuous gradient of at least 5 % via an active siphon using rigid piping.

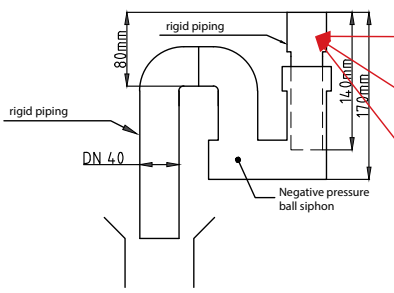
If the gradient is too low or if cables are run horizontally, the condensate collected cannot flow out of the ventilation unit and may cause water damage.

For proper connection of the LG 150 ventilation unit, we recommend condensate trap model HL 136.3 (negative pressure ball siphon) as a siphon for the unit.
Fill the siphon with water to effectively prevent odours and to avoid leakage. For installation, please refer to the diagram below.

Attention!: Perfect functioning of the condensate drainage must be checked and ensured before putting the compact ventilation unit into operation. The siphon provided by the customer or condensate drain pipe must be filled with an active water seal.

Never operate the ventilation device with the inspection doors open and ensure that the front covering is installed correctly.

WALL CONDENSATE DRAIN CONNECTION



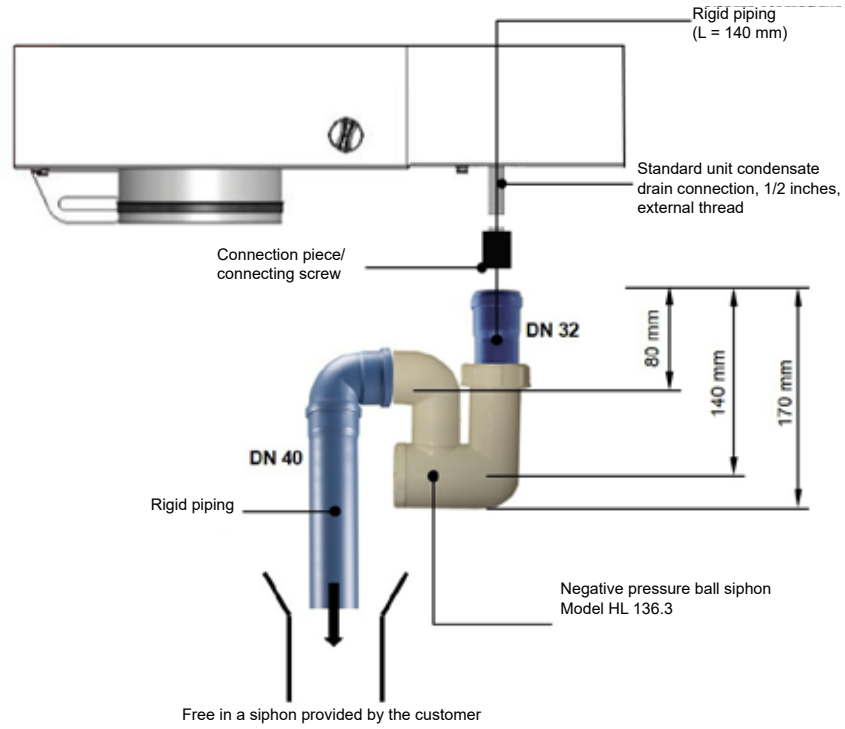
Example: condensate drain connection with connecting screw and HL 136.3 ball siphon

ACCESSORY ITEMS (see page 55 for item numbers)

Connector HL40.2 for HT pipe ø 40 mm

Connector HL30.2 for HT pipe ø 32 mm

Connecting screw for HL 136.3 ball siphon



Siphon provided by the customer: For reasons of hygiene, the water in the unit's siphon must flow freely into the siphon provided by the customer. Therefore, the two siphons must be separate from each other spatially.

CEILING INSTALLATION

1. Solid ceiling:
Ceiling installation: the ventilation unit is mounted to a suitable, level solid ceiling.

2. Mounting:
The unit is mounted to the ceiling via four mounting straps. The fastening screws are screwed in via the drilled holes on the mounting straps by means of assembly dowels in the ceiling (min. traction force 0.5 kN).

For ceiling installation, the ventilation unit is pre-configured so that it is mounted at an offset angle on the side of the siphon. Hence, the ventilation unit is automatically mounted with a gradient of at least 2 % in the direction of the condensate drain connection. Separate spacer bushings or similar accessories are not required.

This ensures an appropriate gradient for safe discharge of condensate water. The condensate drainage pipe from the unit outlet, provided by the customer, must be installed with a continuous gradient of at least 5 %.

3. Condensate drain connection (standard heat exchanger only):
Requirements for cleaning and filling the condensate drain provided by the customer are outlined in *Section 18*.

For installation in a suspended ceiling, an assembly opening must be provided in order to enable potential filter changes and parts replacement.

The assembly opening must have at least the dimensions of the front of the device in order to ensure a disassembly of the entire front cover. An assembly opening, which only takes into account the dimensions of the inspection cover to replace the air filters, is not sufficient.

The *condensate drainage* pipe from the unit outlet should preferably be laid with rigid piping and with a continuous gradient of at least 5 % via an active siphon.

If the gradient is too low or if cables are run horizontally, the condensate collected cannot flow out of the ventilation unit and may cause water damage.

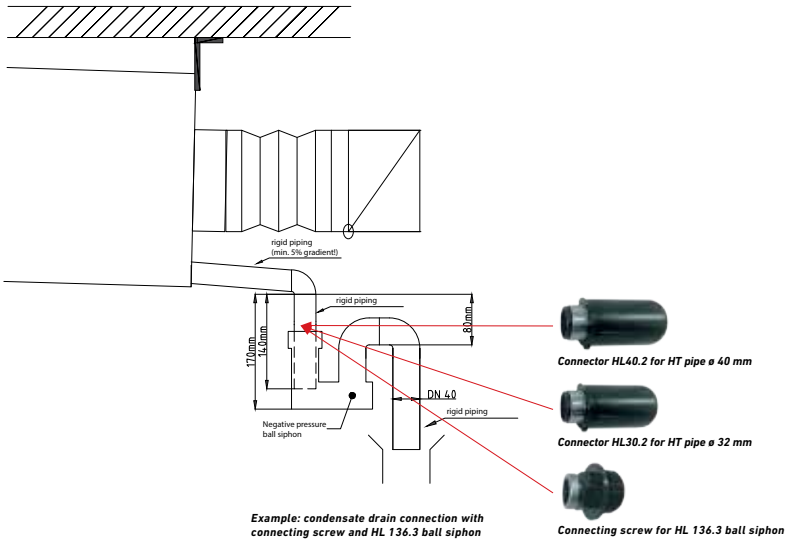
For proper connection of the LG 150 ventilation unit, we recommend condensate trap model HL 136.3 (negative pressure ball siphon) as a siphon for the unit.
Fill the siphon with water to effectively prevent odours and to avoid leakage. For installation, *please refer to the diagram below.*

Attention!: Perfect functioning of the condensate drainage must be checked and ensured before putting the compact ventilation unit into operation. The siphon provided by the customer or condensate drain pipe must be filled with an active water seal.

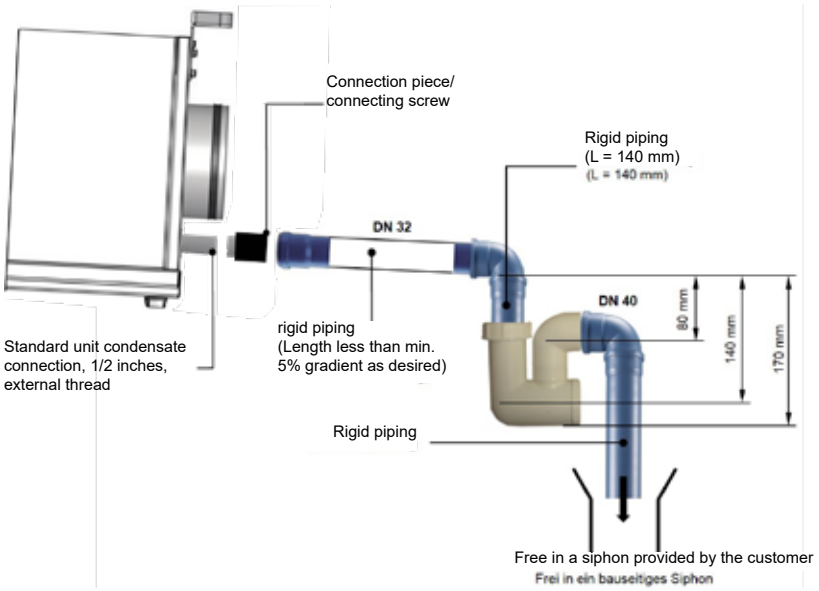
Never operate the ventilation device with the inspection doors open and ensure that the front covering is installed correctly.

Example of ceiling installation

WALL CONDENSATE DRAIN CONNECTION



Example: condensate drain connection with connecting screw and HL 136.3 ball siphon



Siphon provided by the customer: For reasons of hygiene, the water in the unit's siphon must flow freely into the siphon provided by the customer. Therefore, the two siphons must be separate from each other spatially.

ACCESSORY ITEMS (for item numbers, see page 55)

CONNECTING AIR DUCTS AND COMPONENTS

1 Supply air
2 Extract air
3 Outdoor air
4 Exhaust air

The unit's connectors must be connected to air duct connections. Airtightness and vibration isolation must be ensured.

Air pipes and attachments such as sound absorbers etc. may only be attached to the ventilation unit using adequately dimensioned elements for mounting to suitable solid wall or ceiling structural components.

Avoid using flexible hoses for connections to the unit.

When connecting pipes, ensure that no tools or assembly material fall into the unit's connections or onto the unit itself. This could cause damage components such as fan blades.
Air duct and installation components must be suitably and adequately insulated in accordance with project specifications.

Air connections:
The outdoor air and exhaust air ducts, e.g. between the ventilation unit and the roof feed-through, must be sufficiently insulated for energy reasons and to prevent condensate formation.

Condensate must not be allowed to form on the air ducts and roofing. Any lines running outside the thermally insulated building shell must be adequately insulated in cold areas.

To ensure proper and functional operation of the unit, suitable thermal and sound insulation and installation materials must be provided as per the planning documentation and technical data, such as sound absorbers of adequate size, supply air and extract air valves, overflow openings etc.

Sound absorbers must be factored in to ensure appropriate noise levels in the living space.

LEGEND FOR THE SYMBOLS USED

The corresponding air type for each connection piece on the ventilation unit is marked by means of a symbol.

Extract air

Outdoor air

Exhaust air

Supply air

SEALING

Non-corrosive, neutrally cross-linking sealing materials must be used for all sealing required during installation. For example Sikaflex®-221, silicone-free (Art. No.: 12DMAUSSEN).

BEFORE PUTTING INTO OPERATION

Fill the condensate water drip tray with sufficient water before putting the ventilation unit into operation. Check that water is drained safely and that all connections are impermeable.

Remove all tools and assembly materials from the unit when work is complete. Ensure that no tools or assembly materials remain in the unit as these may damage or destroy the unit when it is put into operation.

17. Electrical connection

- Warning: hazardous electrical voltage!
- Disregarding the hazard may result in death, injury or material damage.

- 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 and work on electrical components may only be carried out by authorised electricians only.

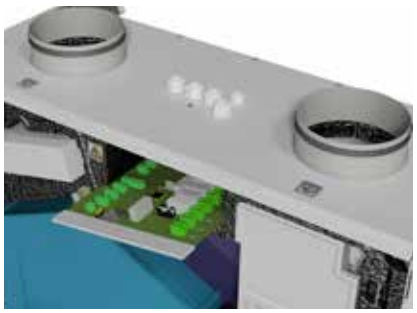
The relevant national and local regulations and standards must be complied with during assembly and electrical installation.

The LG 150 compact ventilation unit is designed for a 230 V/50 Hz power supply. The unit is not designed for connection to three-phase supply with 400 V/50 Hz.

The safety information under Item 4 – and, in particular, the point on electrical connections – must be observed when performing any electrical work.

- Electrics must be connected in accordance with the associated wiring diagram (see page 45).
- 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 supply pipe's input fuse must have isolating characteristics.
- Only impulse or AC/DC sensitive earth leakage circuit breakers (type A or B) with a 30 mA tripping current are permitted.
- 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.)

PROCEDURE



1. Open the unit
When opening the ventilation unit for electrical connection works, the front cover - including the inspection doors - must be unscrewed.

2. Remove the control board
Extract the control board from the withdrawable unit far enough for the required plug positions to be accessible.

3. Cable feed-throughs
Connection cables must be fed through the cable glad on the top of the ventilation unit in order to connect the cables for the relevant control unit as well as optional system components such as external reheating or external sensors.

4. Connecting the control unit to the control board
The control system consists of a service board and a control unit. The service board is connected to the control unit using a bus connection. The service board can communicate internal statuses and operating and fault messages to the control unit via this line connection.

A screened cable J-Y(ST)Y2x2x0.8 is required to establish the connection. Cable length must not exceed 100 m. The screening must be connected to the ventilation unit's PE protective earthing. The connecting cable is not included in the scope of supply.

The plug is connected to the service board and control unit with a box header.

"MINI" CONTROL UNIT INSTALLATION

A suitable installation site must be chosen for the control unit i.e. not in the vicinity of equipment affected by temperature, not directly at windows, not in direct sunlight and not behind or in furniture.

The "MINI" control unit does not have an integrated temperature sensor. This must be installed externally if required and connected to the control system.

The room temperature sensor is required for the control system's regulating action (optional extract air, supply air or room temperature control). This function is described in ***Section 19: "Adjustable Parameters"*** of this guide.

The "MINI" control unit is installed by screwing the mounting bracket supplied into an conventional electrical installation wall socket. The control unit and cover frame are attached to the mounting bracket after plugging in the connection cable. The fastening plate must be mounted on a level surface using flat countersunk screws, to ensure that all components fit optimally.

"TOUCH" CONTROL UNIT INSTALLATION

The temperature sensor is located on the underside of the control unit. To ensure accurate and conclusive temperature measurement, it is important to place the control unit in a location that:

- is not exposed to direct sunlight.
- is not located directly above or close to a direct source of heat (e.g. room heater).

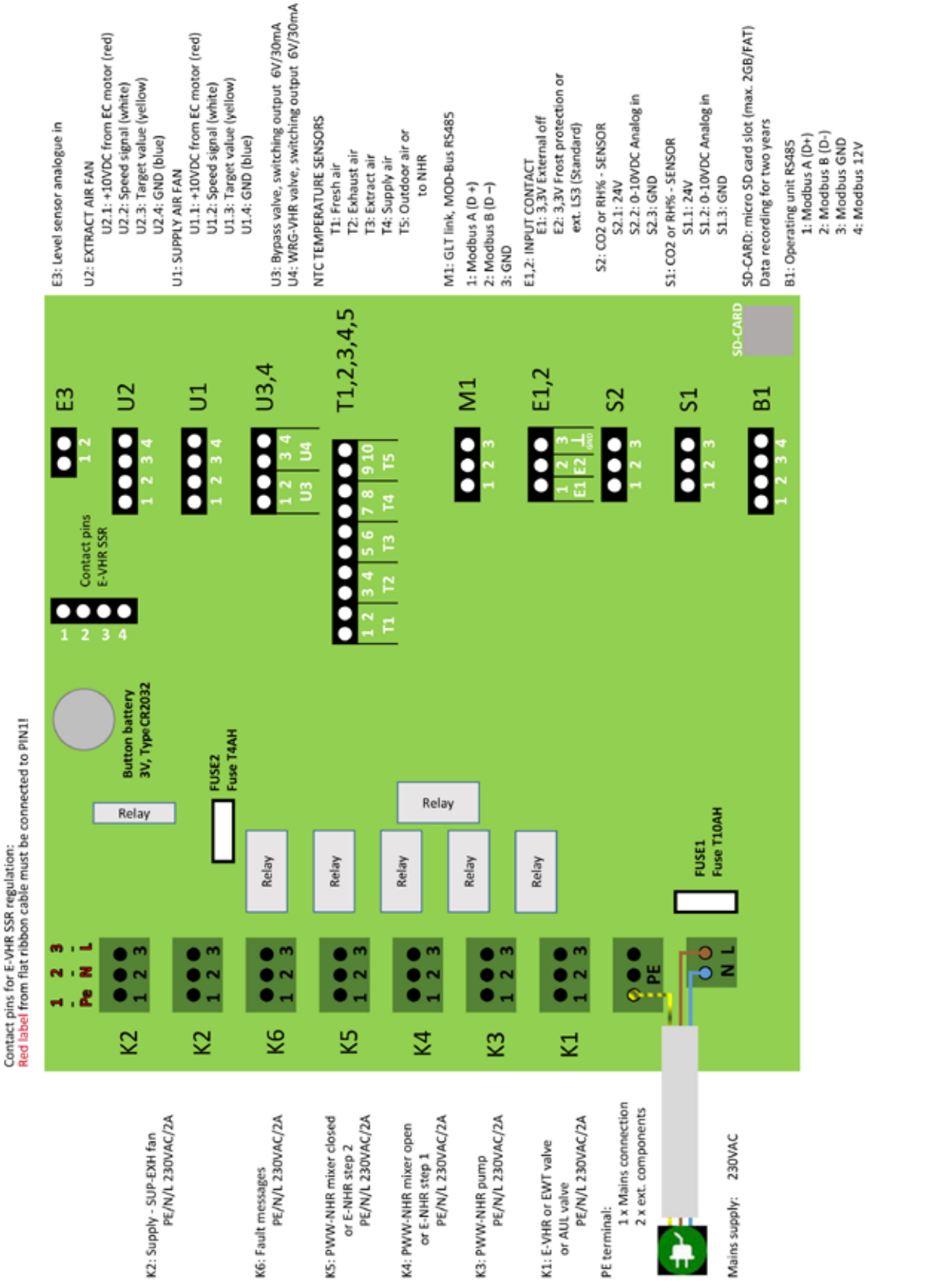
The "TOUCH" control unit is installed by screwing the mounting bracket supplied into an ordinary electrical installation wall socket. The control unit and cover frame are attached to the mounting bracket after plugging in the connection cable.

Figure: "TOUCH" control unit wall mounting

CIRCUIT AND WIRING DIAGRAM

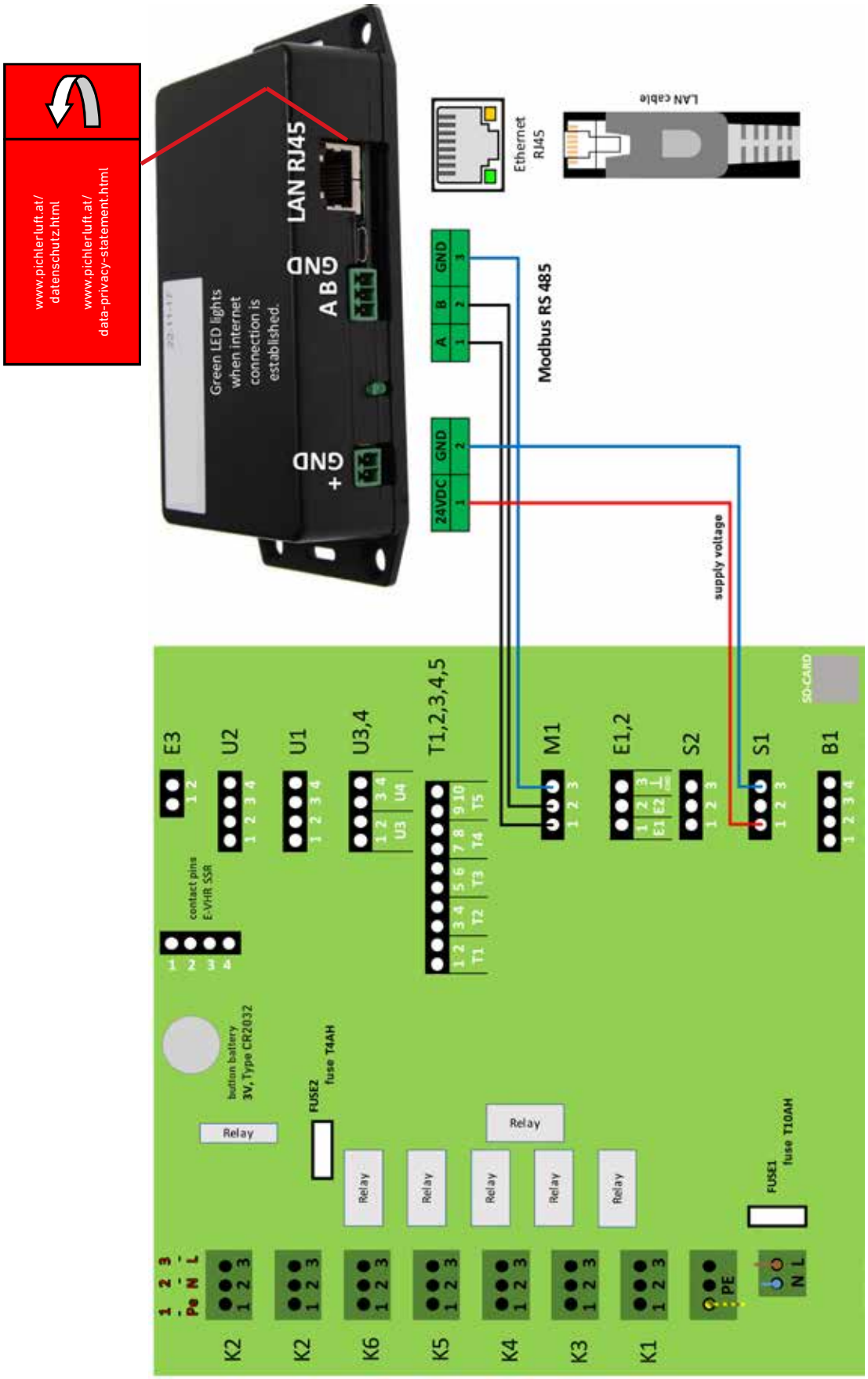
In general, external system components, extension components and temperature sensors required must be connected in accordance with the electrical connection diagram.

Temperature sensors T1 to T4 are factory-wired. The control system automatically recognises when outside temperature sensor T5's electrics are connected.

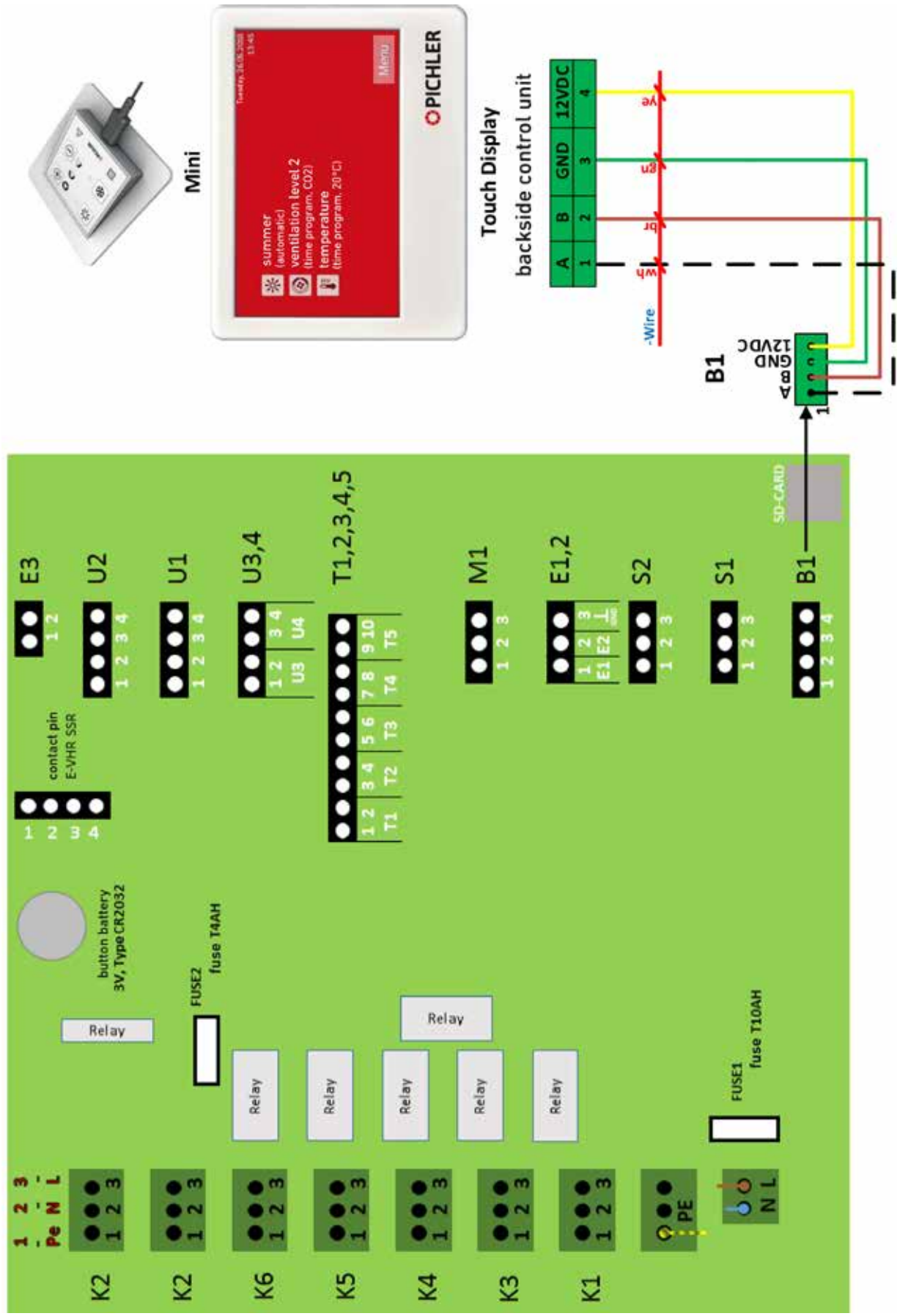


CIRCUIT AND WIRING DIAGRAM GATEWAY

The gateway communicates via the Modbus RTU connection of the building control system (BCS). Therefore only either the gateway or the Modbus RTU can be used for the BCS, and not the two options at the same time.



CIRCUIT AND WIRING DIAGRAM CONTROL UNIT „MINI“ OR „TOUCH“



MAINS CONNECTION

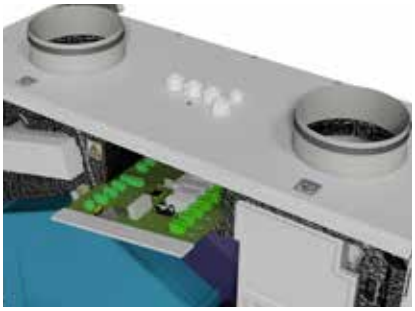
The ventilation unit is ***not ready to be plugged in*** on delivery. It is supplied with a ready-to-use mains power cable, 1 m in length. After successful unit installation, the mains must be connected properly on-site using the connecting cables.

The ventilation unit may be operated with the rated voltage indicated on the nameplate only. The supply pipe must be secured with 13A.

The supply pipe's input fuse must have isolating characteristics.

The power connection must be connected in accordance with the specifications in the wiring plan. The supply pipe must be dimensioned by an authorised electrician in full compliance with the relevant guidelines.

Only impulse or AC/DC sensitive earth leakage circuit breakers (type A or B) with a 30 mA tripping current are permitted.



Control board

Before working on the control board, the unit must be isolated from the mains (all poles) and protected from being switched back on.

After dismantling the front cover and removing the control board, the terminals for the control lines and the electrical input fuse are accessible.

Control lines

All lines for external components such as 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.

Fault alarm output

230 VAC and I_{max} = 0,5 A
(see circuit diagram).

Circulating pumps

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

Replacing the unit's internal fuse

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

Internal fuse: Glass tube fuse, 10 A ø 5 x 20 mm, slow-blow.

Re-heater battery (external)

An external temperature sensor is required for connection of an external re-heater battery. The external supply air sensor (available as an optional accessory), 2 m in length, is connected to input T5 and installed in the air duct after the heater battery.

The user must switch to the "Re-heater Battery" parameter in the operating software. If a temperature sensor is not connected to input T5, a fault message is output.

18. Maintenance and cleaning

SAFETY INSTRUCTIONS

Always pull the mains plug or fully isolate (all poles) of the ventilation unit from the mains when carrying or maintenance work on the ventilation unit an secure against renewed switc-on.

Other unit parts and components e.g. geothermal heat exchanger, pre- and re-heater battery, sound absorbers etc. must be serviced and cleaned in accordance with the regulations and instructions.

Exercise caution and be aware of safety and hazards when opening the maintenance doors and unscrewing the front panel or covers. 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.

Observe the safety instructions in ***Section 4, particularly the "Electrical Connection Works"*** item, when carrying out any electrical work.

MAINTENANCE INSTRUCTIONS FOR SPECIALIST COMPANIES

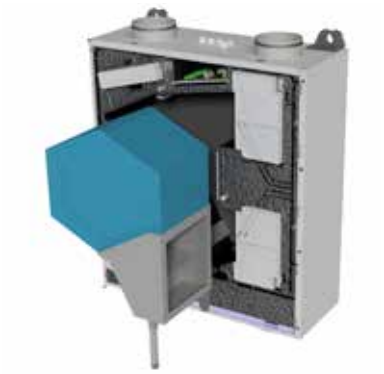
The work described below may be carried out on the ventilation unit by specialists only. Any defects detected during servicing must be remedied immediately to ensure safe operation of the unit. Only original spare parts may be used for repairs and replacements.

HEAT EXCHANGER

Cleaning interval:
The heat exchanger must be checked for soiling at least once a year. We recommend cleaning as needed, depending on the heat exchanger's level of soiling.

Disassembly:

1. The front panelling must be unscrewed in order to perform maintenance on the heat exchanger.
2. Unscrew both condensate plugs from the condensate drip tray.



3. The condensate tray is then extracted by approx. 10 cm from the base housing in order to dismantle the fill level monitor.
4. The heat exchanger can then be removed completely from the ventilation unit.

Cleaning:
The heat exchanger is cleaned by rinsing with hot water (maximum 50°C) and ordinary (non-corrosive) cleaning agent. After cleaning, rinse with warm water. Never blow compressed air through the exchanger. This can destroy the unit.

Installation:

1. Before installing the exchanger in the unit, the four sealing mats on the heat exchanger must be greased lightly to ensure easy and smooth insertion.
2. Ensure that the condensate drip tray is initially inserted only far enough to ensure that the fill level monitored can be reinstalled.
3. Only then can the condensate drip tray be inserted fully.
4. After returning the heat exchanger to its position, both condensate plugs must be screwed back into the condensate drip tray. Take care to ensure correct positioning.

ENTHALPY EXCHANGER

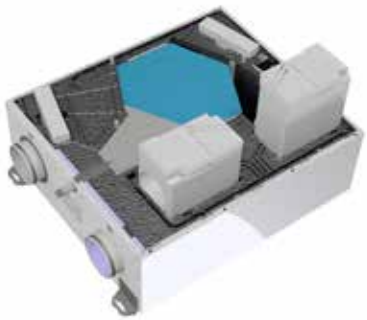
Cleaning interval:
For devices with enthalpy exchangers, the level monitor must be visually inspected for corrosion at least once a year.

FANS

The motor housing may be opened and works performed on the motor's electrical components by the manufacturer of the fan only. If the fan is defective in any way, it must be replaced with a new, original fan.

Cleaning
Cleaning may be required depending on the fans' level of soiling.

1. Maintenance and cleaning work on the fan is restricted to the fan housing and rotor.



2. Before carrying out any work on the fans, the unit must be disconnected completely from the power supply (all poles) and secured against being switched back on.
3. The front panelling must be unscrewed in order to access the fans.
4. The fan unit can be extracted from the basic housing along with the fan's housing.
5. Pay attention to the electrical connecting cable to the motor. It must not be damaged.
6. The fan housing can then be opened and the fan removed.
7. Use a soft brush to clean the fan blades. The fan housing is cleaned with a vacuum cleaner.

Avoid causing damage to the fan blades. Do not remove or damage wheel balance weights as this may cause an imbalance of the rotor which, in turn, may increase noise and vibration levels.

ELECTRICAL PTC PRE-HEATER BATTERY (OPTIONAL)

Cleaning interval:
We recommend cleaning the electrical PTC pre-heater battery at least once a year, depending on its level of soiling.

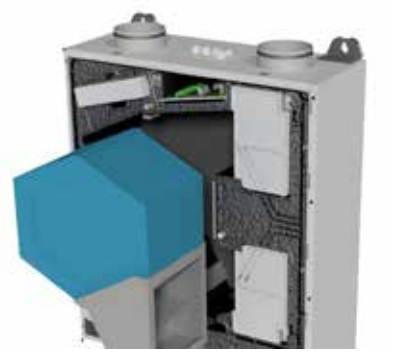
Attention! Never move the bypass flaps by hand!

Cleaning

1. Before commencing any work on the electrical heater batteries, the ventilation unit must be disconnected completely from the power supply (all poles) and secured against being switched back on.
2. After opening the mounting straps, the complete bypass valve assembly must be removed carefully from the ventilation unit for cleaning purposes. Pay attention to the electrical connection. It must not be damaged.
3. The battery's blades may not be damaged during cleaning.
4. Use compressed air, a vacuum cleaner or a soft brush to remove dust.
5. When cleaning external electrical pre-heater batteries, it is essential that the prefilter is also checked (if present) and that it is replaced if soiled.

UNIT HOUSING - INTERIOR CLEANING

Cleaning interval:
We recommend cleaning at least once a year, depending on the level of soiling.



Cleaning
Handle the insulated surfaces of the housing with care when cleaning. Using excessive force during cleaning, e.g. wiping or scrubbing, can cause damage to insulating surfaces. 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 temperature sensors and the electrical wiring.

CONDENSATE DRAINAGE

Cleaning interval:
Depending on the level of soiling and on temperatures, cleaning the condensate drain, drainage pipe and siphon at least once a year is recommended. Fault-free functioning of the condensate drainage pipe and of its components must be ensured for safe operation of the unit.

Cleaning
1. To carry out maintenance tasks, screw off the housing front first. Then you can carefully pull out the heat exchanger including the condensate cup and the condensate drain forwards from the basic housing.
2. In the case of devices with an enthalpy exchanger the fill level monitor has to be dismounted or unplugged from the control board. Here the condensate cup is designed without a condensate drain.
3. Remove any deposits or blockages in the discharge pipe and siphon.
4. Clean the condensate cup with a damp cleaning cloth.

Functional test:
5. It is essential that a functional test of the condensate drainage system is conducted after completion of cleaning.
6. To do so, fill the condensate drip tray must be with a sufficient quantity of water and ensure that the entire volume of water that is filled can drain off safely via the condensate drainage line into the drain pipe. Ensure that the system is watertight.
7. Fill the odour trap (siphon) with water before switching the unit back on to prevent unpleasant smells and leaks.

Use an ordinary watering can or similar for this purpose.

MAINTENANCE TABLE

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

Unit installed by:			Date
No.	**Maintenance works (e.g. filter change)**	**Performed by Signature**	**Date**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

19. Initial start-up

The ventilation system must be complete, connected and ready for operation before it is put into operation for the first time. The unit can be put into operation and system settings can be configured only when all work on the system is complete.

The factory settings on the control unit may be changed by a specialist installer only. Incorrect settings may cause the unit to malfunction.

Ventilation level	Operating mode	Designation	Volume flow	
			LG 150 A	*LG 150 B*
I	Basic ventilation	Reduced ventilation mode with minimal domestic ventilation	50 m^3/h	60 m^3/h
II	Standard ventilation	Ventilation level active if no other ventilation level is selected manually or automatically	90 m^3/h	110 m^3/h
III	Intensive ventilation	Operation with increased volume flow, boost ventilation for short, intensive building ventilation	130 m^3/h	180 m^3/h

Ventilation level factory settings

Basic process for putting into operation

- Inspecting the unit prior to putting in operation
- Are all air ducts and components fully installed and airtight?
- Are all system components fitted and electrically connected?
- Is the electric wiring complete and the control unit fitted?
- Is the condensate drainage system complete?
- Are the air vents, inlet and outlet valves 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 all fire dampers used open (if applicable)?

Setting system parameters

- Check system components and correct settings where necessary.
- Set system parameters, e.g. adjust volume flow/ventilation level.
- Set software's system clock

20. Troubleshooting

Error descriptions are provided for the corresponding light patterns in the following table. Errors can be located precisely using the service software (available to specialist personnel only).

Model	Error
Flashes once	Z05
Flashes twice	Z04
Flashes three times	Z06, Z07, Z08, Z09, Z10, Z11, Z12, Z13, Z14, Z15
Flashes 4 times	Z01, Z03, Z17, Z18, Z21
Flashes 5 times	Z02
Filter LED lights up	Z16

Model	Attention
Filter/error LED flashes 6 times	Z20
Filter LED flashes 6 times	Z19

Model	Error
Z01	Inspect geothermal heat exchanger if supply air/extract air temperature is exceeded
Z02	Fault during data transmission
Z03	Danger of freezing - hot water re-heater battery
Z04	Extract air fan blocked
Z05	Supply air fan blocked
Z06	Short circuit temperature sensor T1
Z07	Short circuit temperature sensor T2
Z08	Short circuit temperature sensor T3
Z09	Short circuit temperature sensor T4
Z10	Short circuit temperature sensor T5
Z11	Outage temperature sensor T1
Z12	Outage temperature sensor T2
Z13	Outage temperature sensor T3
Z14	Outage temperature sensor T4
Z15	Outage temperature sensor T5
Z16	AReplace extract air/supply air filter (filter LED lights up)
Z17	Condensate drip tray full
Z18	Bypass valve error (current monitoring))
Z21	Re-heater battery frost protection active

Model	Attention
Z19	Fan differential - basic ventilation
Z20	Fan differential too high

21. Installation/Operation of service software and firmware updates

The control unit must be connected to a laptop via the micro-USB cable in order to perform troubleshooting.

Further information on installation/operation of service software and firmware updates is available from certified partners on request.

Service hotline: +43 (0)463 32769-290
Email: service@pichlerluft.at

22. Spare parts and accessories

Only original spare parts may be installed or used for replacement work and repairs. Dependable operation is ensured only if original spare parts are used.

CONTROL ELEMENTS

Designation	Item number
"MINI" control unit	08LGMINI150200
"TOUCH" control unit	08LG150250TC
CO_2- sensor	07RCO248330
Humidity sensor	07RHF49360
Humidity and CO_2-sensor	07RCO2TRH
Glass fuse, slow-blow, 10 A ø 5 x 20 mm	40LG040110
Humidity and VOC-sensor	07KVOCTRH
External NTC temperature sensor; length 2 m	40LG041920

SYSTEM COMPONENTS

Designation	Item number
VBC water reheater battery	01VBC125
PVC screw joint; ½ inch to 1¼ inch	08REDPVC11412
Connector HL40.2 for HT pipe ø 40 mm; made from PE	08UEGSHL40R12PE
Connector HL30.2 for HT pipe ø 32 mm; made from PE	08UEGSHL30R12PE

AIR FILTER

Designation	Item number
Filter ODA ISO ePM2,5 55% outdoor air, standard)	40LG050230
Filter ETA ISO Coarse 70% (extract air, standard)	40LG050240
Filter ODA ISO ePM1 80% (optional)	40LG050250

GATEWAYS

Designation	Item number
Modbus/Nabto-Gateway	08GATEWAYNABTO
Modbus/KNX-Gateway	08KNXGAB

23. Product data sheets

PRODUCT DATA SHEET: LG 150 A

	manual control	clock control	central demand control	local demand control	
Specific energy consumption (SEC)					
cold climate	-77,5	-78,5	-80,4	-83,7	[kWh/(m²·a)]
average climate	-38,3	-39,2	-40,8	-43,7	[kWh/(m²·a)]
warm climate	-13,2	-14,1	-15,6	-18,1	[kWh/(m²·a)]
Specific energy consumption class	A	A	A	A+ (most efficient)	
Type					
"residential ventilation system", "bidirectional ventilation system"					
Motor and drive					
variable speed			x-value	2	[-]
Type of heat recovery system					
recuperative					
Thermal efficiency of heat recovery			η_t	92,4%	[-]
Maximum flow rate			q_{Vd}	150	[m³/h]
Electric power input of the fan drive, including any motor control equipment, at maximum flow rate			P_E	54,9	[W]
Sound power level			L_{WA}	39	[dB(A)]
Reference flow rate			q_{Vn}	105	[m³/h]
Reference pressure difference			p_{tU}	50	[Pa]
Specific power input			SPI	0,25	[W/(m³/h)]
Ventilation control (CTRL)					
local demand control	1	0,95	0,85	0,65	[-]
Maximum air leakage rate referred to reference flow rate					
internal			q_{vi} / q_{Vn}	0,86%	[-]
external			q_{ve} / q_{Vn}	1,05%	[-]

Filter change

The filters are to be replaced as soon as:
- the warning light appears on the operator control unit "MINI"
- the command to replace the filters appears on the display of the operator control unit "TOUCH"
  (marked red in the pictures alongside)

Operator control unit "MINI"

Operator control unit "TOUCH"

CAUTION:
If the filters are not changed regularly, the system can not work efficiently and the power consumption increases.

Waste disposal

Units that are no longer in working order have to be dismantled and properly disposed of by a specialized company via suitable collection centres and in compliance with the waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive).

Annual electricity consumption (AEC)	3,6	3,3	2,7	1,8	[kWh electricity/a]
Annual heating saved (AHS)					
cold climate	91,1	91,4	91,8	92,8	[kWh primary energy/a]
average climate	46,6	46,7	46,9	47,4	[kWh primary energy/a]
warm climate	21,1	21,1	21,2	21,4	[kWh primary energy/a]

Information based on the current state of knowledge of EU Regulations 1253/2014 and 1254/2014
Download from: www.pichlerluft.at

PRODUCT DATA SHEET: LG 150 AF

	manual control	clock control	central demand control	local demand control	
Specific energy consumption (SEC)					
cold climate	-72,4	-73,6	-76,0	-80,3	[kWh/(m²·a)]
average climate	-35,7	-36,7	-38,6	-42	[kWh/(m²·a)]
warm climate	-12,1	-12,9	-14,6	-17,4	[kWh/(m²·a)]
Specific energy consumption class	A	A	A	A+ (most efficient)	

Type
"residential ventilation system", "bidirectional ventilation system"

Motor and drive
variable speed — x-value: 2 [-]

Type of heat recovery system
recuperative

Thermal efficiency of heat recovery	η_t	84,2%	[-]
Maximum flow rate	q_{Vd}	150	[m³/h]
Electric power input of the fan drive, including any motor control equipment, at maximum flow rate	P_E	54,9	[W]
Sound power level	L_{WA}	39	[dB(A)]
Reference flow rate	q_{Vn}	105	[m³/h]
Reference pressure difference	p_{tU}	50	[Pa]
Specific power input	SPI	0,25	[W/(m³/h)]

Ventilation control (CTRL)					
local demand control	1	0,95	0,85	0,65	[-]

Maximum air leakage rate referred to reference flow rate

internal	q_{vi} / q_{Vn}	0,76%	[-]
external	q_{ve} / q_{Vn}	1,05%	[-]

Filter change
The filters are to be replaced as soon as:
- the warning light appears on the operator control unit "MINI"
- the command to replace the filters appears on the display of the operator control unit "TOUCH"
  (marked red in the pictures alongside)

Operator control unit "MINI"

Operator control unit "TOUCH"

CAUTION:
If the filters are not changed regularly, the system can not work efficiently and the power consumption increases.

Waste disposal
Units that are no longer in working order have to be dismantled and properly disposed of by a specialized company via suitable collection centres and in compliance with the waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive).

Annual electricity consumption (AEC)	3,6	3,3	2,7	1,8	[kWh electricity/a]
Annual heating saved (AHS)					
cold climate	86,0	86,5	87,5	89,5	[kWh primary energy/a]
average climate	44,0	44,2	44,7	45,7	[kWh primary energy/a]
warm climate	19,9	20,0	20,2	20,7	[kWh primary energy/a]

Information based on the current state of knowledge of EU Regulations 1253/2014 and 1254/2014
Download from: www.pichlerluft.at

PRODUCT DATA SHEET: LG 150 B

	manual control	clock control	central demand control	local demand control	
Specific energy consumption (SEC)					
cold climate	-74,9	-76,2	-78,6	-82,7	[kWh/(m²·a)]
average climate	-35,5	-36,7	-38,8	-42,5	[kWh/(m²·a)]
warm climate	-10,3	-11,4	-13,5	-16,9	[kWh/(m²·a)]
Specific energy consumption class	A	A	A	A+ (most efficient)	

Type
"residential ventilation system", "bidirectional ventilation system"

Motor and drive			
variable speed	x-value	2	[-]
Type of heat recovery system			
recuperative			
Thermal efficiency of heat recovery	η_t	90,9%	[-]
Maximum flow rate	q_{Vd}	180	[m³/h]
Electric power input of the fan drive, including any motor control equipment, at maximum flow rate	P_E	98,8	[W]
Sound power level	L_{WA}	45	[dB(A)]
Reference flow rate	q_{Vn}	126	[m³/h]
Reference pressure difference	p_{tU}	50	[Pa]
Specific power input	SPI	0,348	[W/(m³/h)]

Ventilation control (CTRL)					
local demand control	1	0,95	0,85	0,65	[-]

Maximum air leakage rate referred to reference flow rate			
internal	q_{vi} / q_{Vn}	0,71%	[-]
external	q_{ve} / q_{Vn}	0,87%	[-]

Filter change
The filters are to be replaced as soon as:
- the warning light appears on the operator control unit "MINI"
- the command to replace the filters appears on the display of the operator control unit "TOUCH"
(marked red in the pictures alongside)

Operator control unit "MINI"

Operator control unit "TOUCH"

CAUTION:
If the filters are not changed regularly, the system can not work efficiently and the power consumption increases.

Waste disposal
Units that are no longer in working order have to be dismantled and properly disposed of by a specialized company via suitable collection centres and in compliance with the waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive).

Annual electricity consumption (AEC)	4,8	4,4	3,6	2,3	[kWh electricity/a]
Annual heating saved (AHS)					
cold climate	91,6	91,8	92,3	93,1	[kWh primary energy/a]
average climate	46,8	46,9	47,2	47,6	[kWh primary energy/a]
warm climate	21,2	21,2	21,3	21,5	[kWh primary energy/a]

Information based on the current state of knowledge of EU Regulations 1253/2014 and 1254/2014
Download from: www.pichlerluft.at

PRODUCT DATA SHEET: LG 150 BF

	manual control	clock control	central demand control	local demand control	
Specific energy consumption (SEC)					
cold climate	-67,2	-68,9	-72,2	-78,0	[kWh/(m²·a)]
average climate	-30,8	-32,3	-35	-39,8	[kWh/(m²·a)]
warm climate	-7,3	-8,6	-11,1	-15,3	[kWh/(m²·a)]
Specific energy consumption class	B	B	A	A	

Type
"residential ventilation system", "bidirectional ventilation system"

Motor and drive
variable speed — x-value: 2 [-]

Type of heat recovery system
recuperative

Thermal efficiency of heat recovery	η_t	83,4%	[-]
Maximum flow rate	q_{Vd}	180	[m³/h]
Electric power input of the fan drive, including any motor control equipment, at maximum flow rate	P_E	135,4	[W]
Sound power level	L_{WA}	45	[dB(A)]
Reference flow rate	q_{Vn}	126	[m³/h]
Reference pressure difference	p_{tU}	50	[Pa]
Specific power input	SPI	0,399	[W/(m³/h)]

Ventilation control (CTRL)					
local demand control	1	0,95	0,85	0,65	[-]

Maximum air leakage rate referred to reference flow rate			
internal	q_{vi} / q_{Vn}	0,63%	[-]
external	q_{ve} / q_{Vn}	2,06%	[-]

Filter change
The filters are to be replaced as soon as:
- the warning light appears on the operator control unit "MINI"
- the command to replace the filters appears on the display of the operator control unit "TOUCH" (marked red in the pictures alongside)

Operator control unit "MINI"

Operator control unit "TOUCH"

CAUTION:
If the filters are not changed regularly, the system can not work efficiently and the power consumption increases.

Waste disposal
Units that are no longer in working order have to be dismantled and properly disposed of by a specialized company via suitable collection centres and in compliance with the waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive).

Annual electricity consumption (AEC)	5,4	5,0	4,1	2,6	[kWh electricity/a]
Annual heating saved (AHS)					
cold climate	85,5	86,0	87,1	89,1	[kWh primary energy/a]
average climate	43,7	44,0	44,5	45,6	[kWh primary energy/a]
warm climate	19,8	19,9	20,1	20,6	[kWh primary energy/a]

Information based on the current state of knowledge of EU Regulations 1253/2014 and 1254/2014
Download from: www.pichlerluft.at

24. EC Declaration of Conformity (EG-Konformitätserklärung)

Hersteller/Manufacturer:	J. Pichler Gesellschaft m.b.H.
Anschrift/Address:	Karlweg 5 9021 Klagenfurt am Wörthersee
Bezeichnung/Product description:	Lüftungsgerät in Kompaktbauweise Serie LG 150 mit integrierter Steuerung

Ausführungen/Type:

LG150-AWR / LG150-AWL
LG150-ADR / LG150-ADL
LG150-AWRD / LG150-AWLD
LG150-ADRD / LG150-ADLD
LG150-BWR / LG150-BWL
LG150-BDR / LG150-BDL
LG150-AFWR / LG150-AFWL
LG150-AFDR / LG150-AFDL
LG150-BFWR / LG150-BFWL
LG150-BFDR / LG150-BFDL
in Verbindung mit -V (Vorheizregister)
mit Bedieneinheit Type „MINI" oder „TOUCH"

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender europäischen Richtlinien überein: *The products described above in the form as delivered are in conformity with the provisions of the following European Directives:*

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

2014/30/EG Zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit
On the harmonisation of the laws of the Member States relating to electromagnetic compatibility

2009/125/EG Richtlinie des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten zur Schaffung eines Rahmens für die Festlegung von Anforderungen an die umweltgerechte Gestaltung energieverbrauchsrelevanter Produkte
Council Directive on the approximation of the laws of the Member States establishing a framework for the setting of ecodesign requirements for energy-related products

Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen und Verordnungen:
Conformity to the Directives is assured through the application of the following standards and regulations:

VO 1253/2014/EU Verordnung (EU) der Kommission zur Durchführung der Richtlinie 2009/125/EG des Europäischen Parlaments und des Rates hinsichtlich der Anforderungen an die umweltgerechte Gestaltung von Lüftungsanlagen
COMMISSION REGULATION (EU) implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for ventilation units

VO 1254/2014/EU zur Ergänzung der Richtlinie 2010/30/EU des Europäischen Parlaments und des Rates im Hinblick auf die Kennzeichnung von Wohnraumlüftungsgeräten in Bezug auf den Energieverbrauch
VO 1254/2014/EU supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of residential ventilation units

ÖVE / ÖNORM EN 60335-1
ÖVE / ÖNORM EN 60335-2-30 (sinngemäß)
ÖVE / ÖNORM EN 60335-2-65 (sinngemäß)
ÖVE / ÖNORM EN 60335-2-80 (sinngemäß)
ÖVE / ÖNORM EN 50366
ÖVE / ÖNORM EN 62233
ÖVE / ÖNORM EN 55014-1
ÖVE / ÖNORM EN 55014-2
ÖVE / ÖNORM EN 61000-3-2
ÖVE / ÖNORM EN 61000-3-3

Eine vom Lieferzustand abweichende Veränderung des Gerätes führt zum Verlust der Konformität.
Product modifications after delivery may result in a loss of conformity.

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitsinformationen der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

J. Pichler Gesellschaft m.b.H.
Geschäftsleitung / General Manager

Klagenfurt, am 01. August 2016

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

EPREL
Our LG 150 compact ventilation unit is listed in the European Product Database for Energy Labelling (EPREL).

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PICHLER
Systematic ventilation.

J. PICHLER
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