

Original Operating Instructions

Mechanical Ventilation Heat Recovery Unit CLIMOS F 200 Eco



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Index

0	Preamble	5
0.1	Validity	5
0.2	Target group and standard operation	5
0.2.1	Qualification of target group	5
0.2.1.1	Users	5
0.2.1.2	Qualified personnel	5
0.2.2	Standard operation of the unit	5
1	Introduction and safety	5
1.1	Proper use	5
1.1.1	Heat recovery unit	5
1.1.2	Control panel	5
1.2	Safety	6
1.2.1	Safety regulations	6
1.2.2	Installation conditions	6
1.2.3	Symbols used	6
1.3	Warranty and Liability	6
1.3.1	Warrant Terms	6
1.3.2	Liability	7
2	Hints for the operator and the qualified personnel	7
2.1	Product description	7
2.1.1	Type plate	8
2.1.2	Frost protection	8
2.1.3	Joint operation with heat-producing appliances	9
2.2	Available control modules	9
2.2.1	External control panel	9
2.2.1.1	Operating functions control panel	9
2.2.1.2	Signalling of operating and maintenance modes	10
2.2.2	External control signal 0-10V	10
2.2.3	Boost ventilation mode with external boost ventilation sensing device	10
2.3	Maintenance by the operator	11
2.3.1	Replacement of the filter	11
2.3.2	Reset of filter runtime	13
2.3.3	What to do in the event of a failure?	13
2.4	Disposal	13
3	Hints for qualified personnel	13
3.1	Installation requirements	13
3.1.1	Transport and packing	13
3.1.2	Checking of the scope of delivery	13
3.2	Mounting	13
3.2.1	Mounting Preparations	14
3.2.2	Mounting position ceiling-hanging	14
3.2.3	Mounting position lying	15
3.2.4	Mounting position wall-mounted horizontally	15
3.2.5	Mounting position wall-mounted vertically	15
3.2.6	Mounting position inclined wall horizontally	16
3.2.7	Mounting position inclined wall vertically	16
3.2.8	Air duct connection	17
3.3	Electrical connections	18
3.3.1	Connection control panel	18
3.3.1.1	Connecting of the connection cable to the control panel	18

3.3.1.2	Connecting of the connection cable to the control unit	19
3.3.2	Connection of external boost ventilation switch	23
3.3.3	Connection of external sensors	23
3.4	Commissioning of the CLIMOS	23
3.4.1	Operational readiness	23
3.4.2	Adjusting the air volume flow	23
3.4.3	Adjustment of the Valves	24
3.5	Maintenance and repair by qualified personnel	24
3.5.1	Inspecting and cleaning the heat exchanger	25
3.6	Visualising of operating modes	29
3.7	Technical description	30
3.7.1	Designs layout air connection	30
3.7.2	Technical specification	30
3.7.3	Dimensional sketch	32
3.7.4	Circuit diagram CLIMOS Eco - series	33
4	Annexes	34
4.1	Checklist A maintenance works user	34
4.2	Checklist B maintenance works qualified personnel	35
4.3	Commissioning and handover certificate	36
4.4	Air volume log	37
4.5	Product fiche	38
4.6	Product label	39
4.7	Conformity	40
4.7.1	Declaration of conformity of the European Union	40

0 Preamble

0.1 Validity

This document applies to:

- CLIMOS F 200 Eco – Serie (Zehnder Climos 200 Enthalpie Eco – Serie)

The types of device CLIMOS F 200 Eco, are hereinafter referred to under the product name CLIMOS, unless details are for type differentiation.

The subject of this manual is the CLIMOS in its various design variants. Possible accessories are only described to the extent necessary for appropriate operation of the unit. Please refer to the respective instructions for further information on accessory parts.

0.2 Target group and standard operation

This manual is for users and qualified personnel. The activities are only allowed to be carried out by appropriately trained personnel who are sufficiently qualified for the respective work involved.

0.2.1 Qualification of target group

0.2.1.1 Users

Users must be instructed by qualified personnel as follows:

- Instruction in hazards when handling electrical devices
- Instruction in the system's operation
- Instruction in the maintenance of the CLIMOS
- Knowledge of and compliance with this manual, including all safety instructions.

0.2.1.2 Qualified personnel

Qualified personnel must have the following qualifications:

- Training in dealing with hazards and risks when installing and operating electrical devices
- Training for the installation and commissioning of electrical devices
- Knowledge of and compliance with the locally applicable building, safety and installation regulations of the relevant local authorities or municipalities, the regulations of the water and electric utilities, and other official regulations and guidelines
- Knowledge of and compliance with this document, including all safety instructions

Unless otherwise stated in this manual, only a recognized qualified person is authorized to install, connect up, commission, and to service the CLIMOS.

0.2.2 Standard operation of the unit

This unit can be used by children aged 8 and over and also persons with reduced physical, sensory or mental abilities, or a lack of experience and knowledge provided that they are under supervision or have been instructed on the safe use of the unit and understand the risks that result from it. Children must not play with the unit. Children must not carry out cleaning and user maintenance without supervision.

1 Introduction and safety

The CLIMOS is built to the current state of the art and the recognized safety regulations. The unit is subject to continuous improvement and development. This is why it is possible for your unit to deviate slightly from the description.

1.1 Proper use

1.1.1 Heat recovery unit

The heat recovery unit can be used for controlled ventilation in living and office areas (with reservations in the industrial sector) at usual interior air humidity of approx. 40 – 70 % rh, temporarily up to approx. 80 % rh. Any other use is considered as being diverted from the intended use. The heat recovery unit is not designed to discharge excessive air humidity, especially in the first utilisation phase of new buildings.

For safety reasons, it is not permitted to modify the product or to install parts which are not expressly recommended for this product or distributed by PAUL Wärmerückgewinnung GmbH.

1.1.2 Control panel

With the control panel you operate the system from a central location. The control panel is only suitable for use in the interior area.

1.2 Safety

Always observe the safety regulations and installation conditions in the current operating manual. Failure to observe the safety regulations, installation conditions, instructions, warnings, and comments in this document can result in personal injury or damage to the unit.

1.2.1 Safety regulations

- Do not make any changes to the unit or to the specifications listed in this document. Such changes can cause personal injury or lead to reduced performance in the ventilation system
- Always comply with the general locally-applicable building, safety and installation regulations of the relevant local authorities, the regulations of the water and electric utilities, and all other official regulations
- Installation, commissioning, and maintenance must be carried out by an authorized person or company, unless otherwise stated in this document
- Always disconnect the unit from the power supply before you start working on the ventilation system
- Do not operate the CLIMOS without having connected air ducts with a minimum length of 900 mm
- Do not disconnect the unit from the power supply unless instructions to the contrary are listed in the manual
- The control unit can be damaged by static charge; which is why you must always take measures to prevent electrostatic discharge when handling the control unit (e.g. antistatic wrist strap)
- Replace the filters (at least) every six months. This ensures a pleasant and healthy air quality, and the unit will be protected against contamination
- Only operate the unit with a closed housing
- Keep this document in the vicinity of the unit during the entire service life of the ventilation unit

1.2.2 Installation conditions

- Check that the installation area is frost-protected
- The manufacturer recommends not to mount the device in areas with a higher average humidity (ambient ambient conditions not permanently > 70% rh at 22 ° C)
- The acceptable temperature range for the air being moved is between -20 °C and +40 °C
- The unit must not be installed in rooms subject to explosion hazards
- When installing the unit, make sure that the applicable country-specific standards / regulations for compliance with protection zones when installing electrical systems in rooms with a bathtub or a shower are observed
- The unit must not be used for extracting combustible or explosive gases
- Check whether the electrical installation is suitable for the maximum power of the unit. The values for the electrical input power can be found in the "Product data sheet" chapter
- Check that the installation area of the unit meets the requirements in the "Installation requirements" chapter

1.2.3 Symbols used

You will find the following symbols in this document:



Important note!



Caution: Risk of affecting the operation of the ventilation system or damaging the unit!



Caution: Risk of personal injury!

1.3 Warranty and Liability

1.3.1 Warrant Terms

Warranty according to our general terms and conditions (<http://www.international.zehnder-systems.com/company/general-terms-and-conditions>). Warranty claims can only be asserted for material defects and/or design faults that have occurred during the warranty period. Repair work under the warranty conditions is only allowed to be carried out with the prior and written approval by Zehnder Group. A warranty on spare parts is only then given if those parts have been delivered by the manufacturer and were installed by an installation technician recognized by the manufacturer.

The warranty shall be null and void if:

- the warranty period has elapsed
- the unit is operated without filters released by the manufacturer of the ventilation unit
- parts are installed that are not supplied by the manufacturer
- the unit is used improperly
- the defects occur as a consequence of an incorrect connection, improper use, or from system contamination
- unauthorized changes or modifications to the system are made

1.3.2 Liability

The CLIMOS was developed and manufactured for use in so-called comfort ventilation systems. Any other use is considered as "improper use" and can result in damages to the CLIMOS or in personal injuries, for which the manufacturer cannot be made liable. The manufacturer is not liable for any damage, which is due to the following causes:

- Non-observance of the notes on safety, operation and maintenance, stated in this manual
- The installation was not performed according to the regulations
- Mounting of the spare parts, which were not delivered and prescribed by the manufacturer
- The defects occur due to incorrect connection, improper use or soiling of the system
- Normal wear

2 Hints for the operator and the qualified personnel

2.1 Product description

The CLIMOS is a ventilation device with heat recovery for healthy, balanced and energy-saving comfort ventilation. A comfort ventilation system consists in exhausting stale, odorous air for example from the kitchen, the bathroom, W.C.s and in introducing an equal quantity of fresh air into living rooms, bedrooms and children's rooms.

For heat recovery, the CLIMOS is equipped with a membrane moisture heat exchanger (enthalpy exchanger) which, due to its physical properties, is not only able to transfer heat, but also moisture. The use of moisture sensors for limit monitoring in rooms with high humidity rise is recommended. The casing is made of powder-coated sheet metal with anthracite colouring. The internal lining made of high-quality polypropylene provides the necessary heat insulation and device noise protection.

The CLIMOS is equipped with an integrated defroster heater. The design of layout air connection is available in the construction types A or B. Amongst others, the type plate informs about the construction types.

The CLIMOS includes two maintenance-free 230 Vac radial fans with the integrated power supply unit and electronic commutation. The volume flow constant fans keep the air quantity at a constant speed for each selected fan rotary speed. The air quantity is also not affected by soiled filters.

By default, a filter in class ISO Coarse ≥ 70 % (M5) is used in the unit for the outdoor air and the extract air. As an option, filters in class ISO ePM1 ≥ 60 % (F7) can be used for the outdoor air.

They consist of a synthetic woven filter medium with a frame made of polypropylene.

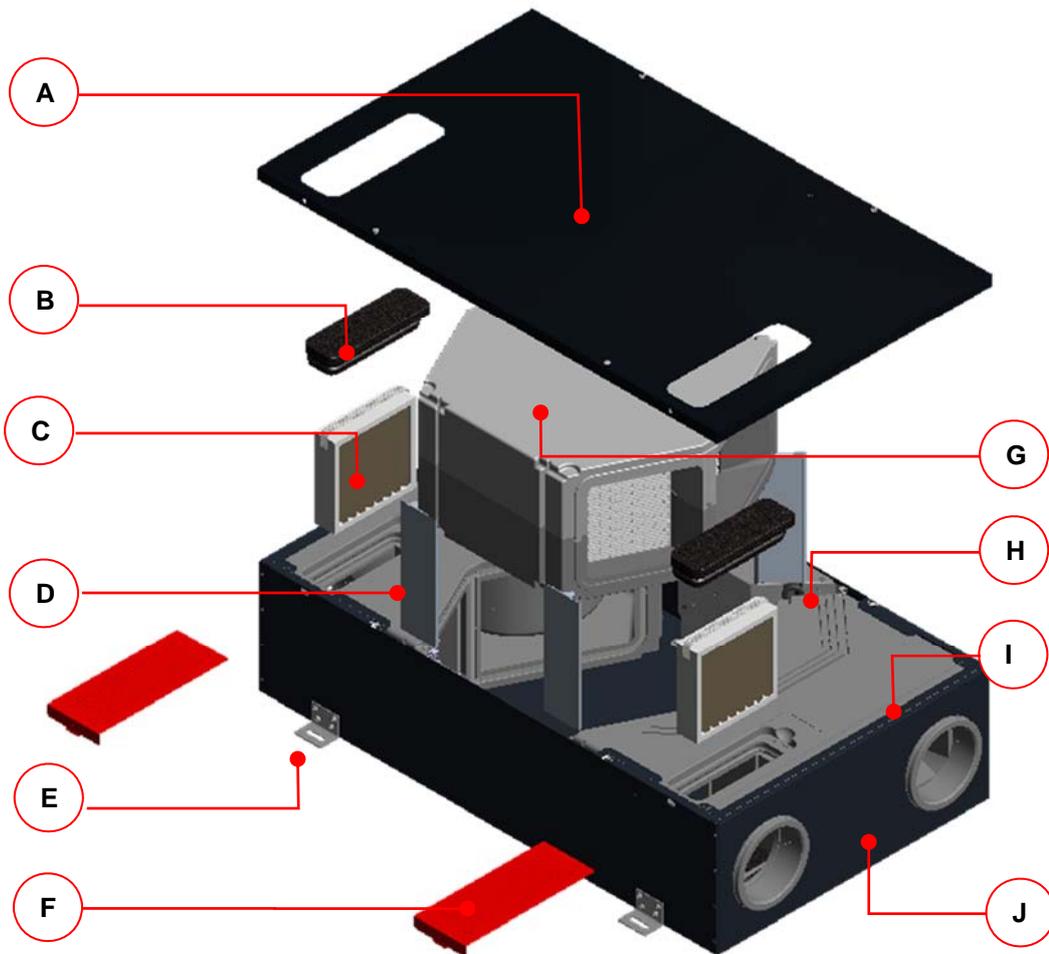


Fig 1: Main components CLIMOS

Item	Designation
A	Casing cover with quarter turn lock (4x)
B	EPP filter cover (2x)
C	Filter (2x)
D	Retaining clamps (4x)
E	Mounting bracket (4x)
F	Design filter cover (2x), Option
G	Heat exchanger box
H	Control unit
I	Fan box (2x)
J	Housing

Tab. 1: Main components CLIMOS

2.1.1 Type plate

The type plate clearly identifies the product. The information on the type plate is necessary for the safe use of the product and in case of service-related questions. The type plate is located on the side of the casing next to the electrical connections. The type plate must be permanently attached to the product.

2.1.2 Frost protection

The CLIMOS is equipped with an automatic frost protection which prevents the heat exchanger from freezing at a too low outside temperature. If the outside air temperature limit at the device falls below the threshold value a PTC heater battery is activated. If the heat emission of the PTC heater battery is not sufficient enough, the fans will be temporarily switched off when the threshold value is exceeded.



Monitoring of the supply air temperature for frost protection of an optional hydraulic heater battery downstream is not available!

2.1.3 Joint operation with heat-producing appliances

In case of simultaneous operation with heat-producing appliances, e.g. chimneys, the corresponding standards and regulations must be complied with by the qualified personnel. The joint operation of indoor air-dependant heat-producing appliances and ventilation plants requires an appropriate safety device (differential pressure switch) or a plant-specific measure, in the event that dangerous negative pressures can be generated in the installation room of the heat-producing appliance during operation.

2.2 Available control modules

The CLIMOS can be equipped with the following control panels:

- External control panel (W x H x D in mm: 71 x 71 x 25)
- External control signal (0-10 V)
- External boost ventilation switch (any number, potential-free)

2.2.1 External control panel

The operating panel is equipped with a rotary knob for stepless control of the ventilators with a 9-step scaling for the air volume flow. The two ON/OFF buttons are used to select the operating mode. Either normal mode (both ventilators on), or extract air (only exhaust air ventilator on) or supply air mode (only supply air fan on) can be selected. The selected operating mode is indicated by green a LED of the respective symbol. The operating functions are carried out with the button boost ventilation mode / reset filter runtime. The fan-symbol with the red LED signals the respective operating mode depending on the function.

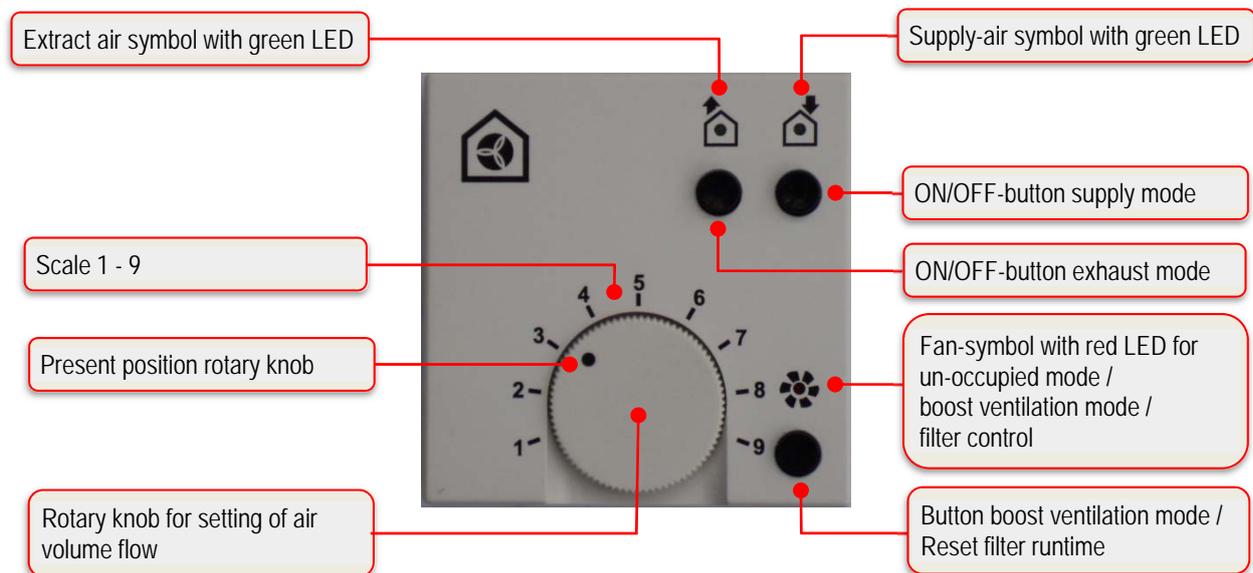


Fig 2: Control and information panels control panel

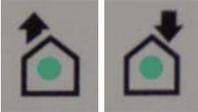
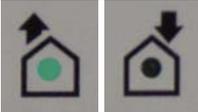
2.2.1.1 Operating functions control panel

Description	Explanation
Positioning rotary knob	<p>Un-occupied mode: intermittent operating mode with the smallest air volume flow Pos. min (rotary knob on the left): 5 min ON and 1 min OFF Position 1: 3 min ON and 3 min OFF Pos. below 2: 1 min ON and 5 min OFF Position rotary knob between Pos. min and below 2: cycling proportional</p> <p>Operating-mode: Position 2: smallest air volume flow Position 9: largest air volume flow Position rotary knob between Pos. 2 and Pos. 9: air volume flow proportional</p>
Push button extract air mode	<p>The extract air mode and the exhaust air fan are set by pushing and locking. By pushing again the extract air mode is deactivated again.</p> <p> This push button <u>cannot be operated</u> when the ventilation device is run with a heat-producing appliance, unless the supply air mode is activated simultaneously! The simultaneous operation of the ventilation device and the heat-producing appliance has increased safety-related requirements for <u>low pressure monitoring</u> with a switch-off function for the ventilation device.</p>

Push button supply air mode	The supply air mode and the supply air fan are switched on by pushing and locking. By pushing again the supply air mode is deactivated again.
Normal-mode	Both fans are switched on by pushing and locking.
Button boost ventilation mode / reset filter runtime	<p>Function-button for boost ventilation mode: Pushing this button activates the boost ventilation with an air volume flow for the duration of 15 min which corresponds to position 9 of the rotary knob. After the boost ventilation time of 15 min is over, the air-flow returns to the previously supplied air quantity in the respectively active operating mode. The boost ventilation mode can be terminated any time by pushing this button > 3 seconds.</p> <p>Function button for reset filter runtime: An operating hour counter with a set runtime of 180 d is integrated in the control for cyclical filter control. The button boost ventilation mode / reset filter runtime is used to reset the filter runtime. Pushing this button > 3 s restarts the filter runtime. If a reset of the filter runtime is carried out before expiration of the 180 d by pushing the button > 3 s, the reset is acknowledged by 4x quick flashing of the LED-fan-symbol.</p> <p> No reset command is possible during an active boost ventilation mode!</p>

Tab. 2: Operating functions external control panel

2.2.1.2 Signalling of operating and maintenance modes

Symbol	LED-Signalling	Function / meaning / measure
	Both LEDs lights	Operating mode normal mode (exhaust and supply air)
	LED extract air symbol lights	Operating mode extract air mode active (extract air only)
	LED supply air symbol lights	Operating mode supply air mode active (supply air only)
	LED fan symbol lights	Boost-ventilation mode active;  Boost-ventilation mode is possible in any operating mode!
	LED fan symbol is flashing	Un-occupied mode is active;  Un-occupied mode is possible in any operating mode!
	LED fan-symbol is flashing quickly	Filter runtime expired; carry out filter control or filter change  Boost ventilation mode cannot be activated as long as there is not reset command!

Tab. 3: Function assignment of LED-signalling

2.2.2 External control signal 0-10V

The ventilation device can be operated with an external control signal 0-10 V. A 0-10 V applied analogue signal is interpreted as control signal for the fan rotational speed. The externally supplied control voltage is only valid above the range of the present scale position of the rotary knob.

 **In order to use the whole external 0-10 V – control range, the rotary knob must be in position 1!**

2.2.3 Boost ventilation mode with external boost ventilation sensing device

In most cases, boost ventilation sensing devices are mounted in exhaust air rooms such as bathrooms, W.C.s or kitchens in order to activate temporary maximum ventilation in these rooms for fast discharge of increased moisture and odours.

When operating this control element, the functional properties and visualisations described for the boost ventilation mode are generated. The boost ventilation mode is started again at each activation and interrupts the current operating mode for the duration set. Following this, the device switches back to the previously active operating mode.

2.3 Maintenance by the operator

Maintenance of the ventilation device and plant by the operator is limited to the periodic change of the filters and cleaning of the supply and extract air valves. The filter must be checked every 3 months and changed if necessary, however, at least every 6 months.

In this context, also check other filters available inside the ventilation plant and change them if necessary. A replacement or cleaning of the filter mats at the extract air valves (e.g. bathroom, kitchen, W.C.s) should be carried out every 2 – 3 months or at your own discretion when checking the degree of soiling.



If maintenance work is not carried out regularly, this impairs the functioning of the comfort ventilation in the long term!

2.3.1 Replacement of the filter



The plant must not be operated without filter. During filter replacement and maintenance work, the ventilation device must be switched off!

Two high-quality original filters of the manufacturer are installed inside the CLIMOS. After the corresponding message of the control panel or after visualisation of a programmed digital output signal, the filters in the CLIMOS shall be checked. In order to do so, proceed as follows:

1. Switch the device to standby mode or disconnect it from the power supply.
2. If applicable, pull the red design filter cover **A** out of the casing cover's holder.

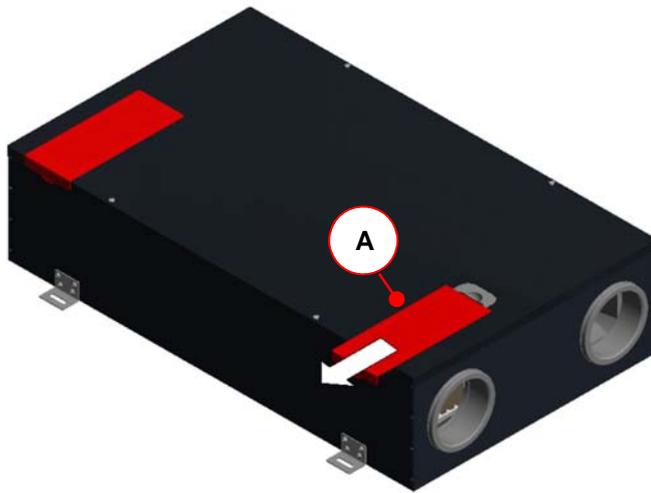


Fig 3: Removal of the design filter cover

3. Grasp into the recessed grip **B** of the filter compartment.



Perhaps the EPP-filter covers are very tight during the first filter change. Using a blunt object (e.g., the handle of a spoon) the EPP-filter cover can be levered.



Fig 4: Recessed grip filter compartment

- Remove the EPP filter cover **C**.

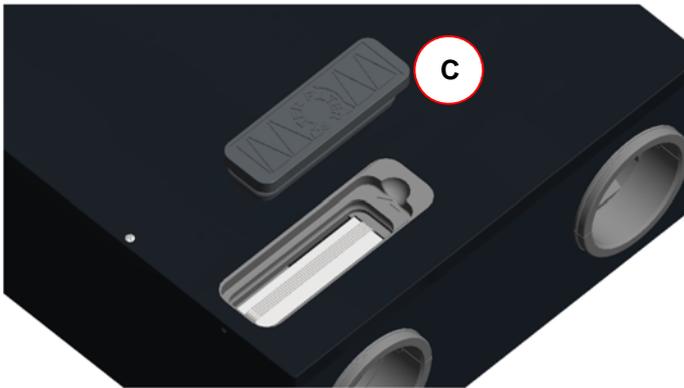


Fig 5: Removal of the EPP filter cover

- Pull the filter **D** out of the filter compartment by holding it on the strap.

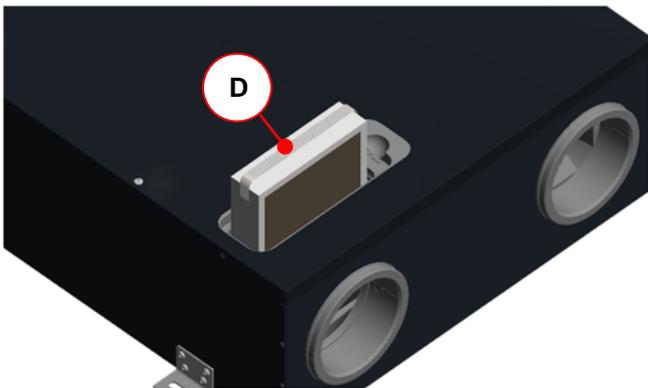


Fig 6: Removal of the filter

- Insert the new filter.



The arrow E on the filter frame and the arrow F impressed into the EPP filter compartment (next to the recessed grip) must point in the same direction!

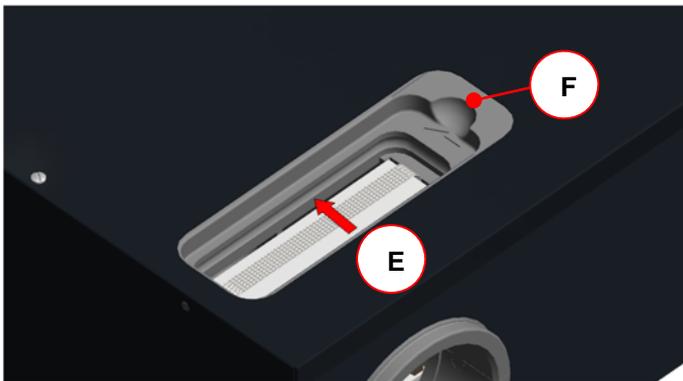


Fig 7: Insertion of the new filter



ISO ePM1 ≥ 60 % (F7) filters must be inserted into the filter compartment of the outside air connection depending on the type of device in accordance with the type plate! The outdoor

air connection is marked with the symbol  AUL ODA  on the label air connections.

- Close all filter covers in reverse order.
- Proceed in the same manner for the other device filter.
- Re-establish the mains connection.

2.3.2 Reset of filter runtime

After a filter change the counter for the filter runtime has to be reset. The reset is carried out by pushing the button boost ventilation mode / reset filter runtime > 3 s. The quick flashing cycle of the LED in the filter-symbol is ended.



All maintenance work performed must be documented in check list A!

2.3.3 What to do in the event of a failure?

Please contact the installer immediately in the event of a failure. Make a note of the error display and the failure code respectively. Also note down the type of your CLIMOS, for that purpose, see type plate on the side of the device.

The mains connection must always be available, unless the CLIMOS must be put out of operation due to a serious failure, maintenance work or for other imperative reasons.



As soon as a power disconnection has been performed, the living space is not mechanically ventilated anymore. This may cause moisture and mould problems in the living space. Therefore, the long-term shutdown of the CLIMOS has to be avoided!

For the period of absence, the plant should be operated at the lowest fan speed or in the unoccupied mode!

2.4 Disposal

When the life time cycle of your CLIMOS has expired, the company PAUL Wärmerückgewinnung GmbH offers you free take-back. If you do not make use of the possibility of feedback of recyclable product parts into the cycle of materials, we would like to remind you that the CLIMOS must not be disposed of in the normal household garbage. For this kind of disposal, please obtain information on the possibilities of reuse of components or the eco-friendly treatment of the materials from your community.

3 Hints for qualified personnel

3.1 Installation requirements

For proper installation, the following requirements must be fulfilled:

- Assembly in accordance with the general and on-site safety and installation instructions, amongst others of the electric power station and water works as well as in accordance with the instructions contained in this operating manual.
- Frost-free room in the interior
- Voltage supply 230 Vac, 50-60 Hz
- Sufficient space for air duct connections and maintenance work

3.1.1 Transport and packing

Proceed with care when transporting and unpacking the CLIMOS.



The packaging of the device may only be removed immediately before assembly! Prior to and during assembly interruptions, the open air duct connection stubs must be protected with the caps of the air connection against ingress of construction dust and moisture!

3.1.2 Checking of the scope of delivery

If you detect any damages or incompleteness to/of the delivered product, please contact the supplier immediately. The scope of delivery includes:

- HRU CLIMOS, check the type plate and make sure that it is the correct construction type; right (type A) or left (type B);
- 230 V power cable with plug connection of a lower power device; length 2 m
- Control panel;
- Operating manual;
- 4 mounting brackets
- Set of design filter covers (option)

3.2 Mounting

For the CLIMOS, the distances to adjoining surfaces, which are not shown to scale in Fig. 8, must be observed. The surfaces may consist of combustible materials.

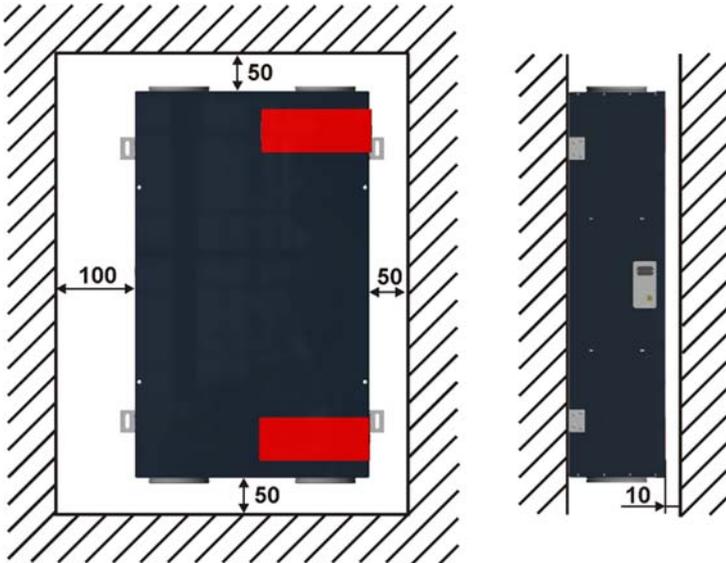


Fig 8: Distances in mm to adjacent surfaces

For the CLIMOS the following mounting positions are possible:

- ceiling-hanging or lying (horizontally)
- wall-mounted (horizontally or vertically)
- inclined wall (horizontally or vertically)



The exhaust air connection



must always be located at the top!

3.2.1 Mounting Preparations

At first, mount at the long sides of the CLIMOS 2 pieces of the provided mounting brackets each with 4 cross-head screw each.



Fig 9: Mounting brackets

At first, check the necessary load capacity of the respective fixing surface (own weight of the CLIMOS is 30 kg) and the secure fixing possibility using the mounting brackets. If the fixing is made at a wooden or lightweight construction, we recommend the die insertion of a vibration-damping distance washer for each mounting bracket.

3.2.2 Mounting position ceiling-hanging

In case of the mounting position ceiling-hanging, the mounting is made horizontally at the ceiling surface in the slotted holes (38x10 mm) of the 4 mounting brackets with suitable fixing elements depending on the ceiling construction.

If the CLIMOS is to be mounted in an intermediate ceiling, we recommend the use of the product-related drywall inspection flap in the suspended ceiling. The distance between the lower edge of the raw ceiling and the lower edge

of the drywall inspection flap is at least 270 mm. In this case, the ventilation device is fixed centrally in the opening space of this maintenance flap at the raw ceiling.

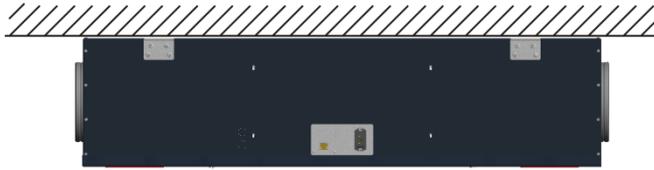


Fig 10: Mounting position ceiling-hanging

3.2.3 Mounting position lying

In case of the mounting position lying, the mounting is made horizontally on the ground surface in the slotted holes (38x10 mm) of the 4 mounting brackets with suitable fixing elements depending on the ceiling construction.

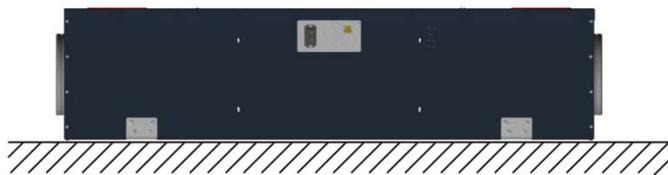


Fig 11: Mounting position lying

3.2.4 Mounting position wall-mounted horizontally

In case of the mounting position wall-mounted horizontally, the mounting is made horizontally at the wall surface in the slotted holes (38x10 mm) of the 4 mounting brackets with suitable fixing elements depending on the wall construction.



The exhaust air connection for the construction types A or B must always be located at the top!

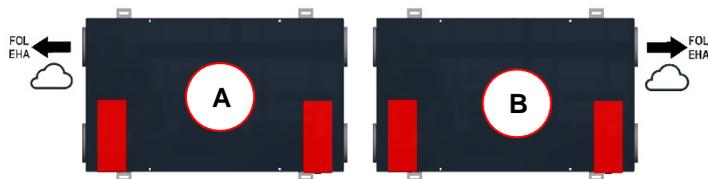


Fig 12: Mounting position wall-mounted horizontally

3.2.5 Mounting position wall-mounted vertically

In case of the mounting position wall-mounted vertically, the mounting is made horizontally at the wall surface in the slotted holes (38x10 mm) of the 4 mounting brackets with suitable fixing elements depending on the wall construction.



The exhaust air connection for the construction types A or B must always be located at the top!

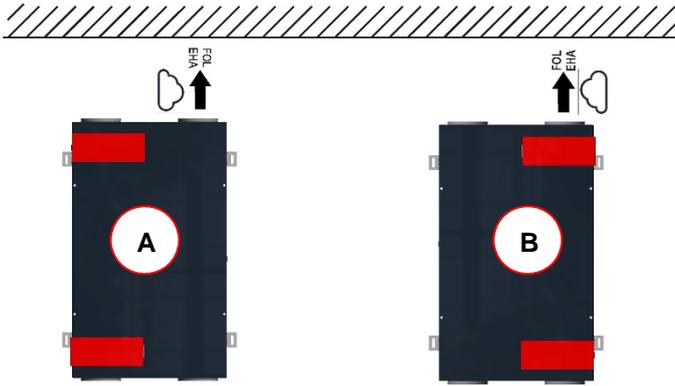


Fig 13: Mounting position wall-mounted vertically

3.2.6 Mounting position inclined wall horizontally

In case of the mounting position inclined wall horizontally the mounting is made horizontally at the inclined wall surface in the slotted holes (38x10 mm) of the 4 mounting brackets with suitable fixing elements depending on the wall construction.



The exhaust air connection for the construction types A or B must always be located at the top!

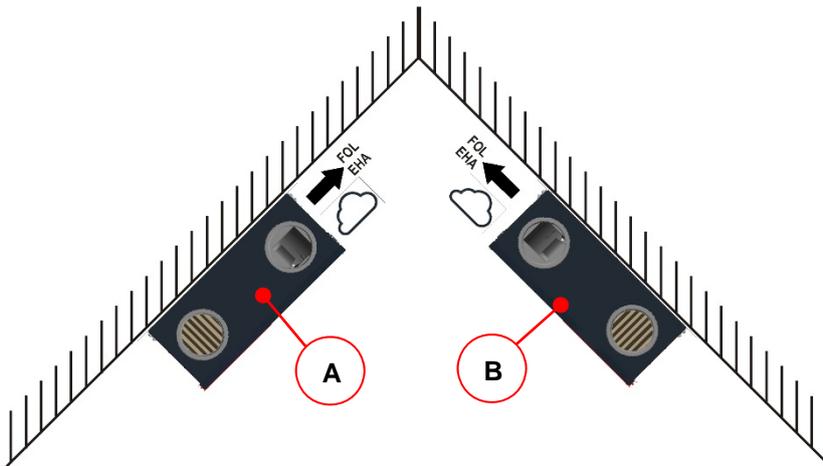


Fig 14: Mounting position inclined wall horizontally

3.2.7 Mounting position inclined wall vertically

In case of the mounting position inclined wall vertically the mounting is made vertically at the wall surface in the slotted holes (38x10 mm) of the 4 mounting brackets of the 4 mounting brackets with suitable fixing elements depending on the wall construction.



The exhaust air connection for the construction types A or B must always be located at the top!

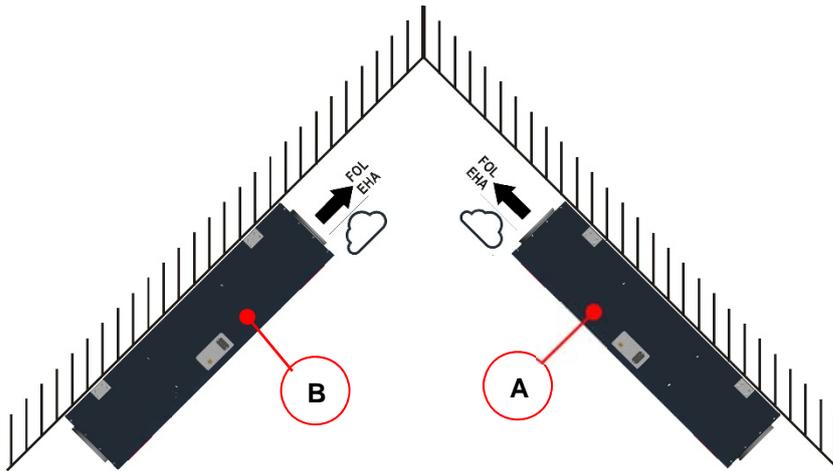


Fig 15: Mounting position inclined wall vertically

3.2.8 Air duct connection

When mounting the air ducts, the following points must be taken into account:

- Mount the types of air ducts of the ventilation plant to the connection stubs according to the present construction form **R (right - type A)** or **L (left - type B)**, see label air ducts next to the type plate.

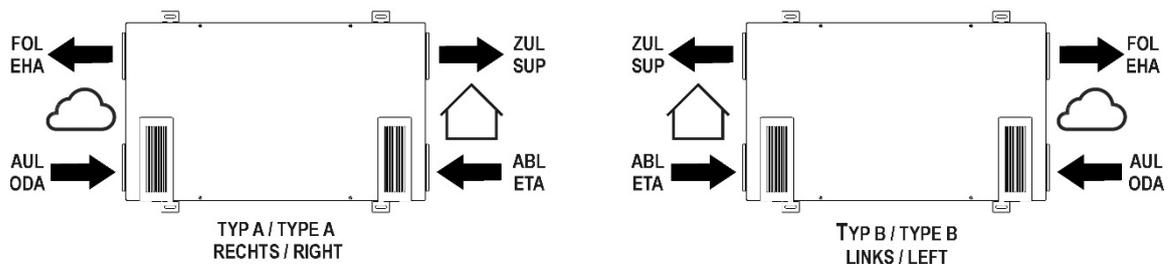


Fig 16: Arrangement of air ducts depending on construction type – right (type A) or left (type B)

- Remove the caps of the air connection sockets
- Use air duct material with air resistance as low as possible, and connect the ventilation components air-tight among each other
- The connection stubs of the device are made of EPP and have sleeve dimensions DN 125
- The outdoor air and exhaust air ducts must be insulated in such a way that they are vapour-diffusion tight
- In the event that a low point is unavoidable when installing the exhaust air duct from the device's exhaust air stub to the exhaust air outlet, a connection for condensate drain must be provided at that point
- A straight pipe routing of the exhaust air from the device connection stub to the roof hood should be avoided, since during defrosting of possible ice formations, they might fall onto the blades of the exhaust air fan and cause damage to these blades

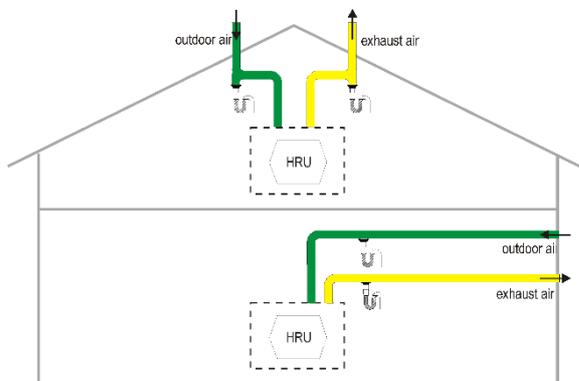


Fig 17: Arrangement drainage of the outdoor air duct and exhaust air duct

- If a silencer is provided at the exhaust air stub, it must be guided upwards by means of a bend in order to protect it against drenching caused by condensate returning from the exhaust air duct.
- If the exhaust air is guided over the roof, this guidance must be equipped with a double-wall or insulated roof lead-through. Thus, condensate formation between the roof boards is prevented.

- For the supply and extract air ducts, we recommend a thermal and vapour resistant insulation in order to avoid unnecessary temperature loss both in summer and winter.

3.3 Electrical connections



Electrical connections must be established in accordance with the applied standards to electrical equipment and only by qualified personnel!

The electrical power supply of the CLIMOS is provided via the 3-pole plug connection **A** of a lower power device by means of the power cable. The cable to the control panel is connected to control board of the device. To do this the cable have to be led through the cable glands M16 by using one off the prepunched cable bushings **B**.



Fig 18: Casing side of the electrical connections

Position	Designation
A	3-pole IEC connector
B	Pre-cut cable bushing (2x) for cable gland M16
3.7.4	Circuit diagram CLIMOS F 200 Eco Comfort

Tab. 4: Assignment of the electrical connections

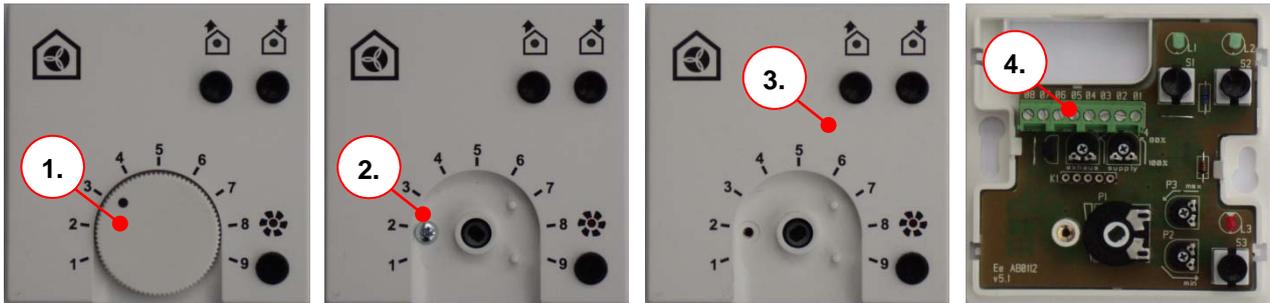
3.3.1 Connection control panel

3.3.1.1 Connecting of the connection cable to the control panel

The external operating panel is installed in a standardised switch box.

For connecting between the control panel and the control unit an 8-wire UTP data cable 2x4 is recommended. 4 wires are connected to the terminal points X.01 to X.04 according to Tab. 5. The maximum cable length is 25 m.

Open the control panel as follows:



1. Pull of rotary knob

2. Unscrew fixing screw

3. Take top of control panel off

4. Access connection terminal

Connection terminal control panel	Signal
X.01	+12 V
X.02	U _s (control voltage supply air fan)
X.03	U _e (control voltage exhaust air fan)
X.04	GND
X.05	Analogue input 0-10 V
X.06	Analogue input GND
X.07	Input external boost ventilation button
X.08	Input GND external boost ventilation button

Tab. 5: Terminal assignment connection terminal operating panel

3.3.1.2 Connecting of the connection cable to the control unit

Proceed as follows in order to connect the connection cable to the control board:

1. Disconnect the CLIMOS from the power supply.
2. If applicable, pull the red design filter covers **A** out of the casing cover's holder.

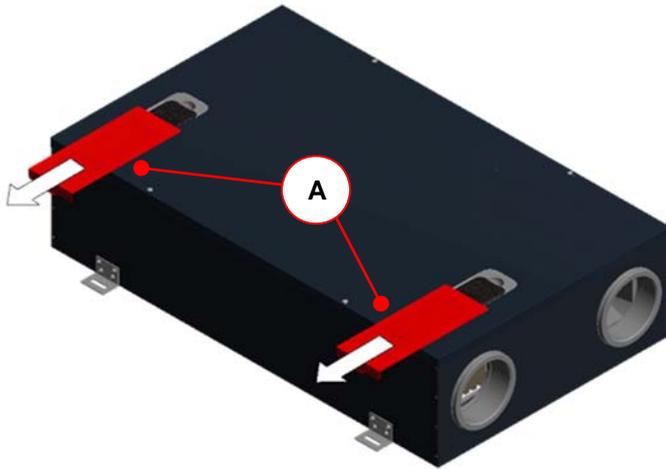


Fig 19: Pull out 2x design filter covers

3. Open the quarter turn locks **B** by turning the captive screw by 90 °.

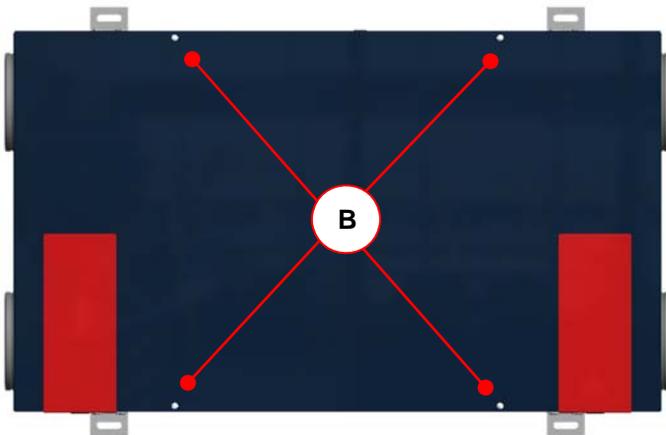


Fig 20: Casing cover with 4x quarter turn lock **B**

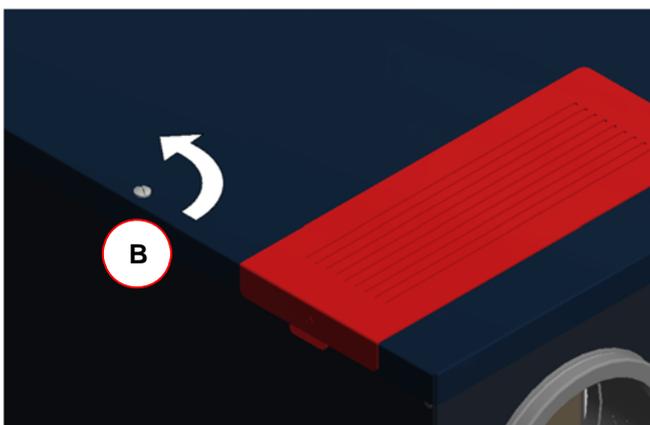


Fig 21: Quarter turn lock with captive screw

4. Remove the casing cover **C** and remove the cable for potential equalisation from the flat plug of the casing cover.

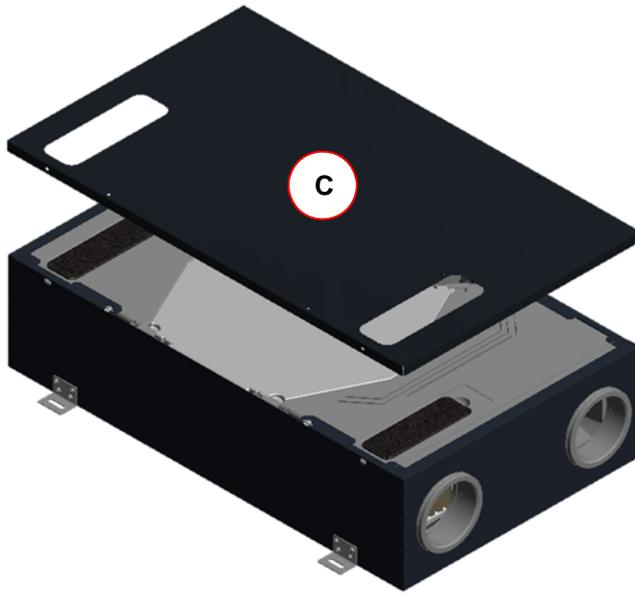


Fig 22: Remove the casing cover **C** from the device

5. Loosen the 2 locking screws **D** of the control system casing by approx. 4 - 6 mm by turning them counter clockwise and remove the cable for potential equalisation from the flat plug of the control system casing.

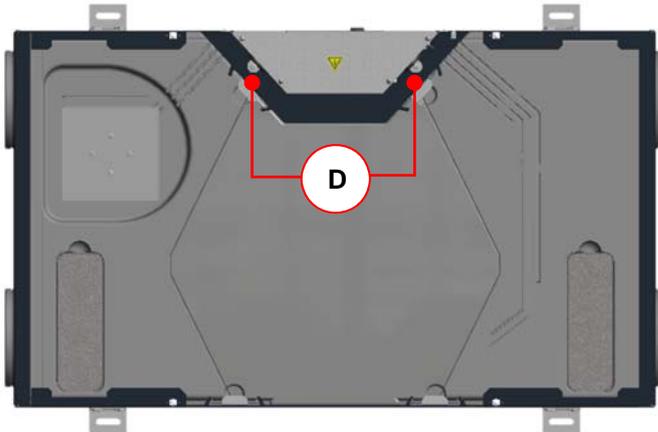


Fig 23: Screws **D** for fastening the control system casing

6. Push the control system casing in the direction of the arrow by approx. 3 - 5 mm in such a way that the press-in keyhole fasteners unlatch from the 4 keyholes **F** of the casing wall.

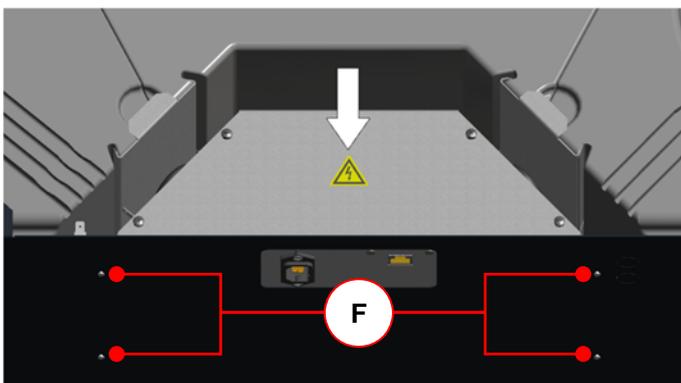


Fig 24: Unlocking the keyhole connection

7. Withdraw the control system casing step by step as indicated by the arrows.

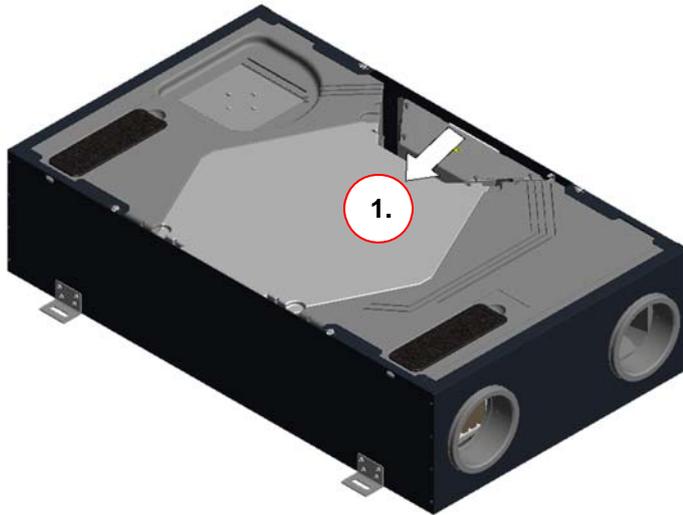


Fig 25: Removal of the control system casing in direction heat exchanger

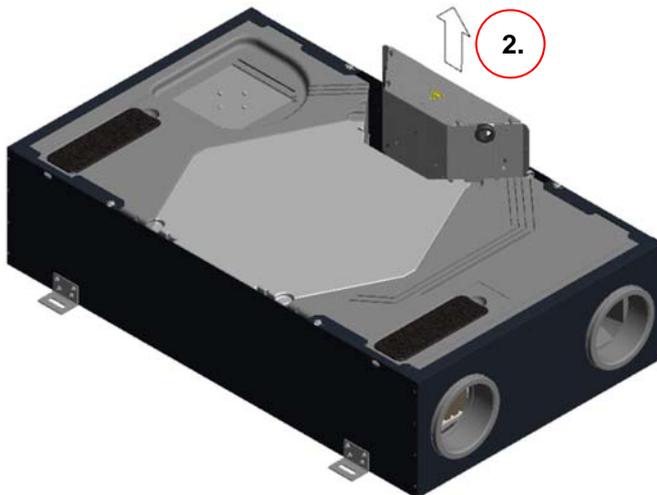


Fig 26: Removal of the control system casing above

8. Guide the cable through one of the two rubberised grommets **F** of the control system casing.

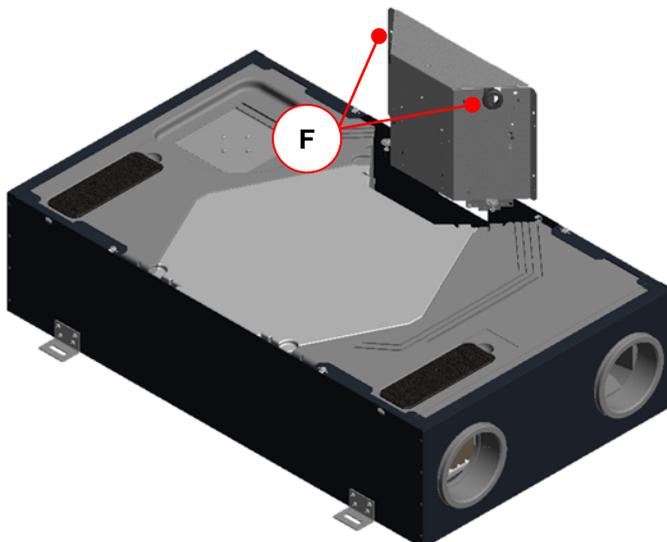


Fig 27: 2x cable grommet **F** at the control system casing

- Connect it to the terminal points provided for that purpose according to Tab. 6.

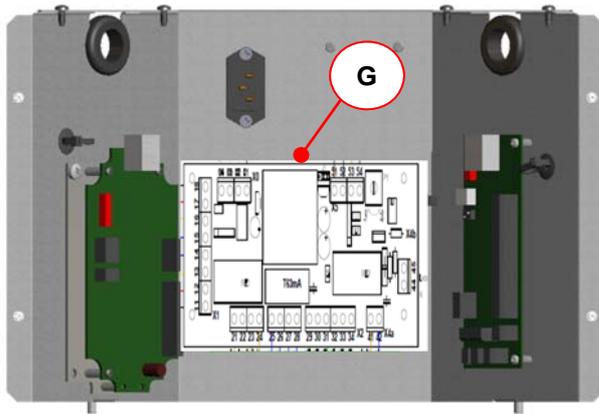


Fig 28: control system casing with control board G

Terminal X0 control board	Signal
X0.01	+12 V
X0.02	U _s (control voltage supply air fan)
X0.03	U _e (control voltage exhaust air fan)
X0.04	GND

Tab. 6: Terminal assignment terminal X0 control board

- Remount the control system casing in reverse order. Introduce the press-in keyhole fasteners of the control system casing into the keyholes E.

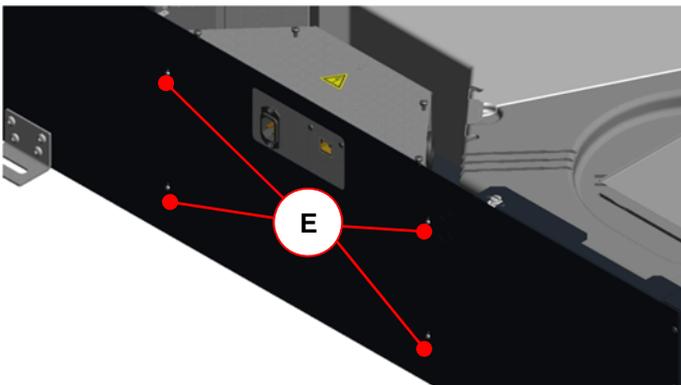


Fig 29: Establishment of the keyhole connection

- Place the cables into the free space between the control system casing and the EPP modules.



Make sure that no cables get jammed under the control system casing!

- By turning the locking screws D in the press nuts clockwise, the control system casing is fixed by the press-in keyhole fasteners latching into the restriction of the keyholes. During this process, the press-in keyhole fasteners and, in consequence, the control system casing are shifted by approx. 3 - 5 mm in the direction of the arrow.

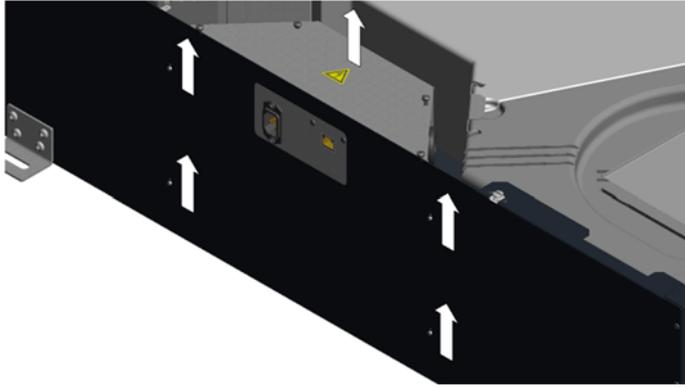


Fig 30: Locking of the control system casing

13. Connect the cables for potential equalisation to the respective flat plugs of the casing parts.
14. Close the casing cover by turning the 4 captive screws of the quarter turn locks **B** by 90°.
15. Re-establish the mains connection.

3.3.2 Connection of external boost ventilation switch

The boost ventilation mode can be activated by actuating one or more boost ventilation switches connected in parallel. The switches which are usually installed in the design of the respectively used switch range are triggered when the boost ventilation mode is activated. The potential-free connection between button and connection terminal of the operating panel is made with an at least 2-strand cable (recommendation: cable type J-Y(ST)Y 2x2x0.6).

Connection terminal operating panel	Wire cable boost ventilation switch
X.07	Ader 1
X.08	Ader 2 (GND)

Tab. 7: Terminal assignment connection boost ventilation switch

3.3.3 Connection of external sensors

A sensor-controlled automatic mode can be operated with an analogue 0-10 V-sensor-signal which is generated by one or several sensors. The connection between the sensor module and the connection terminal of the operating panel is made with the cable prescribed for the transmission of the sensor signal.

Connection terminal operating panel	Wire cable sensor module
X.05	Wire 1 (sensor signal 0...10 V)
X.06	Wire 2 (GND)

Tab. 8: Terminal assignment connection analogue sensor signal

3.4 Commissioning of the CLIMOS

3.4.1 Operational readiness



Operational readiness is ensured if the requirements acc. to country-specific regulations are met. For that purpose, cleanliness of the air duct material, the availability, correct installation and operational readiness of the entire ventilation equipment provided for the plant must be particularly ensured.



Check all safety-relevant parts and perform a functional test!

3.4.2 Adjusting the air volume flow

After having verified the operational readiness, the CLIMOS can be commissioned as follows. The scaling of the available air volume flow in relation to the position of the rotary knob is shown in diagram 1. According to the plant design the total outside air volume flow is to be laid out as nominal ventilation. This nominal air volume flow should, according to diagram 2, correspond to a rotary knob position of 4 to 6.

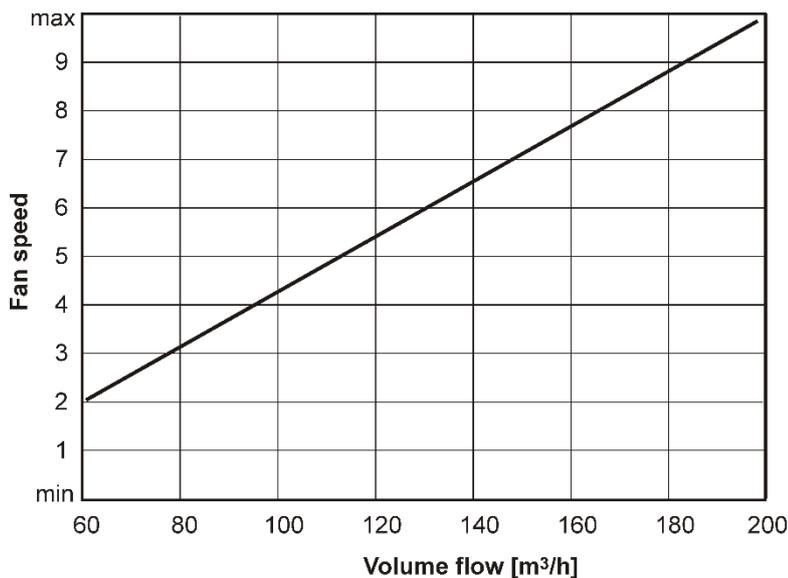


Fig 31: Chart 1, Parameterizing fan speed

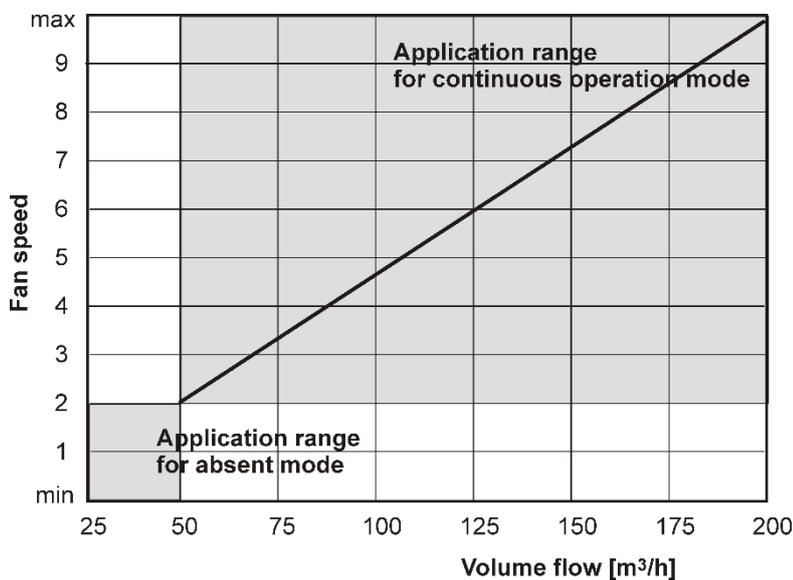


Fig 32: Chart 2, Assignment volume flow ranges

3.4.3 Adjustment of the Valves



Make sure that the supply and extract air valves are open as much as possible at the beginning of the volume flow measurement.

- Set the fans to nominal air volume flow
- Adjustment of the air volume flows to the air valves by means of a volume flow hood and an anemometer (see air volume log)
- Adjustment of the air gap on the valve must not be too narrow – aerodynamic noises! Better: Adjustment of a lower fan output or restriction of the volume flow in the pipeline (installation of a throttle flap or throttle foam insert)
- Readjustment of the valves
- Locking of the adjusted positions of the valves and flaps
- Recording of the adjusted air quantity and all further adjustments in the designated documentations

3.5 Maintenance and repair by qualified personnel



If regular maintenance work is not performed at the CLIMOS, this impairs the functioning of the comfort ventilation.

The maintenance and repair by qualified personnel should only be carried out by a maintenance service on the basis of a maintenance contract. The maintenance and repair measures for the CLIMOS include the inspection and

cleaning of the fans and the heat exchanger. Cleaning of the heat exchanger is carried out depending on the degree of soiling; the maintenance interval should not exceed two years.



The maintenance work performed must be documented in check list B!

3.5.1 Inspecting and cleaning the heat exchanger

In order to do so, proceed as follows:

1. Disconnect the CLIMOS from the power supply.
2. If applicable, pull the red design filter covers **A** out of the casing cover's holder.

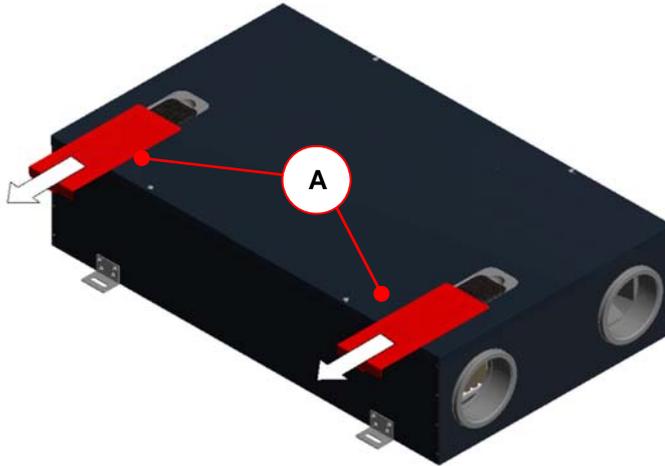


Fig 33: Pull out 2x design filter covers **A**

3. Open the quarter turn locks **B** by turning the captive screw by 90°.

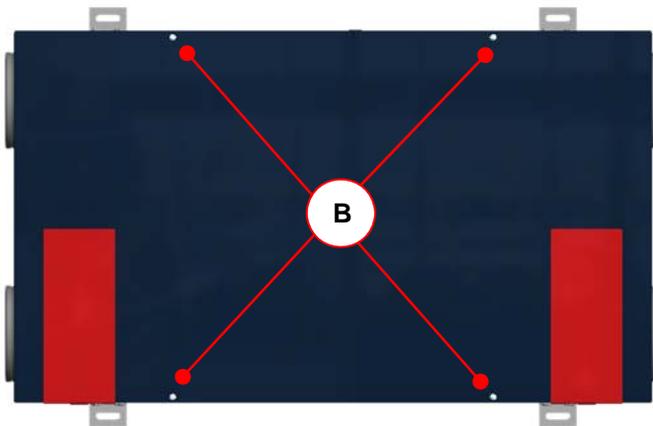


Fig 34: Casing cover with 4x quarter turn lock **B**

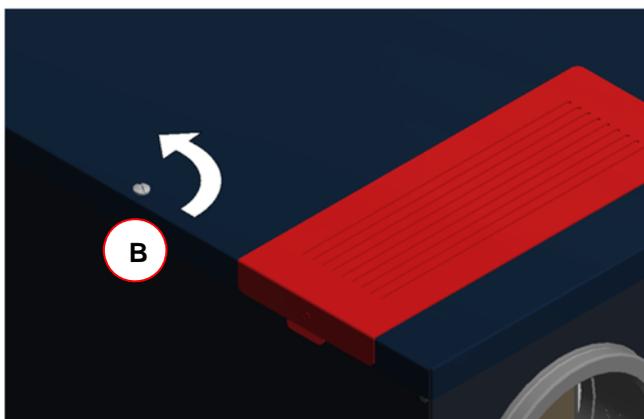
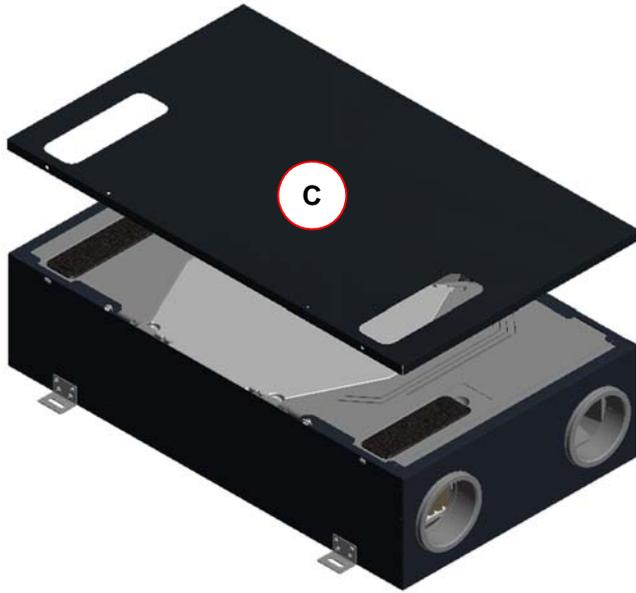


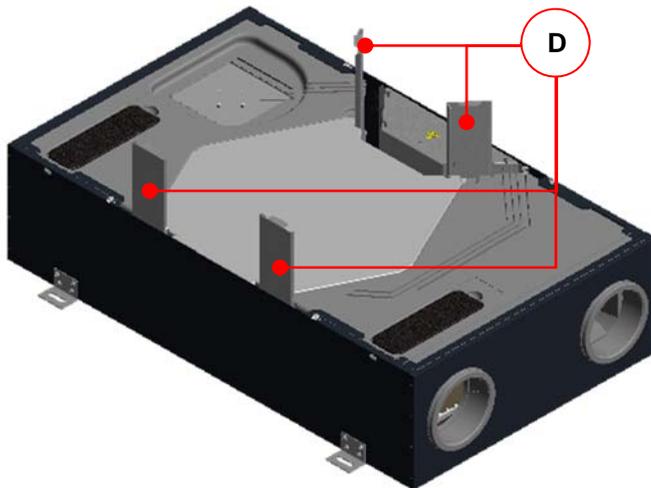
Fig 35: Quarter turn lock with captive screw

4. Remove the casing cover **C** and remove the cable for potential equalisation from the flat plug of the casing cover.



*Fig 36: Remove the casing cover **C** from the device*

5. Pull the retaining clamps **D** (4x) out of the EPP foam modules in vertical position.



*Fig 37: Retaining clamps **D** for form-fit fastening of the EPP foam modules*

6. Push each of the fan boxes **F** in the direction of the air duct connections by approx. 3 - 4 mm so that the heat exchanger box **G** is unlocked out of the tongue-and-groove joint.

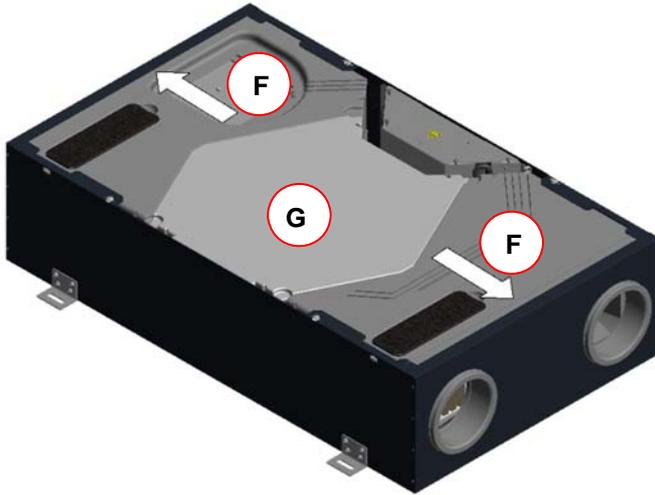


Fig 38: Unlocking of the heat exchanger box **G** by shifting the fan boxes **F**



In the event that the fan boxes **F** cannot be shifted, the air duct connection stubs of the fan boxes **F** must be shortened!

Cut through the EPP connection stubs in the circumferential groove **H** (set point of sectioning)

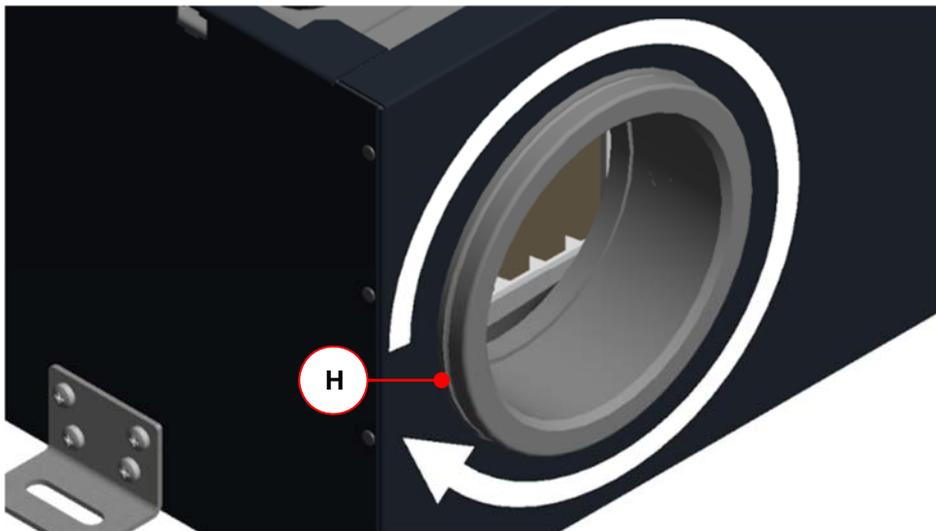


Fig 39: Shortening of the EPP connection stub at the set point of sectioning of the circumferential groove **H**



After having finished the maintenance work, all disconnected air ducts must be reconnected to the heat recovery unit in air-tight condition. A vapour resistant and thermal insulation must be established at the sectioning points of the outside and exhaust air connection stubs!

7. Pull out the heat exchanger box **G** in vertical position.

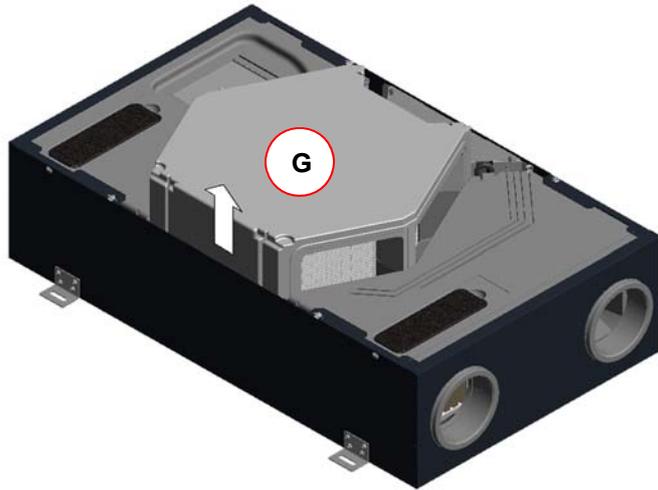


Fig 40: Removal of the heat exchanger box **G**

8. Clean the internal heat exchanger **I** of the heat exchanger box **G**, if necessary.

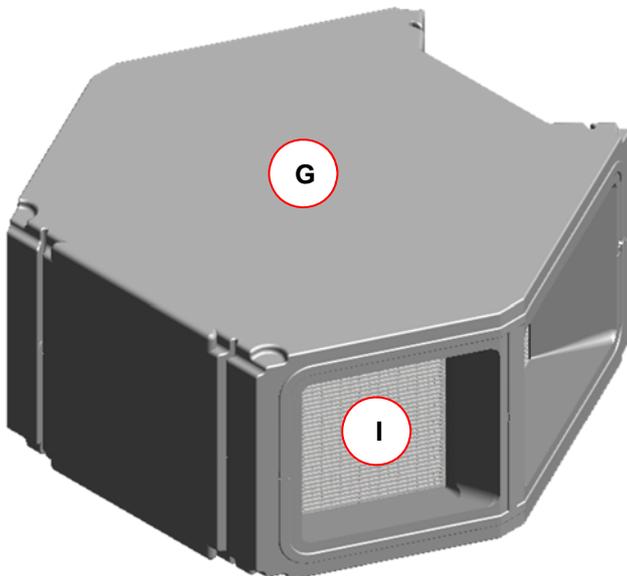


Fig 41: Heat exchanger **I** in the heat exchanger box **G**

In order to do so, proceed as follows:

- Dip the heat exchanger into warm water several times (max. 40 °C).
- Subsequently, thoroughly rinse the heat exchanger using warm tap water (max. 40°C).



As a general rule, do not use any aggressive or dissolvent detergents!

- For drying, position the heat exchanger in such a way that existing residual water can run out of the openings.
- Let the heat exchanger run completely dry before reinstalling it.



Hints for proper cleaning can also be found at the manufacturer's website.

9. Carefully aspirate with a vacuum cleaner the outdoor casing **J** of the fan boxes and suck the PTC heating elements of the integrated defroster off with a suitable suction nozzle.



Do not touch any parts of the defroster with your hands, and do not damage the temperature sensor while cleaning!

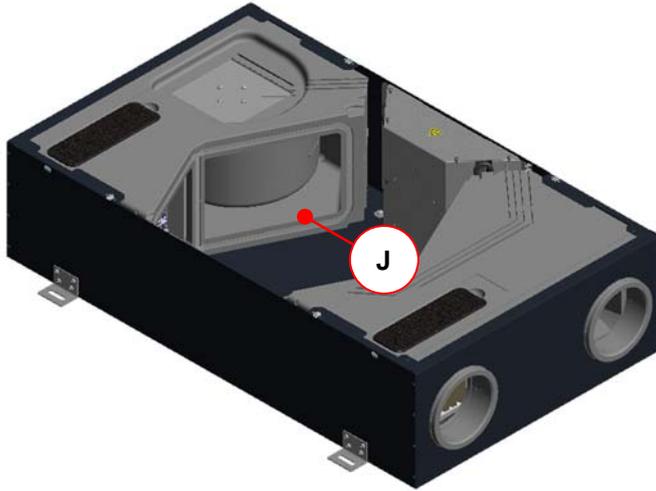


Fig 42: Outdoor casing fan box J (2x)

10. After inspection, mount all parts in reverse order.



When installing the heat exchanger box, ensure correct locking with the fan boxes by means of the tongue-and-groove joint!

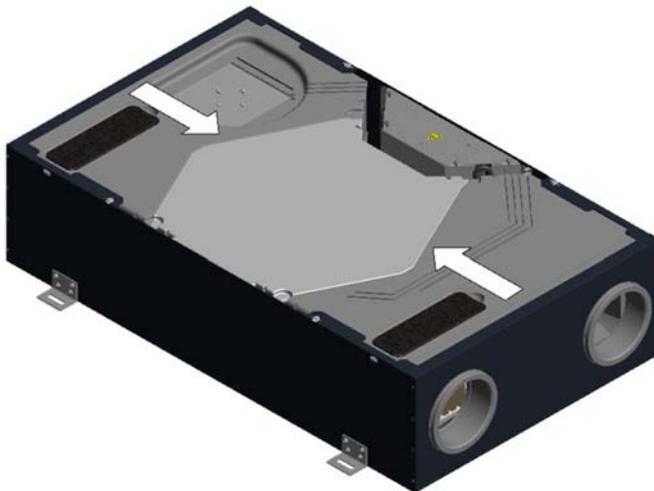


Fig 43: Push direction of the fan boxes for locking with the heat exchanger box

11. Connect the cable for potential equalisation to the flat plug of the casing cover.
12. Close the casing cover by turning the 4 captive screws of the quarter turn locks by 90°.
13. Re-establish the mains connection.

3.6 Visualising of operating modes

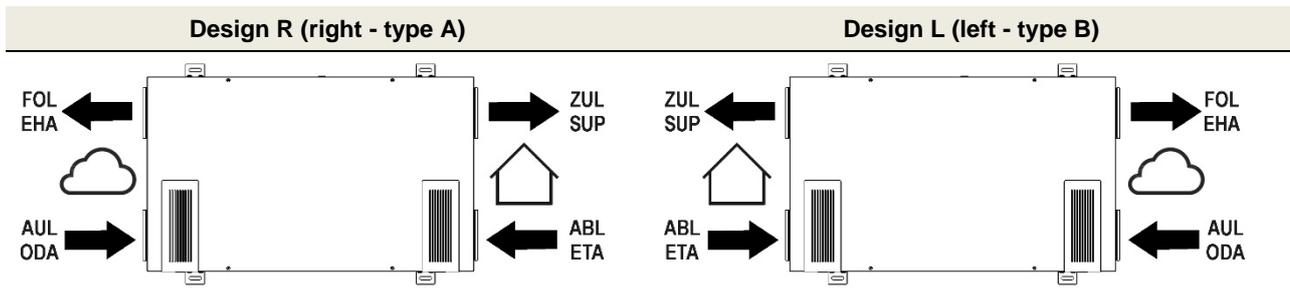
The control unit is equipped with 3 LEDs for signalling of operating modes. The following operating conditions are shown with LED-signalling:

LED	Signalling	Condition / cause
LED 1	lights	Device operational / operating voltage supplied
LED 2	lights dark	Normal operating mode
	flashes	Temperature downstream of preheater too low, fans are switched off
	flashes 2x per second	Temperature downstream of preheater < 1K below threshold value
	flashes 3x per second	Temperature downstream of preheater < 2K below threshold value
	flashes 4x per second	Temperature downstream of preheater < 3K below threshold value
LED 3	lights	Preheater heats

Tab. 9: Overview visualising operating modes

3.7 Technical description

3.7.1 Designs layout air connection



Tab. 10: Overview types of designs R (right - type A) and design L (left - type B)

3.7.2 Technical specification

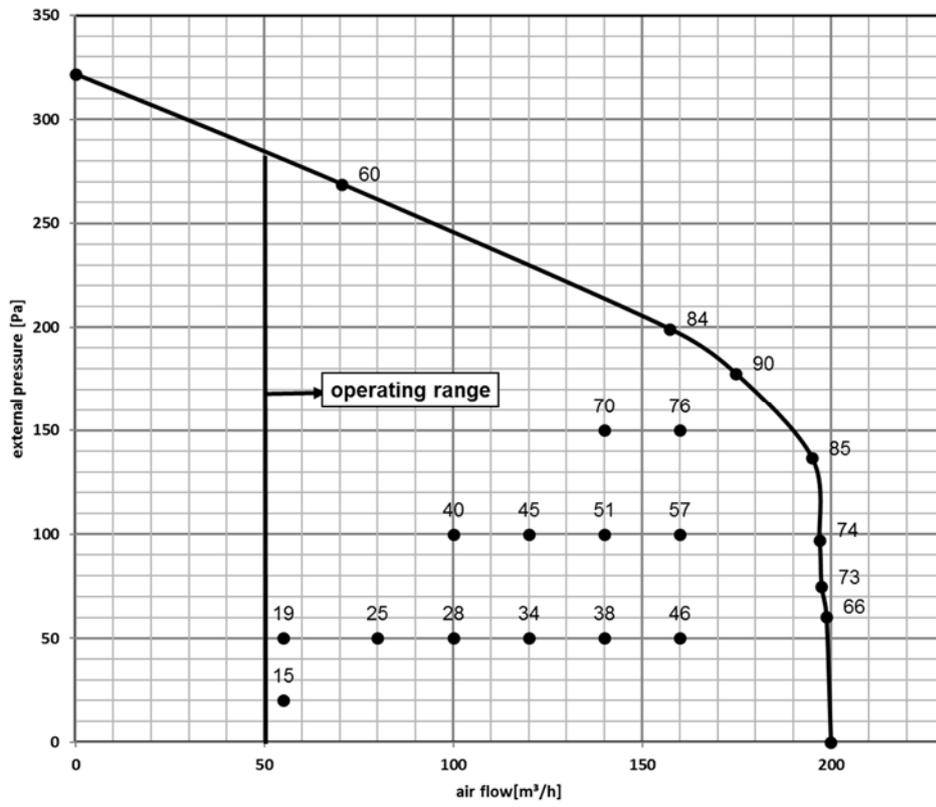
General specification	Description / value
Type of heat exchanger	Enthalpy exchanger with polymer membrane
Casing / internal lining	Steel sheet galvanised, powder-coated, thermal bridge-free; internal lining made of expanded polypropylene EPP for thermal and sound insulation
Pipe connections	DN 125 (sleeve dimensions)
Weight	30 kg
Electrical connection	230 Vac, 50-60 Hz; 2 m power cable with plug connection of a low power device
Connected load	110 W / 810 W (without / with preheater)
Protection class	I
Degree of protection	IP 30
Limitations of use	-20 to 40 °C
Assembly site	Frost-free interior area; Ambient conditions: < 70 % rh at 22 °C
Installation position	Ceiling-hanging or lying (horizontally) Wall-mounted (horizontally or vertically) Exhaust air connection must always be located at the top! Inclined wall (horizontally or vertically) Exhaust air connection must always be located at the top!

Tab. 11: Generell specification

Operating data	Value
Air flow	50 bis 200 m³/h
Efficiency criterion	0,40 Wh/m³ (bei 111 m³/h / 100 Pa)
Heat recovery rate acc. PHI	84 % (bei 111 m³/h / 100 Pa); CLIMOS F 200
Heat recovery rate acc. DIN 4719	111 % (bei 112 m³/h / 100 Pa)
Sound, device emission	38 dB(A) (bei 100 m³/h / 100 Pa)
(acc. to DIN EN ISO 3743-1, distance of 3 m)	42 dB(A) (bei 200 m³/h / 100 Pa)

Tab. 12: Operating data

p- \dot{V} -characteristic curve



Please note:

The numerical values of the p- \dot{V} -characteristic curve which are illustrated in the chart indicate the power consumption in [W] in the respective operating points without activated preheater.

Tab. 13: Chart 3, p- \dot{V} characteristic curve

3.7.3 Dimensional sketch

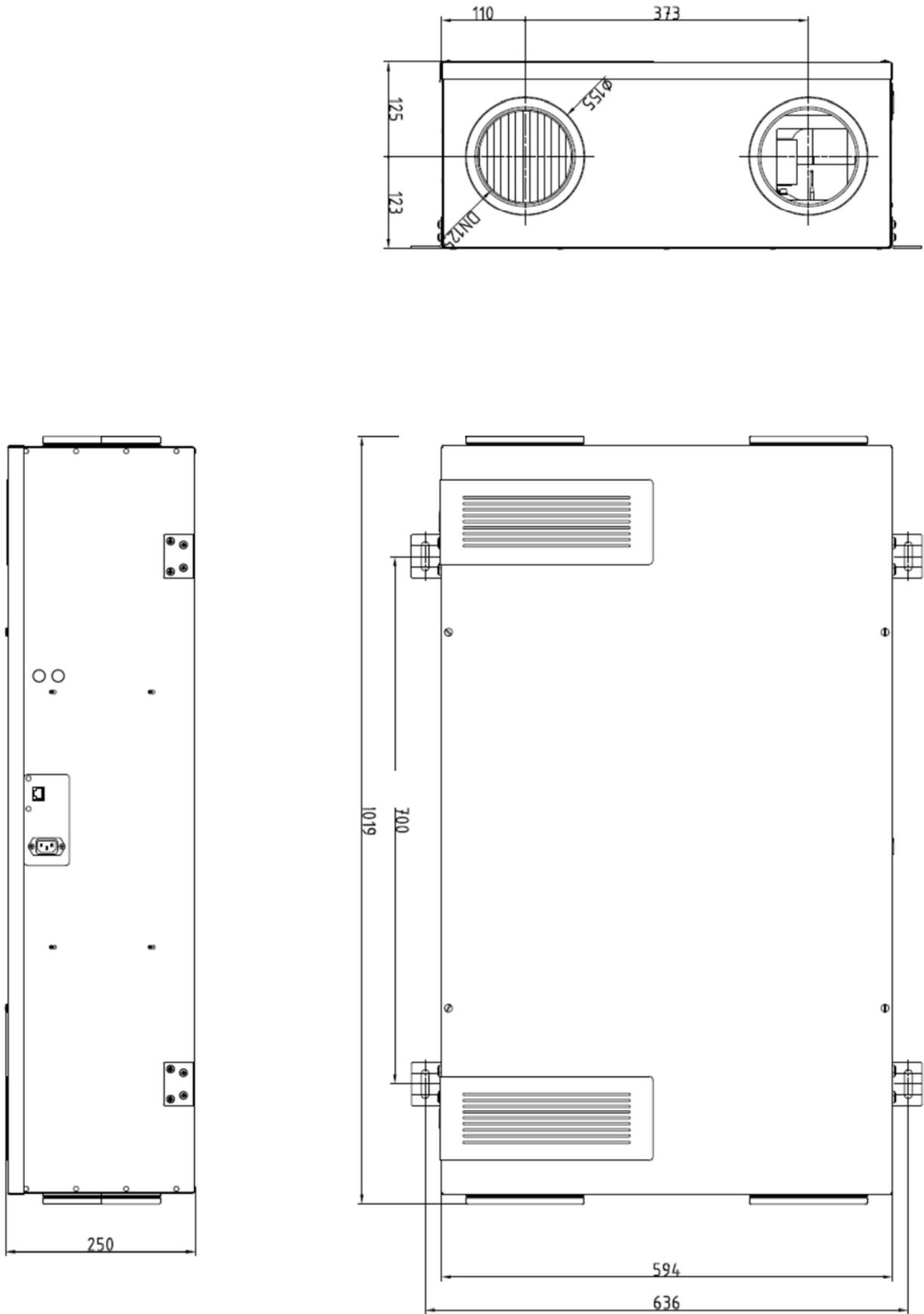


Fig 44: Dimension drawing

3.7.4 Ciriut diagram CLIMOS Eco - series

- funktion adjusting trimmer on control panel:**
 P2 - limitation min. fan speed (limitation un-occupied mode)
 P3 - limitation max. fan speed
 P4 - decrease supply fan speed
 P5 - decrease extract fan speed
- BS** - input boost button
AI - analogue input 0-10V
Ue - output voltage for exhaust fan
Us - output voltage for supply fan
P1 - setting anti-freeze threshold value: 0°C(max) through - 3°C(min) **J1** on position **E**
- L1** - signalling power supply
L2 - signalling working mode
 lightless - normal mode
 slowly blink - preheater temperature very high
 quickly blink - preheater temperature low
 2x - temperature lower 1°C like setpoint
 3x - temperature lower 2°C like setpoint
 4x - temperature lower 3°C like setpoint
 fans off
- is lit - ext. enable signal is activ, fans off
 L3 - signalling powered preheater

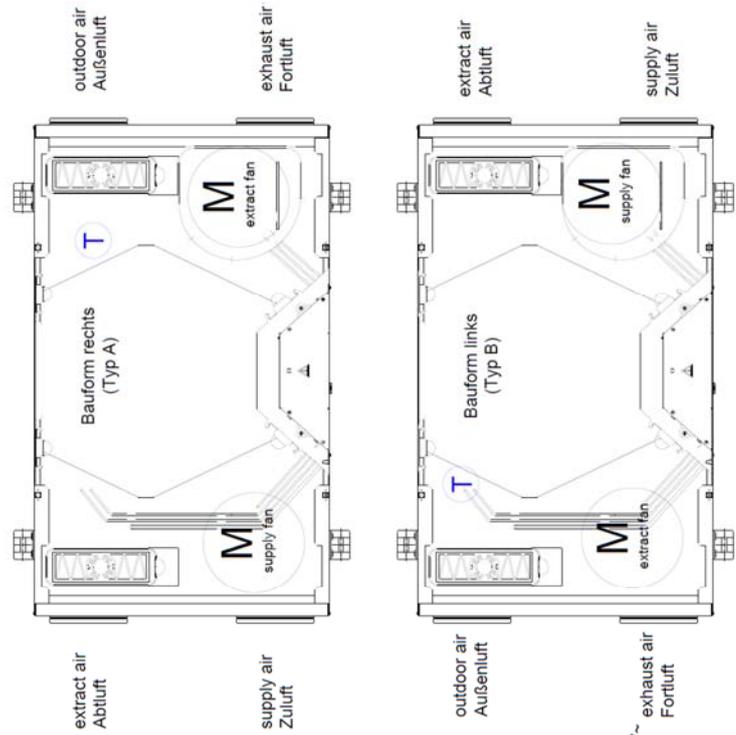
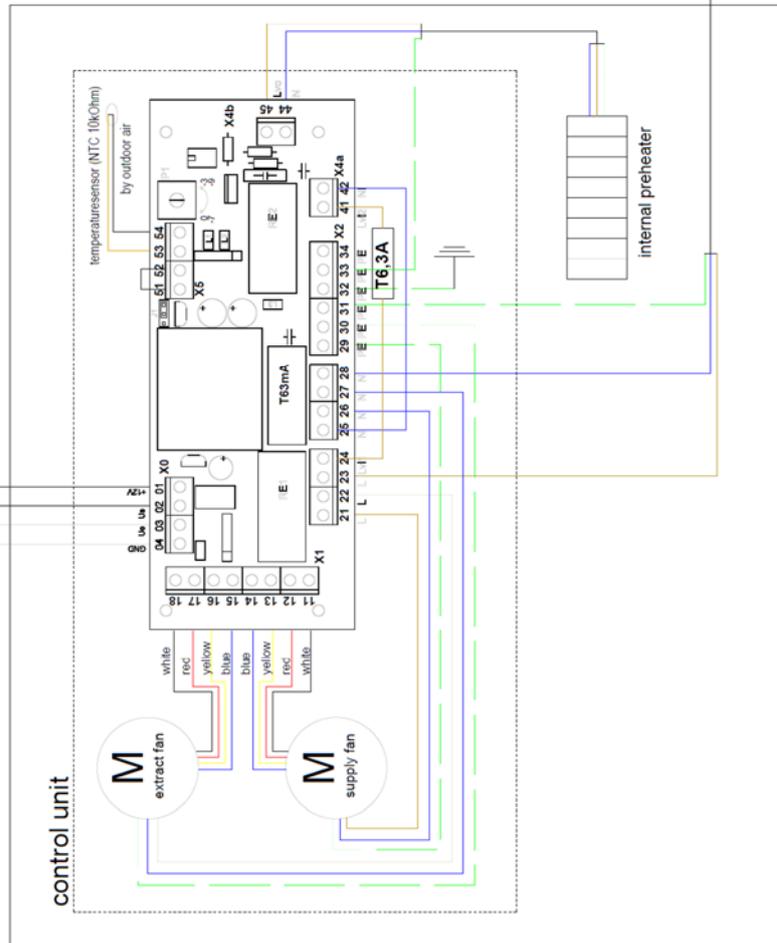
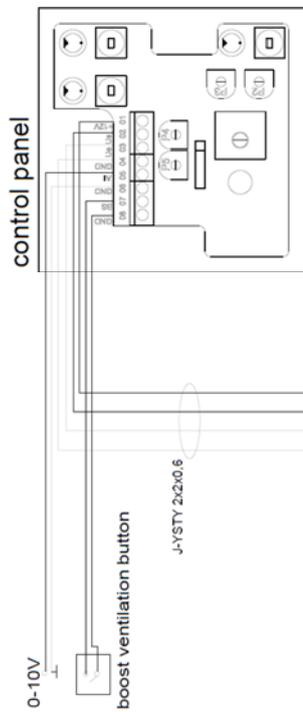


Fig 45: Terminal assignment CLIMOS Eco

4.2 Checklist B maintenance works qualified personnel

Maintenance works			Enter Result					
<ul style="list-style-type: none"> - Inspection of MVHR unit based according to the currently valid national standards - Informal report for comments on MVHR unit's condition - Use additional sheet of paper for adding reports of subsequent years 								
No.	Parts	Annually	Result	20...	20...	20...	20...	20...
1	Ventilator / Ventilation Device	Have the components been cleaned? - Ventilator - enthalpy exchanger - air handling cylinders of the device	yes / no					
		Frost protection / thaw setup functional?	yes / no					
		Is the transmission of structure-born noise, fixing prevented?	yes / no					
		Are the operation displays functional?	yes / no					
2	Electrical Engineering/ Regulation	Are the cable connections and terminal fixing secure?	yes / no					
		Are the control devices and control units functional?	yes / no					
3	Air duct / heat insulation	Is the device cleaned (if required)? Is the testing in place? If required, refer to VDI 6022 for cleaning	yes / no					
		Is the heat insulation and vapour barrier in order?	yes / no					
		Are the flexible connections between the device and the air duct functional?	yes / no					
4	Ventilator, ventilation device, Filter, filter status	Are the stipulated filter class adhered to?	yes / no					
5	Ventilator / ventilation device and heat-producing appliance if available	Is the safety device with heat-producing appliance functional?	yes / no					
6	Exhaust air/supply air-passage	Seat and lock given?	yes / no					
		Is the stipulated filter class adhered to?	yes / no					
		Filter, filter status ok?	yes / no					
		Is the air quantity according to the log?	yes / no					
7	Overflow air passages	Is there is free cross-section?	yes / no					
		No transmission of structure-born noise and transmission of airborne sound?	yes / no					

4.3 Commissioning and handover certificate

Customer data		
Name:	First Name:	Tel:
Street:	Postal Code:	City:
Construction Projects:		
Type of device:	Serial number:	Year of manufacture:

Completeness			
No.	Parts	Design	Result
1	Supply air duct	- Design as planned - There is an option to clean	yes / no yes / no
2	Supply air duct passages	- Layout as planned - Design as planned - There is an option to clean	yes / no yes / no yes / no
3	overflow air passages	- Layout as planned - Design as planned	yes / no yes / no
4	Exhaust air passages	- Layout as planned - Design as planned - There is an option to clean	yes / no yes / no yes / no
5	Exhaust air line	- There is an option to clean	yes / no
6	Exhaust air ventilator	- There is an option to clean	yes / no
7	Control unit and control device	- functional	yes / no
8	Filter, optional	- Exchange or there is an option to clean	yes / no
9	Heat exchanger for mechanical ventilation heat	- There is an option to clean	yes / no
10	Documentation	- available	yes / no

Function			
1	Operational at nominal ventilation, as planned	Result OK. Measure required	yes / no yes / no
2	Switching stages is possible, as planned	Result OK. Measure required	yes / no yes / no
3	Electrical power consumption	Result OK. Measure required	yes / no yes / no

Auditor's Report	
Date:	Signature/Stamp:.....
Start-up Personnel / Installer	

4.4 Air volume log

Customer data					
Name:		First name:		Tel:	
Street:		Postcode:		City:	
Construction Projects:					
Type of device:		Serial number:		Year of manufacture:	
Measurement data					
Used measuring device:		Description of failures during the measurement:		Internal temperature:	
External temperature:					
Filer status during calibration	Outdoor	Exhaust air	State of building moisture: % r.h. without ventilation mode	Fan speed ratio	
clean				Exhaust air / Supply air:	
approx. days used				
Very dirty					
Supply Air				Ventilator stage: %	
No.	Room Description	Project Date m³/h	m³/s	Measurement Data m³/h m³/s	
Exhaust Air				Ventilator stage: %	
No.	Room Description	Project Date m³/h	m³/s	Measurement Data m³/h m³/s	
P _{el} = W (2 Ventilators)					
⇒ The listed measurement data should be determined according to the real available components. ⇒ The hygienic requirements of operation of the ventilation system have been referred to. ⇒ The influence of the room air humidity on winter and summer operation has been referred to. ⇒ Only original parts (e.g. filter) may be used to claim warranty.					
Date: Signatures:					
				Start-up Personnel / Installer	
				User	

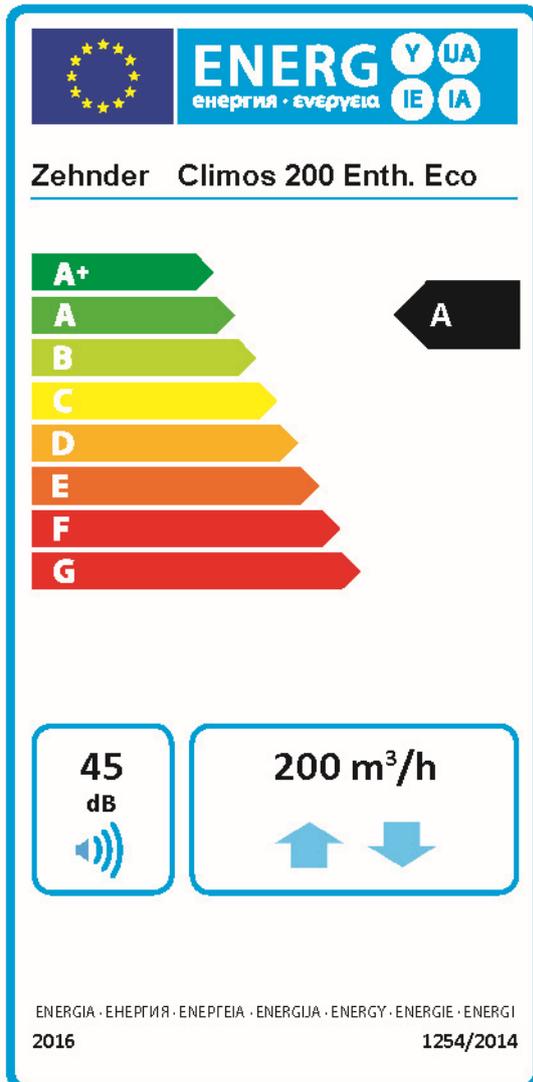
4.5 Product fiche

Product fiche for RVU per EU Regulation No. 1254/2014 Contains information requirement for RVUs as per EU Regulation No. 1253/2014 Heat recovery unit Zehnder Climos 200 Enthalpie Eco (V)										
Supplier's name or trade mark	Zehnder Group			Zehnder Group			Zehnder Group			
Supplier's model identifier	Climos 200 Enthalpie Eco (V)			Climos 200 Enthalpie Eco (V)			Climos 200 Enthalpie Eco (V)			
SEC [kWh/(m ² a)] specific energy consumption (cold, average, warm)	-66,9	-32,2	-9,6	-71,6	-35,8	-12,7	-77,2	-40,0	-16,1	
SEC Class	A+	B	F	A+	A	E	A+	A	E	
Type of ventilation unit	Bidirectional RVU			Bidirectional RVU			Bidirectional RVU			
Type of drive installed	Multi-speed			Variable speed			Variable speed			
Type of heat recovery system	Recuperative			Recuperative			Recuperative			
Thermal efficiency [%]	78			78			78			
Maximum flow rate [m ³ /h]	200			200			200			
Electric power input [W]	74			74			74			
Sound power level [dB(A)]	45			45			45			
Reference flow rate [m ³ /h]	140			140			140			
Reference pressure difference [Pa]	50			50			50			
SPI [W/(m ² h)]	0,30			0,30			0,30			
Control factor and typology	1 Manual control			0,85 Central demand control			0,65 Local demand control			
Declared maximum internal and external leakage rates [%]	Internal: 0,5			Internal: 0,5			Internal: 0,5			
	External: 1,3			External: 1,3			External: 1,3			
Mixing rate	-			-			-			
Position and description of visual filter warning	Symbolized message on control panel			Symbolized message on control panel			Symbolized message on control panel			
Internet address for assembly and disassembly instructions	www.international.zehnder-systems.com			www.international.zehnder-systems.com			www.international.zehnder-systems.com			
Airflow sensitivity to pressure variations [%]	-			-			-			
Indoor/outdoor air tightness [m ³ /h]	-			-			-			
AEC [kWh/a] annual electricity consumption (cold, average, warm)	958	421	376	854	317	272	741	204	159	
AHS [kWh/a] annual heating energy saved (cold, average, warm)	8216	4200	1899	8421	4305	1947	8695	4445	2010	

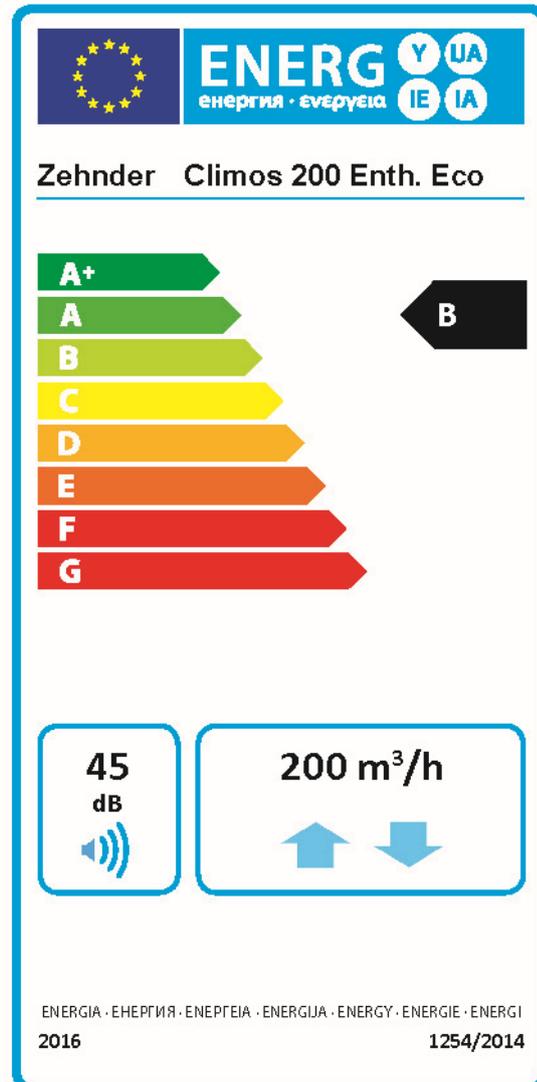
4.6 Product label

For the CLIMOS, there are two different product labels, depending on the application of the device. The product label, which applies for the ventilation plant, conforms to the installation of the plant and to the model identifier of the product data sheet. The product label shows the following information from the product data sheet:

- energy efficiency class for climate zone „average“
- sound power level L_{WA} indoors
- highest air volume flow



With central demand control
With local demand control



With manuell control

4.7 Conformity

4.7.1 Declaration of conformity of the European Union

Manufacturer:

PAUL Wärmerückgewinnung GmbH
August-Horch-Straße 7
08141 Reinsdorf
Germany

EU DECLARATION OF CONFORMITY

We hereby declare that the product/series described below conforms to the relevant fundamental health and safety requirements of the applicable European Union Directives as outlined herein – both in its basic design and construction as well as in the version marketed by us – and that sole responsibility lies with the manufacturer.

Product Description: **Heat Recovery Unit** **CLIMOS F 200 Eco - series**

Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 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

Applied standards:

EN 60335-1:2012 + AC:2014 + A11:2014 Household and similar electrical appliances - Safety – General requirements
EN 60335-2-40:2003 + A11:2004 + A12:2005 + A1:2006 + A13:2012/AC:2013 + A13:2012 + A2:2009 + AC:2006 + AC:2010 Household and similar electrical appliances - Safety / Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Applied standards:

EN 61000-6-1:2007 Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments
EN 61000-6-3:2007 + A1:2011/AC2012 + A1:2011 Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments
EN 55011:2009 + A1:2010 Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement

Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 in view of the requirements to be met by the environmentally compatible design of energy-related products

Applied standards:

Ecodesign Regulation (1254/2014/EU)

Directive 2010/30/EU of the European Parliament and of the Council 19. Mai 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products

Applied standards:

Labeling Regulation (1254/2014/EU)

Directive 2011/65/EU of the European Parliament and of the Council of 8. June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Applied standards:

EN 50581:2013-02 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Further applied standards:

EN ISO 12100:2010 Safety of machinery – General principles for design – Risk assessment and risk reduction
EN ISO 3743-1:2010 Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for small movable sources in reverberant fields – Part 1: Comparison method for a hard-walled test room
DIN EN 13141-7:2010 Performance testing of components/products for residential ventilation – Part 7: Performance testing of a mechanical supply and exhaust ventilation units (including heat recovery) for mechanical ventilation systems intended for single family dwellings
DIN EN ISO 10140-2:2010 Acoustics – Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation
EN ISO 717-1:2013 Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation

Signed for and on behalf of:

Reinsdorf, 25/03/2017



Michael Pitsch
Managing Director



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