



Original operating and service instructions

RCC

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Introduction

Overview

Manual	<p>This is the manual for the Dantherm residential ventilation units of the RCC series. This manual applies to units with serial numbers from:</p> <p>11915960</p>
Models	<p>The RCC units are available in two product variants. These product variants are fitted with different fans, which affects their performance. However, these product variants are identical in terms of function and installation.</p>
Safety	<p>This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, unless they have been given supervision or instructions concerning the use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.</p> <p>The unit must be earthed via cables with earthing conductor and earthed power supply. Check the power cable for damage or loose connections. If the power cable is damaged, it must be replaced by the manufacturer, customer service or similarly qualified persons in order to avoid a hazard.</p>
Target group	<p>This manual is for both installers and users of the product. Installation and repair of the unit is to be carried out by qualified personnel only. It is the responsibility of the installer to read and understand this manual prior to initial start-up and setup of the unit. The warranty is limited to units that have been installed by trained personnel.</p> <p>Apart from replacing the air filter and cleaning the outside of the system, any other type of maintenance activity must be carried out by persons suitably qualified.</p>
Copyright	<p>No part of this manual may be reproduced without the prior written permission of Dantherm.</p>
Reservations	<p>Dantherm reserves the right to make changes and improvements to the product and the manual at any time without any obligation to give prior notice.</p>
Recycling	<p>This unit is designed to provide a long service life. At the end of its service life, the unit must be recycled in accordance with national regulations and with high environmental protection considerations.</p>

**Abbreviations in
this manual**

The following abbreviations are used in this manual:

Abbreviation	Description
Operating mode A	Standard operating mode on delivery, connection diagram and further information see page 33
Operating mode B	Operating mode with electronically swapped airflow direction, connection diagram and further information see page 33
BP	Bypass damper
DHCP	Automatic assignment of an Ethernet address provided from an external network component (if unit is connected to Ethernet)
F7	Filter class (ePM1), improved – absorbs finer particles than G4 class filters
G4	Standard air filter class (ISO Coarse)
IP	Unique address for Ethernet port
LAN	The local network is the internal network that may have a wireless access
PC	Personal computer running MS Windows
PC Tool	Device-specific software application for Windows
RH	Relative humidity
S1	Temperature sensor no 1
S2	Temperature sensor no 2
S3	Temperature sensor no 3
S4	Temperature sensor no 4
T1	Outside air inlet into the unit
T2	Supply air from the unit into the dwelling
T3	Extract air from the dwelling into the unit
T4	Exhaust air from the unit to the outside
USB	Universal serial bus connection – part of almost any computer
VOC	Volatile organic compounds sensor, measures volatile organic compounds and controls the ventilation level depending on the pollution of the air

Symbols used in the operating instructions

In these operating instructions, particularly important text passages are highlighted with signal words and symbols that are described below.

Signal words

DANGER

...indicates a hazard which, if not avoided, will result in death or serious injury.

WARNING

...indicates a hazard which, if not avoided, could result in death or serious injury.

CAUTION

...indicates a hazard which, if not avoided, could result in a minor or moderate injury.

NOTICE

...indicates important information (e.g. property damage) but does not indicate hazards.

INFO

Information marked with this symbol helps you to carry out your tasks quickly and safely.

Hazard symbols



This symbol is used to warn you of potential risk of injuries. Follow all safety instructions indicated in the manual next to the warning triangle to avoid potential injury or death.



Electrical voltage!

This symbol indicates that there are dangers to the life and health of persons due to electrical voltage when handling the system.



Sharp element

This symbol indicates that there is a risk of injuring your hands on a sharp element when carrying out certain work.



No reaching in

This symbol indicates that it is forbidden to reach into certain components of the unit with your hands.



Protective gloves

This symbol indicates that it is required to wear protective gloves when performing a specific operation.



Protective mask

This symbol indicates that it is required to wear a protective mask when performing a specific operation.



Disconnect mains plug from electrical outlet

This symbol indicates that you have to remove the power plug from the socket before carrying out certain work.

USER MANUAL

Overview

Introduction

Target group



This part of the manual is intended for the users of the product. All instructions described in the Installation and Service Manual for Professionals must be carried out by trained technicians.

Note! Read carefully before use. Keep for future reference.

It is the responsibility of the operator to read and understand this manual and other information provided and to apply the correct operating procedures.

Read the entire manual before starting up the unit for the first time. It is important to be familiar with the correct operating procedures for the unit and all related safety precautions to avoid the risk of personal injury and/or property damage.

WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, unless they have been given supervision or instructions concerning the use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

NOTICE

Damage to the unit and risk of mould!

Dust, dirt and moisture entering the unit during the construction phase can damage the unit and cause mould to form inside.

- Prevent dust, dirt and moisture from entering the unit during the construction phase by blocking all air ducts and inlets to the unit.
- Do not operate the unit until the house is clean and habitable.
- Never use the unit to dry a house that is still damp during the construction phase!

Operation

Overview



DANGER

Danger to life due to exhaust gases!

When using open fireplaces in combination with this unit, negative pressure may arise inside the dwelling. The exhaust gases produced at the fireplace will be carried into the dwelling and can endanger your life.

- Operate the unit in fireplace mode when making an open fire inside the dwelling and make sure that the exhaust gases can escape easily.
- Install alarm devices that warn you of dangerous exhaust gases.



WARNING

Serious risk of injury to hand and fingers with active fans

Reaching your hand into a running fan during operation can result in serious injury or mutilation of the hands.

- Never reach into one of the fans when the unit is in operation.

Control panel

The control panel comes with four keys, each with an associated LED underneath. In the centre of the membrane keyboard is an illuminated LED indicator with four levels to indicate the fan speed. The LED always indicates the current fan speed regardless of the operating mode.

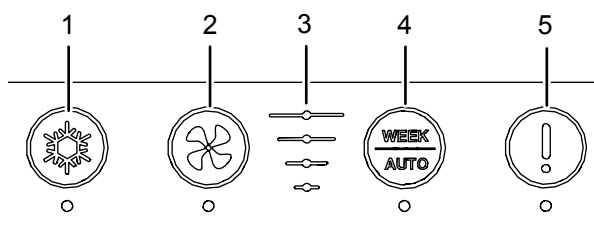


Fig. 1: Buttons and displays on the control panel

Item	Designation	Function
1	Bypass button	press briefly: activates/deactivates manual bypassing press and hold for 5 seconds: activates/deactivates summer mode
2	Fan speed button	press briefly: increases the fan speed by one step press and hold for 5 seconds: activates/deactivates fireplace mode
3	Fan speed level indication	indicates the fan speed (stage 0 to 4)
4	Week/Auto button	press briefly: activates the selected week program press and hold (for 5 seconds): activates demand-controlled operation
5	(Filter) alarm button	press and hold (for 5 seconds): deactivates the filter alarm resets the timer of the filter alarm (even if the alarm is not triggered) LED: orange: check filter red: error alarm (see 54)

Standard operating modes

NOTICE

Risk of water damage!

In case of heavy condensation, water can leak out of the air duct system which can lead to water damage.

- Never switch off the ventilation unit to save energy. Leave the unit switched on continuously to prevent the formation of condensate.

The unit comes with three standard operating modes:

- Manual operation
- Automatic operation (according to week program)
- Demand-controlled operation

Decide which of the three standard operating modes you want your unit to run in and adjust the settings as desired using the Dantherm PC Tool, the Dantherm Residential App or the HRC3 remote control. Note, however, that mandatory minimum values for air exchange may apply.

Manual operation



Controlling the fan speed manually. In manual mode, the ventilation unit operates at the selected fan speed until it is changed manually.

Briefly pressing the fan speed button activates the manual mode. The fan speed is increased by one level (stage 0–4) each time the button is actuated. After stage 4, the fan speed starts again at stage 0. The stage of the fan speed is indicated by the fan speed level indication on the control panel.

INFO

If the unit runs at stage 4 (fan boost) or stage 0 (off) in manual mode, it will automatically switch to stage 3 (nominal mode) after four hours.

Stage 0 of the fan speed can be locked using the PC Tool. If stage 0 is locked, the fan speed jumps to stage 1 after stage 4.

When the manual mode is activated, this will be indicated by continuous illumination of the respective LED.

Automatic operation (according to week program)



When automatic operation is activated, the unit will automatically adjust the fan speed to a preset week program.

You can activate the week program from the unit's control panel, but you cannot select it. Selecting one of the 11 week programs (10 preset programs + one customisable program in the PC Tool) can only be achieved via the Dantherm Residential App, the HRC3 remote control or the PC Tool. For more information on the weekly programmes, please refer to the chapter "Week programs of the time switch".

Briefly pressing the *Week/Auto* button activates automatic operation. When a week program is activated, this will be indicated by continuous illumination of the respective LED.

Demand-controlled operation



Activate demand-controlled operation if you want to control the quality of the room air automatically. In this mode, the measured values of the VOC, RH and/or CO₂ sensors are used to control the quality of the room air. Therefore, the respective sensors must be connected for demand-controlled operation. The CO₂ sensor can only be connected via an installed Accessory Controller (HAC).

Pressing and holding (five seconds) the *Week/Auto* button activates demand-controlled operation. When demand-controlled operation is activated, this will be indicated by the corresponding LED flashing slowly.

Temporary operating modes (override)

With the exception of the automatic bypass function, the temporary operating modes are activated manually and temporarily override the settings of the selected main mode. The temporary operating modes are stopped automatically by a timer or if certain conditions are not met, but can also be deactivated manually (with the exception of the automatic bypass function).

Bypass mode (cooling)

In bypass mode, the bypass damper is opened, which will guide the airflow around the heat exchanger. The outdoor air is thus guided into the dwelling without heat recovery. The bypass mode can be activated in two ways:

- Automatic bypass function
- Manual bypass function

Automatic bypass function



When using the automatic bypass function, the bypass damper is automatically opened/closed when the conditions for automatic bypass are met.

You can change the setpoints for the minimum outdoor temperature (T_{min}, default setting: 15 °C) and max. indoor temperature (T_{max}, default setting: 24 °C) via the PC Tool or the Dantherm HRC3 remote control.

If the conditions for automatic bypass are met, the open status of the damper is indicated by the continuous illumination of the corresponding LED.

Conditions for activating the automatic bypass function:

- The outdoor temperature is at least 2 °C below the extract air temperature
- AND the outdoor temperature is above the setpoint (T_{min})
- AND the extract air temperature is above the setpoint (T_{max}).

If one of the following conditions are met, the bypass is deactivated:

- The outdoor temperature is above the extract air temperature.
- The outdoor temperature is at least 2 °C below the setpoint (T_{min}).
- The extract air temperature is at least 1 °C below the setpoint (T_{max}).

NOTICE

Waste of energy!

If the settings for the bypass temperature are too low, there is a risk that the unit will open the bypass while the central heating inside the dwelling is active.

Manual bypass function



If bypass/cooling is desired and the automatic bypass function is not activated, the bypass can be activated manually. The bypass is opened once the conditions for manual bypass are met within the set time period (default setting: six hours). The time period can be changed by means of the PC Tool. Briefly pressing the bypass button activates/deactivates the manual bypass mode. An active bypass mode (open damper) is indicated by the continuous illumination of the corresponding LED.

Note: If the bypass mode is activated but the conditions for the open bypass damper are not met, the activated bypass mode is not indicated by the LED.

Conditions that must be met to activate the automatic bypass function:

- The outdoor temperature is at least 2 °C below the extract air temperature
- AND the outdoor temperature is above 9 °C

Summer mode

In summer mode, the supply air fan is stopped so that only the extract air fan is operating. In this case, the fresh air supply is ensured by opening windows, doors, etc.

INFO

The summer mode is automatically deactivated once the outdoor temperature drops below 14 °C.



Pressing and holding the bypass button for five seconds will activate/deactivate the summer mode. When the summer mode is activated, this will be indicated by the corresponding LED flashing.

Fireplace mode

The fireplace mode can be activated when you light a fire in the fireplace. The unit will then generate excess pressure for seven minutes to prevent the formation of smoke in the living room. If the fireplace mode is not deactivated manually, it switches off automatically after seven minutes.

INFO

The fireplace mode is only activated once the supply air temperature is above 9 °C.



Pressing and holding the fan speed button for five seconds will activate/deactivate the fireplace mode. When the fireplace mode is activated, this will be indicated by one of the three fan speed LEDs flashing.

User rights

This unit is designed for hidden installation. For this reason, user intervention can only be performed via external devices, i.e. either by a wireless remote control or a smartphone app. Please refer to the respective manual for these accessories for the relevant instructions. Users can obtain the PC Tool from their local retailer and carry out the specified functions. The PC Tool offers more extensive options for installers. The following table indicates all the functions that are available via the specified interfaces. In addition to the functions listed in the table, the unit has an acoustic alarm signal for the filter alarm. The abbreviations stand for:

- A = Available to all users
- P = Available for installers only

Function	Wired remote control HCP11	Hand-held remote control	Smart-phone	PC Tool
Basic operation				
Selection of the basic operating mode (manual, week program and demand-controlled, provided the respective sensor is available)	A	A	A	A
Selection of fan speed 1–4 in manual fan mode	A	A	A	A
Selection of summer mode	A	A	A	A
Selection of fireplace mode	A	A	A	A
Activation of absence mode	-	A	A	A
Activation of night mode	-	A	A	A
Setting the start and stop time of night mode	-	A	A	A
Base values				
Indication of the current operating mode	A	A	A	A
Indication of the current fan speed	A	A	A	A
Indication whether summer mode is active or not	A	A	A	A
Indication of temperatures T1–T4	-	A	A	A
Indication of the temperature T5, with activated wireless remote control	-	A	A	A
Speed display of the supply air and extract air fan speed	-	P	-	P
Filter				
Filter contamination – three-stage display	-	A	A	A
Acoustic filter alarm	A	A		
Resetting the filter timer after expiry	A	A	A	A
Resetting the filter timer before expiry	A	A	A	A
Indication of the remaining filter time in days	-	-	A	A
Alarms				
Acoustic alarm signal	A	A		
Error indication in real time	-	A	A	A
Indication of specific error codes	A	A	A	A
Indication of historical error logs with time stamps	-	-	-	A

Function	Wired remote control HCP11	Hand-held remote control	Smart-phone	PC Tool
Time and Date				
Indication and setting of time/date	-	A	A	A
Selection of week program no.	-	A	A	A
Individual settings for week program 11	-	-	-	A
Indication of the operating time counter	-	-	-	A
Indication of date of installation	-	-	-	A
Manual calibration of nominal speed				
PC Tool instructions	P	-	-	P
Network				
Enable DHCP	-	-	-	A
Assigning a fixed TCP/IP network address (or automatic use of DHCP)	-	-	-	A
Software versions				
Indication of the main PCB's software version	-	P	-	A
Indication of the software version of the wireless remote control	-	P	-	-
Indication of the software version of the smart-phone app	-	-	A	-
Indication of the software version of the PC Tool	-	-	-	A
Indication of the HAC software version	-	P	-	-
Forced test run of internal preheater and bypass				
Started from PC Tool	-	-	-	P
External override				
Function setting for digital input	-	-	-	P
Unit type configuration				
Indication of unit type	-	-	-	A
Selection of unit type	-	-	-	P
Serial number indication and setting	-	-	-	P
Unit name setting	-	-	-	P
Indication of unit name	-	-	A	A
Indication of A/B function switch position	-	-	-	A
Dwelling settings				
Type selection private/business – (when using business, deactivate stage 0)	-	-	-	P
Selection of building insulation	-	-	-	P
Selection whether a fireplace is available (defrost under pressure not allowed)	-	-	-	P

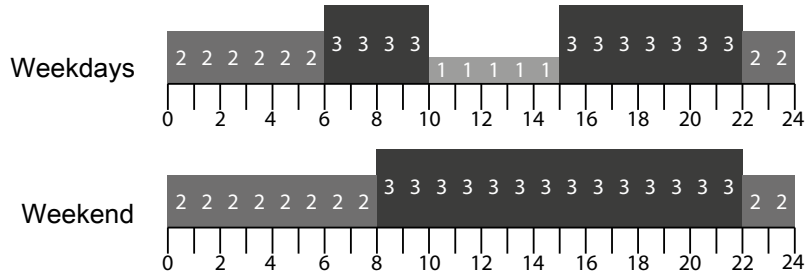
Week programs of the time switch

The following illustrations indicate the preset fan stages for one day (0 to 24 h) in the respective programs.

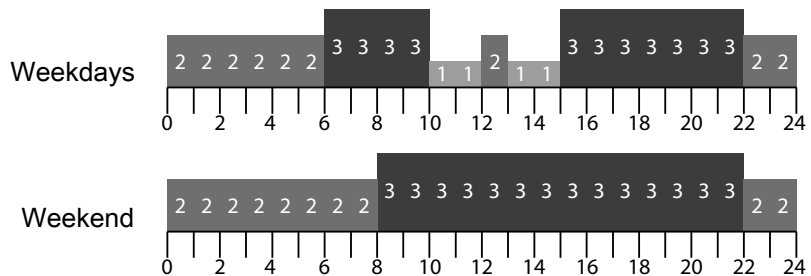
Each of the programs offers two settings:

- Weekdays (Mon–Fri)
- Weekends (Sat–Sun)

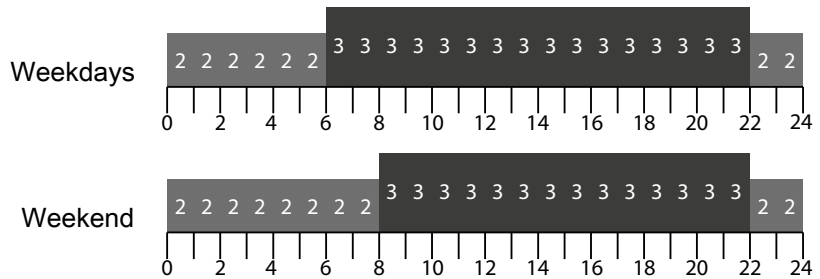
Program 1



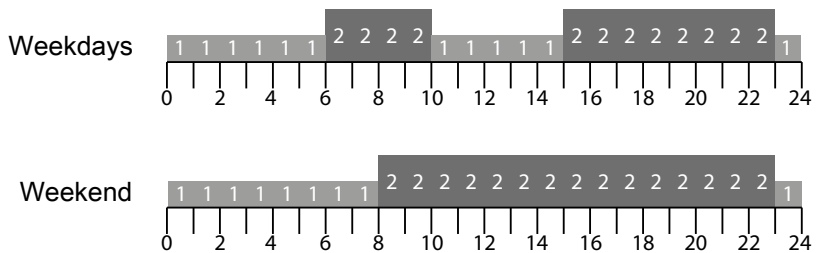
Program 2



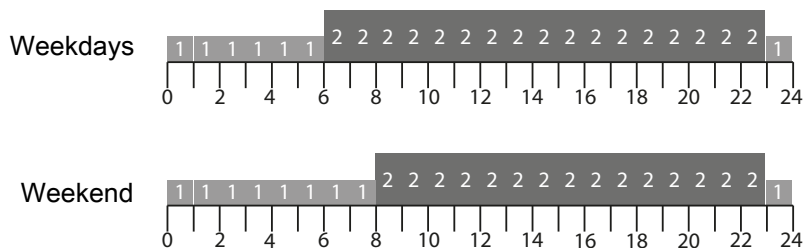
Program 3



Program 4

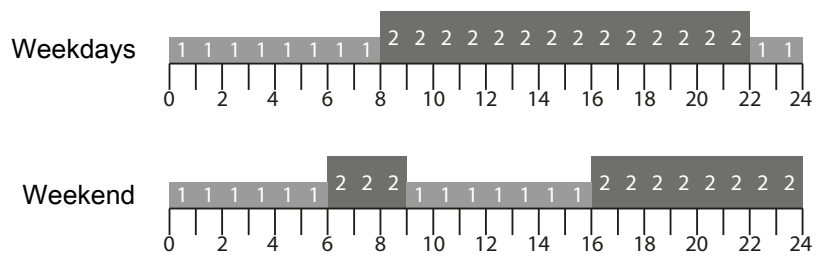


Program 5

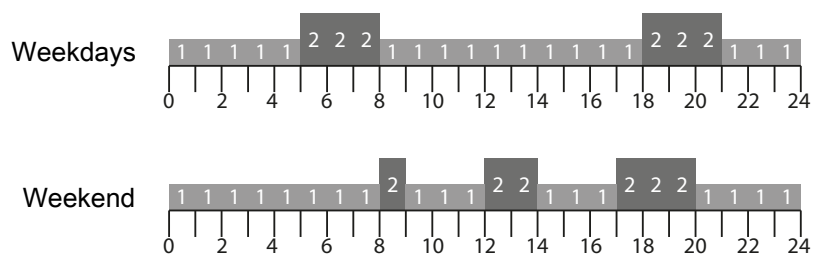




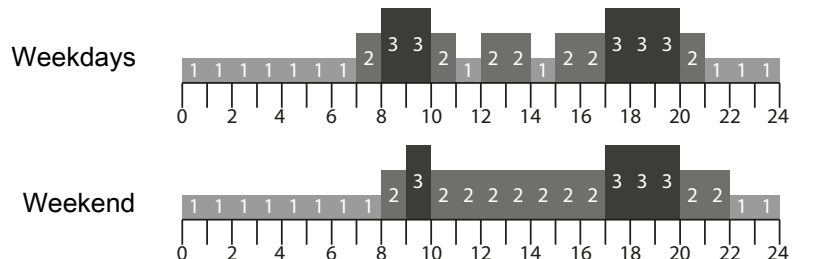
Program 6



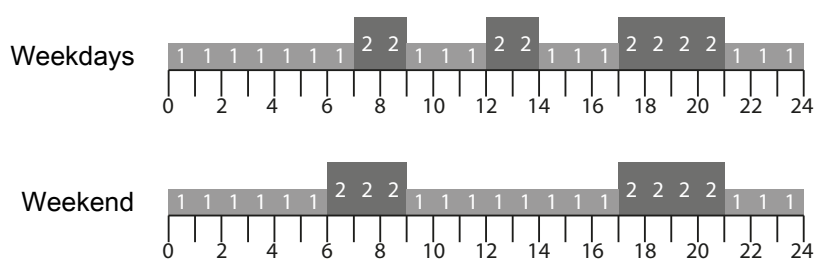
Program 7



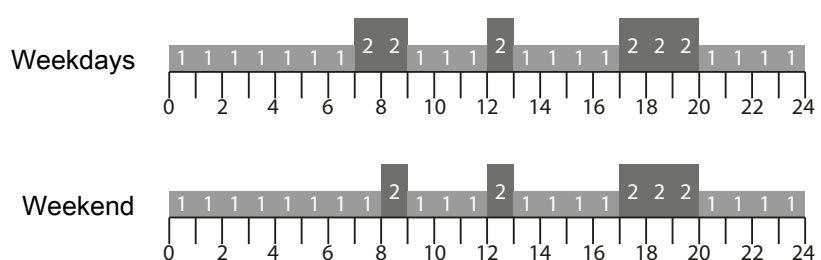
Program 8



Program 9



Program 10



Program 11



Maintenance and care

Preventive maintenance activities are required at regular intervals to ensure efficient and optimal operation without unwanted failure and to ensure an expected service life of at least 10 years.

Note that the filter maintenance intervals may vary depending on the specific ambient conditions. Also be aware and that moving parts are wear parts that must be replaced when worn.

The factory warranty is only valid if it can be documented that regular preventive maintenance activities have been carried out as prescribed. Proof can be provided by a written logbook with a company stamp or similar.

Maintenance intervals

The filters are the only parts that the user can maintain. Maintenance of the filter must be carried out at least at the following intervals:

Interval	Task	To be carried out by:
Six months	Check filter(s). Replace filter(s) if required.	User
Annually	Replace filter(s)	User

Filters – Alarm and inspection



INFO

Other components must be maintained by trained specialist personnel at least every two years. For more information, please refer to the chapter "Maintenance and Troubleshooting" in the Installation and Service Manual for Professionals. Check which activities have to be carried out. At an early stage, contact a specialist company to commission the activities.

The unit is provided with an integrated timer for the filter alarm which is activated every 12 months by default. The time period for the filter alarm can be changed via the remote control or the PC Tool.

When the timer expires, a filter alarm is triggered. An acoustic signal is emitted and the LED under the ⓘ button is illuminated in orange. If the LED is illuminated in red, please refer to the "Troubleshooting" section in the Installation and Service Manual for Professionals.

Please proceed as follows to inspect the filter and replace it if necessary:

1. Remove the filters and check them after the filter alarm has been triggered.

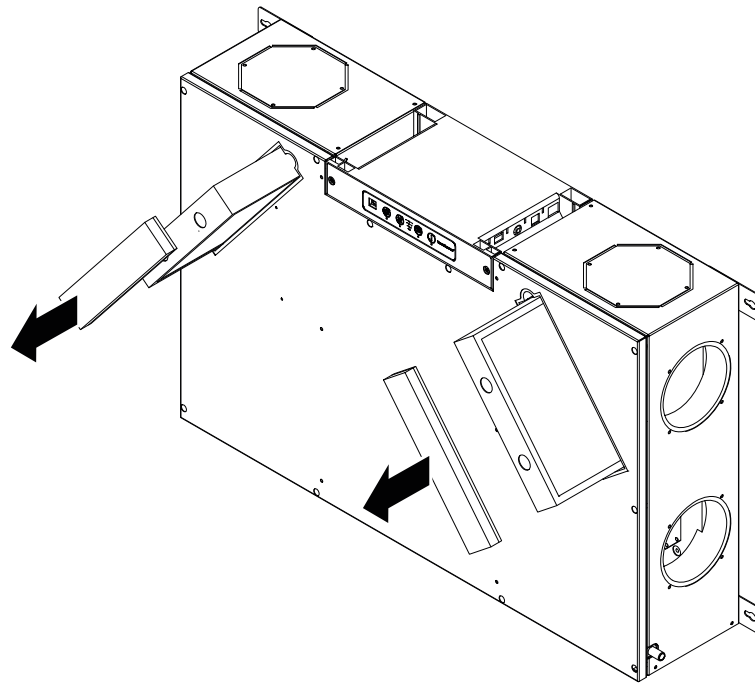



Fig. 2: Replacing the filters

2. Check the filters for dirt (after six months). Replace the filters if you notice heavy soiling or clogging. **Note:** Always replace both filters, even if only one filter is clogged, to avoid an imbalance in the airflow passing through the unit.
3. Replace the filters after 12 months, regardless of whether they are clogged or an alarm has been triggered.
4. Insert the clean filters into the unit. Ensure that the filters are inserted the right way round. The arrow on the filters must point inwards.
5. Press the  button for 5 seconds.
 - ⇒ The filter alarm is stopped and the filter alarm timer is reset.
 - ⇒ A brief acoustic signal will be emitted indicating that the filter alarm timer has been reset correctly.

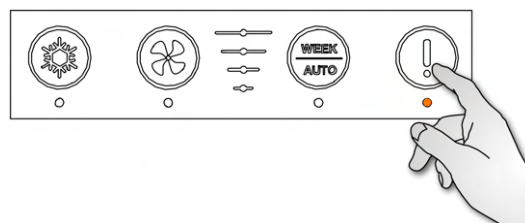


Fig. 3: Stopping the filter alarm

INSTALLATION AND SERVICE MANUAL FOR PROFESSIONALS

Overview

Introduction

Target group

This part of the manual is intended for use by suitably qualified personnel only.

Safety precautions

It is essential to be familiar with the correct operating procedure of the residential ventilation system and all safety measures. Dantherm accepts no liability for operational failures or personal injury resulting from the failure to comply with safety measures.

Safety



Observe the following safety instructions:

- Do not use the unit in potentially explosive rooms or areas and do not install it there.
- Ensure that all electric cables outside of the unit are protected from damage (e.g. caused by animals). Never use the unit if electric cables or the power connection are damaged!
- Only plug the power plug into a properly fused (earthed) mains socket.
- Only install the unit in accordance with the national regulations for electrical connection.
- Prevent dust, dirt and moisture from entering the unit during the construction phase by blocking all air ducts and inlets to the unit.
- Do not operate the unit until the house is clean and habitable.
- Observe the operating conditions specified in the "Technical data" chapter.
- Do not cover any air intakes or outlets at any point – except with accessories intended for this purpose.
- Before carrying out maintenance, care or repair work on the unit, remove the power plug from the mains socket. When doing so, pull the plug, not the cable.

Product description

Scope of delivery and unpacking



CAUTION

Feet crushing hazard if the unit tips over

There is a risk of the unit tipping over during unpacking and risk of injuring the foot of a person standing nearby.

- Until the unit is installed, the largest surface of the unit should be positioned on the floor.

Check the scope of delivery for transport damage during unpacking:

1. Report obvious, external damages to the carrier, packaging company, post office, etc. immediately upon receipt and note the damage in the consignment or transport documents.
2. Remove the packaging completely (without using a knife) and dispose of the packaging material according to the local regulations.
3. Check the content of the box.
4. If you notice any transport damage after unpacking the unit or if the delivery is incomplete, contact the responsible sales representative or specialist dealer immediately.

Scope of delivery

The following parts are included in the scope of delivery:

- 1 x unit RCC
- 1 x additional material consisting of:
 - 1 x manual
 - 1 x set of labels, data sheets etc.
 - 1 x hose clamp

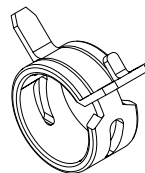
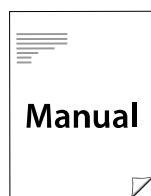


Fig. 4: Mounting material

General description

Introduction

The residential ventilation unit RCC is designed to provide dwellings with fresh air by heat exchange from the extract air to the supply air. This results in a low energy loss. The unit is designed for installation underneath a ceiling in dry surroundings, with temperatures > 12 °C., e.g. in utility rooms or rooms with similar heating requirements. The air duct connections can be switched electronically, offering the option to direct the connected duct system either to the right or to the left as described on page 33.

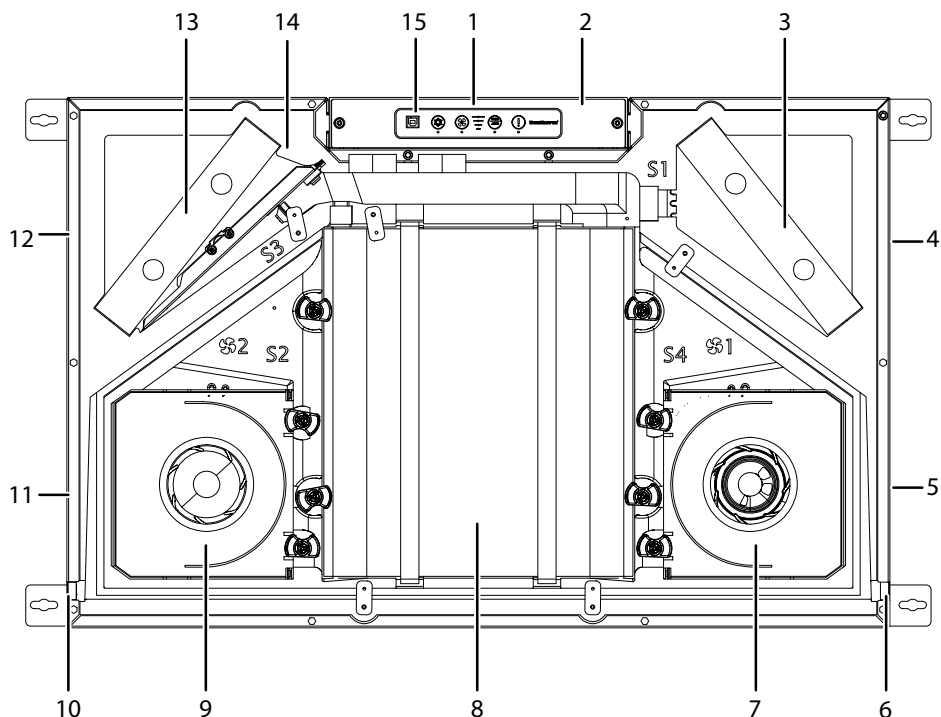


Fig. 5: Product overview (without condensation tray)

Item	Operating mode A (default)	Item	Operating mode B
1	Control panel	1	Control panel
2	Control, printed circuit board	2	Control, printed circuit board
3	Supply air filter ISO Coarse or ePM1	3	Extract air filter ISO Coarse
4	Outdoor air – T1	4	Extract air – T3
5	Exhaust air – T4	5	Supply air – T2
6	Water drainage spigot	6	Blocked (closed with cap)
7	Extract air fan	7	Supply air fan
8	Heat exchanger	8	Heat exchanger
9	Supply air fan	9	Extract air fan
10	Blocked (closed with cap)	10	Water drainage spigot
11	Supply air – T2	11	Exhaust air – T4
12	Extract air – T3	12	Outdoor air – T1
13	Extract air filter ISO Coarse	13	Supply air filter ISO Coarse or ePM1
14	Bypass module	14	Bypass module
15	USB connection	15	USB connection

Nameplate

The nameplate, which indicates the respective product variant, is located on the side of the unit (opposite the control panel). Below the control panel there is another label providing basic information about the unit.

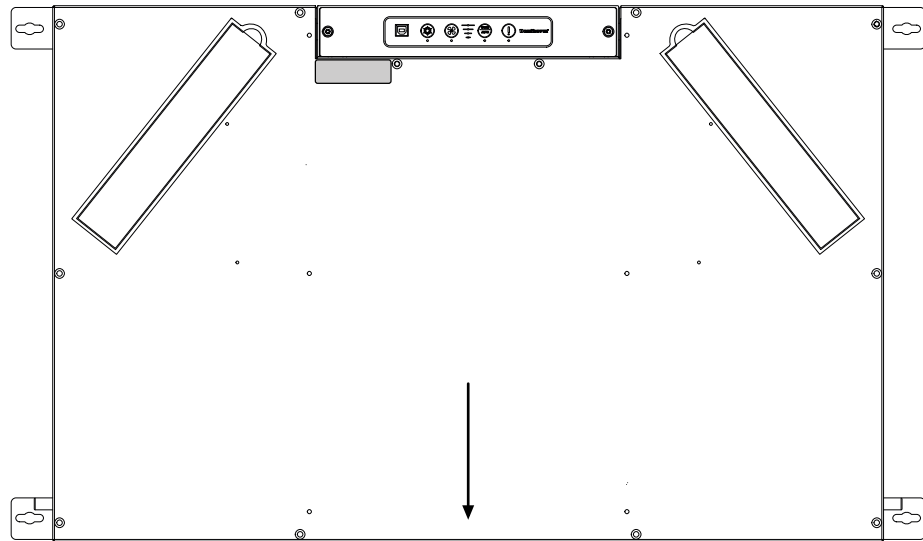


Fig. 6: Nameplate

Airflows

This figure indicates the standard airflow paths through the unit. Further information on changing the operating mode can be found on page 35.

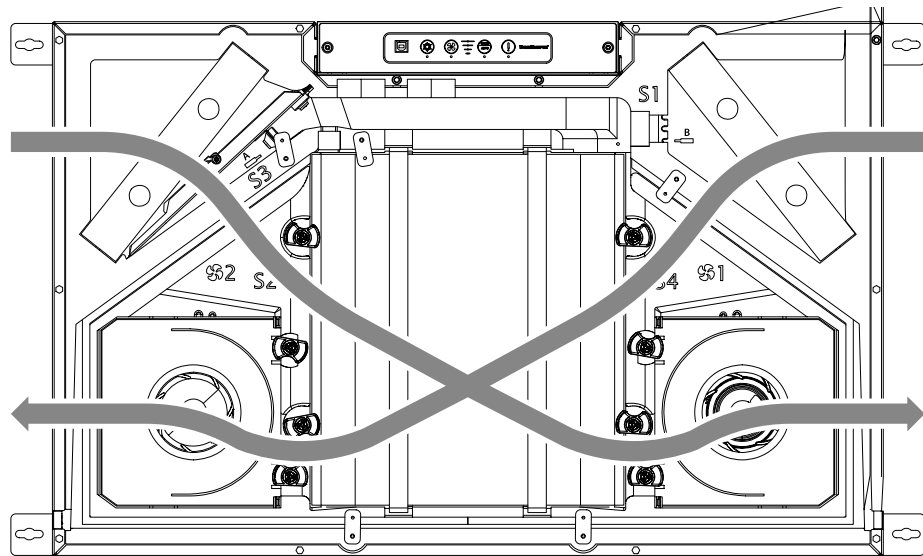


Fig. 7: Airflow paths inside the unit

Positioning of the sensors This figure indicates the correct placement of the sensors (if available) inside the unit.

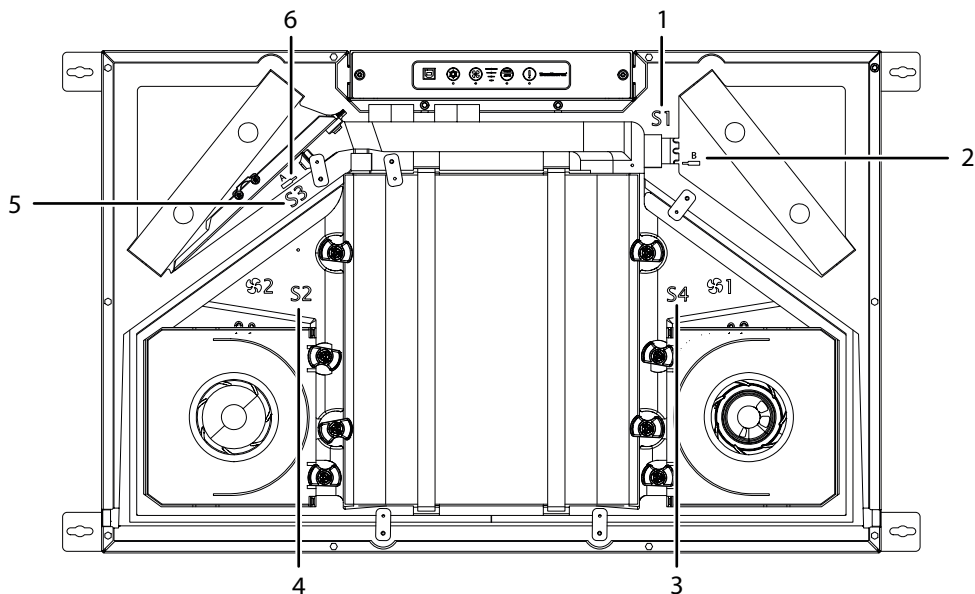


Fig. 8: Positioning of the sensors

Item	Operating mode A (default)	Item	Operating mode B
1	Outdoor air sensor T1	1	Extract air sensor T3
2	-	2	Air humidity/VOC sensor
3	Exhaust air sensor T4	3	Supply air sensor T2
4	Supply air sensor T2	4	Exhaust air sensor T4
5	Extract air sensor T3	5	Outdoor air sensor T1
6	Air humidity/VOC sensor	6	-

Components description

The individual components included in the RCC unit are described in this section. Please use the figure on page 20 for reference.

- Cabinet** The outer cabinet parts are made of galvanised steel. The inner part is a closed polystyrene block. Only the front cover and drip tray need to be removed to insert accessories or replace components.
- The inside of the cabinet is sound- and heat-insulated with polystyrene foam. The cabinet of the unit is designed to be installed in ambient temperatures of 12 °C to 45 °C.
- Heat exchanger** The counterflow heat exchanger absorbs the thermal energy from the extract air and transfers thermal energy to the supply air.
- Fans** The supply air fan provides fresh outdoor air via the heat exchanger to the distribution ducts through which the air is distributed to bedrooms, living rooms, children's rooms, study spaces, etc. The supply air fan is also used to distribute the air. The extract air fan extracts stale, humid indoor air from kitchens, bathrooms, toilets, utility rooms and other wet rooms in the dwelling.
- Bypass damper** The operation of the heat exchanger is deactivated by the motorised bypass damper. The bypass damper is used in warm summer conditions, when colder outdoor air can be used to reduce the indoor temperature if the indoor temperature exceeds a preset upper temperature limit.
- Control** The main control of the unit is located at the main PCB.
- Air humidity sensor** The air humidity sensor in the extract air duct continuously monitors the quality of the extract air and adjust the airflow accordingly. This operating mode is called "demand mode". If the unit is connected to an HRC remote control, the level will be indicated on the display with three level symbols. The demand mode is used to ensure the correct ventilation rate with the lowest possible power consumption.
- Filter** The unit is equipped with two ISO Coarse cassette filters. These filters protect the heat exchanger and improve the indoor climate by removing dust and particles from both airflows.
- An ePM1 class filter can be obtained as alternative/accessory. If an ePM1 filter is used, it always is to be installed in the supply airflow where it also removes very small particles from the air.
- Water drain** The unit is equipped with 2 water drainage spigots for draining condensate. It is compulsory to mount a water hose to the spigots next to T4 to drain off the condensate water to a drain. Please refer to the connection label on the unit for the correct drainage. The remaining unused drain must be closed with the supplied cap.

Accessories

The unit is delivered ex-factory without any optional accessories mounted. The accessories are to be mounted prior to initial unit installation, or, if required, after start-up, if additional functionality is requested. For the installation of the accessories, please refer to the instructions supplied with each accessory.

Electric preheating

The unit can be equipped with an electrical preheating element that preheats the incoming air. The preheater increases the temperature of the outdoor air supplied to the heat exchanger. This way, the risk of ice formation inside the heat exchanger is reduced during operation in very cold weather conditions.

The preheater is an external device that is connected to and controlled by the control unit of the RCC.

Hand-held remote control

To control the RCC, Dantherm recommends using a remote control specifically designed for this unit series.

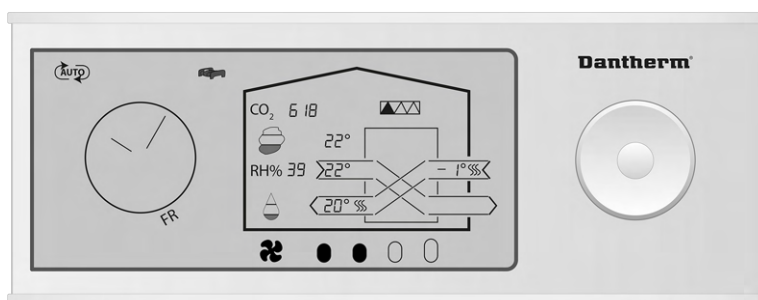


Fig. 9: Hand-held remote control

Wired remote control (HCP 11)

A wired remote control (HCP 11) without display can be connected to the unit as an alternative to the hand-held remote control.

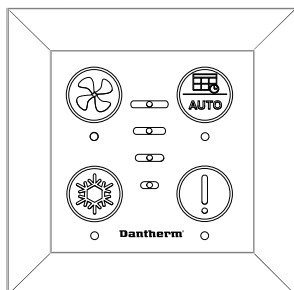


Fig. 10: Wired remote control HCP 11

Accessory control (HAC 2)

A variety of accessories can be connected to the unit via the accessory control HAC 2.



Fig. 11: Accessory control HAC 2

VOC sensors

In addition to the air humidity sensors (RH %) (see page 23), the RCC can be equipped with VOC sensors (volatile organic compounds). These sensors provide a continuous quality control of the indoor air and adjust the airflow accordingly, which results in sufficient ventilation with the lowest possible electrical power consumption.



Fig. 12: VOC sensor

Filters

Replacement filters in sets of 2 ISO Coarse filters or 1 ISO Coarse filter plus 1 ePM1 filter (pollen filter) are available as spare parts.

Special operating modes

In this section, the operation of the system under special conditions is described. For details on the standard operating modes, please refer to page 9.

Preheating (with preheating coil)

The preheating process is controlled through monitoring of temperatures registered by all sensors inside the unit and its purpose is primarily to prevent the icing inside the heat exchanger. Depending on the overall temperature conditions and in order to save energy, the control will continuously attempt to exploit as little of available preheater capacity as possible.

- When the preheater is active, the temperature of the outdoor air will be increased to maintain a stable airflow and stable operation of the unit as a whole. Nevertheless, if some harsh conditions appear in which the preheating coil can no longer ensure frost-proof operation, the defrosting program will be activated.
- The effects experienced during the period of time in which the preheater is active will be a higher exhaust air temperature and a slightly higher supply air temperature.
- If needed, further improvements and adjustments of the supply air temperature can be achieved if an after-heater is applied.

The temperature setpoints during operation with an active preheating coil are fixed and cannot be changed.

Defrosting

An optimal operation at low outdoor temperatures is ensured by the use of the preheating coil. The defrosting process is the only remaining operating mode to protect the heat exchanger against icing in the following cases:

- if the unit is not equipped with a preheating coil.
- if the unit is fitted with a preheating coil but the outdoor temperatures are so extreme that the preheating capacity is not sufficient.

The defrosting process is a temporary state that is controlled in a similar way to the preheating process. Defrosting is cancelled as soon as the system has reached the temperatures required for normal operation.

INFO

The defrost mode is a safety mode. During defrosting the unit cannot change to another operating mode until defrosting is completed. When the defrost mode is active, the HRC 3 indicates dEF on the display.

There are two different procedures for defrosting:

- no fireplace in the house (default setting)
- fireplace in the house

You can change the defrosting procedure via the PC Tool. However, the setpoints for defrosting cannot be changed.

Standard defrosting procedure

The standard defrosting procedure without a fireplace in the house will trigger the following steps:

- The speed of the supply air fan decreases slowly, and if necessary, until the minimum speed is reached.
- After 10 seconds, if necessary, the supply air fan switches off completely while the exhaust air fan continues to run to defrost the ice by means of warm air from the interior rooms.
- When the defrosting process is completed, the supply air fan starts at minimum speed and increases its speed until the originally desired speed is reached.

The defrosting process creates a negative pressure in the dwelling. Depending on the air tightness of the dwelling, the negative pressure leads to the following:

- If the dwelling is not completely airtight, the "missing" supply air will penetrate through small leaks in the dwelling envelope. In this case, the conditions for defrost mode are favourable.
- If the dwelling envelope is completely airtight and the "missing" supply air cannot enter the dwelling via other ways, defrosting is not as efficient and is only performed in low/freezing temperature conditions. **NOTICE! Under such conditions, we strongly recommend using a preheating coil.**

Alternative defrosting procedure

If there is a fireplace in the house, the alternative defrosting procedure is selected via the PC Tool and will trigger the following steps:

- The speed of the supply air fan and exhaust air fan decreases slowly, and if necessary, until the minimum speed is reached.
- After 10 seconds, if necessary, both fans are switched off completely for four hours.
- When the defrosting process is completed, both fans start at minimum speed and increase their speed until the originally desired speed is reached.

Stopping the operation

If no preheater is installed and the outside temperature is -13 °C for more than 4 minutes and 25 seconds, the operation of the unit is switched off for 30 minutes. This is also carried out if the defrost mode is activated. After 30 minutes, the unit tries to start and the previous operating mode will be activated.



INFO

If an electric preheating coil is installed, this safety shutdown procedure is automatically deactivated.

Description of the components of the control unit

The control system of the unit is located on the main PCB along with other outputs and inputs.

The control unit with LED display is connected to the main PCB via a flat cable.

The general architecture of the system control is shown in the figure below:

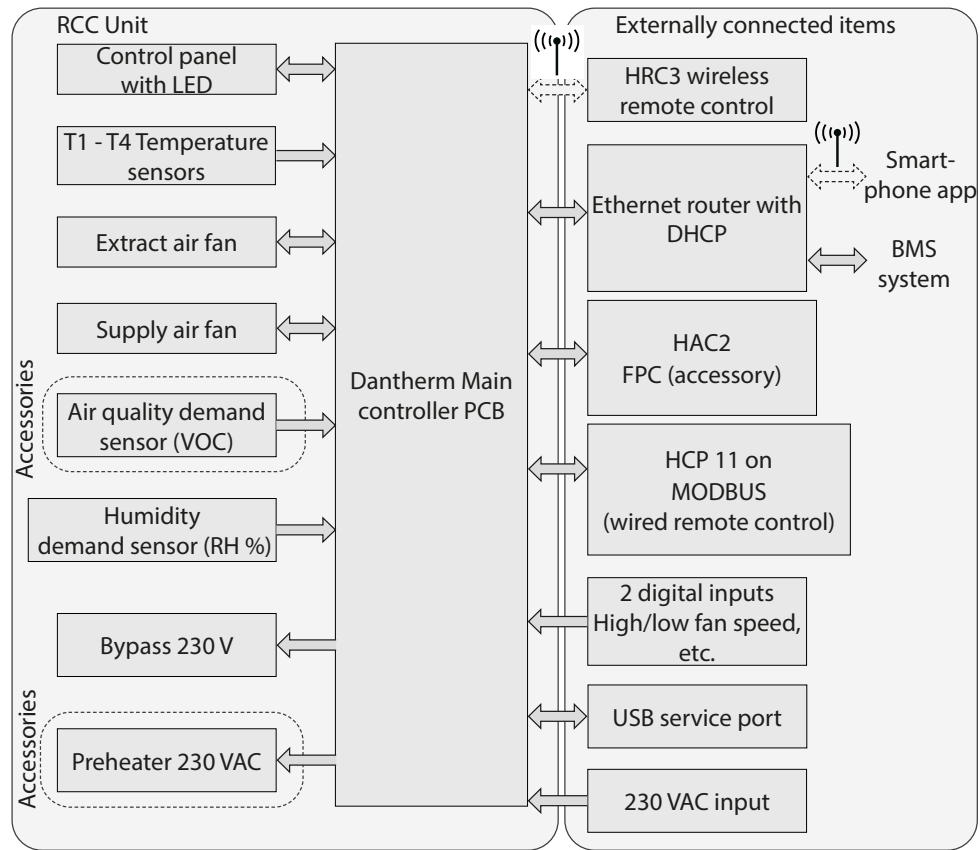


Fig. 13: Components of the system control

Control unit

The control unit is located on the top of the unit. The main PCB is mounted underneath the cabinet of the control unit.

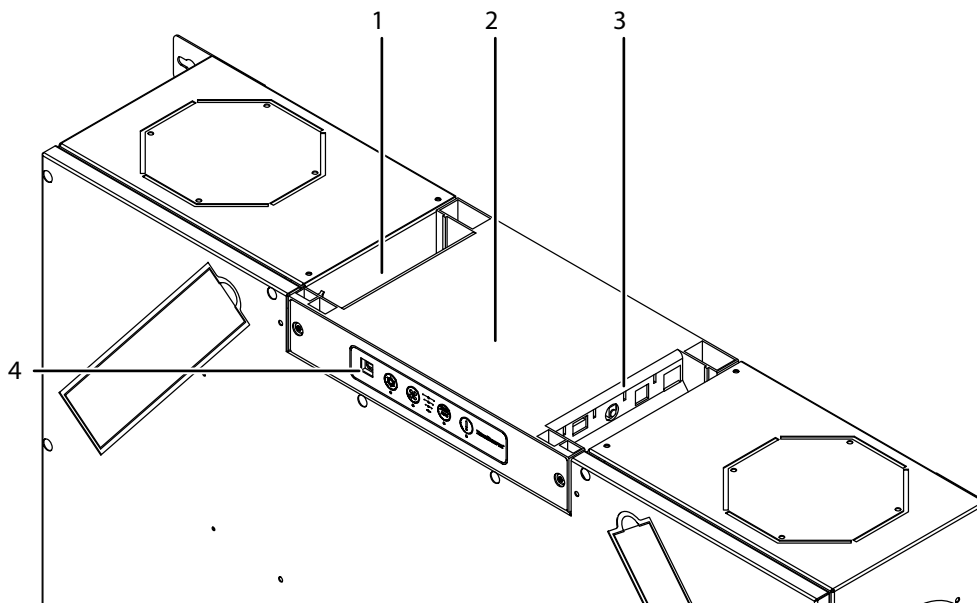


Fig. 14: Control panel

- | | | | |
|---|--|---|--|
| 1 | Power supply | 3 | External connections |
| 2 | Main PCB (inside the cabinet) and control unit | 4 | USB connection for:
- using the PC Tool
- reading out the error list |

External connections (main PCB)

The external connections of the main PCB on the back of the control unit are depicted in the figure below. For further explanations on how to use the external connections, please refer to the section *External Connections* in the *Installation* chapter. See also the circuit diagram in the chapter *Annex* for the connection to the different ports.

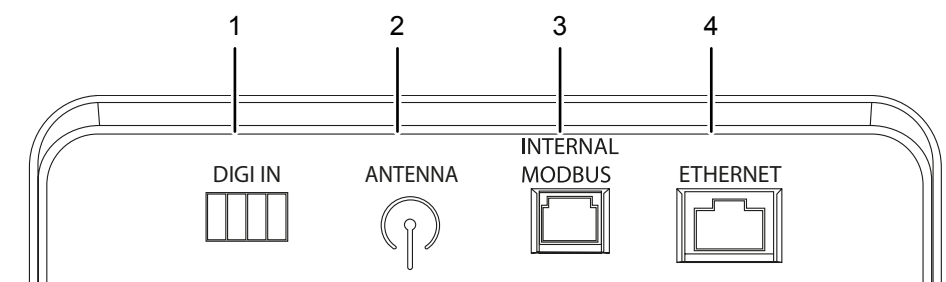


Fig. 15: External connections on the PCB

- | | | | |
|---|---|---|--|
| 1 | Digi In:
External digital input to select specific operations | 3 | Internal Modbus:
The Modbus RTU port is intended for internal communication between the unit and Dantherm accessories (HAC2 + HCP 11 + FPC) |
| 2 | Antenna:
Antenna slot for connection to the radio remote control | 4 | Ethernet:
LAN connection |

Digital input

The unit is equipped with 2 override inputs, also named digital inputs. These inputs can be used to select a different fan speed or to activate alarms.

By default, the digital inputs are set as follows:

- Digital input 1: fan stage 2
- Digital input 2: fan stage 4

Functional principle (see example in figure):

- Switch DI1 between pins 2 and 4 will activate input 1
- Switch DI2 between pins 3 and 4 will activate input 2

The digital input can be used as follows:

- Fan stages from 0 – 4
- Safety shutdown
- Water level sensor
- Boost for kitchen hood
- Further options

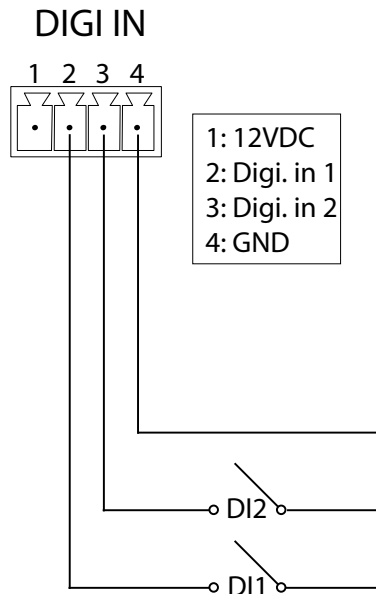


Fig. 16: Digital input

Important information and settings in the PC Tool can be found in the "External Control" menu item.

MODBUS

MODBUS RTU is used for internal communication between the unit (main PCB) and Dantherm accessories (HAC, FPC or HCP11). Modbus RTU is connected via the RS485 port.

INFO

An external Building Management System (BMS) cannot be connected as Modbus RTU via the RS485 connection or via Dantherm accessories (HAC, FPC, or HCP11).

Modbus TCP/IP: The Dantherm ventilation units are provided with the option to communicate with Modbus TCP/IP via the Ethernet connection. This can be used for Building Management Systems (BMS) or communication with smartphone apps.

Connecting to LAN

Connect the unit to a LAN port using a standard Ethernet cable with an RJ45 connector. If a non-prefabricated cable is used, first install a sufficient cable length through the house. Mount the RJ45 connector using the standard Ethernet cable crossover terminology as specified in T568B. These assembly instructions can be found on the internet, for example on Wikipedia.

The unit can be controlled via a smartphone app (IOS and Android) if your unit is connected to the same network via WiFi.

IP address assignment status	Description
Dynamic IP	If the unit is connected to a router with an integrated DHCP server, it will automatically retrieve the IP address from the router when the unit starts up.
Static IP	The PC Tool allows you to assign a static IP address to the unit.

Installation

General requirements

Installation site and directing the air duct connections

The following should be considered when selecting an appropriate installation site:

1. The unit is intended for installation in dry environments at temperature levels $>12\text{ }^{\circ}\text{C}$, e.g. in utility rooms or rooms with similar heating requirements.
2. The unit can be mounted vertically or horizontally on a wall or horizontally on the ceiling. Before carrying out the installation, please ensure that the ceiling or wall structure is able to support the additional weight of the unit.
3. The direction of the airflow can be switched electronically, offering the option to direct the connected duct system either to the right or to the left. Further information on changing the operating mode can be found on page 35.

Allow for additional space

This unit is designed to be used in concealed installations.

Please provide for additional space:

- To replace the unit if necessary.
- For the installation of an external preheater (accessory), which is mounted from the outside into the duct system within the area of the incoming outdoor air at T1.
- For checking and testing drain hoses, even if no preheater is installed.

These requirements are also to be observed by the customer service if the unit has to be completely dismantled due to maintenance purposes. Any warranty claims can only be acknowledged if the aforementioned requirements are fulfilled. See the minimum dimensions below for the space required for wall or ceiling mounting.

Space requirements for ceiling mounting

If you install the unit under the ceiling, please allow enough space on both sides to screw the screws properly into the ceiling. Please also allow for additional space on the side of the unit with the control panel.

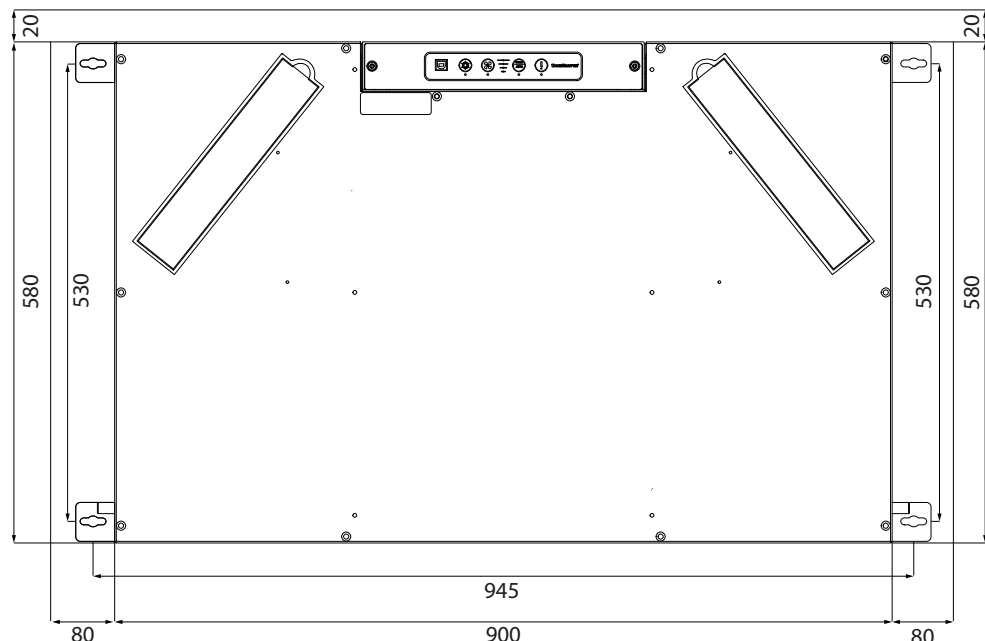


Fig. 17: Space requirements for ceiling mounting

Space requirement for wall mounting

If the unit is to be mounted vertically on the wall, T1 and T4 (cold air ducts) must always be located at the bottom of the unit. Please allow enough space on both sides to screw the screws properly into the wall.

If the unit is to be fitted with an additional preheater, please observe the instructions for fitting the preheater before installing the RCC. These can be found in the operating instructions for the preheater.

INFO

The preheater is always placed on the same side as the filters of the RCC and must be taken into account with regard to the space requirements of the unit.

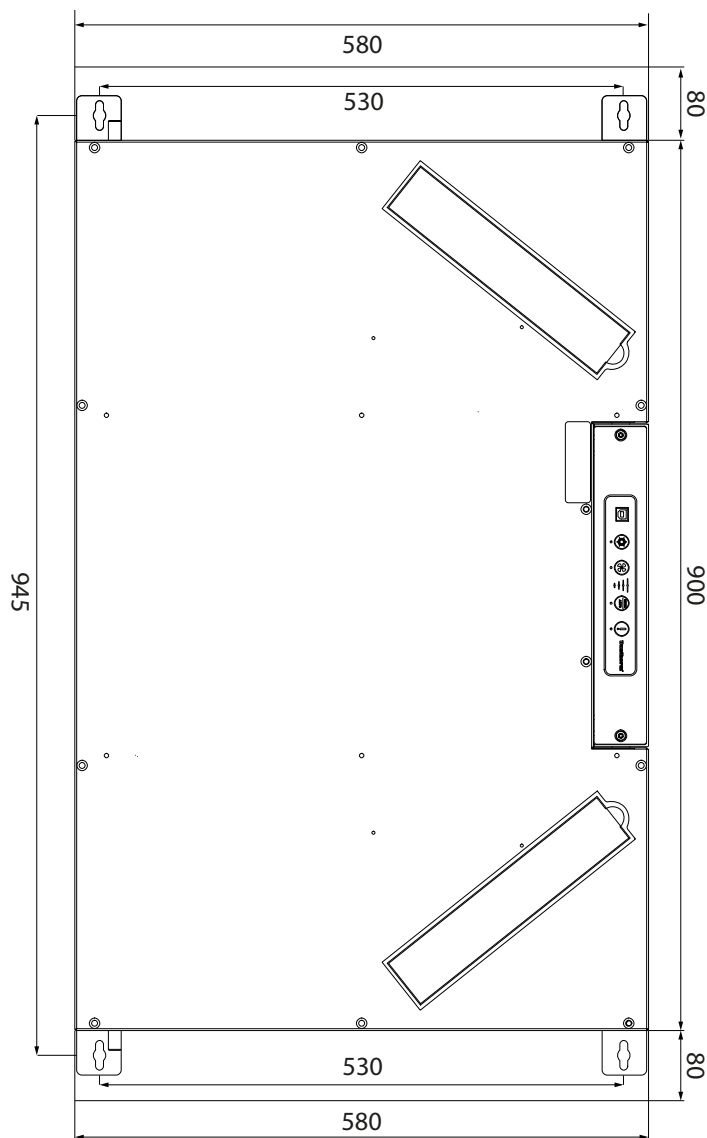


Fig. 18: Space requirement for the preheater for wall mounting

INFO

For horizontal wall mounting, the unit must be installed with the control panel facing upwards. The minimum distances for screwing in the screws are the same.

Installation options

The unit offers a variety of installation options, such as vertical or horizontal mounting, flexible cable routing and flexible air duct connections, making the unit suitable for a wide range of installation sites. Check the installation options and decide which is most suitable for the demands on site.

Vertical or horizontal

For vertical and horizontal installation, make sure that the condensation drain hose (1) is not routed into the floor drain, but ends above it.

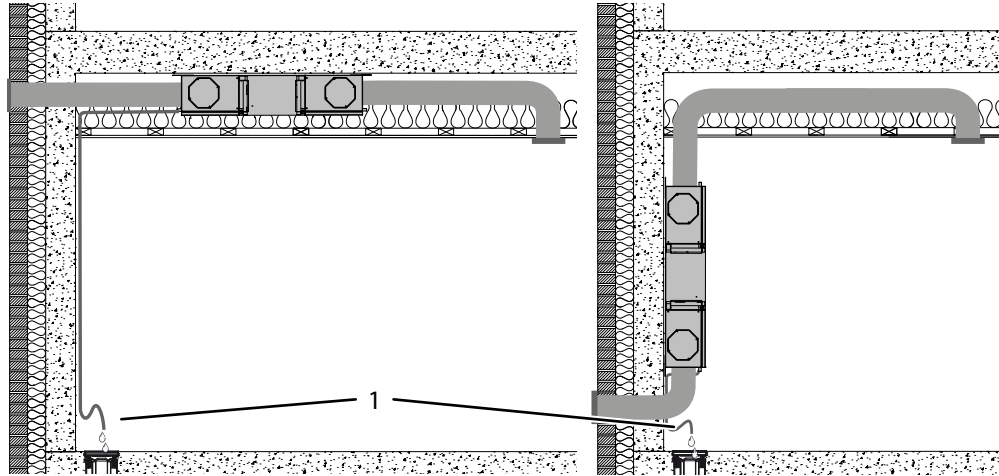


Fig. 19: Ceiling mounting (left) and wall mounting (right) with condensation drain hose

NOTICE

Before carrying out the installation, please ensure that the ceiling or wall structure is able to support the weight of the unit.
Make sure to allow for sufficient space for future maintenance work.

Selection of the operating mode

The air ducts leading into the dwelling can either be connected to the right or left side. Operating mode A is set as standard. (Carry out the steps in the *Change-over to operating mode B* section on page 35 to switch to operating mode B.)

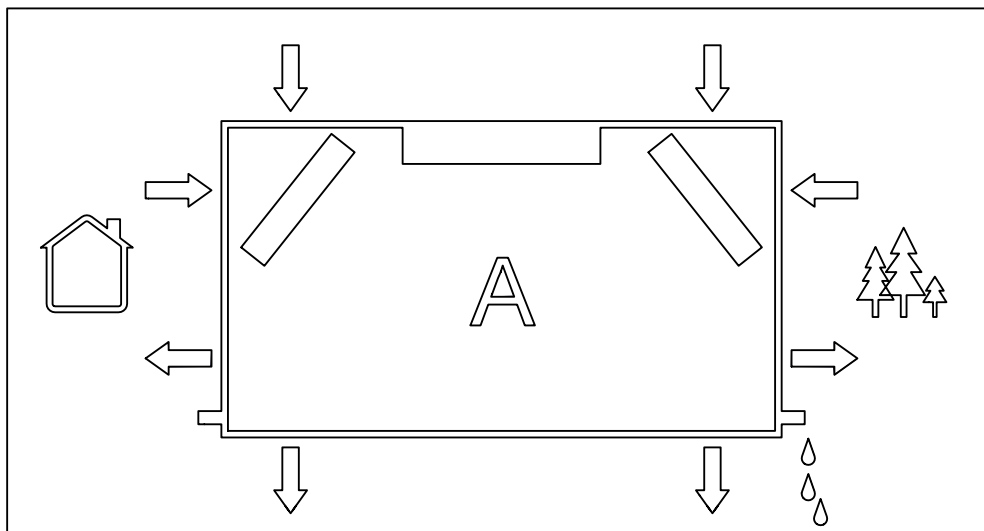


Fig. 20: Connection of the air ducts in operating mode A

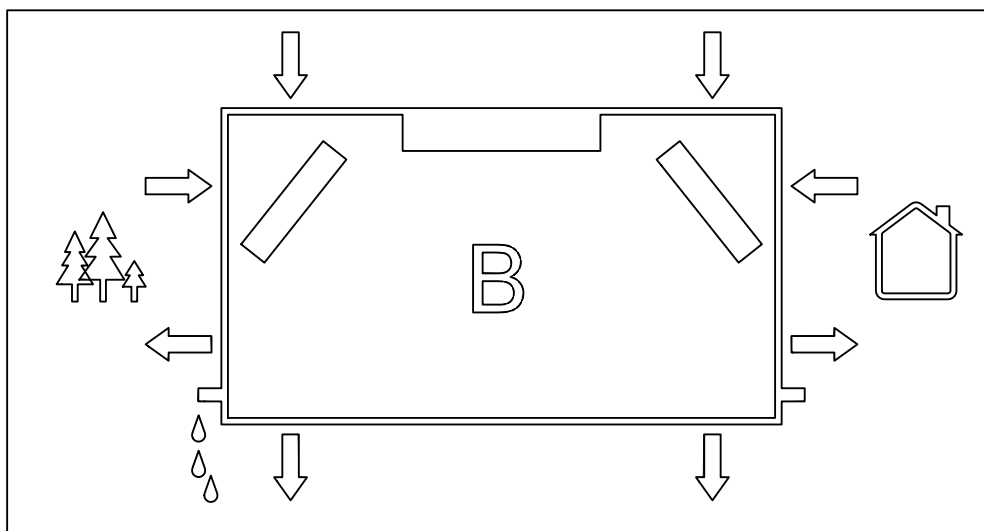


Fig. 21: Connection of the air ducts in operating mode B



⚠ DANGER

Risk of electric shock!

You can be severely injured by an electric shock.

- Always disconnect the unit from the mains by removing the mains plug from the socket before opening the unit!

NOTICE

Damage to the unit due to water accumulation

If the unit is mounted horizontally on the wall without being tilted, condensate may accumulate and cause damages to the unit.

- Lower the side of the unit with the active condensate drain by at least 40 mm.

Change-over to operating mode B

If local systems require operating mode B, follow the procedure below and check the information on the label to connect the water drain properly.

1. Loosen the two screws securing the control unit to the unit.
2. Pull the control unit all the way out of the unit until reaching the stop.

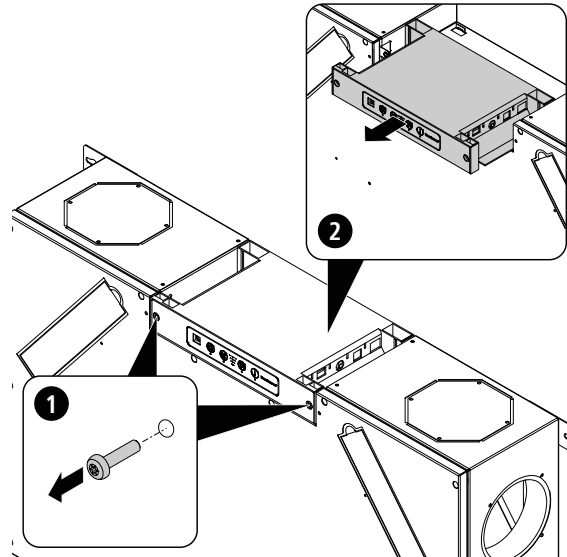


Fig. 22: Temporarily pulling out the control unit

⇒ You can now access the control unit's main PCB.

3. The main PCB is equipped with a switch that can be used to change the operating mode. By default, operating mode A is set as depicted in the figure. Slide the switch to the right to select operating mode B.

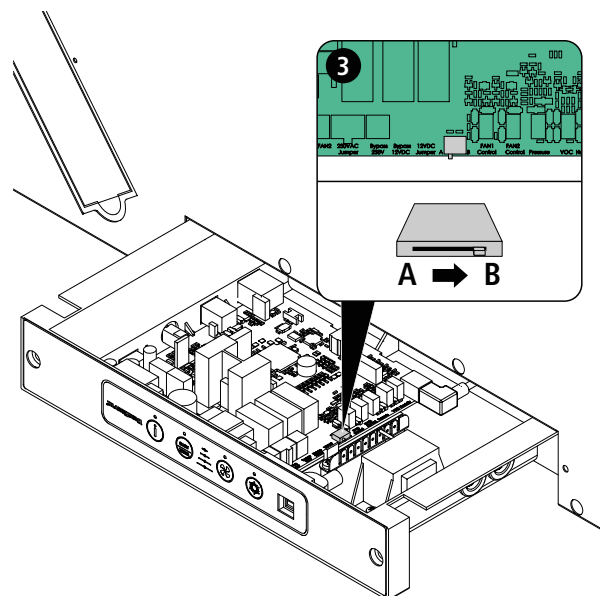
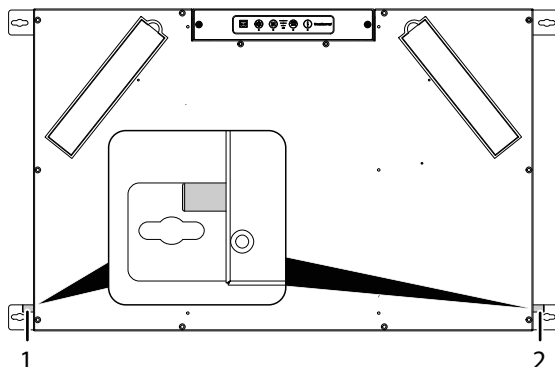


Fig. 23: Changing the operating mode

4. Push the control unit back into the unit and fasten it with the two screws.

5. Swap the condensate drain (1) and plug (2) as indicated. For a detailed description of the installation of the condensation drain hose, see page 44.



6. To change the RH sensors, open the side panel and look for the "A" and "B" markings. Move the humidity sensor (and the VOC sensor, if installed) to the position for operating mode B.

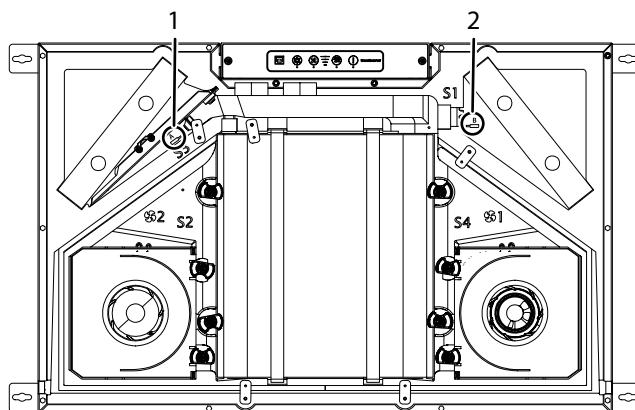
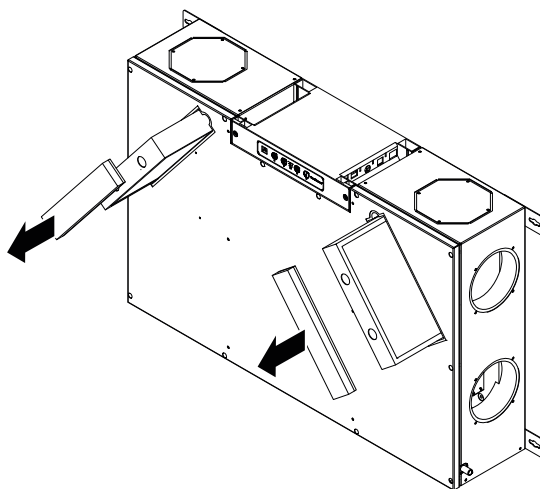


Fig. 24: Positioning of the humidity sensor

- 1 Attaching the humidity sensor when using operating mode A 2 Attaching the humidity sensor when using operating mode B

7. Change the filter (ONLY if the optional pollen filter ePM1 is used for the supply air). For information on the correct positioning of the ePM1 filter for operating mode A/B, please refer to the table on page 20.



8. Attach a new B label and a calibration label on the unit.
9. Connect the air duct as indicated on the label and described on page 43.
10. Calibrate the unit as described on page 46.

Air duct connections

By default, only the duct connections on the shorter sides of the unit are open. The inlets and outlets of the airflows in the two operating modes are depicted in the figures below.

Colour (arrows)	Designation of the airflow	Description
green	T1	Outdoor air
red	T2	Supply air
yellow	T3	Extract air
brown	T4	Exhaust air

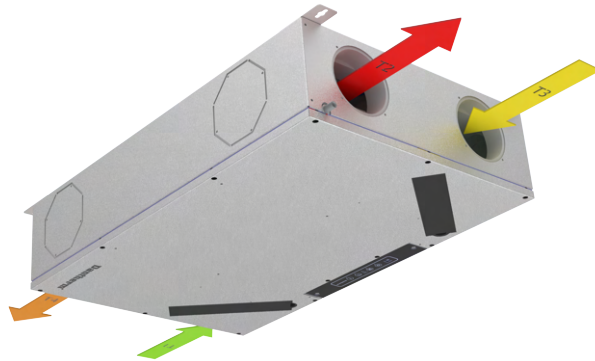


Fig. 25: Airflows in mode A

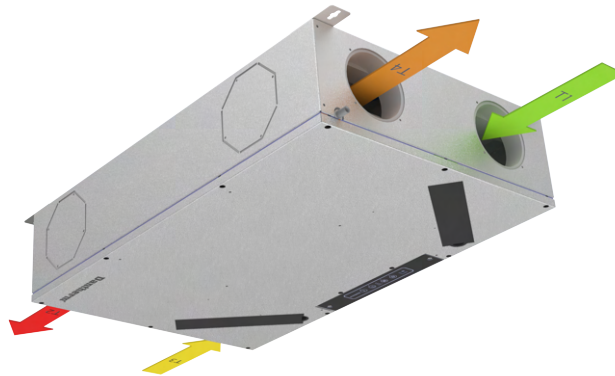


Fig. 26: Airflows in mode B

The ducts on the long sides of the unit are sealed by default, but can optionally be opened to allow further connection options. When using the air duct connections on the longer side, the unused air duct connections must be sealed (see page 39).

The following connection options are possible:

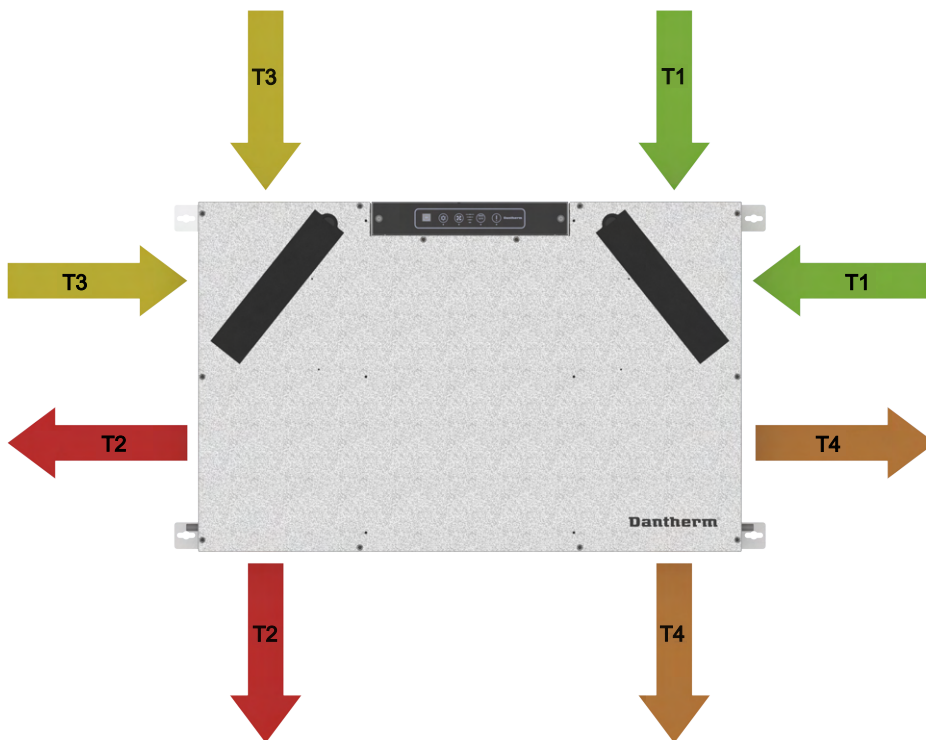


Fig. 27: Optional airflows in mode A

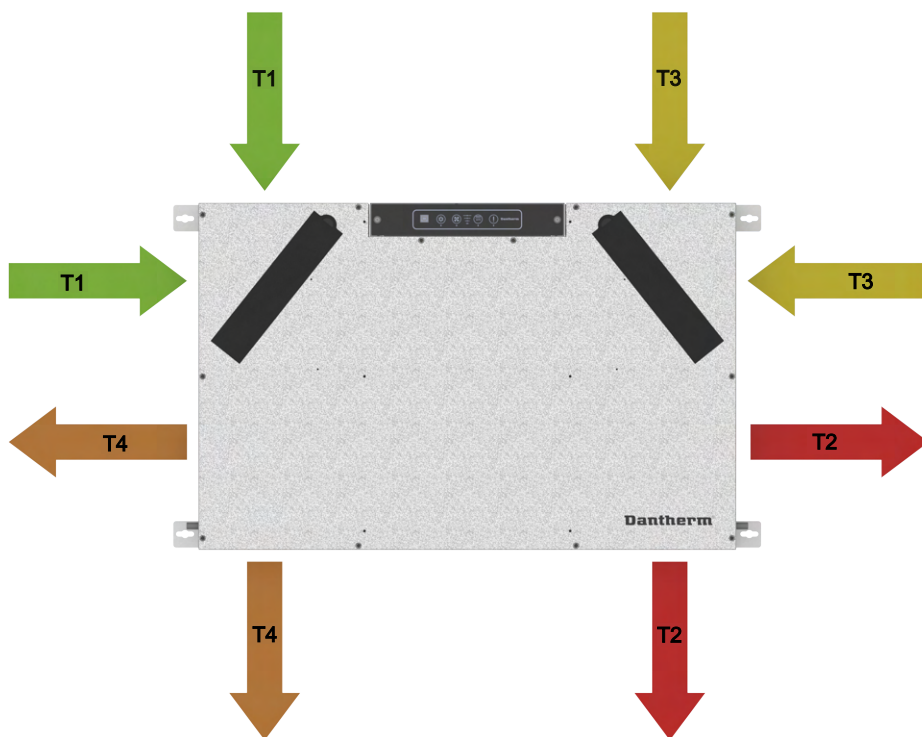


Fig. 28: Optional airflows in mode B

Using the side connections

INFO

Usually, you can only use one of the air duct inlets (T1, T3) and air duct outlets (T2, T4) at a time. If you want to use the sealed duct connections on the longer sides of the unit, you have to remove the covers and use them to seal the duct connections on the shorter sides, which are open by default.



CAUTION

Risk of hand injuries!

You may cut yourself on sharp edges when cutting out the metal parts.

- Wear protective gloves!

Please proceed as follows to use the duct connections on the longer sides of the unit:

1. Open the four sealed air duct connections on the longer sides of the unit with side cutters. Remove any excess metal.

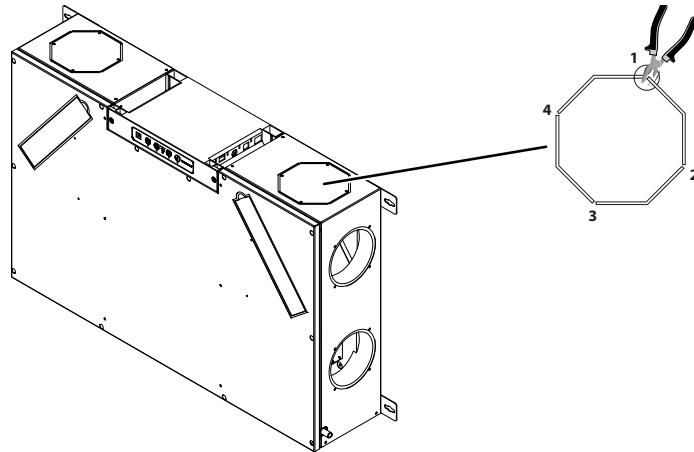


Fig. 29: Opening the air duct connections: side connection (top figure)

2. If you do not use the air duct connections on the shorter sides, which are open by default, place an insulation piece in a cap. Then close the corresponding duct connection on the shorter side of the unit with the insulation cap.

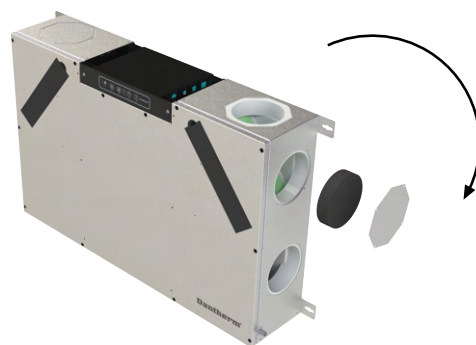


Fig. 30: Inserting the insulation cap

3. Connect the air ducts as described in the section "Air duct connections" on page 37.

Assembly

Vertical wall mounting

Please proceed as follows to mount the unit vertically on a wall:

1. Place the unit in a suitable position on the wall (see page 31).
2. Use a spirit level to ensure vertical alignment.
3. Drill two holes into the upper mounting bracket, insert the appropriate screws and tighten them lightly.
4. Drill two holes into the lower mounting bracket, insert the appropriate screws and tighten them lightly.
5. Before tightening the four screws firmly, press the unit down so that all the screws are seated in the upper part of the mounting bracket slots.

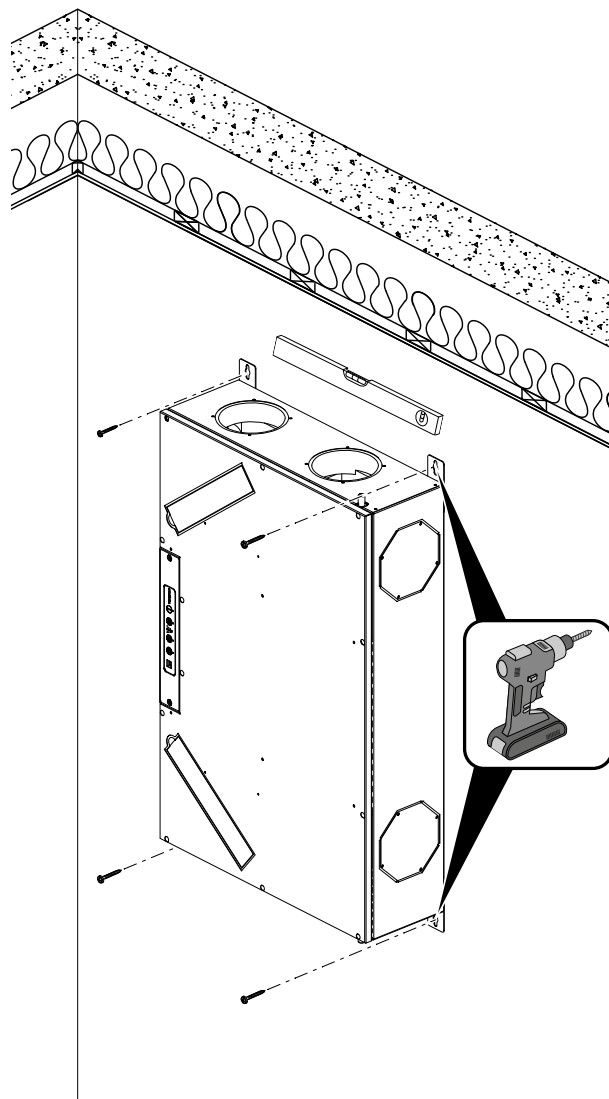


Fig. 31: Vertical wall mounting

6. Connect the air ducts according to the description in the chapter *Installation options*.
Important: The air ducts T1 and T4 must ALWAYS be routed to the duct connections at the bottom of the unit.

NOTICE

Damage to the unit due to water accumulation

If the unit is mounted vertically on the wall, the optional sealed air duct for the exhaust air (T4) must not be used (on the left or right depending on the operating mode, but always to the side of the active condensate drain). Failure to do so may cause water to accumulate and damage the unit.

- In the case of vertical mounting, do not use the sealed air duct for the exhaust air on the longer side of the unit. The duct outlet must be sealed.

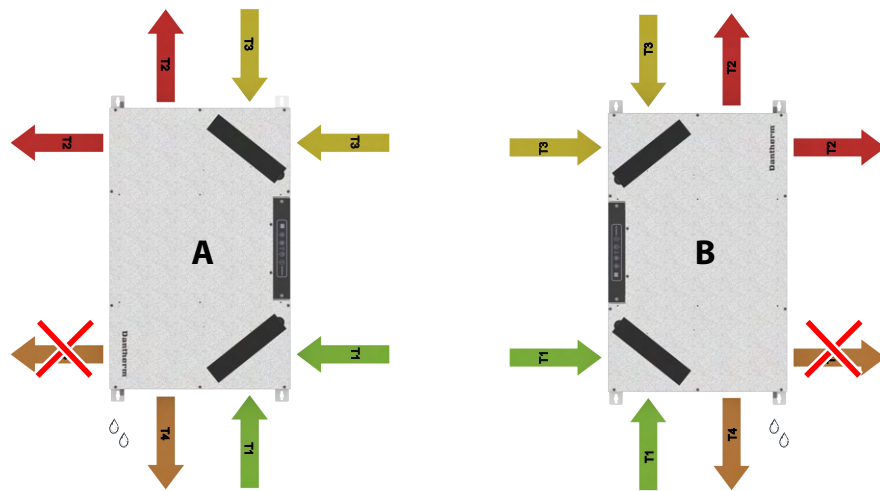


Fig. 32: Vertical wall mounting – prohibited duct connections

7. Connect the hose of the condensate drain.

Horizontal wall mounting

Please proceed as follows to mount the unit horizontally on a wall:

1. Place the unit in a suitable position on the wall (see page 31).
2. When positioning the unit, ensure that the side of the unit with the active condensate drain (left or right, depending on the operating mode) is positioned with an inclination of at least 40 mm towards the floor.

NOTICE

Damage to the unit due to water accumulation

If the unit is mounted horizontally on the wall without being tilted, condensate may accumulate and cause damages to the unit.

- Lower the side of the unit with the active condensate drain by at least 40 mm.

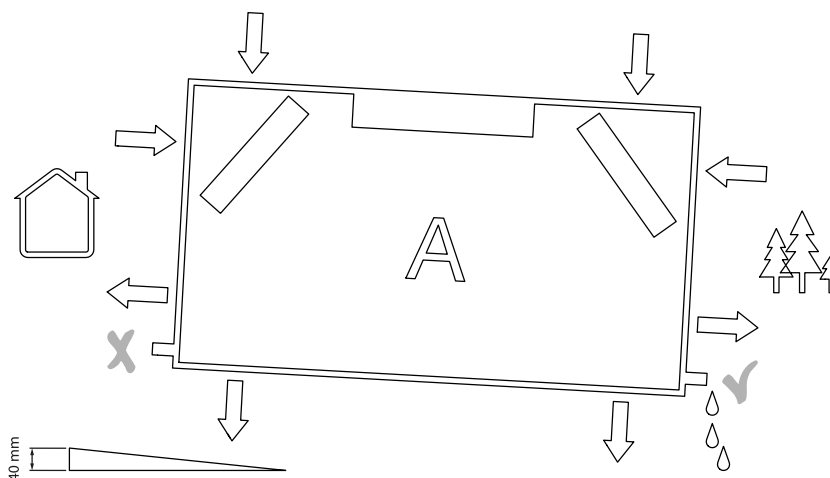


Fig. 33: Horizontal wall mounting with inclination – mode A

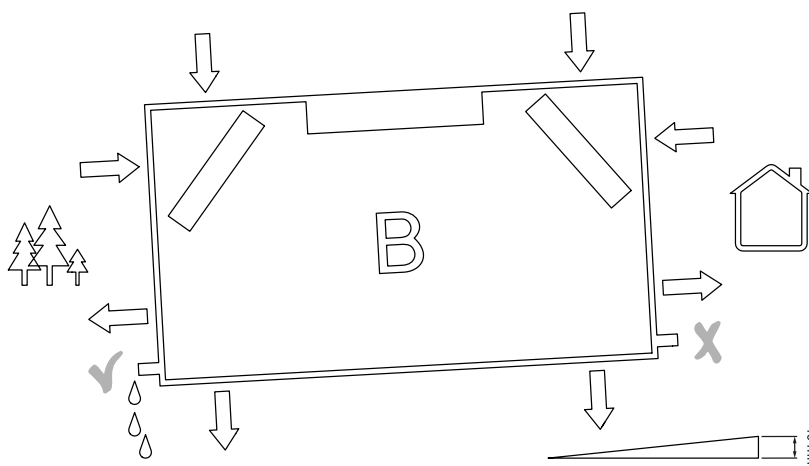


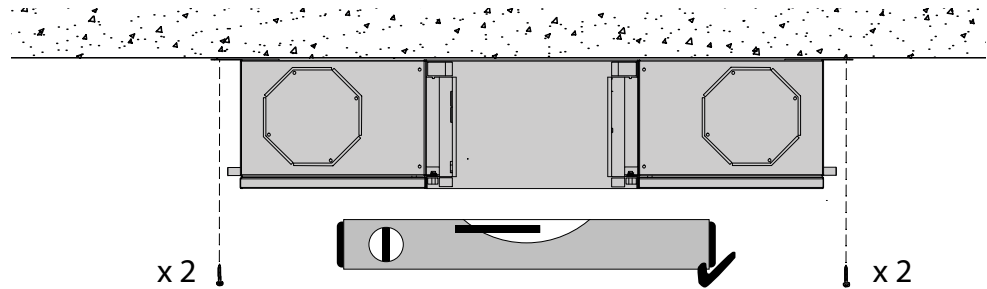
Fig. 34: Horizontal wall mounting with inclination – mode B

3. Drill two holes into the left mounting bracket, insert the appropriate screws and tighten them lightly.
4. Drill two holes into the right mounting bracket, insert the appropriate screws and tighten them lightly.
5. Before tightening the four screws firmly, push the unit to the left so that all the screws are seated in the right part of the mounting bracket slots.
6. Connect the air ducts according to the description in the chapter *Installation options*.
7. Connect the hose of the condensate drain.

Ceiling mounting

Please proceed as follows to mount the unit horizontally on the ceiling:

1. Place the unit in a suitable position on the ceiling (see page 31).
2. Drill two holes into the left mounting bracket, insert the appropriate screws and tighten them lightly.
3. Drill two holes into the right mounting bracket, insert the appropriate screws and tighten them lightly.



4. Before tightening the four screws firmly, push the unit to the left so that all the screws are seated in the right part of the mounting bracket slots.
5. Connect the air ducts and the drain hose.

Connecting the duct system

Only connect the air ducts to connections with spigots (specifications in accordance with local regulations).

NOTICE

NEVER screw duct spigots directly into the sheet metal of the unit.

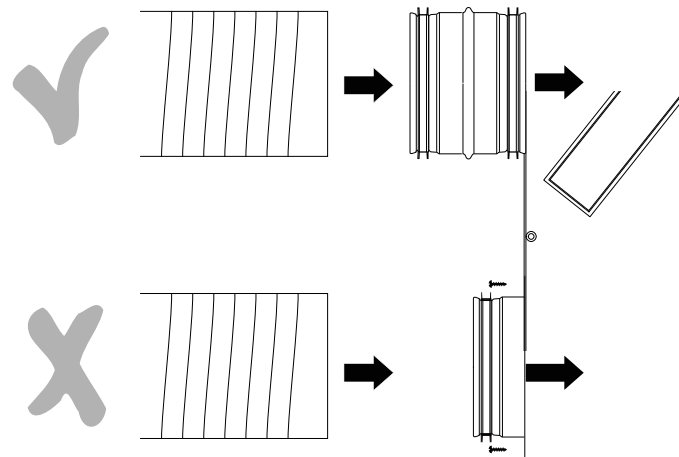


Fig. 35: Correct connection of the air ducts

Insulate the air ducts in accordance with local requirements, taking into account the ambient temperature of the installation.

Securing the air ducts

Make sure that all air ducts are fastened well and secured and ALWAYS securely connected to the ceiling or wall bracket (1).

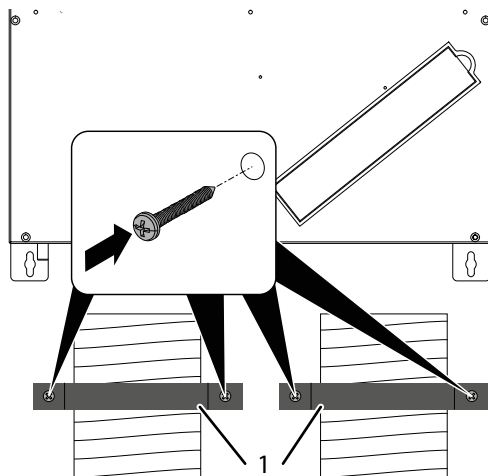


Fig. 36: Securing the air ducts

Condensate drain – General

It is essential to connect a condensation drain hose to the unit, as the air humidity from the extract air condenses inside the heat exchanger.

The condensate is harmful to the environment if it is not handled properly. Therefore, a suitable condensate drain hose must be connected that is both flexible and able to withstand constant bending. We recommend using a steel reinforced spiral hose.

The condensation drain hose is installed with a steady inclination of at least 1% (1 cm/metre).

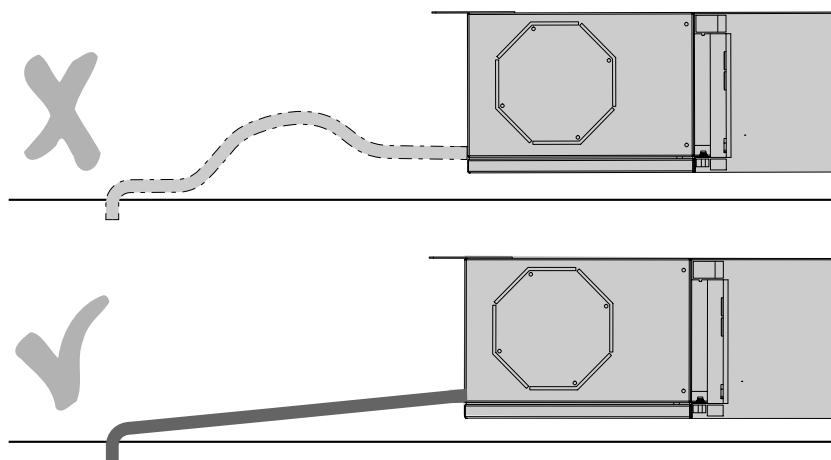


Fig. 37: Correct installation of the drain hose with a steady incline, incorrect above, correct below

**Condensate drain –
Installation**

After the hose has been laid down towards a drain, a siphon must be formed. This prevents the air from escaping from the hose. Mount the condensation drain hose in a way that either a circle or an S is formed, leaving at least 100 mm of barrier height (as depicted). Fill the siphon/loop with min. 0.5 l of water.
If the hose is routed in different ambient temperature conditions, please make sure that the water hose is protected against frost.

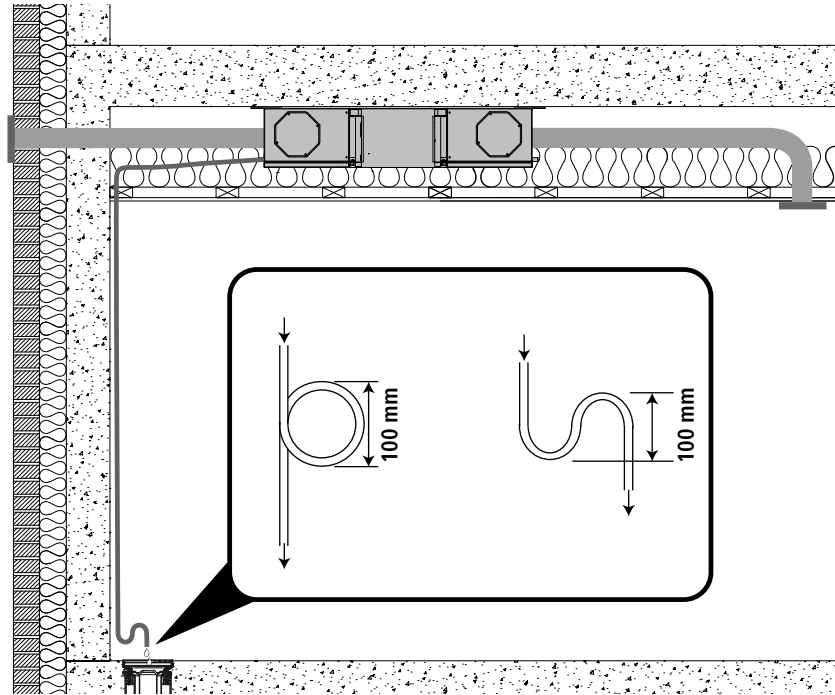


Fig. 38: Siphon at the drain hose

Initial start-up and calibration

The unit must be calibrated after the installation to adapt it to the air duct system. To do so, connect a computer with MS Windows operating system to the USB port on the control panel. Then start the PC Tool software specific to this type of unit.

Power supply connection

The unit is equipped with a Schuko plug (230 V). Never cut this connector off. The unit must be easy to disconnect from the mains, as it must be rebooted when updating the firmware, and the power plug must be unplugged when connecting additional connections. Connect the plug to a 230 V safety socket.

USB connection

Connect the unit to your PC using the USB port on the control panel and the USB cable supplied.

Calibration

NOTICE

Risk of damages caused by humidity!

If the volume of the supply air flow is greater than the volume of the extract air flow, humid air is introduced into the dwelling. This can cause damage to the dwelling if the vapour barrier is not 100 % airtight.

- When adjusting the airflow of the unit it is important to ensure that the extract air flow is 5–10 % greater than the supply air flow.

Proceed as follows to carry out the calibration:

1. Make sure the unit is in the correct operating mode (A or B) according to the air duct connection, and make sure that the correct label is attached to the unit. More information can be found on page 35.
2. The pressure drop that is generated inside the heat exchanger is required for a desired volume flow. These values will be indicated in the airflow chart on the front cover of the unit.

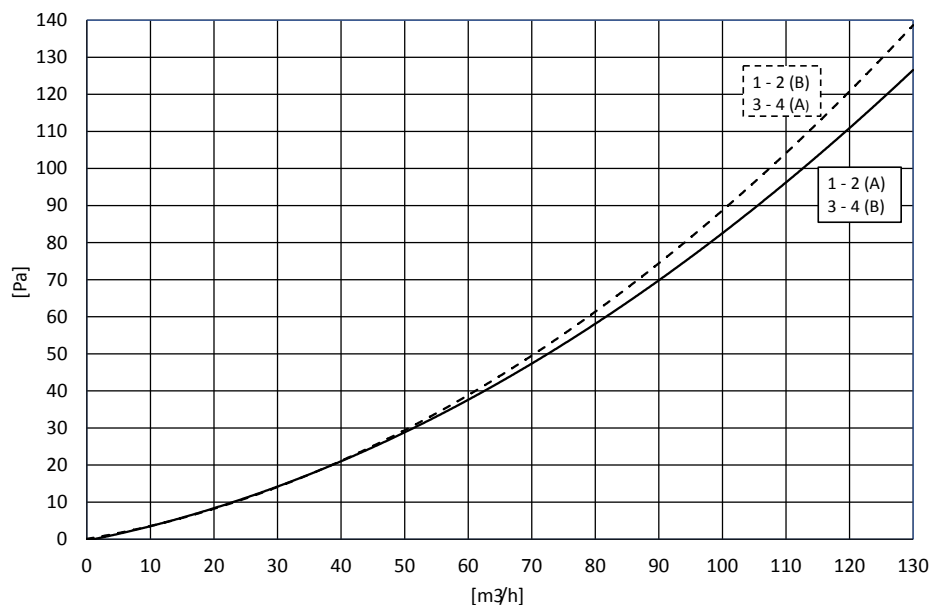


Fig. 39: Airflow chart, X-axis: desired volume flow, Y-axis: required pressure drop inside the heat exchanger

3. Connect the measuring device for determining the ΔPa value via the **extract air duct** (as depicted). The indicated example is based on a unit configuration in **operating mode A**. Use a ball pump needle and pierce it completely through the insulation material. When you pull out the needle again, the hole will be closed again with the insulation material.

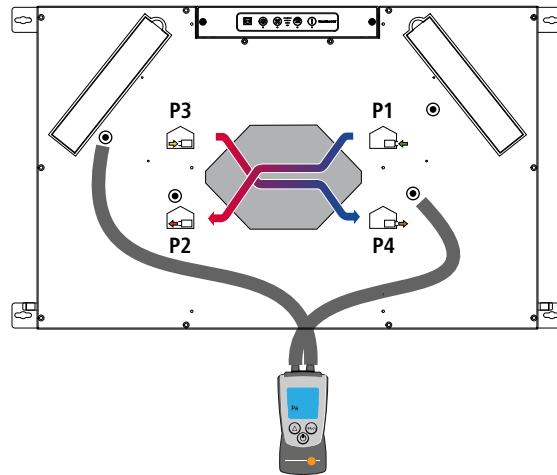


Fig. 40: Pressure measurement P3–P4

4. Adjust the speed of the **extract air fan** according to the instructions given in the PC Tool on your computer. The aim is to adjust the fan until the ΔPa measuring device shows the value of the pressure drop that has been read from the display in step 2.
5. Connect the measuring device for determining the ΔPa value via the **supply air duct** (as depicted). The indicated example is based on a unit configuration in **operating mode A**. Use a ball pump (1) needle and pierce it completely through the insulation material. When you pull out the needle again, the hole will be closed again with the insulation material.

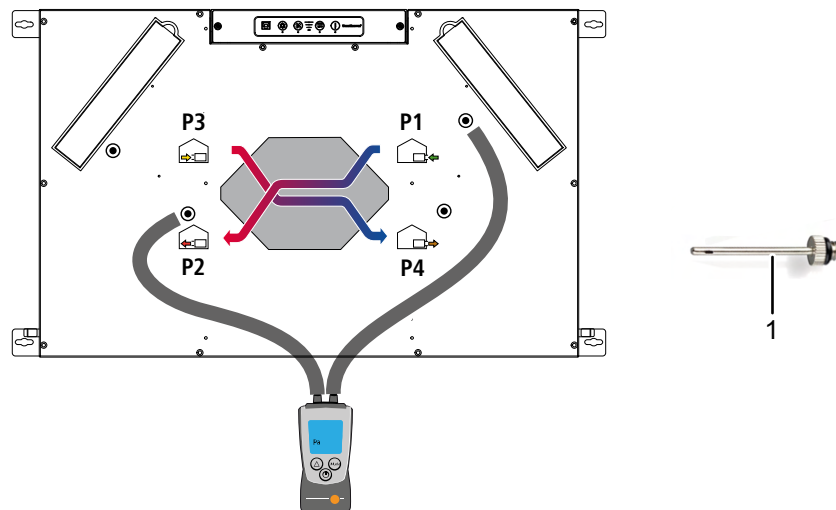


Fig. 41: Pressure measurement P1–P2

6. Adjust the speed of the **supply air fan** according to the instructions given in the PC Tool on your computer. The aim is to adjust the fan until the ΔPa measuring device shows the value of the pressure drop that has been read from the display in step 2. 5 to 10 % from this value can be subtracted to create a low negative pressure inside the dwelling.

7. Disconnect both the ΔPa measuring device and the computer. Adjust the valves in each room to ensure that the desired amount of air can be supplied in each room.

INFO

The setting routine described above only describes the first, orientating part of the system setting.

Please also note the following:

- Fine-tune the valves in all rooms until the desired air volume has been reached in each room.
- Check the main air volume according to the instructions above in this section, as more extensive valve settings can have a major influence on the main air volume.
- Make sure that the extract air volume is always at least 5 % higher than the supply air volume during adjustment in order to create the conditions for a mass balance in the system.

Maintenance and troubleshooting

General maintenance instructions

To ensure that the unit always meets the technical requirements, preventive maintenance activities have to be carried out at specified intervals. This can prevent breakdowns and inefficient operation and maximise the service life of the unit, i.e. to 10 years or more. It is particularly important to note that maintenance intervals for filters can vary depending on the specific environment. Moving parts are subject to wear and tear and need to be replaced when they are worn out, depending on their specific environment. The factory warranty is only valid if preventive maintenance activities have been carried out and documented. This documentation can be in form of a written maintenance protocol.



⚠ DANGER

Risk of electric shock!

You can be severely injured by an electric shock.

- Always disconnect the unit from the mains by removing the mains plug from the socket before opening the unit!

Scope of maintenance

The following parts require preventive maintenance:

Maintenance interval	Task	To be carried out by:
Every 6 months	Check the filters. Replace filter(s) if required.	User
Annually	Changing the filter	User
Every 2 years	Inspecting and cleaning the fans	Trained specialist personnel
	Inspecting and cleaning the heat exchanger	Trained specialist personnel
	Inspecting and cleaning the bypass	Trained specialist personnel
	Cleaning the internal air duct	Trained specialist personnel
	Checking and cleaning drip tray, drain and drain hose	Trained specialist personnel

Cleaning the interior of the unit

Every two years, the unit must be opened to check and clean some components.

Opening the unit

Please proceed as follows to clean the unit:

1. Disconnect the unit from the mains connection (230 V AC).
2. Disassemble the screws and remove the cover.

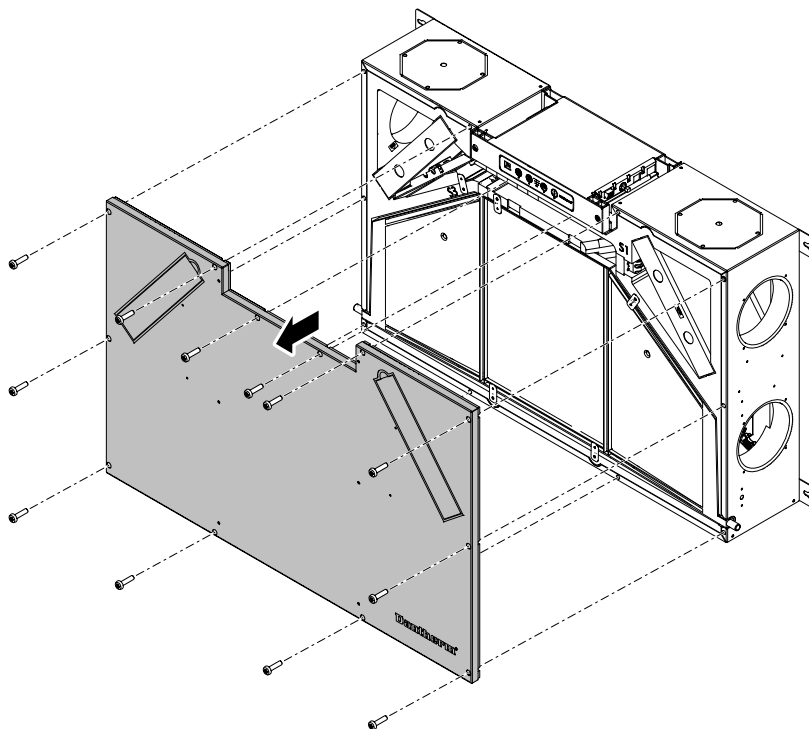


Fig. 42: Removing the cover

**Cleaning the
condensation tray
and condensate
drain**



⚠ CAUTION

Sharp edges!

The locks on the condensation tray may have sharp edges on which you can cut yourself.

- Wear protective gloves when inspecting and cleaning the condensation tray.

1. Remove the drain hose and turn all the depicted locks by 90°.

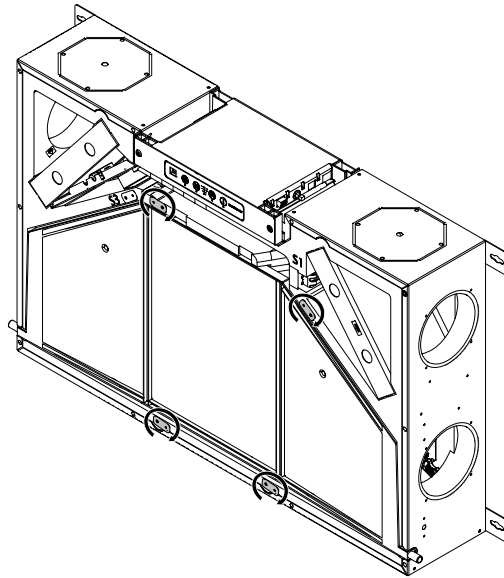


Fig. 43: Opening the locks

2. Remove the condensation tray. Note that the condensation tray may contain small amounts of water when mounted on the ceiling.

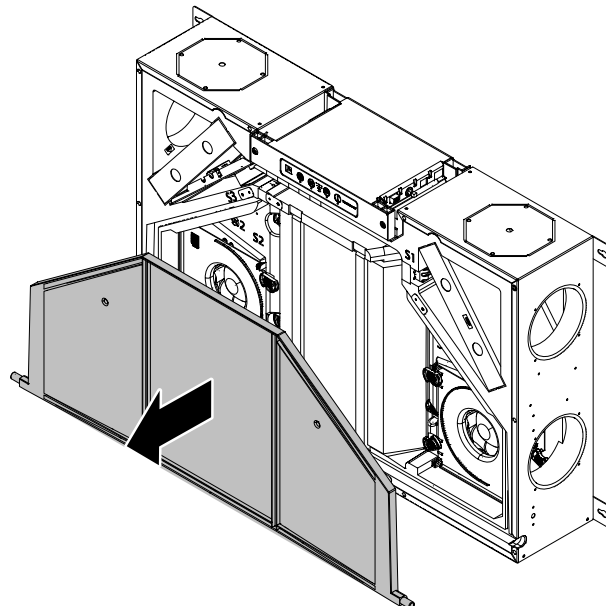


Fig. 44: Removing the condensation tray

3. Make sure that the condensate drain in the condensation tray is not clogged.
4. Clean the condensation tray with soapy water and a brush or cloth.

Inspecting and cleaning the fans

1. Turn all the depicted locks by 90°.

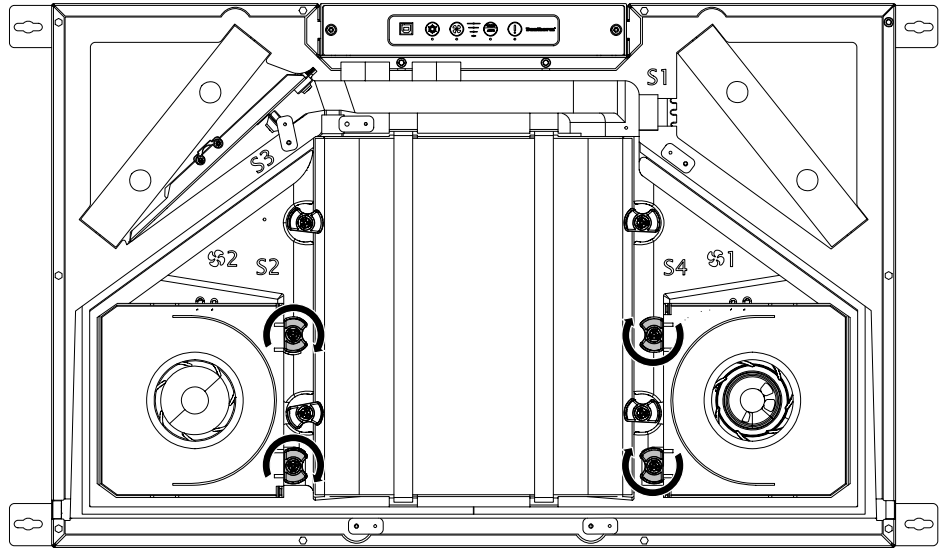


Fig. 45: Unlocking the fan covers

2. Remove the covers of the two fans.

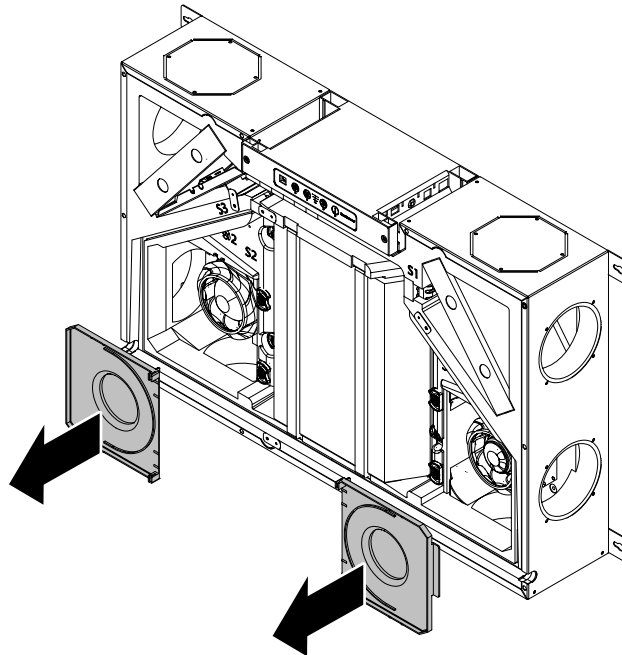


Fig. 46: Removing the fan covers

3. Clean the fan blades with compressed air or a brush. Each blade must be cleaned in a way that the fan remains balanced. Turn the fans carefully and pay attention to bearing noises. If you notice any bearing noises, the fan is worn out and must be replaced.

4. You can remove the fans from the unit in order to remove heavier soiling or replace the fans. To do so, release the locks depicted.

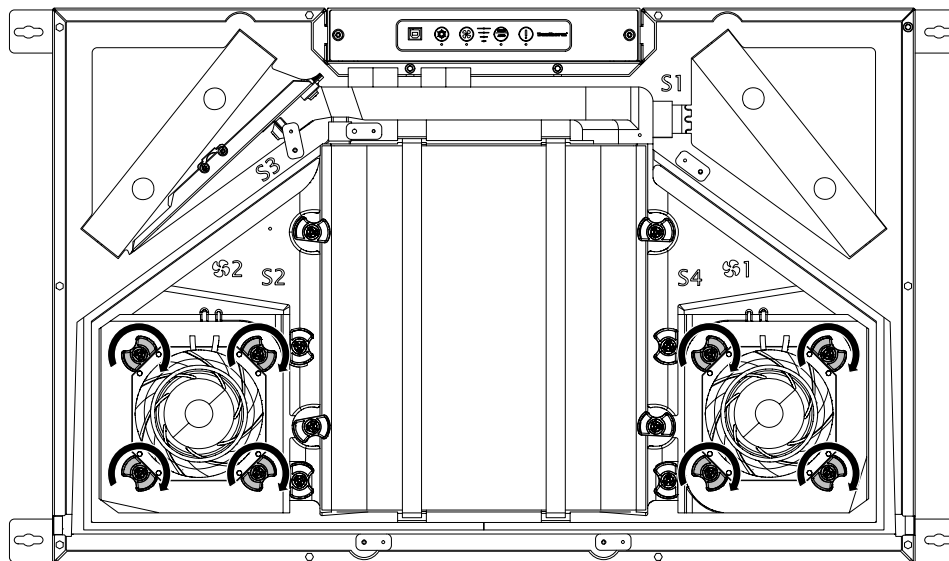


Fig. 47: Opening the fan locks

5. Lift the fans out of the cabinet.

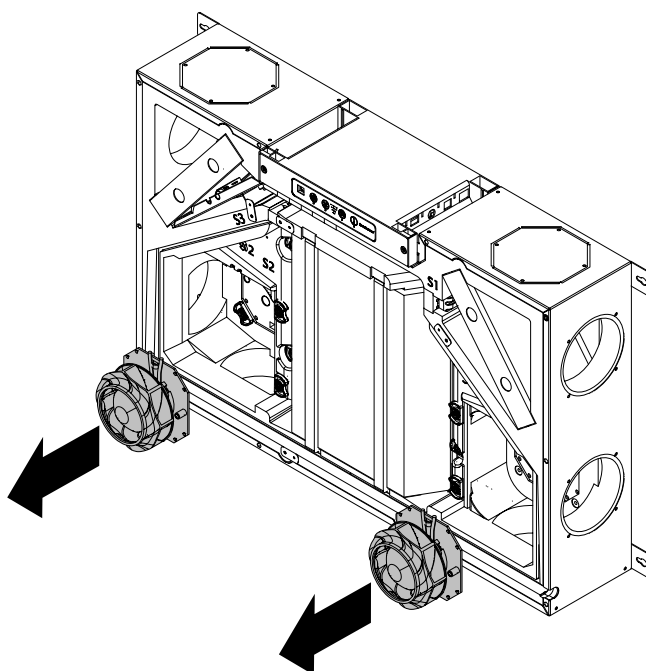


Fig. 48: Removing the fans

INFO

Make sure to close all locks when you reinsert the fans and fasten the covers.

Inspecting and cleaning the bypass

Check and clean the bypass with a brush if necessary.

Inspecting and cleaning the heat exchanger

1. Check the heat exchanger for dust and dirt. Clean all four inlets of the heat exchanger with a soft brush and a vacuum cleaner. In special circumstances (e.g. if there are signs of accumulated, dirty condensate in the heat exchanger), the heat exchanger may need to be removed from the unit and cleaned with soapy water.
2. To remove the heat exchanger, turn the four locks by 90°.

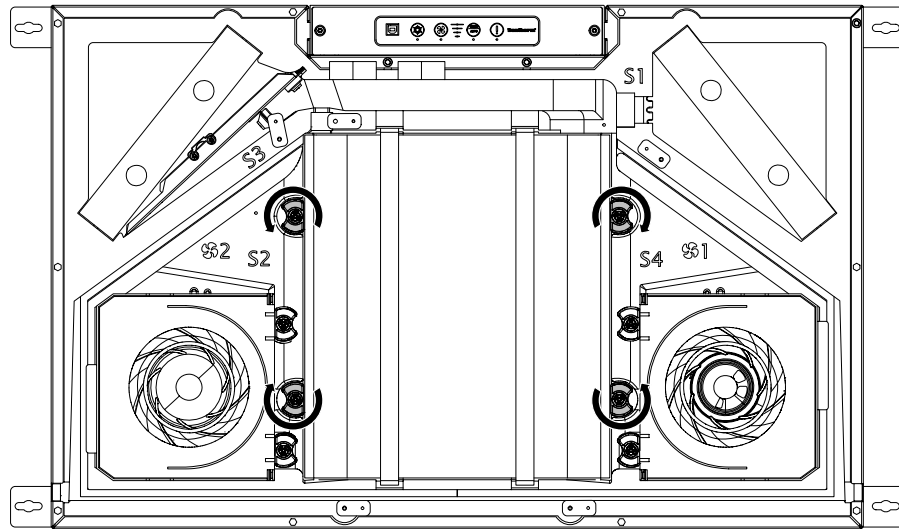


Fig. 49: Opening the heat exchanger locks

3. Lift the heat exchanger out of the unit and clean it.

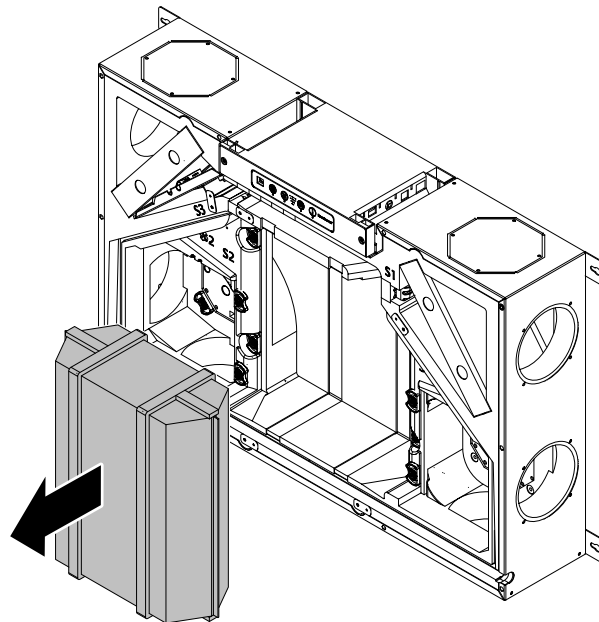


Fig. 50: Removing and cleaning the heat exchanger

INFO

Ensure correct alignment when reinstalling the heat exchanger. There is a seal on the T-profile, which must face the machine.

Cleaning the air ducts and interior

- ✓ The filter, fan housing, bypass and heat exchanger have been removed from the unit.
- 1. Inspect the inner surfaces and the connections of the air ducts for dirt.
- 2. Clean the inner surfaces and the connections of the air ducts with a damp cloth, brush, vacuum cleaner or similar.

Completion of the work

- 1. Check whether all connections are securely fastened to the main PCB.
- 2. Mount the parts that were previously removed: heat exchanger, fans, condensate tray and unit cover.

INFO

Make sure to close the previously released locks again after installing the respective component.

- 3. Check whether a condensate drain is connected and ensure that the opposite spigot of the condensation tray is closed.

Troubleshooting

In this section you will get to know how to detect and correct possible operating errors. Dantherm strongly recommends to connect a remote control to the unit for operation in order to perform proper troubleshooting.

Error signals

Occurring errors are indicated in various ways:

Component	Signal
Ventilation unit	Acoustic signal from the main PCB. Connect a remote control or the PC Tool to indicate the specific error. LED for filter reset
Hand-held remote control	Audible signal and indication of a specific error code.
Wired remote control (HCP 11)	Acoustic signal and flashing LED: The number of flashes corresponds to an error code, followed by a 5 second break. See error list.
PC Tool	Indication of the error number as well as the option to indicate a log of specific operations covering a longer period of time.
Smartphone APP	Indication of a specific error code.

Error list

How to read the error list:

Column	Description	Code	Meaning
A	Number of flashes in the display (wired remote control)	-	-
B	LED for filter reset on the ventilation unit	Y	yellow LED flashes
		R	red LED flashes
C	Acoustic signals	0	no acoustic signals
		1	one acoustic signal/hour
		2	one acoustic signal/sec
Error code	Error number indicated on the display of the hand-held remote control, the smartphone app or in the PC Tool	-	E.g., "E12" stands for error number 12.



Resetting errors

After any inspection or repair carried out due to potential errors, the unit can be reset by disconnecting the unit from the 230 V AC supply and then reconnecting it. This way, the control unit is reset. The unit will resume normal operation and also starts a new search for potential errors.

This process may take up to 15 minutes.

For a full description, see the list below:

A	B	C	Error code	Fault	Potential cause	Action required	Reset
-	Y	1	-	Filter alarm	Filter time period expired	Dismantle the filter(s) and check for dirt Replace the filter(s) and reset alarm	Reset alarm and reset filter(s) by pressing and holding the alarm button for 5 seconds
			Filters are not soiled, the filter time period is therefore too short		Extend the filter timer period	Press and hold the centre button on the wireless remote control for 10 seconds	
			Filters are soiled		Replace the filter(s) and reset alarm	The same procedure can be performed to reset the filter before resetting the alarm.	
			Filters are very soiled, filter time period is too long		Replace the filter(s) and reset alarm Reduce filter timer period		
1	R	1	E1	Exhaust air fan No speed feedback (tachometer) from the exhaust air fan	Exhaust air fan power cable is not connected	Connect exhaust air fan power cable	Manual reset by pressing the alarm button or by switching the unit off/on
					Control cable of exhaust air fan is not connected	Connect control cable of exhaust air fan	
					Exhaust air fan is not functioning	Replace exhaust air fan	
				Exhaust air fan does not run at the desired speed	Fan speed setpoint is too high	Decrease fan speed setpoint	Automatic reset after 140 seconds but alarm will reappear if problem persists
Fan is defective	Replace fan						
2	R	1	E2	Supply Fan No speed feedback (tachometer) from the supply air fan	Supply air fan power cable is not connected	Connect supply air fan power cable	Manual reset by pressing the alarm button or by switching the unit off/on
					Control cable of supply air fan is not connected	Connect control cable of supply air fan	
					Supply air fan is not functioning	Replace supply air fan	
				Supply air fan does not run at the desired speed	Fan speed setpoint is too high	Decrease fan speed setpoint	Automatic reset after 140 seconds but alarm will reappear if problem persists
					Fan is defective	Replace fan	

A	B	C	Error code	Fault	Potential cause	Action required	Reset
3	R	0	E3	Bypass damper does not close as expected	Switch position A: bypass is closed, but supply air temperature is lower than expected Switch position B: bypass is closed, but exhaust air temperature is higher than expected	Check whether bypass is activated in PC Tool	Automatic reset when efficiency is high enough for 30 seconds
						Check if bypass is blocked	
						Check mechanical connection between bypass actuator and bypass valve	
						Check electrical connection between control unit and bypass	
						Check control unit output	
				Bypass damper Reduced heat recovery due to low extract airflow	Extract air filter soiled	Changing the filter	Automatic reset when efficiency is high enough for 30 seconds
					Poor adjustment of the airflows	Adjust the system	
					A bathroom extract air fan creates a negative pressure in the dwelling	Remove the extract air fan from the bathroom and connect the extract air from the bathroom to the ventilation system instead	
					A kitchen extract air fan is creating negative pressure inside the dwelling	Provide heated fresh air for the extraction hood. If this cannot be achieved, open a window/door while the extraction hood is running	
					A stove fan creates negative pressure inside the dwelling	Contact the fireplace/stove supplier to take safety precautions	
Bypass is closed, but supply air temperature is lower than expected Airflows are not balanced. There is much more extract air than supply air	Supply air filter is soiled	Changing the filter					
	Poor adjustment of the airflows	Adjust the system					
4	R	1	E4	Extract air temperature sensor (T1) Control board measures that temperature sensor is open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensor(s) correctly	Automatic reset if the temperature is within the normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensor	
					Resistance in temperature sensor is OK	Replace control board	



A	B	C	Error code	Fault	Potential cause	Action required	Reset
5	R	1	E5	Supply air temperature sensor (T2) Control board measures that temperature sensor is open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensor(s) correctly	Automatic reset if the temperature is within the normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensor	
					Resistance in temperature sensor is OK	Replace control board	
6	R	1	E6	Extract air temperature sensor (T3) Control board measures that temperature sensor is open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensor(s) correctly	Automatic reset if the temperature is within the normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensor	
					Resistance in temperature sensor is OK	Replace control board	
7	R	1	E7	Exhaust air temperature sensor (T4) Control board measures that temperature sensor is open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensor(s) correctly	Automatic reset if the temperature is within the normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensor	
					Resistance in temperature sensor is OK	Replace control board	
8	-	0	E8	Room air temperature sensor (T5)	Only indicated on wireless remote control		Automatic reset
9	-	-	E9	Not used			
10	R	0	E10	Outdoor air temperature < -13 °C	-	-	Automatic restart after 30 minutes

A	B	C	Error code	Fault	Potential cause	Action required	Reset
11	R	0	E11	Supply air temperature < +5 °C Reduced heat recovery due to low extract air temperature	Low temperatures from unheated rooms	Ensure that all ventilated rooms are heated Alternatively, close the air vents to rooms that are not heated	Manual reset by pressing the alarm button or by switching the unit off/on Firmware version 2.9 and higher also offer automatic restart after 10 minutes
					Poorly insulated ducts in cold environments	Improve the insulation of ducts	
				Reduced heat recovery due to low extract airflow	Extract air filter soiled	Changing the filter	
					Poor adjustment of the airflows	Adjust the system	
					A bathroom extract air fan creates a negative pressure in the dwelling	Remove the extract air fan from the bathroom and connect the extract air from the bathroom to the ventilation system instead	
					A kitchen extract air fan is creating negative pressure inside the dwelling	Provide heated fresh air for the extraction hood. If this cannot be achieved, open a window/door while the extraction hood is running	
A stove fan creates negative pressure inside the dwelling	Contact the fireplace/stove supplier to take safety precautions						
12	R	2	E12	Overheating One of the internal sensors measures a temperature of > 70 °C.	Overtemperature caused by fire inside or outside the ventilation unit	Check ventilation unit and surroundings for fire	The alarm indicator can be reset by pressing the alarm button or by switching the unit off/on. However, the unit cannot be started until the causes of the alarm have been eliminated
					Overtemperature due to combination with a pre-heater or post-heater and insufficient airflow	Check ventilation unit and surroundings for fire Check which sensor is measuring a high temperature. Check whether the airflow is blocked and the filters are soiled. If necessary, increase the setting for the minimum airflow	
13	-	0	E13	Communication error / weak signal, indicated on wireless remote control only			Repeat every 5 minutes or when a button is pressed
				No wireless signal	Ventilation unit is switched off	Switch on the ventilation unit	
				Wireless signal is too weak	Antenna is not mounted on the unit	Mount antenna	
					Distance of the remote control is too far from the ventilation unit	Move closer to the ventilation unit Mounting the antenna extension cable	



A	B	C	Error code	Fault	Potential cause	Action required	Reset
14	R	2	E14	Fire alarm Fire protection thermostat connected to the air duct (accessory) Input is normally closed (NC), but now it is open	Fire or smoke sensor connected to this input is active Nothing is connected to this input	Check for smoke or fire Check if sensor and connection are OK Mount short circuit equipment	The alarm indicator can be reset by pressing the alarm button or by switching the unit off/on. However, the unit cannot be started until the causes of the alarm have been eliminated
15	R	1	E15	High water level (accessory) Water level is too high Water level is not too high	The water drain is blocked The water drain is mounted incorrectly Auxiliary drain pump is not operating Water level sensor is not connected Water level sensor is normally open (NO) Digital input incorrectly configured	Clean the water drain Check whether the water drain is mounted on the correct side and make sure that the pipes are not located above the level of the water drain Check pump Check fuse Check wiring Configure or change the water level sensor so that it is normally closed (NC) Check the configuration of the digital input with PC Tool	Automatic reset when the input is closed again
16	R	2	E16	Firmware 2.9 and later: FPC error (accessory), only active if the accessory "fire protection control" is connected to the unit. No communication with fire protection control Missing position feedback for a fire damper Failure during monthly, weekly or manual fire damper test	Fire protection control with this address has already been installed but is no longer accessible A fire damper is closed but should be open Fire damper is jammed either in open or closed position	Check connection to fire protection control Check the power supply to the fire damper Check internal fire detector of the fire dampers Something is blocking the fire damper Fire damper is incorrectly connected Defective fire damper	Manual reset by pressing the alarm button or by switching the unit off/on

Annex

Technical data

Specification	Abbr.	Unit	RCC 130	RCC 220
Max. possible flow rate at 100 Pa	$V_{100\text{ Pa}}$	m ³ /h	130	220
Max. nominal flow rate at 100 Pa	$V_{\text{max, nom.}}$	m ³ /h	120	
Operating range passive house @ 100 Pa	V_{PHI}	m ³ /h	-	54-115
EN 13141-7 reference flow rate @ 50 Pa	V_{ref}	m ³ /h	84	
PERFORMANCE				
Thermal efficiency EN 13141-7 @ reference flow	η_{SUP}	%	86.8	
Filters according to EN 779:2012	Class	-	G4 (F7 optional on supply air)	
Filters according to ISO 16890	Class	-	ISO Coarse 75 % (ePM1>50 % optional on supply air)	
Ambient temperature range for the installation	t_{SURR}	°C	+12 to +45	
Maximum humidity level in the extract air	X	g/kg	10	
Outdoor air temperature range (without preheater installed)*	t_{ODA}	°C	-12 to +45	
Outdoor air temperature range (with preheater installed)	t_{ODA}	°C	-20 to +45	
CABINET				
Dimensions (without brackets)	WxHxD	mm	580 x 900 x 200	
Spigot / air duct connections	Ø	mm	Ø125 – female	
Weight	m	kg	17	
Thermal conductivity of the polystyrene insulation	λ	W/(mK)	0.031	
Heat transfer coefficient of the polystyrene insulation	U	W/(m ² K)	U<1	
Cabinet colour	-	-	galvanised metal, grey	
Fire protection class of the polystyrene insulation according to DIN 4102-1	Class	-	B2	
Fire protection class of the polystyrene insulation according to EN 13501-1	Class	-	E	
ELECTRICAL SPECIFICATIONS				
Electrical voltage	U	V	230	
Max. power consumption (without/with preheater)	P	W	57/957	173/1073
Frequency	f	Hz	50	
Protection type (IP)	Class	-	21	

* It is recommended to use a preheater at outdoor temperatures below -3 °C to ensure balanced ventilation.



Cabinet dimensions

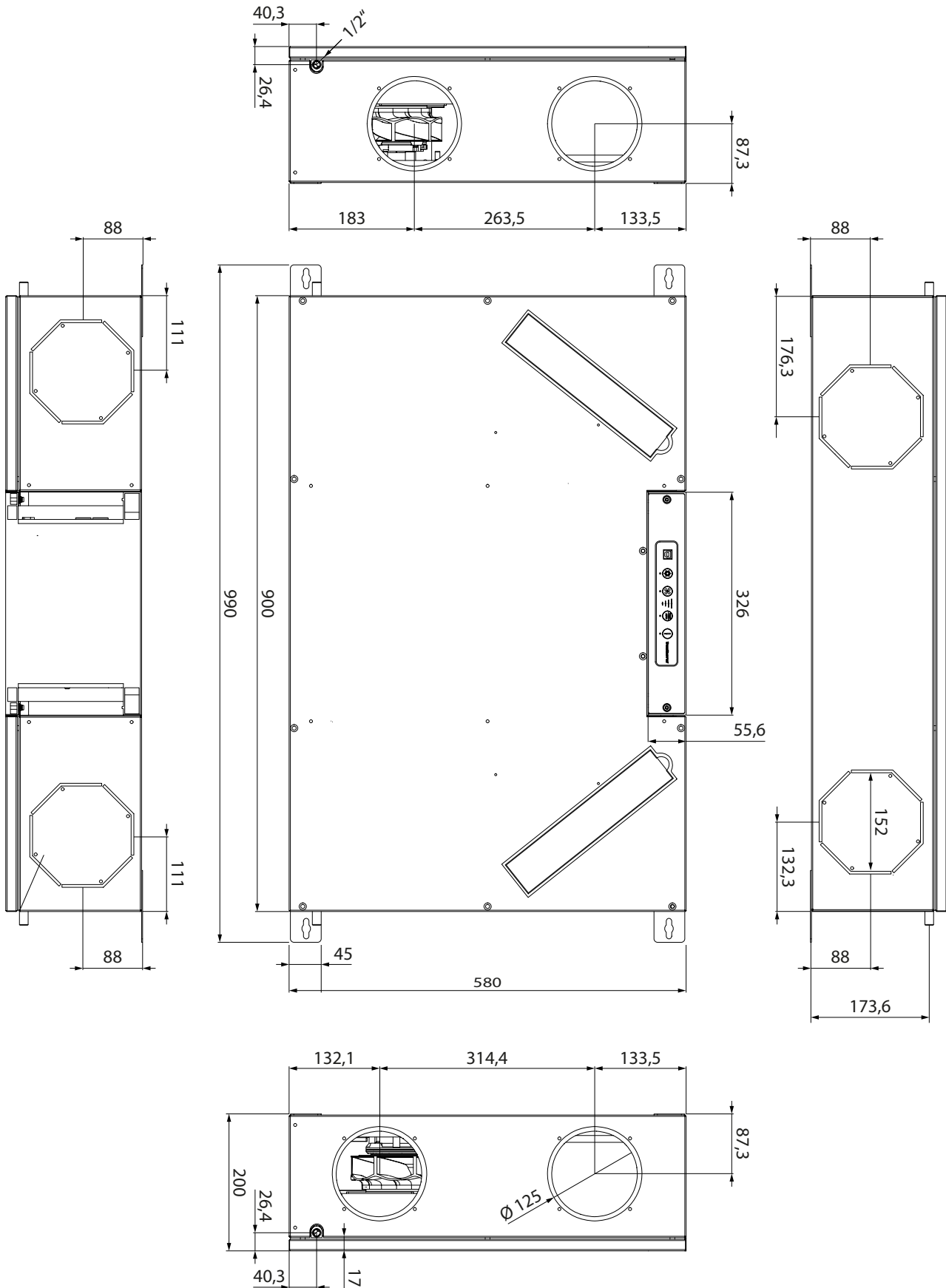


Fig. 51: Dimension drawing of the cabinet

Main PCB with connections

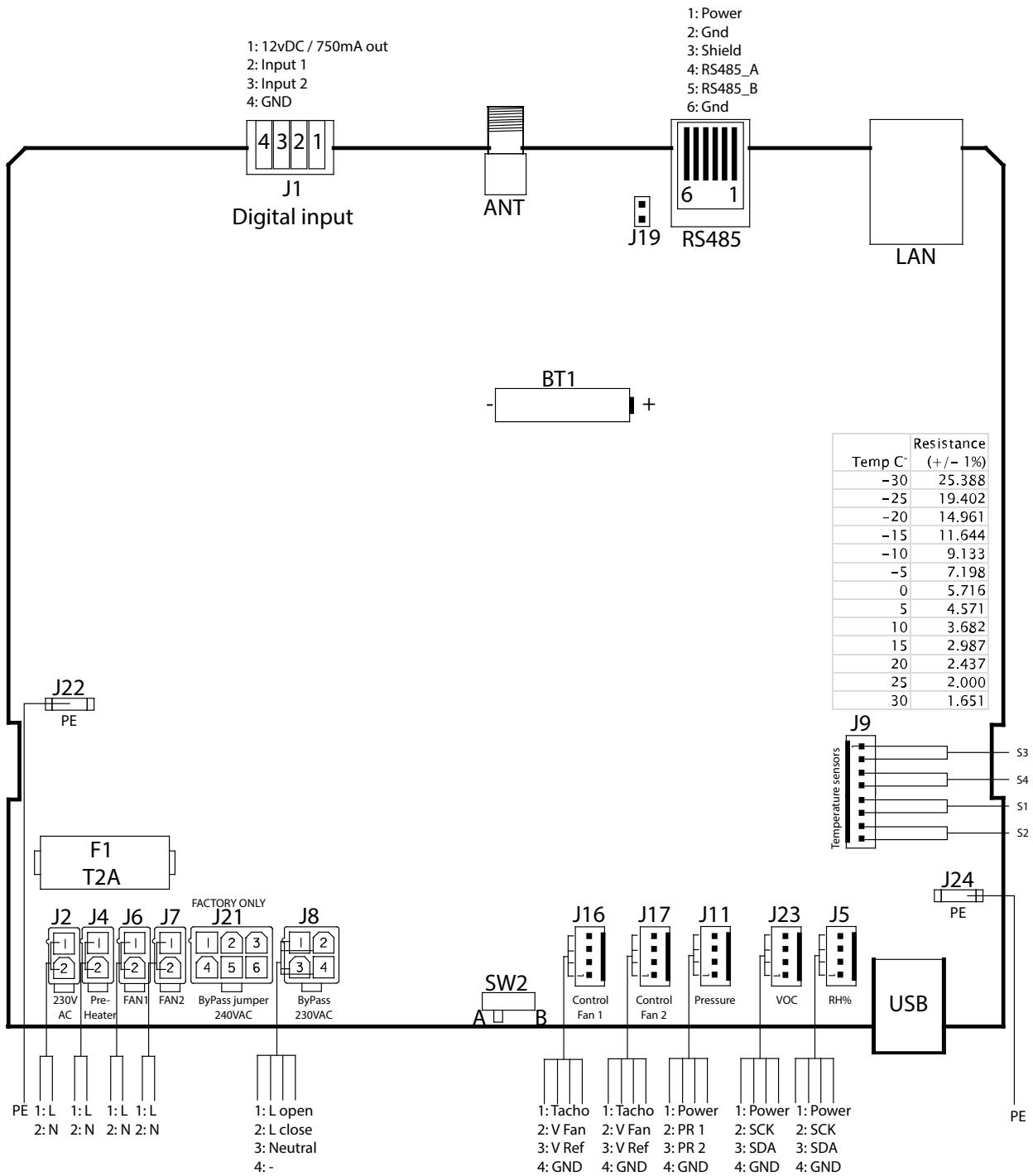


Fig. 52: Circuit PCB with connections

Spare parts

If spare parts are required, please visit Dantherm's online shop:
shop.dantherm.com



Declaration of conformity (EU)

Dantherm A/S, Marienlystvej 65, DK-7800 Skive hereby declares that the unit mentioned below:

No.: 352445 Type: Dantherm RCC series (including all unit variants)

– complies with the following directives:

2014/35/EU	Low Voltage Directive
2014/30/EU	EMC Directive
2014/53/EU	Radio Equipment Directive
2009/125/EC	Eco Design Directive (incl. Regulation 2014/1253)
2011/65/EU	RoHS Directive
1907/2006/EC	REACH Regulation

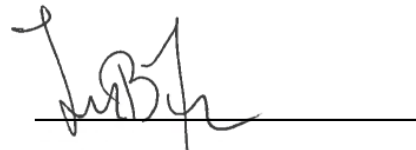
– and is manufactured in compliance with the following standards:

EN 60335-1:2012	Household and similar electrical appliances – Safety – Part 1 (+AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019 + A15:2021)
EN 60335-2-40:2003	Household and similar electrical appliances – Safety – Part 2-40 (+A11:2004 + A12:2005 + A1:2006 + AC/2006 + A2:2009 + AC:2010 + A13:2012 + A13/AC:2013)
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) – Part 3-2
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) – Part 3-3
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) – Part 6-2 (+AC:2005)
EN 61000-6-3:2007	Electromagnetic compatibility (EMC) – Part 6-3 (+A1:2011 + A1/AC:2012)
EN 60730-1:2011	Automatic electrical controls for household and similar use – Part 1
EN 62233:2008	Measurement methods for electromagnetic fields of household appliances
EN 55014-1:2017	Electromagnetic compatibility – Requirements for household appliances – Part 1 (+A11:2020)
EN 55014-2:1997	Electromagnetic compatibility – Requirements for household appliances – Part 2
EN 301 489-1 V1.9.2	Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1
EN 301489-3 V1.6.1	Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 3
EN 300 220-1 V2.4.1	Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices
EN 300 220-2 V3.1.1	Electromagnetic compatibility and Radio spectrum matters (ERM); Short range devices
EN 13141-7:2010	Ventilation for buildings – performance testing of components/ products for residential ventilation
EN 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Skive, 11/09/2023



Muhamed Ziga
Product Manager



Jakob Bonde Jessen
Managing Director



Declaration of conformity (UKCA)

Dantherm A/S, Marienlystvej 65, DK-7800 Skive, declares that the units mentioned below:
Item no.: 352445 type: Dantherm RCC-series (all variants included)

– confirm with the following directives:

- UK SI 2016 No. 1101 Electrical Equipment (Safety) Regulations 2016
- UK SI 2016 No. 1091 Electromagnetic Compatibility Regulations 2016
- UK SI 2017 No. 1206 Radio Equipment Regulations 2017
- UK SI 2019 No. 539 The Eco-design for Energy-Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019
- UK SI 2012 No. 3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- UK REACH The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019

– and is manufactured in compliance with the following harmonized standards:

- EN 60335-1:2012 Household and similar electrical appliances – Safety – Part 1 (+AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019 + A15:2021)
- EN 60335-2-40:2003 Household and similar electrical appliances – Safety – Part 2-40 (+A11:2004 + A12:2005 + A1:2006 + AC/2006 + A2:2009 + AC:2010 + A13:2012 + A13/AC:2013)
- EN 61000-3-2:2014 ElectroMagnetic Compatibility (EMC) – Part 3-2
- EN 61000-3-3:2013 ElectroMagnetic Compatibility (EMC) – Part 3-3
- EN 61000-6-2:2005 ElectroMagnetic Compatibility (EMC) – Part 6-2 (+AC:2005)
- EN 61000-6-3:2007 ElectroMagnetic Compatibility (EMC) – Part 6-3 (+A1:2011 + A1/AC:2012)
- EN 60730-1:2011 Automatic electrical controls for household and similar use – Part 1
- EN 62233:2008 Measurement methods for electromagnetic fields of household appliances
- EN 55014-1:2017 Electromagnetic compatibility – Requirements for household appliances – Part 1 (+A11:2020)
- EN 55014-2:1997 Electromagnetic compatibility – Requirements for household appliances – Part 2
- EN 301 489-1 V1.9.2 Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1
- EN 301489-3 V1.6.1 Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 3
- EN 300 220-1 V2.4.1 Electromagnetic compatibility & Radio spectrum Matters (ERM); Short Range Devices
- EN 300 220-2 V3.1.1 Electromagnetic compatibility & Radio spectrum Matters (ERM); Short Range Devices
- EN 13141-7:2010 Ventilation for buildings-performance testing of components/products for residential ventilation
- EN 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Skive, 02.11.2023

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