



Original user and service instructions

RCV320 P1/RCV320 P2

| en |



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Introduction

Overview

Manual	This is the manual for the Dantherm residential ventilation unit RCV320. The part number of this manual is 110956.
Intended use	The unit RCV320 is designed to supply dwellings with fresh and filtered air and is connected to an air duct system for this purpose. The heat from the extract air is transferred to the supply air inside the unit, without mixing the two airflows.
Foreseeable misuse	Any operation other than as described in this manual is prohibited. Non-observance renders all claims for liability and guarantee null and void. If any unauthorised modifications are made, any claims for liability and guarantee are rendered null and void.
User groups	User groups for these operating and service instructions are: <ul style="list-style-type: none">• Operators using the unit as intended.• Qualified personnel (e.g. refrigeration technicians, installers, service technicians) who properly install and maintain the unit.
Copyright	No part of this manual may be reproduced without the prior written permission of Dantherm.
Recycling	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.
Reservations	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.
Quality Management System	Dantherm has implemented a quality management system in accordance with EN/ISO9001. The system is supplemented with an environmental management system in accordance with EN/ISO14001.

**Abbreviations in
this manual**

The following abbreviations are used in this manual:

Abbreviation	Description
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	Extract air from the unit
S1	Temperature sensor no 1
S2	Temperature sensor no 2
S3	Temperature sensor no 3
S4	Temperature sensor no 4
Operating mode A	Standard operating mode on delivery, connection diagram and further information see chapter <i>Installation options</i>
Operating mode B	Operating mode with inverted fan, connection diagram and further information see chapter <i>Installation options</i>
ISO Coarse 75 %	Standard air filter according to ISO 16890; corresponds to G4 filter according to EN779 (obsolete standard)
ePM1 >50%	Pollen filter according to ISO 16890 – absorbs finer particles than ISO Coarse 75 %. Corresponds to F7 filter according to EN779 (obsolete standard)
BP	Bypass damper (allows filtered fresh air to be blown into the dwelling, bypassing the heat exchanger)
IP	Unique address for Ethernet port
DHCP	Automatic assignment of an Ethernet address provided from an external network component (if unit is connected to Ethernet)
PC	PC running MS Windows
USB	Universal serial bus connection
LAN	Local area network
WAN	Wide area network
BMS	Building Management System
PCB	Printed Circuit Board
FFC	Flat Flexible Cable

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.

INFORMATION

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.



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.

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.

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.

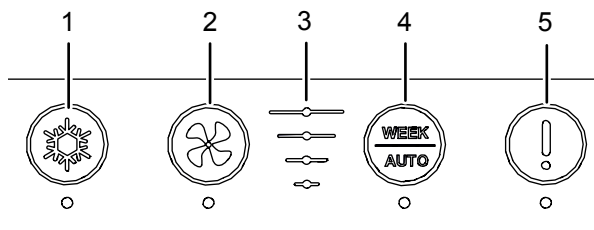


Fig. 1: Buttons and displays on the control panel

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 52)

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 ResidentialApp 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.

INFORMATION

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 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 outside 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 is 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.

INFORMATION

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.

INFORMATION

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.



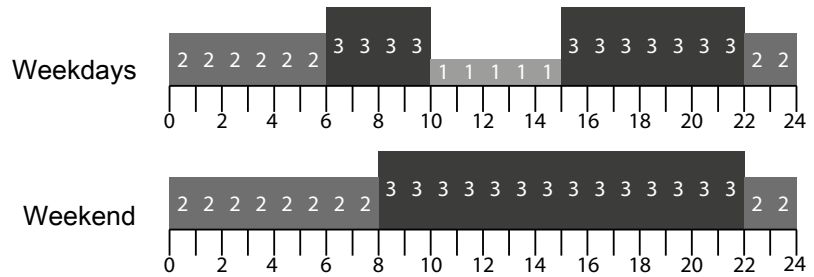
Week programs of the time switch

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

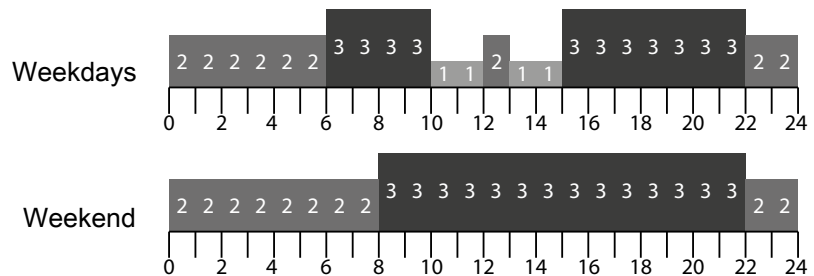
Each of the programs offers two settings:

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

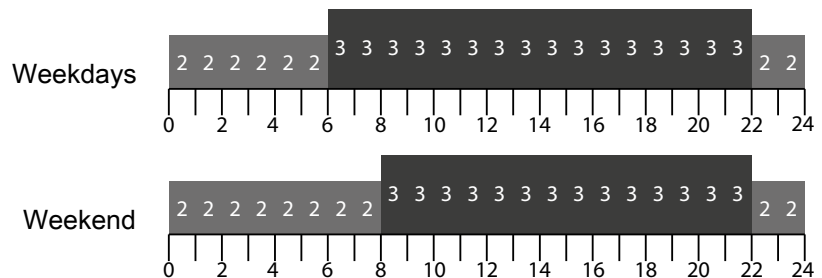
Program 1



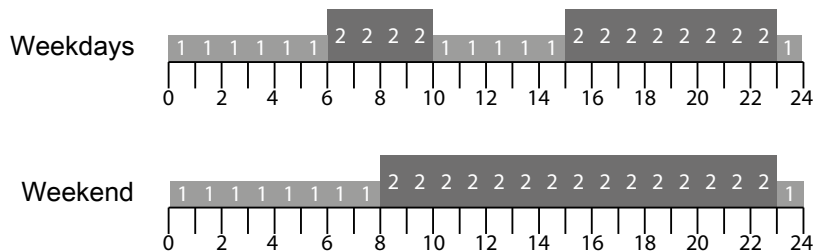
Program 2



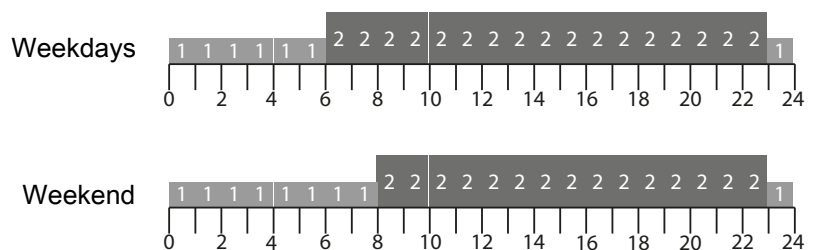
Program 3



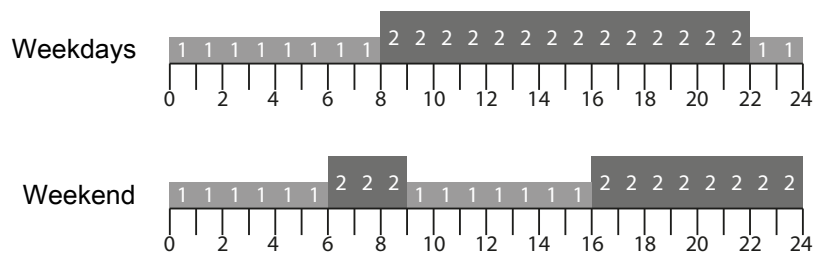
Program 4



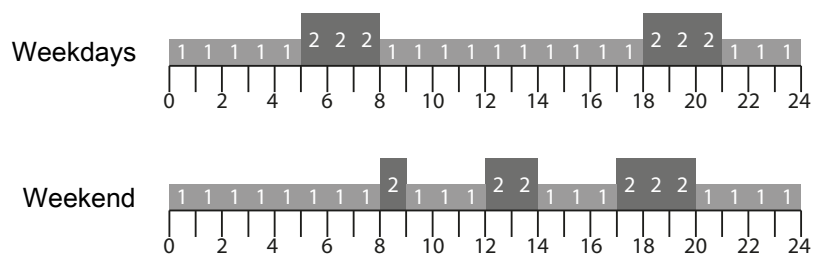
Program 5



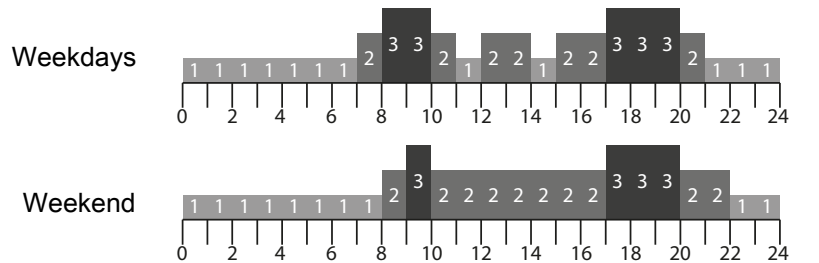
Program 6



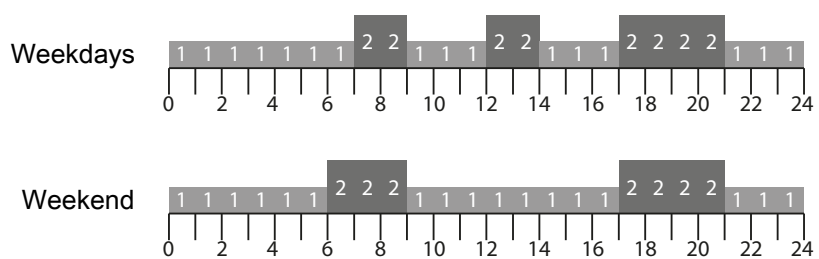
Program 7



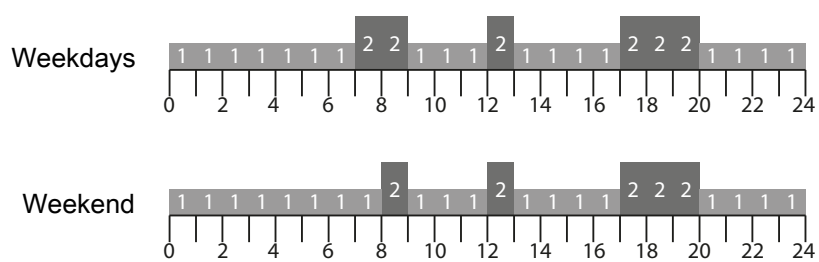
Program 8



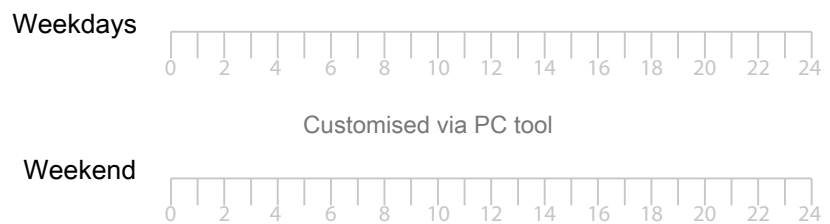
Program 9



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 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 himself/herself. 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



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.

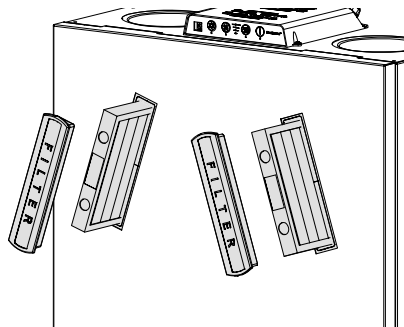


Fig. 2: Removing the filter(s)

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 arrows on the filter must point in the direction shown here.

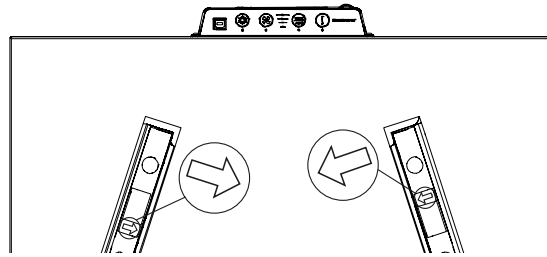


Fig. 3: Checking the filter for correct installation direction

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.

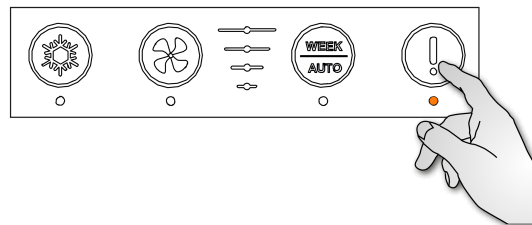


Fig. 4: Stopping the filter alarm

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.
- Do not use the device in wet rooms (e.g. bathrooms or laundry rooms).
- 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

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 RCV320
- 1 x condensation drain hose with hose clamp

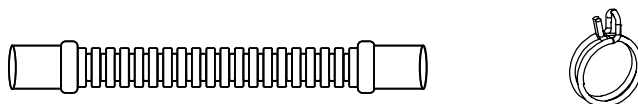


Fig. 5: Condensation drain hose with hose clamp

- 1 x mounting material consisting of:
 - 1 x wall rail
 - 1 x vibration damper
 - 2 x spacer

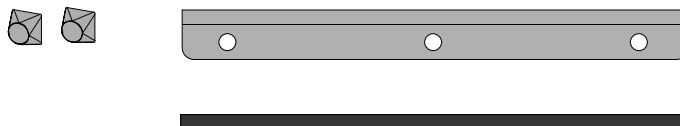


Fig. 6: Mounting material

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



Fig. 7: Mounting material

General description

Introduction

The residential ventilation unit RCV320 is designed to supply dwellings with fresh and filtered air. The heat from the extract air is transferred to the supply air inside the unit without mixing the two airflows. The result is energy-efficient ventilation with low heat energy loss.

The unit is designed for installation in locations with ambient temperatures of -12 °C to 45 °C.

Due to its compact design, the unit can be installed e.g. in utility rooms with little space or in the attic.

The airflow direction can be changed electronically so that the connected ducts can be routed either to the right or to the left.

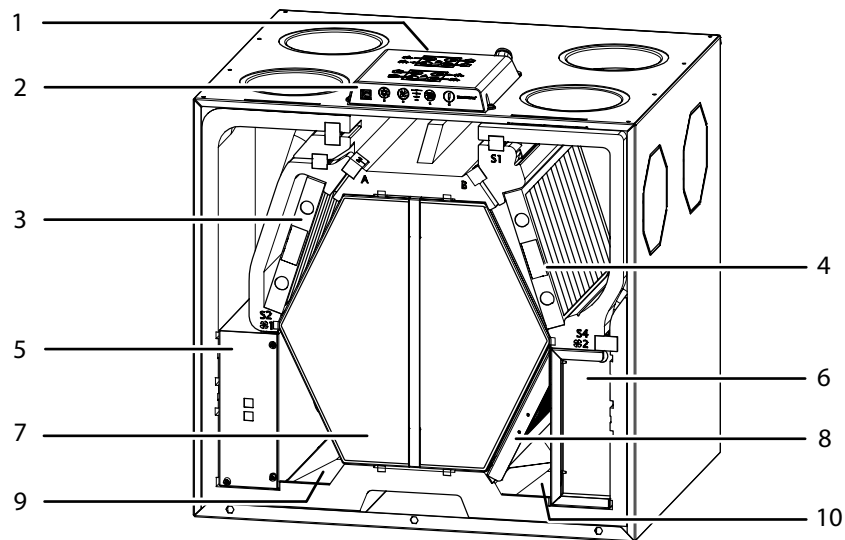


Fig. 8: RCV320 without cover

- | | | | |
|---|--------------|----|--------------------------|
| 1 | Main PCB | 6 | Fan box 1 |
| 2 | Control unit | 7 | Heat exchanger |
| 3 | Filter 1 | 8 | Bypass |
| 4 | Filter 2 | 9 | Drip tray 1 (for mode B) |
| 5 | Fan box 2 | 10 | Drip tray 2 (for mode A) |

Airflows

The unit offers the possibility to swap the directions of the airflows so that there are two operating modes:

- Mode A
- Mode B

The inputs and outputs of the airflows in the two operating modes are depicted in the following figures:

By default, the ducts on the side and bottom of the unit are closed but can be opened and used as shown below. When opening the ducts on the side or on the bottom, the corresponding ducts that are not used are usually closed. If required, two corresponding ducts can be used simultaneously.

The standard operating mode is mode A.

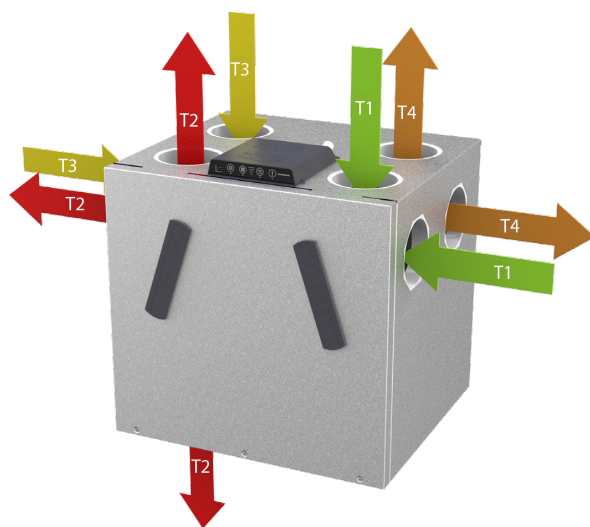


Fig. 9: Airflows in mode A

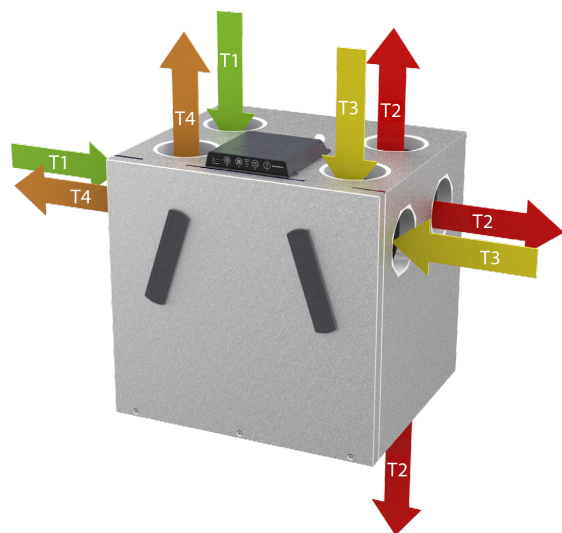


Fig. 10: Airflows in mode B

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

Filters and fans in mode A/B

This illustration shows the function of the different parts in mode A/B, including the filter, the fan and the use of the condensate drain.

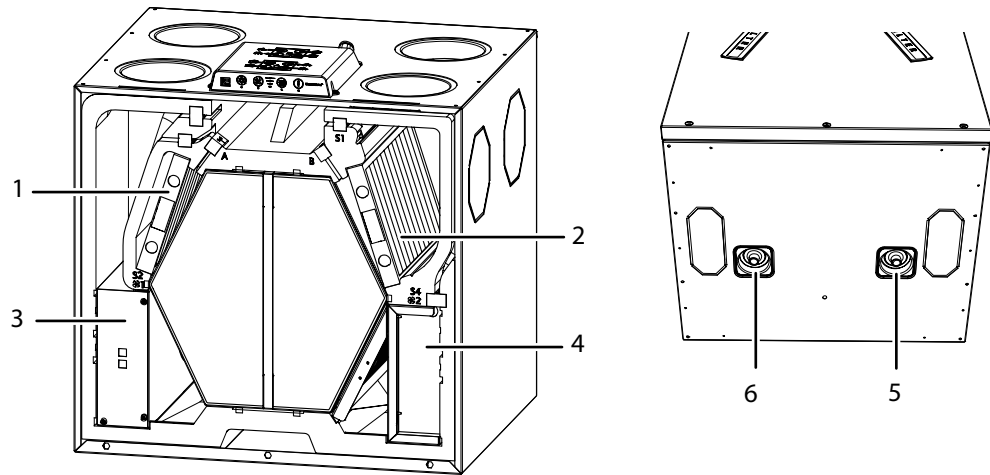


Fig. 11: Parts in mode A/B

Item	Mode A	Mode B
1	Extract air filter*	Supply air filter**
2	Supply air filter**	Extract air filter*
3	Supply air fan	Extract air fan
4	Extract air fan	Supply air fan
5	Condensate drain	-
6	-	Condensate drain

* The extract air filter is an ISO Coarse (75 %) type filter.

**The supply air filter can be either an ISO Coarse (75 %) type filter or a finer ePM1>50 % filter.

Sensors in A/B mode

This illustration shows the function of the sensors in mode A/B.

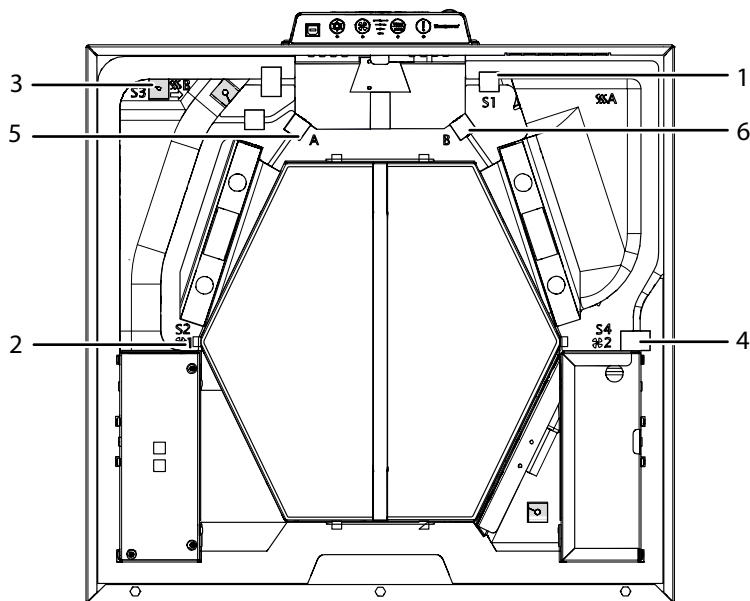


Fig. 12: Positioning of the sensors

Item	Location	Mode A	Mode B
1	S1	T1 temperature sensor – outside air	T3 temperature sensor – extract air
2	S2	T2 temperature sensor – supply air	T4 temperature sensor – exhaust air
3	S3	T3 temperature sensor – extract air	T1 temperature sensor – outside air
4	S4	T4 temperature sensor – exhaust air	T2 temperature sensor – supply air
5	A	VOC and humidity sensor (accessories)	-
6	B	-	VOC and humidity sensor (accessories)

Components description

The individual components of the units included in the standard scope of delivery are described in this section.

Cabinet	<p>The outer parts of the cabinet are made of aluzinc sheet metal. To add accessories or replace components, the front cover must be removed. The inside of the cabinet is sound- and heat insulated with a fire-resistant polystyrene foam block.</p> <p>The unit is designed for installation in locations with ambient temperatures of -12 °C to 45 °C.</p>
Heat exchanger	<p>The counterflow heat exchanger absorbs the thermal energy from the extract air and transfers thermal energy to the supply air.</p>
Fans	<p>The supply air fan provides fresh outside 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 exhaust air fan extracts stale, humid indoor air from kitchens, bathrooms, toilets, utility rooms and other wet rooms in the dwelling.</p>
Bypass damper	<p>The operation of the heat exchanger is deactivated by the motorised bypass damper. The bypass damper is used in warm summer conditions, when colder outside air can be used to reduce the indoor temperature if the indoor temperature exceeds a preset upper temperature limit.</p>
Control unit	<p>The control unit of the appliance is named PCB. The main PCB electrically connects all electrical and electronic parts and various accessory components.</p>
Control unit	<p>The control unit on the front of the unit indicates the operating mode and the fan level in which the unit is operating. Both can be selected and changed via the control unit. The control unit also provides other functions such as resetting the filter alarm.</p>
Temperature sensors	<p>The unit is equipped with 4 temperature sensors that continuously monitor the temperature changes on 4 sides of the heat exchanger, i.e. in outside air, supply air, extract air and exhaust air.</p>
Air humidity sensor	<p>The humidity sensor continuously monitors the quality of the extract air and adjusts the airflow accordingly.</p> <p>This operating mode is called demand-controlled mode. If an HRC remote control is connected, the level is indicated on the display with the level 3 symbol. A demand-controlled operation ensures that the correct ventilation level is achieved with the lowest possible power consumption.</p>
Filter	<p>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.</p> <p>A filter of class ePM1>50 % (pollen filter) is available as an alternative/accessory. When using an ePM1 filter, always install it between the outside air inlet and the heat exchanger.</p>
Condensate drain	<p>The unit is equipped with two drains for the condensate. One of the drains must be connected to the drain hose (1 m drain hose is included) so that the condensate can be directed to a drain. The correct connection to the condensate drain is indicated in the chapter "Installation".</p>
Wall bracket	<p>A wall bracket is included for mounting the unit on a wall.</p>

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 coil

The unit can be equipped with an electric preheating coil that preheats the incoming air. The preheating coil increases the temperature of the outside air entering the heat exchanger and thus reduces the risk of ice forming in the heat exchanger in very cold conditions.

Hot water heating coil

The hot water heating coil is controlled by the HAC 2 control unit (accessory). The water heating coil increases the supply air temperature.

Floor bracket

The unit can be mounted on a floor bracket if it has to be installed on the floor (e.g. for installation in attics). The floor bracket allows easy access to the condensate drain.

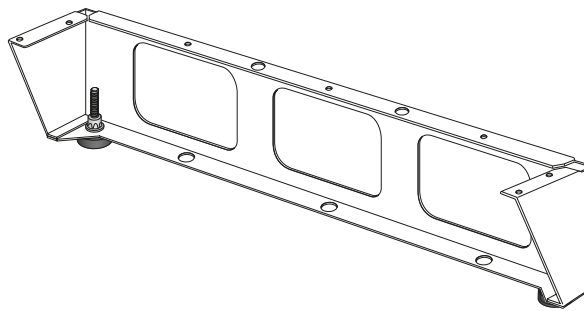


Fig. 13: Floor bracket

Hand-held remote control (HRC 3)

The HRC3 handheld remote control allows you to make numerous settings:

- Setting the ventilation levels
- Checking humidity and temperature
- Activating the cooling function (bypass)
- Setting the manual/demand-controlled mode
- Selecting week programs

The range of the hand-held remote control is up to 30 m. It can be placed on horizontal surfaces or hung on the wall.

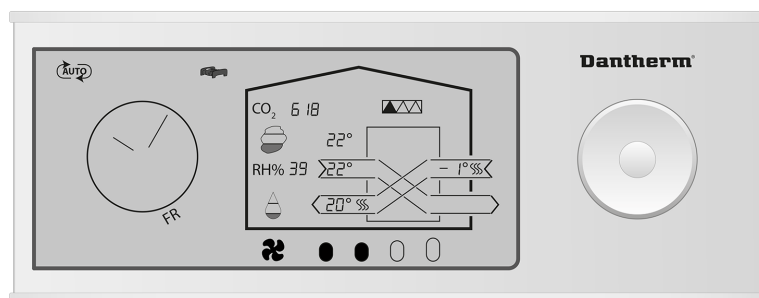


Fig. 14: Hand-held remote control

Wired remote control (HCP 11)

A wired remote control HCP 11 (without display) can be connected to the unit if the control unit is difficult to reach due to the location of the unit. The remote control provides the same functions as the control unit.

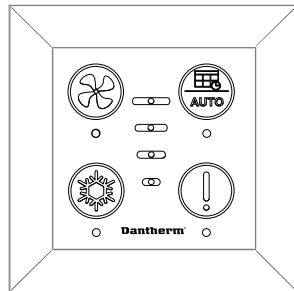


Fig. 15: Wired remote control HCP 11

Accessory control (HAC 2)

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

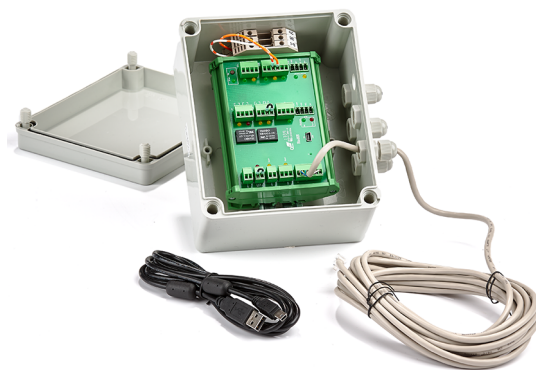


Fig. 16: Accessory control HAC 2

VOC, humidity and CO₂ sensor

The unit can be equipped with a VOC (volatile organic compounds) sensor, a humidity sensor (RH %) and/or a CO₂ sensor.

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. This operating mode is called demand-controlled mode. If an HRC remote control is connected, the level is indicated on the display with the level 3 symbol.

A demand-controlled operation ensures the desired ventilation performance with the lowest possible power consumption.

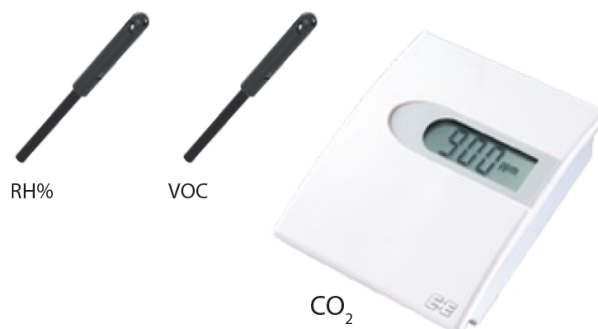


Fig. 17: Humidity sensor (left), VOC sensor (centre) and CO₂ sensor (right)

Filter

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.

Adapter set for oval pipes

Use the adapter for the openings on the bottom side of the unit. The lip seals on the adapter ensure an airtight connection between the unit and the connected ducts.

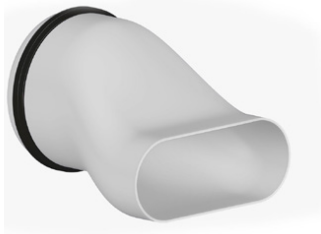


Fig. 18: Adapter set for oval pipes

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)

If a preheating coil is installed, the unit can additionally heat the outdoor air (T1) electrically to reduce the risk of frost and increase the supply air temperature. However, if the preheating coil cannot provide for a frost-proof heat exchanger, the defrosting program will start.

- The preheating process is controlled according to a complex algorithm involving several sensors. The sensors constantly measure temperatures while the system keeps the energy consumption to a minimum.
- The temperature of the outside air is increased just enough to maintain the airflow and, if possible, to avoid that the defrosting mode is started.
- Depending on the temperature conditions, preheating increases/decreases by 10 % every 60 seconds.

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

Defrosting

In cold conditions where the T1 outdoor air is below -3 °C and ice may form due to the condensate in the heat exchanger, the unit will start defrosting.

INFORMATION

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 until the minimum speed is reached.
- After 10 seconds, 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 until the minimum speed is reached.
- After 10 seconds, 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.

INFORMATION

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:

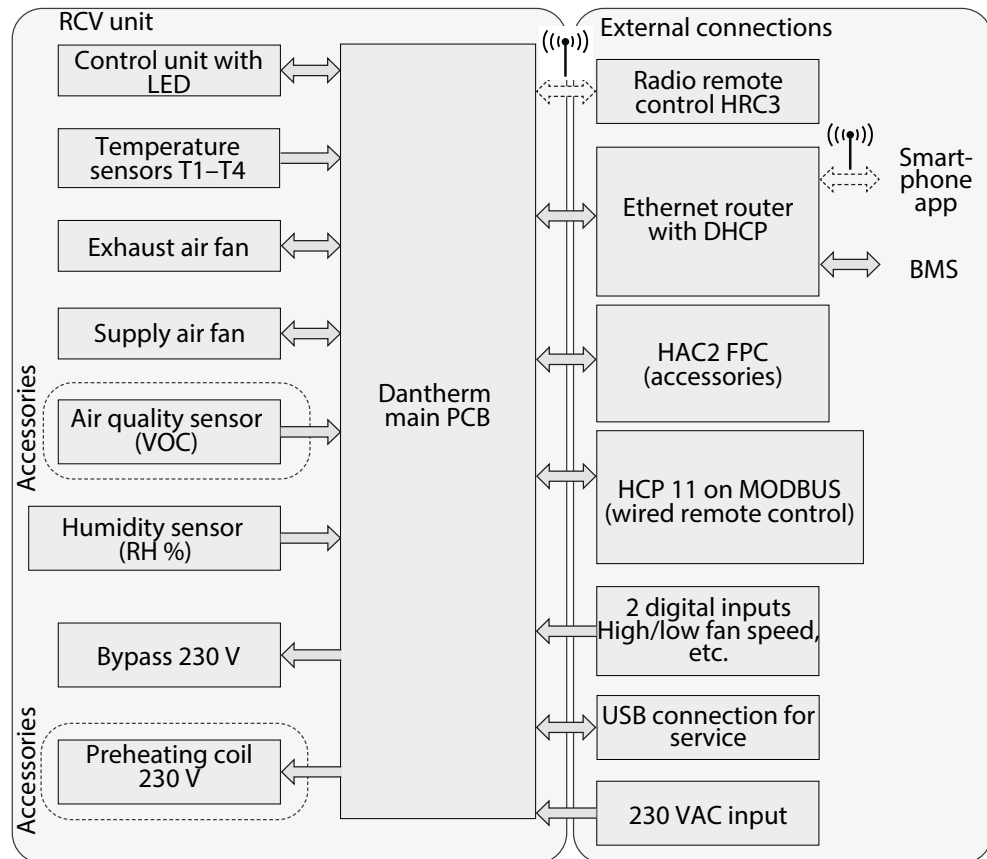


Fig. 19: Components of the system control

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.

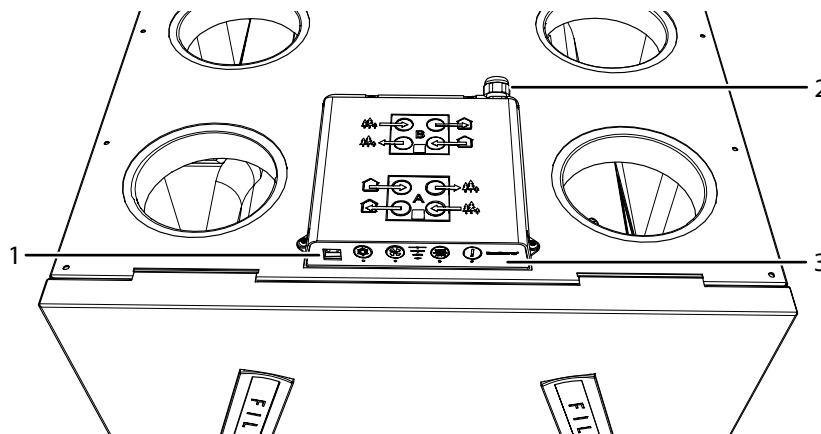


Fig. 20: Control panel

- | | |
|--|---|
| <p>1 USB connection for:
- using the PC tool
- reading out the error list</p> <p>2 Power supply and external connections</p> | <p>3 Main PCB (inside the cabinet) and control unit</p> |
|--|---|

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.

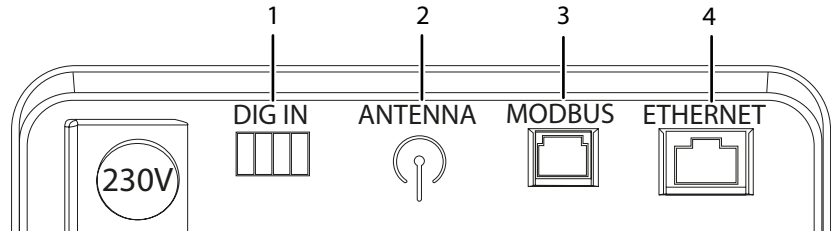


Fig. 21: External connections

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

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

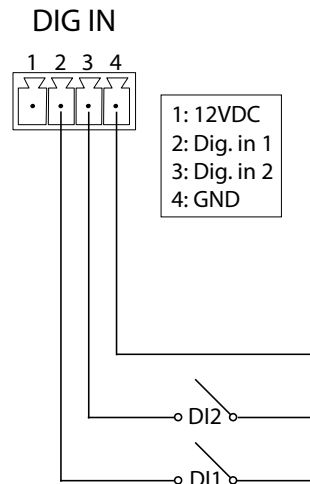


Fig. 22: Digital input

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.

INFORMATION

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

Warranty claims

Using a unit outside the specified conditions and contrary to the intended use leads to the loss of all warranty claims. The warranty is limited to units that have been installed exclusively by trained and certified personnel.

Location requirements

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

- Ensure that installation mode A (standard) or B (optional) can be implemented at the installation site. If mode B is preferred, please follow the change-over procedure on page 36. For more information on the air duct connections in mode A/B, please see page 19.
- The unit is designed for installation in environments at temperature levels $>-12\text{ }^{\circ}\text{C}$. Due to its compact design, the unit can be set up e.g. in utility rooms with little space or in the attic.
- Ensure that the wall structure is able to support the weight of the unit regardless of the type of wall bracket.
- Provide extra space to ensure a proper installation and access for maintenance activities (see following figure).

The additional space required for maintenance activities is depicted in the following figure (top view).

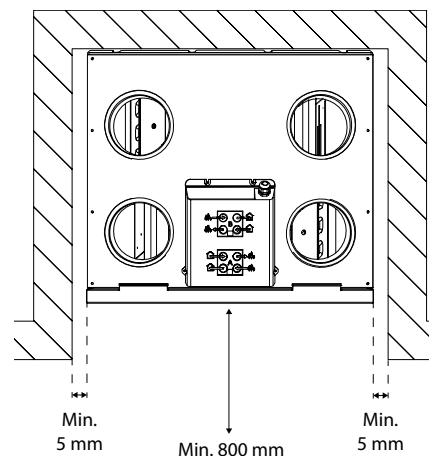


Fig. 23: Space requirement for maintenance activities

Access to the main PCB



⚠ 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!

There are three different ways to access the main PCB:

- Option 1: Partially loosen the control unit and tilt it upwards
- Option 2: Completely loosen and turn the control panel
- Option 3: Access through the interior of the cabinet

Option 1

1. Loosen the two screws (1) on the side of the control unit (2).

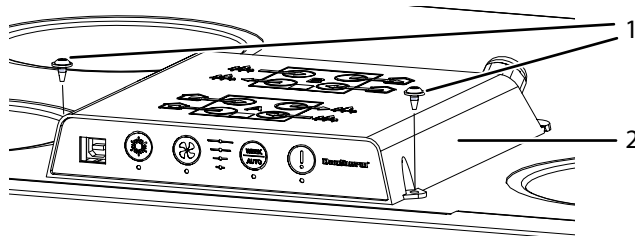


Fig. 24: Loosening the screws on the control unit

2. Tilt the control unit upwards to gain access to the main PCB (3).

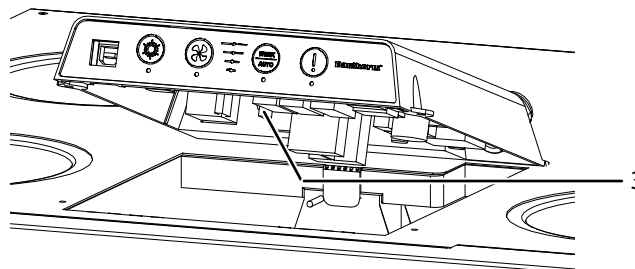


Fig. 25: Tilting the control unit upwards

Option 2

1. Detach the control unit from the unit by removing the four screws (1).

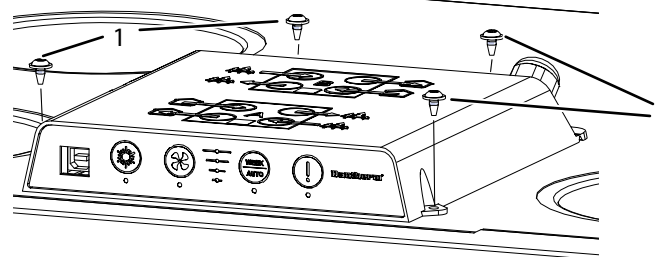


Fig. 26: Dismantling the screws

2. Turn the cabinet over to gain access to the main PCB.

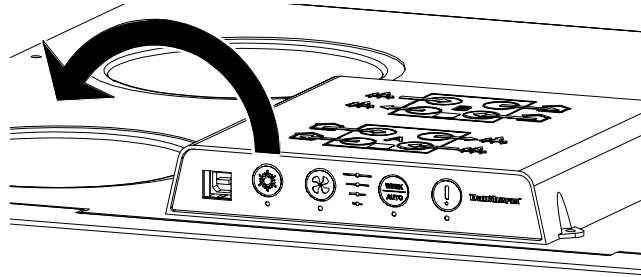


Fig. 27: Turning the control unit

Option 3

1. Loosen the three screws on the bottom of the unit and remove the front cover.

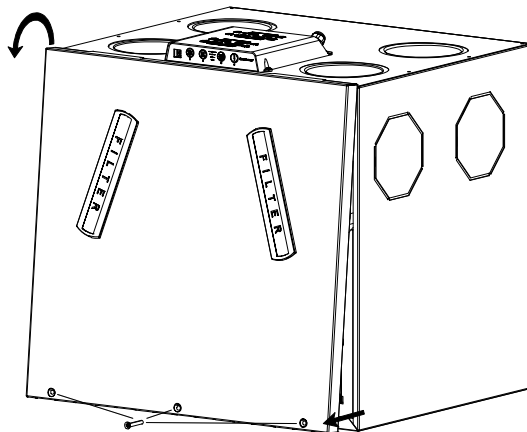


Fig. 28: Removing the front cover

1. A pin/lock is located behind the control unit that holds the main PCB in place. Press the pin/lock (1).

⇒ The main PCB detaches from the control unit.

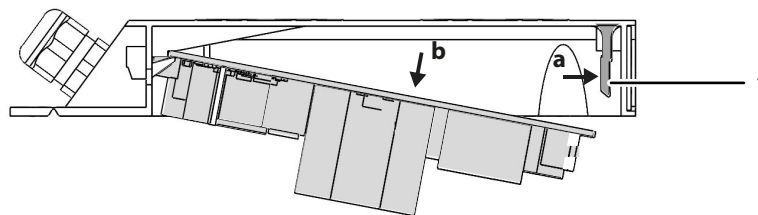


Fig. 29: Detaching the main PCB

2. Remove the main PCB from the control unit.

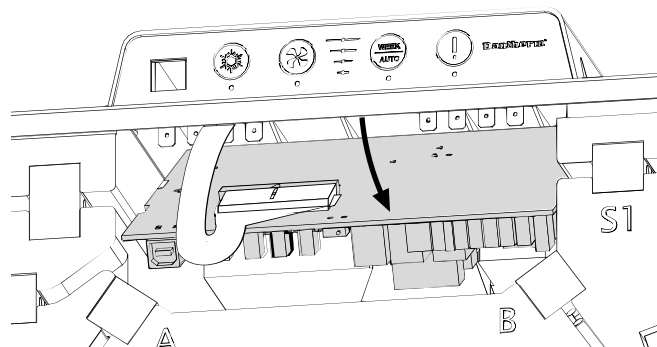


Fig. 30: Removing the main PCB

Installation options

Change-over to 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!

The unit offers the option to exchange the duct connections as described in the section "Product description – General description". Mode A is the default setting. In the following section the change-over from operating mode A to operating mode B is described:

1. Gain access to the main PCB as described in the section "Accessing the main board".
2. Set the switch on the main PCB to operating mode B.

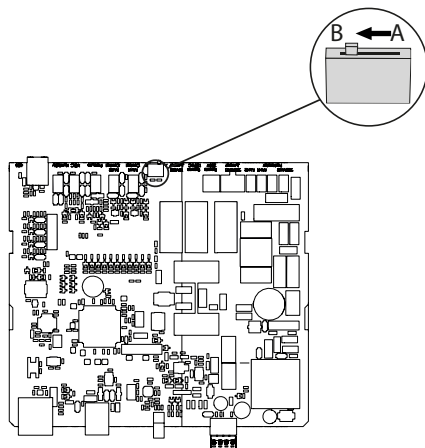


Fig. 31: Setting the switch to operating mode B

3. Remove the front cover if you have not already done so. To do so, loosen the three screws on the bottom of the unit and remove the front cover.

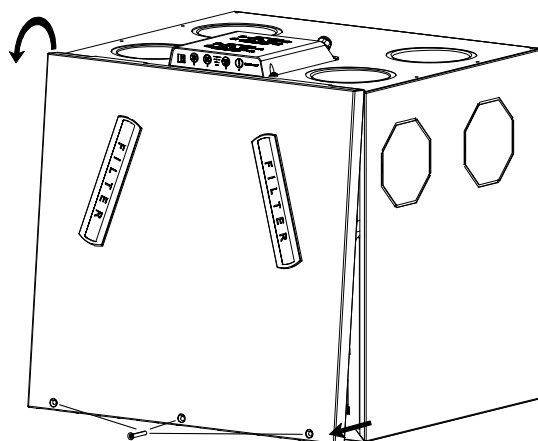


Fig. 32: Removing the front cover

4. Move the cable gland incl. humidity sensor (and VOC sensor, if available) to the position for operating mode B and insert the empty cable gland from position B to position A. Note that 50 mm distance are required from the sensor head to the cable gland in order to obtain a correct measurement.

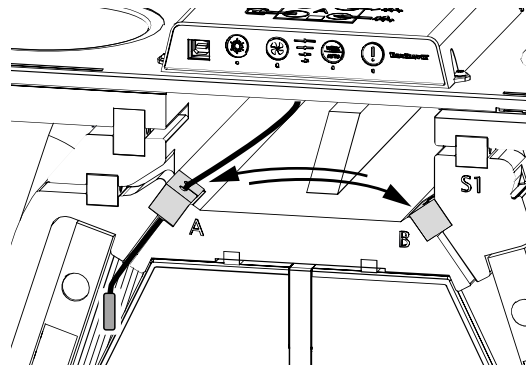


Fig. 33: Exchanging the cable glands

5. Reattach the main PCB, the control unit and the front cover
6. Fit the drain hose to the connection for the operating mode B (1). Observe the labels on the unit.

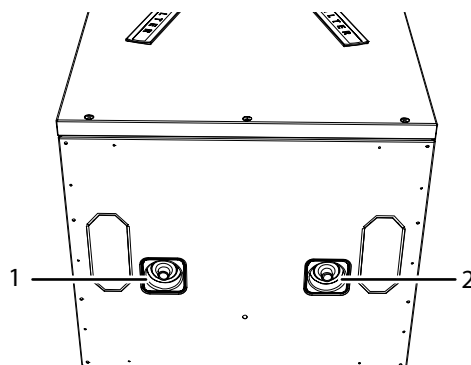


Fig. 34: Condensate drain – Operating mode A and B

- | | | | |
|---|---------------------------------------|---|---------------------------------------|
| 1 | Condensate drain for operating mode B | 2 | Condensate drain for operating mode A |
|---|---------------------------------------|---|---------------------------------------|

7. Change the position of the filters (only if the optional pollen filter ePM1>50% is used). For instructions on the correct positioning of the pollen filter, please refer to the section "General description – Filters and fans in mode A/B".

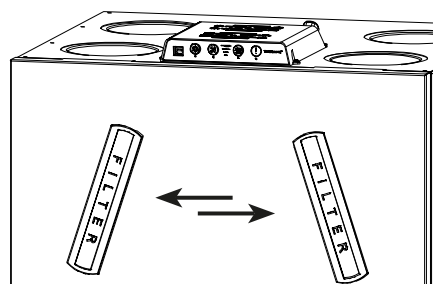


Fig. 35: Changing the position of the filters

Using the side or bottom connections



INFORMATION

You can use two duct connections at a time. If you only want to use the duct connections on the side or at the bottom, you have to close the corresponding duct connections at the top.

CAUTION

Risk of hand injuries!

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

- Wear protective gloves!

To open the spigots on the side or bottom of the unit and to close the corresponding duct connections on the top, please proceed as follows:

1. Open the desired air duct connections on the bottom or side of the unit with side cutters. Remove any excess metal.

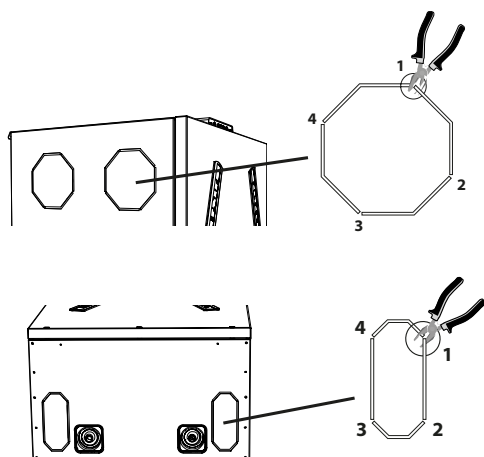


Fig. 36: Opening the air duct connections: side connection (top figure) and bottom connection (bottom figure)

2. Cut a hole in the insulation along the notch (dotted line) to create an opening in the unit. Try to cut along the inner line of the recess to avoid damaging the pipe connection. Do not try to break up the recess, but cut through the entire depth.

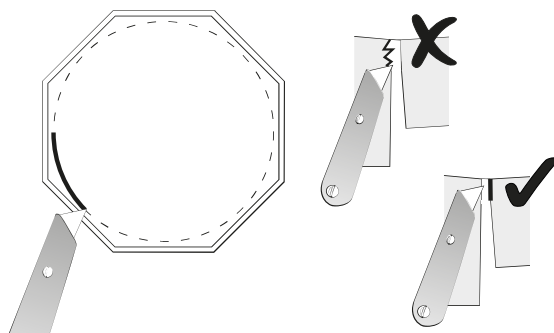


Fig. 37: Cutting connections in the insulation

3. If you will not be using the air duct connections on the top, place an insulation piece in a cap. Then close the corresponding duct connection on the top of the unit with the insulation cap.

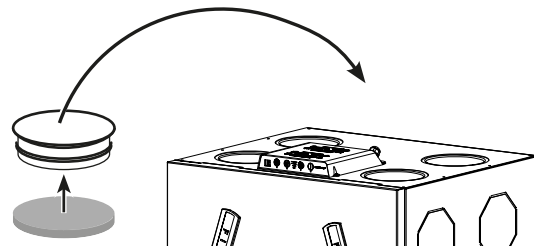


Fig. 38: Inserting the insulation cap

4. Connect the air ducts as described in the section "Connecting the air ducts" on page 44.

Assembly

Wall mounting

1. Fix and level the wall rail with the dimensions shown. **Note:** Make sure to use suitable screws and wall plugs.

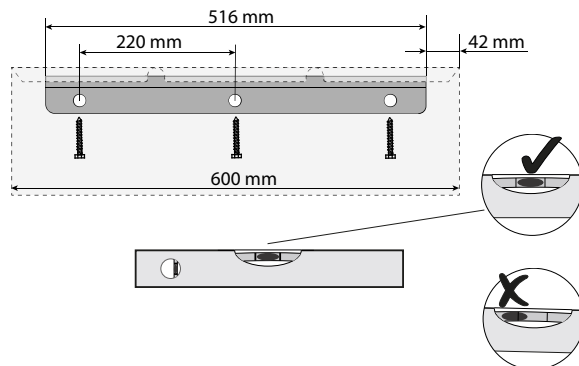


Fig. 39: Mounting the wall rail

2. Mount the two spacers on the bottom and the back of the unit.

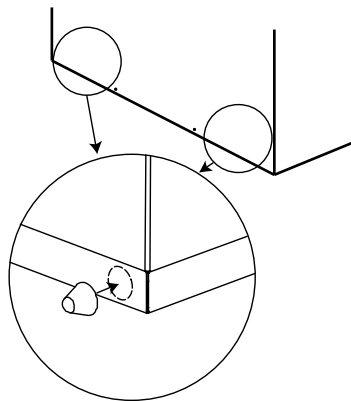


Fig. 40: Mounting the spacers

3. Mount the vibration damper (1) to the wall rail and lift the unit onto the wall rail.

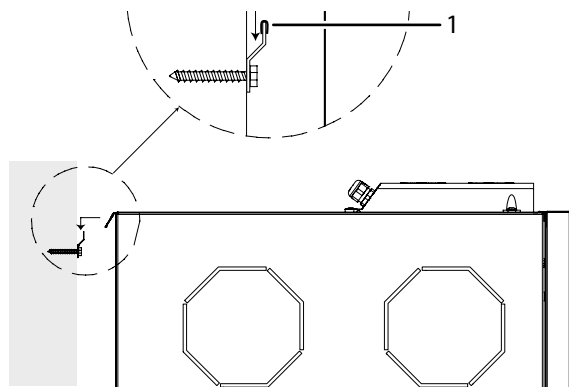


Fig. 41: Mounting the vibration damper

4. Ensure that the unit is horizontally aligned. The top edge of the unit must be in a horizontal position or slightly inclined from the wall. **Note:** The top edge must not be inclined towards the wall as this may cause moisture damages.

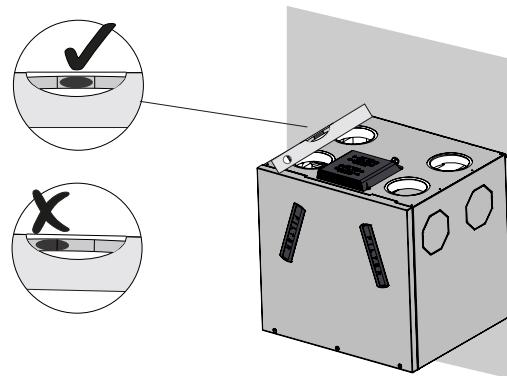


Fig. 42: Checking the alignment

Floor installation

INFORMATION

The unit can transmit vibrations to the surrounding components in non-insulated floor constructions, e.g. in attics. For non-insulated floor constructions, the unit must be placed on a sound-insulating substructure.

1. Create a wooden substructure with an insulation of at least 50 mm thickness for non-insulated floor constructions. Ensure that the substructure is aligned horizontally. **Note:** Make sure that the substructure can support the weight of the unit.

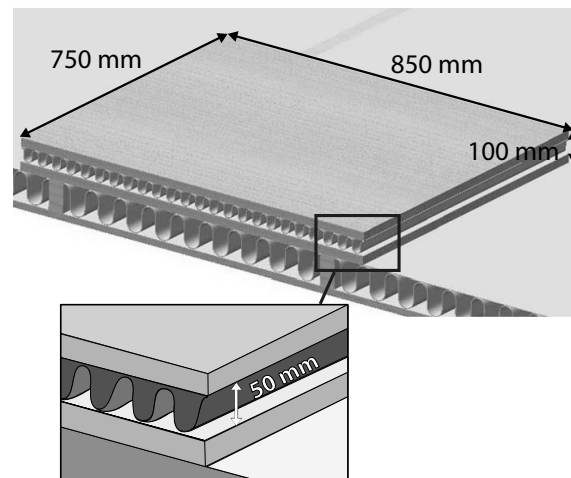


Fig. 43: Creating a wooden substructure

2. Fit the Dantherm-approved floor brackets (accessories) to the unit to establish the required distance from the unit to the floor. **Information:** Dantherm accepts no liability for floor brackets from other manufacturers. Using other floor mounts is at your own risk.

3. Set up the unit and ensure that it is aligned horizontally. **Note:** The top edge must not be inclined backwards as this may cause moisture damages.

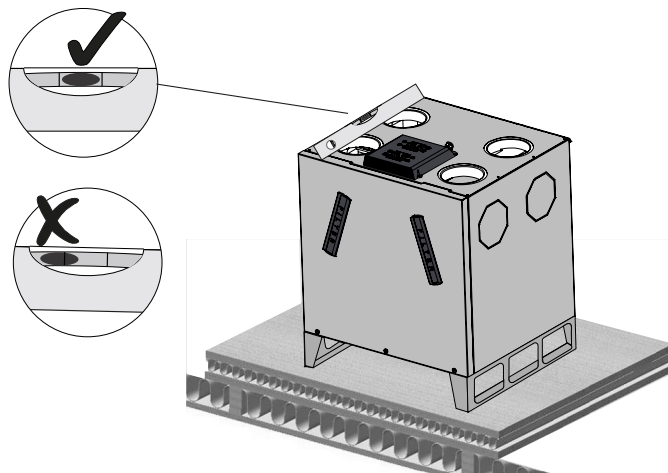


Fig. 44: Setting up the unit horizontally

Mounting the condensation drain hose

When the unit is delivered, the condensate drains are closed. When installing the unit, the correct drain must be opened and a condensation drain hose must be fitted:

1. Open the unit and check which operating mode (A/B) is set on the switch of the main PCB. If necessary, adjust the switch position to your preferred operating mode.

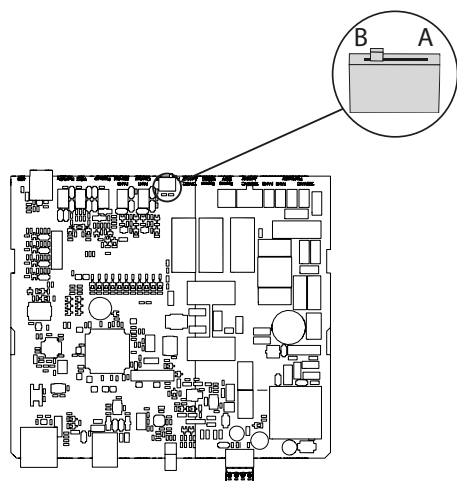


Fig. 45: Checking the operating mode

2. Check to which drain (A/B) the condensate drain must be connected. The process is depicted in the following figures.

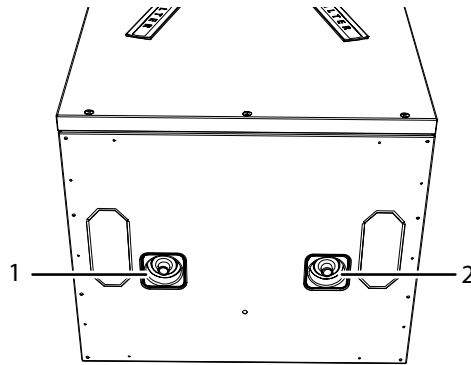


Fig. 46: Condensate drain for operating mode A and B

- 1 Condensate drain for operating mode B
- 2 Condensate drain for operating mode A

3. Remove the plug of the drain to be used. Then connect the condensate drain hose and secure it with the hose clamp provided. Do not use a screw clamp.

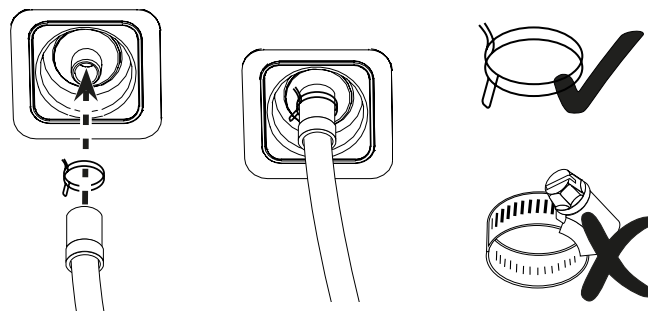


Fig. 47: Connecting the condensate drain hose

4. Ensure that the other condensate drain (1) is closed with a plug (2).

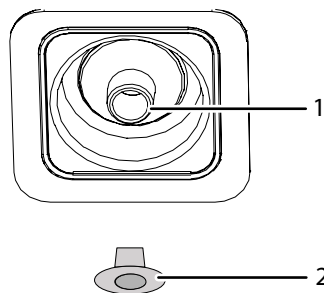


Fig. 48: Fitting the plug on the condensate drain

5. Route the condensate drain hose in a way that a siphon is created that is at least 100 mm high. The siphon can be created in two ways:
A) directly under the unit (suitable for most wall installations) or alternatively
B) at the end of the drain hose (suitable for floor installations)

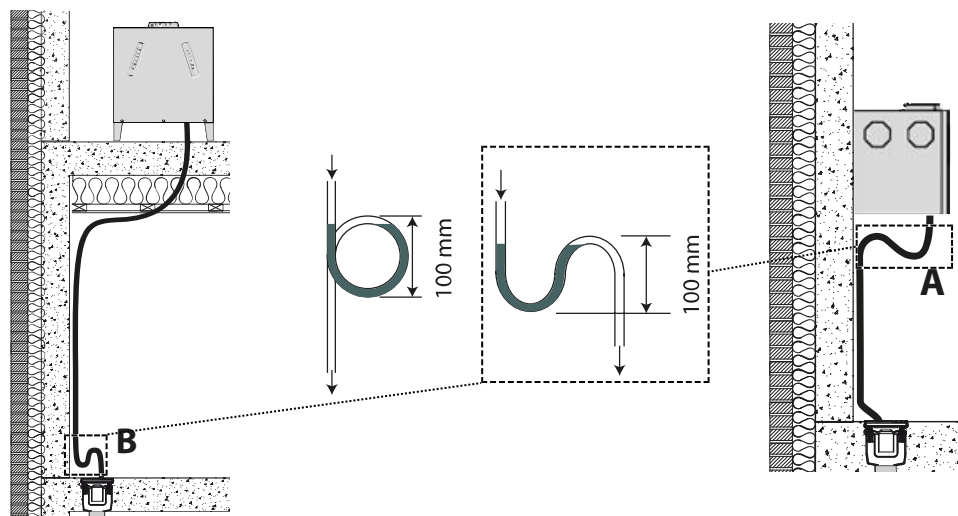


Fig. 49: Creating a siphon

6. Fill the siphon with at least 0.5 l of water.
7. When routing the siphon directly under the unit, use the hose clamp supplied. To do so, fix the hose clamp in the opening on the underside of the unit and guide the condensate drain hose through the hose clamp to create a siphon.

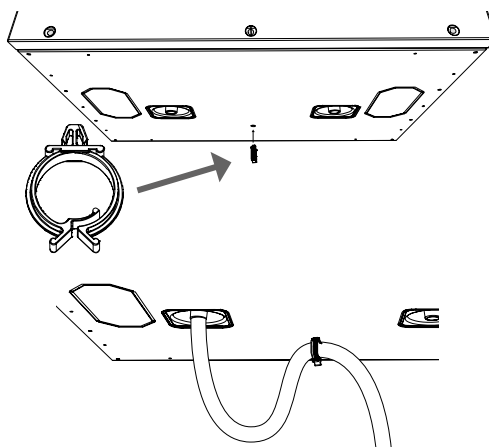


Fig. 50: Using the hose clamp

8. Guide the hose to a drain and make sure it is not exposed to frost. Install a heating cable around the drain hose if the insulation is not sufficient to provide a frostproof drain hose.
9. Ensure a minimum inclination of 1 % (1 cm/metre).

Connecting the air ducts

NOTICE

Danger from dust!

Moisture, dirt or dust entering the duct system may damage the unit.

- Protect ducts and connections until the house is cleaned and ready for occupancy.

✓ All four ducts are fully provided with at least 50 mm insulation (for installations in heated rooms) or 100 mm insulation (for installations in the attic/ in low temperature surroundings).

1. Before connecting the air ducts, observe which inputs and outputs are available in operating mode A or operating mode B.

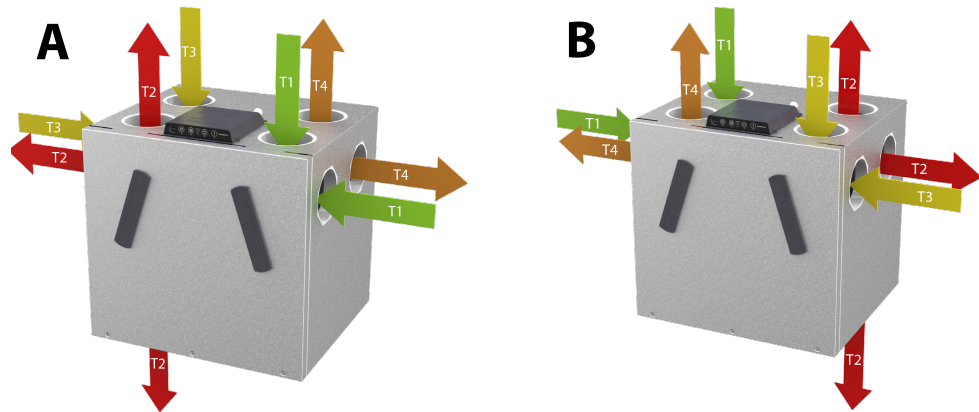


Fig. 51: Observing the connections

2. Connect the air ducts to the desired duct connections on the unit, either on the top (standard) or on the side or bottom (optional). Ensure that the diameter of the air ducts is equal or larger than the one of the unit connection. For information on the dimensions, please refer to the section "Technical data".

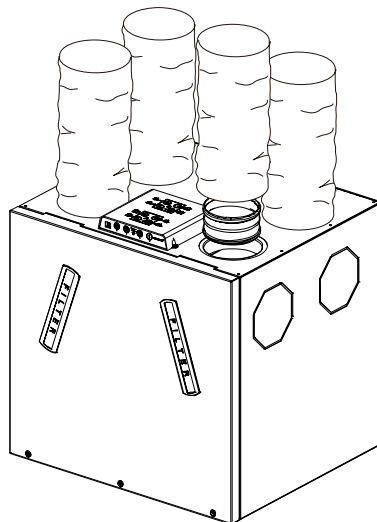


Fig. 52: Connecting the air ducts

Initial start-up and calibration

To control the humidity level and to achieve the right comfort level, it is important to regulate the amount of supply air entering the house and the amount of exhaust air being discharged from the house.

This is achieved by setting the fan speed in a nominal mode corresponding to speed 3.

INFORMATION

Pour 0.5 l of water into the siphon before carrying out the calibration to prevent air from escaping from the condensate drain.

INFORMATION

Observe the following:

- The required airflow for each room must comply with the national standards for ventilation and/or building regulations.
- Major adjustments to the valves may greatly affect the main airflow. For this reason, check the main airflows and adjust them if necessary. In order to ensure reliable operation and to establish the conditions for mass balancing within the system, the volume of the final total extract airflow achieved during calibration must be 5 to 10 % greater than the volume of the total supply airflow achieved.

Calibration of the air ducts

As first step of the calibration process, the total/main airflow must be measured at the external duct system with suitable equipment and simultaneously adjusted to the setpoint using the PC tool or at the control unit.

Then the valves in all rooms must be set in way that the required airflow is achieved for the respective rooms.

Calibration on the unit

Some units can also be calibrated directly on the unit. You can recognise these units by the four calibration openings (1) on the front.

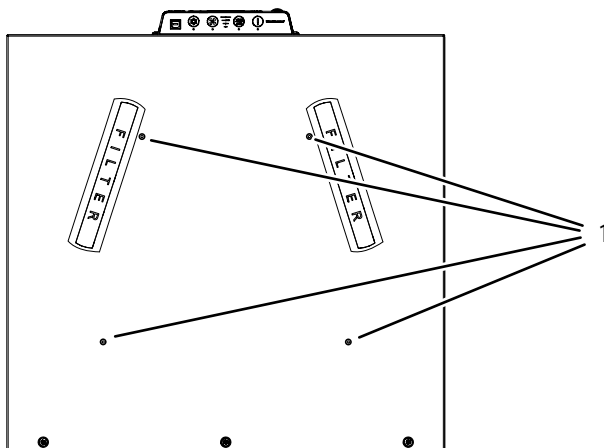


Fig. 53: Front view with calibration openings

Please proceed as follows to calibrate these units:

1. Insert the power plug of the unit into a 230 V safety socket.
2. Start the PC.
3. Connect the ventilation unit to your PC with a USB cable.
4. Start the PC tool on your computer and set up the connection to the ventilation unit.

- Read out the pressure drop Δp inside the heat exchanger that is required for a desired volume flow from the airflow diagram. The pressure drop Δp is located on the unit (--- = supply air, -- = extract air).

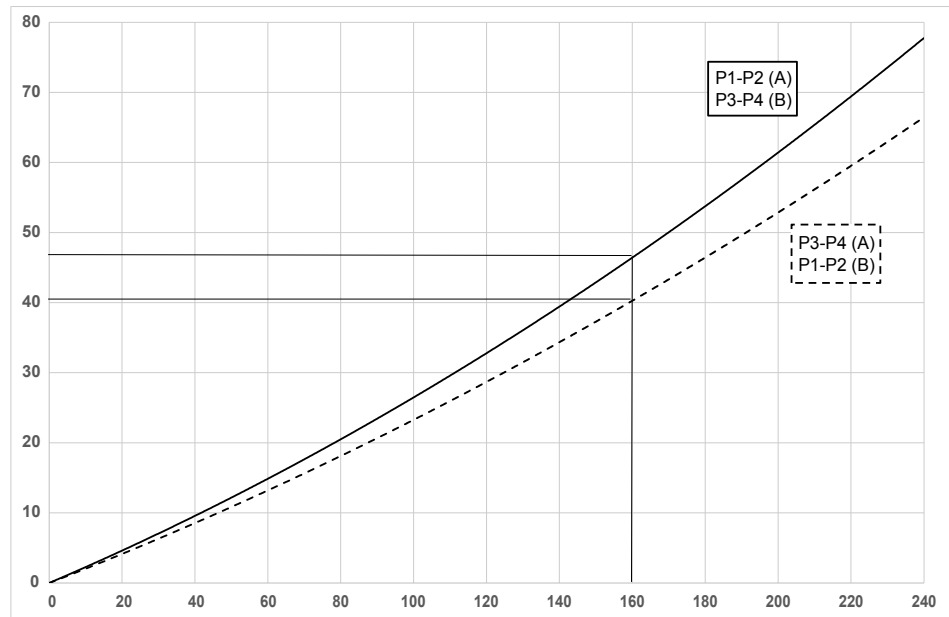



Fig. 54: Airflow diagram

- Mount a ball pump needle on each of two hoses of equal length.

Ball pump needle: 

- Connect the hoses to the ΔPa measuring device.
- Push the needles completely through the rubber cover of P3 and P4 (operation mode A, see figure) or P1 and P2 (operation mode B).

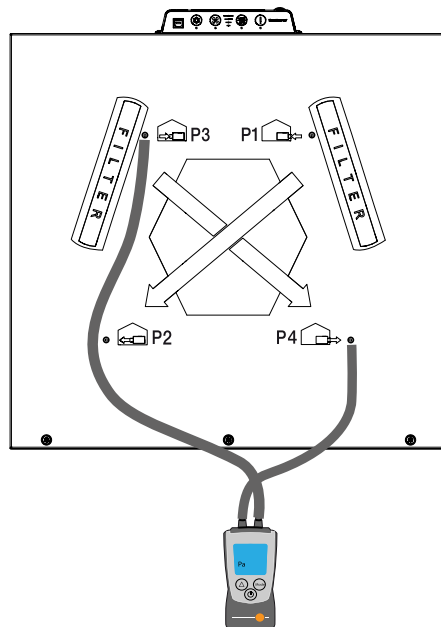


Fig. 55: Calibrating the extract air, operating mode A

- Follow the instructions in the PC tool and adjust the speed of the exhaust air fan until the ΔPa measuring device indicates the value from step 5.

10. Push the needles completely through the rubber cover of P1 and P2 (operation mode A, see figure) or P3 and P4 (operation mode B).

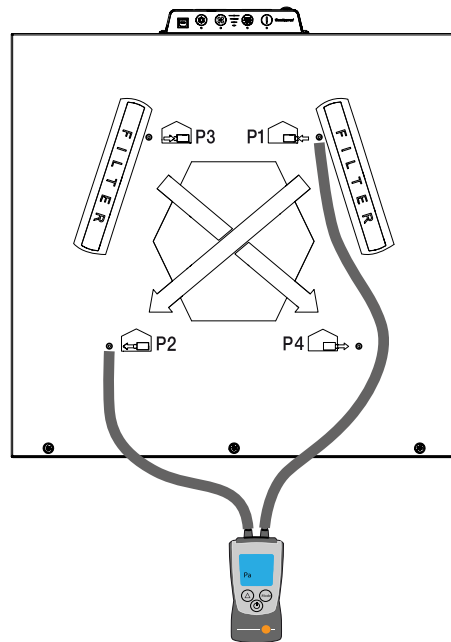


Fig. 56: Calibrating the supply air, operating mode A

11. Follow the instructions in the PC tool and adjust the speed of the supply air fan until the ΔPa measuring device indicates the value from step 5.

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 Loosen the three screws on the bottom of the unit and remove the front cover.

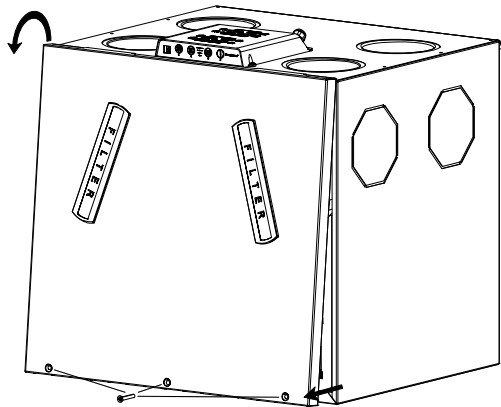


Fig. 57: Removing the front cover

Inspecting and cleaning the fans



CAUTION

Sharp edges!

The fan cabinets may have sharp edges on which you can cut yourself.

- Wear protective gloves when inspecting and cleaning the fan cabinets.

1. Pull out the left fan cabinet with pliers.
2. Pull out the right fan cabinet by hand.

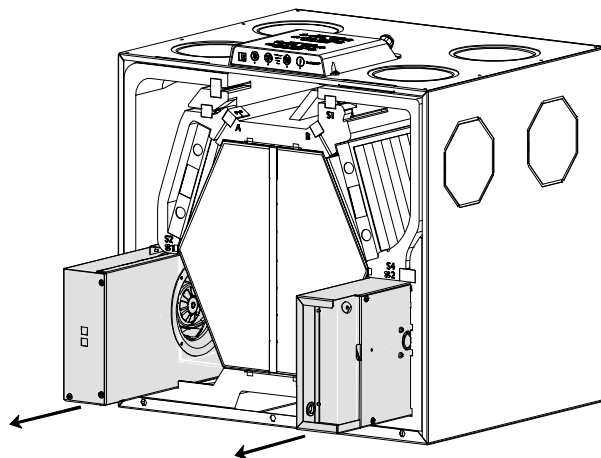


Fig. 58: Removing the fan cabinet

3. Carefully clean the fan blades with compressed air or a brush through the opening on the underside of the fan cabinet. All blades must be clean in order to maintain the balance of the fan. Be careful not to remove the small stabilizer pieces on the fan as this may cause vibrations.
4. Turn the fan with your fingers and check whether you can hear any noise from the bearing. If you can hear noise from the bearing, the fan probably needs to be replaced.

Inspecting and cleaning the bypass

Check and clean the bypass with a brush if necessary.

Inspecting and cleaning the heat exchanger

1. Pull the heat exchanger out of the unit.

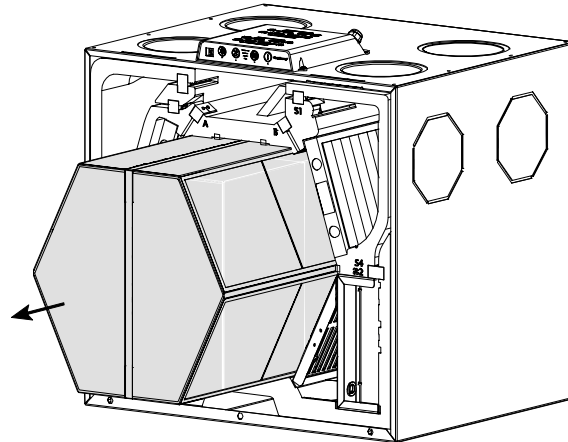


Fig. 59: Removing the heat exchanger

2. Clean the heat exchanger and its four inlets with a soft brush and a vacuum cleaner. In particular cases, e.g. if there are clear traces of accumulated, contaminated condensate in the heat exchanger, it is necessary to clean the heat exchanger with soapy water.

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.

Checking and cleaning the condensate drain

- ✓ The filter, fan housing, bypass and heat exchanger have been removed from the unit.
1. Make sure that the condensate drain in the drip tray is not blocked.
 2. Clean the drip tray with soapy water and a brush/cloth.
 3. Check the drain hose for damage and correct installation. For information on the correct installation, please refer to page 42.

Completion of the work

1. Check whether all connections are securely fastened to the main PCB.
2. Mount all parts that were previously removed.

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 10/11)	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 re-set 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 to 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 on the membrane keyboard operating panel 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 re-appear if problem persists
					Fan is defective	Replace fan	
2	R	1	E2	Supply air 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 on the membrane keyboard operating panel 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 re-appear 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	
				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	Outside 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 on the membrane keyboard operating panel 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	
				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 display 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 preheater 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	Check for smoke or fire Check if sensor and connection are OK	The alarm display 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
					Nothing is connected to this input	Mount short circuit equipment	
15	R	1	E15	High water level (accessory) Water level is too high	The water drain is blocked	Clean the water drain	Automatic reset when the input is closed again
				Water level is not too high	The water drain is mounted incorrectly	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	
					Auxiliary drain pump is not operating	Check pump Check fuse	
					Water level sensor is not connected	Check wiring	
				Water level is not too high	Water level sensor is normally open (NO)	Configure or change the water level sensor so that it is normally closed (NC)	
					Digital input incorrectly configured	Check the configuration of the digital input with PC tool	
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	Fire protection control with this address has already been installed but is no longer accessible	Check connection to fire protection control	Manual reset by pressing the alarm button on the membrane keyboard operating panel or by switching the unit off/on
				Missing position feedback for a fire damper	A fire damper is closed but should be open	Check the power supply to the fire damper Check internal fire detector of the fire dampers	
					Failure during monthly, weekly or manual fire damper test	Fire damper is jammed either in open or closed position	

Annex

Technical data

TECHNICAL DATA	Abbr.	Unit	RCV 320 P1	RCV 320 P2
Max. flow rate at 100Pa	V_{100Pa}	m ³ /h	320	320
Max. nominal flow rate at 100Pa	$V_{max.nom}$	m ³ /h	200	200
Operating range passive house @ 100 Pa	VPHI	m ³ /h	71 to 162	
EN 13141-7 reference flow rate @ 50 Pa	Vref	m ³ /h	140	140
PERFORMANCE				
Thermal efficiency according to EN 13141-7 @ reference flow	η_{SUP}	%	94	95
Leakage (external and internal) according to EN 13141-7		%	< 2 % (class A1)	< 2 % (class A1)
Filters according to EN 779:2012		-	G4 (optional on supply air: F7)	G4 (optional on supply air: F7)
Filters according to ISO 16890		-	ISO Coarse (ePM1>50 % optional on supply air)	ISO Coarse (ePM1>50 % optional on supply air)
Ambient temperature range for the installation	t_{SURR}	°C	-12 to +45	-12 to +45
Maximum humidity level in the extract air	x	g/kg	10	10
Outside air temperature range (without preheating coil installed)*	t_{ODA}	°C	-12* to +40	-12* to +40
Outside air temperature range (with preheating coil installed)	t_{ODA}	°C	-20 to +40	-20 to +40
CABINET				
Dimensions (with bracket)	WxHxD	mm	600 x 603 x 548	600 x 603 x 548
Spigot / air duct connections	Ø	mm	Ø125 – female**	Ø125 – female**
Weight	m	kg	32	32
Thermal conductivity of the polystyrene insulation	λ	W/(mK)	0.031	0.031
Heat transfer coefficient of the polystyrene insulation	U	W/(m ² K)	U<1	U<1
Drain hose (included in scope of delivery)	Ø - length	"-m	3/4" – 1 m	3/4" – 1 m
Cabinet colour	RAL	-	no paint/ galvanised steel	no paint/ galvanised steel
Fire protection class of the polystyrene insulation according to DIN 4102-1		-	B2	B2
Fire protection class of the polystyrene insulation according to EN 13501-1		-	E	E



TECHNICAL DATA	Abbr.	Unit	RCV 320 P1	RCV 320 P2
ELECTRICAL SPECIFICATIONS				
Electrical voltage	U	V	230	230
Max. Power consumption (without/with preheater)	P	W	170/1070	170/1370
Frequency	f	Hz	50	50
Protection type (IP)		-	21	21

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

** Optional supply air connections on the bottom: oval (68 x 163), female

Cabinet dimensions

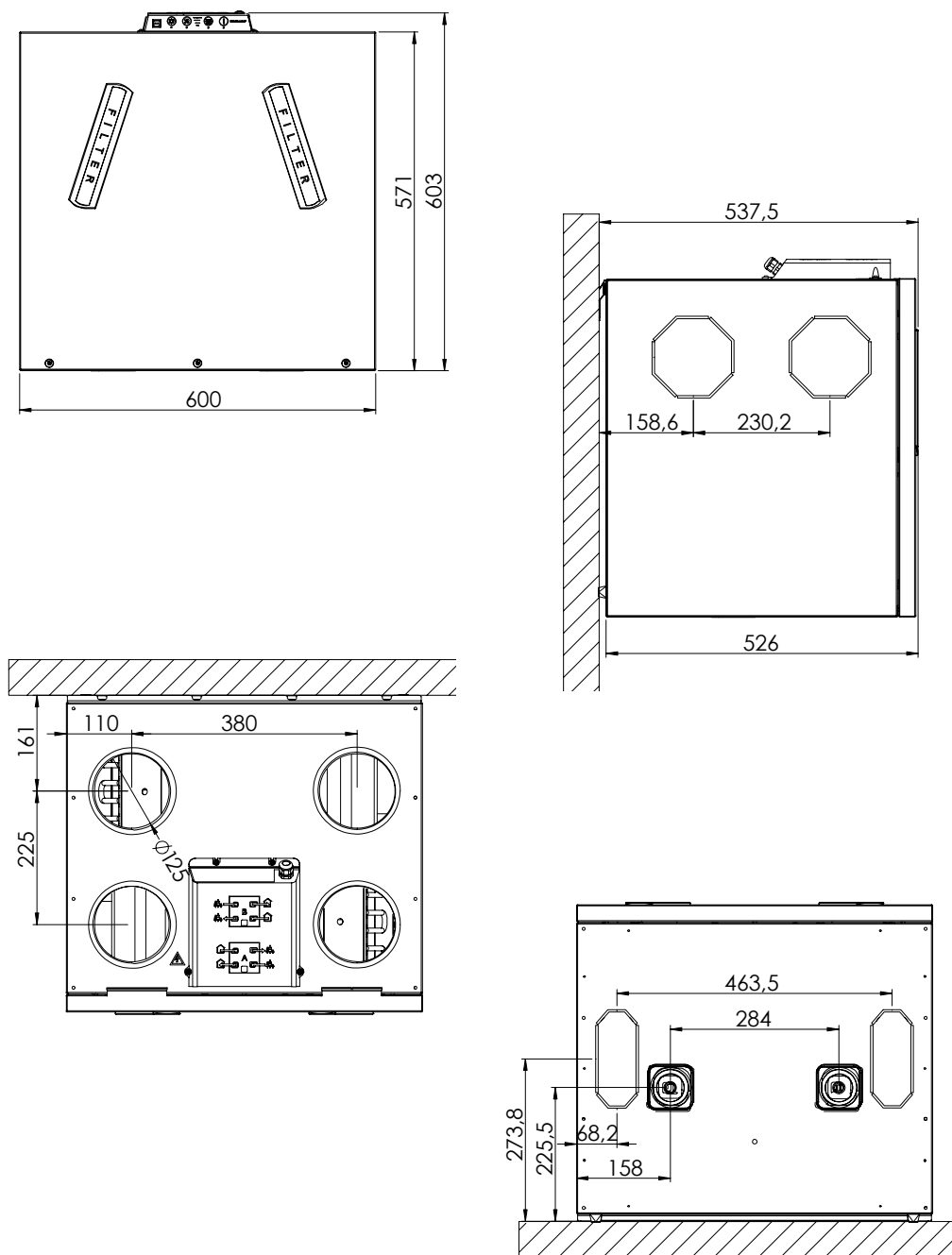


Fig. 60: Cabinet dimensions



Main PCB with connections

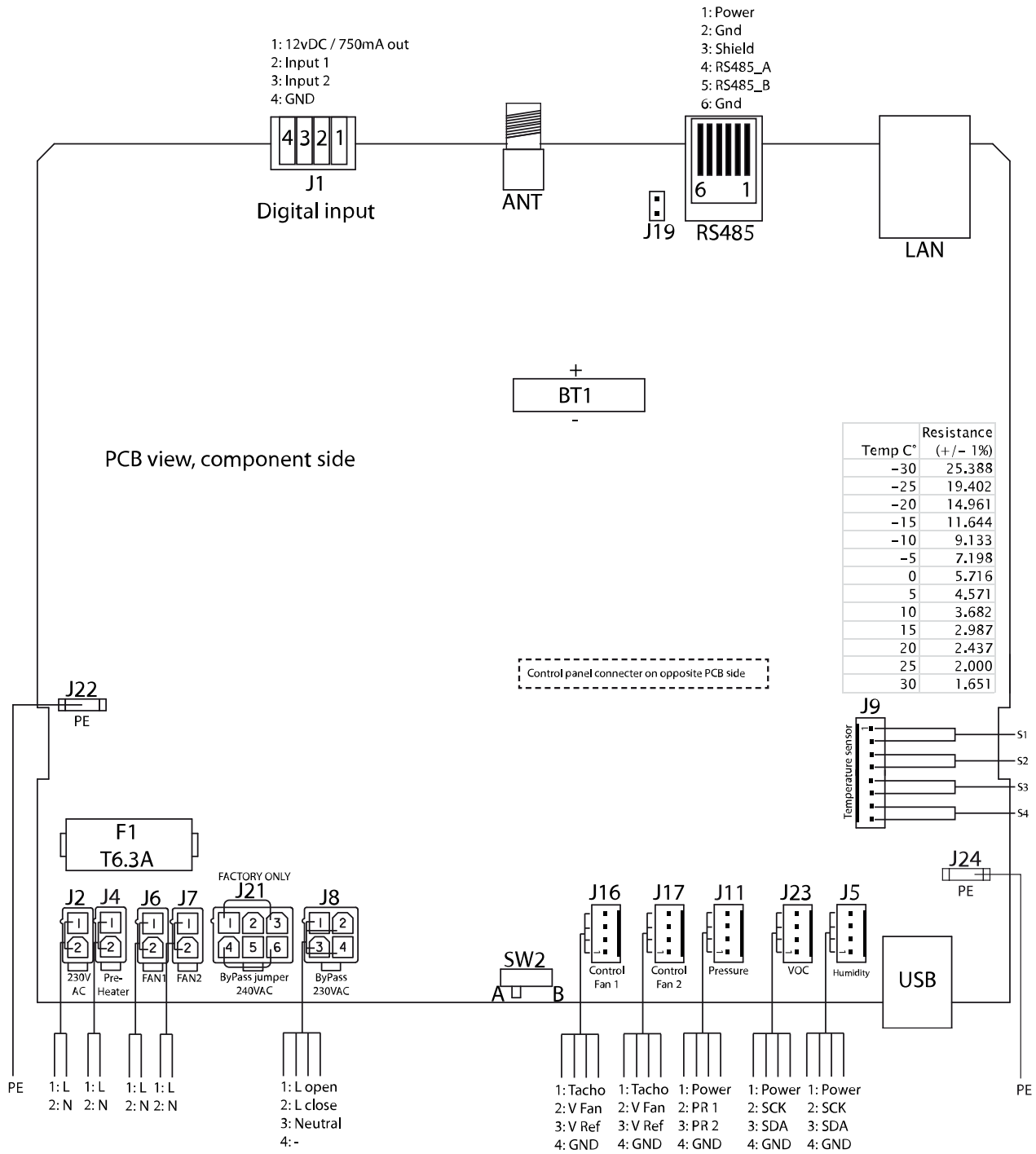


Fig. 61: Main PCB with connections

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.: 352482 Type: RCV 320 (all variants included)

– complies with the following directives:

2014/35/EU	Low Voltage Directive
2014/30/EU	EMC Directive
2014/53/EU	Radio Equipment Directive
2009/125/EG	Eco Design Directive (incl. Regulation 2014/1253)
2011/65/EU	RoHS Directive
1907/2006/EG	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)
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 55014-1:2006	Electromagnetic compatibility – Requirements for household appliances – Part 1
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, 28/03/2022

Product manager

Jakob Bonde Jessen, Managing Director

Declaration of conformity (UKCA)

Dantherm, Marienlystvej 65, DK-7800 Skive, declares that the units mentioned below:
Item no.: 352482 Type: RCV320 (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

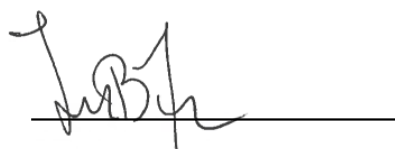
– and is manufactured in compliance with the following harmonized standards:

EN 60335-1:2012	Household and similar electrical appliances – Safety – Part 1 (+AC:2014 + A11:2014 + A13:2017 + A1:2019 + A2:2019 + A14:2019)
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
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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
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Skive, 28-03-2022



Product Manager



Managing Director
Jakob Bonde Jessen



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