Dantherm®
CONTROL YOUR CLIMATE

MANUAL

RCV 320 P2

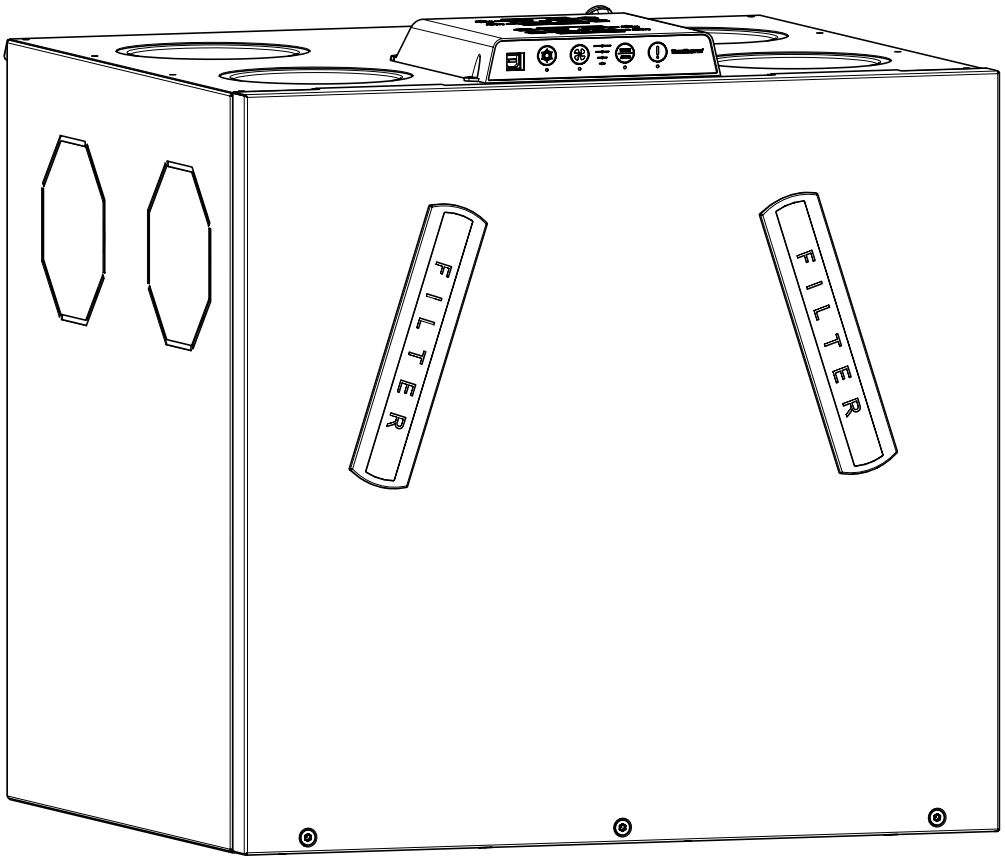

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Table of contents

This manual covers the following topics:

USER MANUAL

INSTALLATION & SERVICE MANUAL FOR PROFESSIONALS

Introduction

About this Manual

Manual

This is the service manual for the Dantherm residential ventilation units RCV 320.
The manual contains information targeted at:

- Product users and
- Professionals such as installers and service technicians

This manual is intended for both installers and users of the product.
Installation and repair of the unit must be carried out by qualified personnel only. It is the responsibility of the installer to read and understand this service manual prior to initial start and setup of the RCV unit. The warranty is limited to devices installed by trained personnel.

The USER MANUAL contains information that may be relevant to professional technicians.
The INSTALLATION & SERVICE MANUAL is intended for trained personnel only.

Copyright

Copying this service manual, or parts thereof, is not permitted without the prior written consent of Dantherm.

Reservations

Dantherm reserves the right to change and improve the product and service manual at any time without prior notice or obligation.

Abbreviations in this manual

This manual uses the following abbreviations in connection with ventilation terminology.

Abbr.	Description
T1	Outside air enters the unit
T2	Supply air from the unit into the home
T3	Extract air from home to unit
T4	Exhaust air from the unit
S1	Temperature sensor no 1
S2	Temperature sensor no 2
S3	Temperature sensor no 3
S4	Temperature sensor no 4
Mode A	Indicates operating mode A. See more on page 17
Mode B	Indicates operating mode B See more on page 17
ISO Coarse 75%	Standard air filter according to ISO 16890. Corresponds to G4 filter according to EN 779 (outdated directive)
ePM1>50%	Pollen filter according to ISO 16890 - absorbing finer particles than ISO Coarse 75%. Corresponds to F7 filter according to EN779 (outdated directive)
BP	Bypass damper (makes it possible to supply fresh filtered air to the dwelling without heat recovery in heat exchanger)
IP	Unique address for Ethernet port.
DHCP	Automatic setting of an Ethernet address supplied by an external network component (if the device is connected to the Ethernet)
PC	Personal computer running MS Windows
USB	Universal serial bus connection
LAN	Local area network
WAN	Wide area network (Internet)
BMS	Building Management System
PCB	Printed Circuit Board
FFC	Flat Flexible Cable

Symbols in this manual

The following symbols are used in this manual to draw attention to hazards and additional information of particular relevance.

Category	Symbols Used	Risks/ meaning
General warning symbols	 WARNING	Risk of serious injury.
	 CAUTION	Risk of minor or moderate injury or damage to property.
Specific warning symbols	 WARNING	Risk of serious injury due to sharp elements/ edges.
	 WARNING	Risk of serious injury as e.g. electric shock due to electricity.
	 WARNING	Risk of serious injury due to hot surfaces
General note	 NOTE	Further tips and information regarding the use of the device.
Mandatory action signs		Read and understand this service manual
		Disconnect mains plug from electrical outlet
		Wear gloves

The warning and caution symbols are described as follows:


WARNING
CAUTION

Type and source of hazard
Further clarification, if applicable.

- Measures to remedy the hazard or immediate measures if the risk becomes acute are described in this way

Recycling

This unit is designed to have a long life. At the end of its useful life, the unit should be recycled in accordance with national regulations, with particular regard to the protection of the environment.

USER MANUAL

Introduction

Overview

Target group

This part of the manual, entitled the USER MANUAL, is intended for users of the product.
All instructions described in the INSTALLATION & SERVICE MANUAL FOR PROFESSIONALS must be carried out by trained technicians.

WARNING

This device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, unless they are under supervision or have been instructed in the use of the device by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the appliance.
Apart from replacing air filters and cleaning the system externally, all maintenance must be carried out by trained personnel. .

Safety precautions

It is important to know the correct operating procedure for the residential ventilation system and all its safety measures. Dantherm accepts no liability with regard to lost business or personal injury as a result of non-compliance with safety measures.

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Operation

Control panel - overview

interface

The control panel has four buttons (two on the left side and two on the right side) with corresponding LEDs underneath. An LED light with four levels indicating the fan speed is situated in the middle. It will always indicate the current fan speed regardless of the operating mode.

This illustration shows an overview of the different modes (three main modes and three temporary override modes) and other functions that can be displayed in the control panel and activated via the buttons.

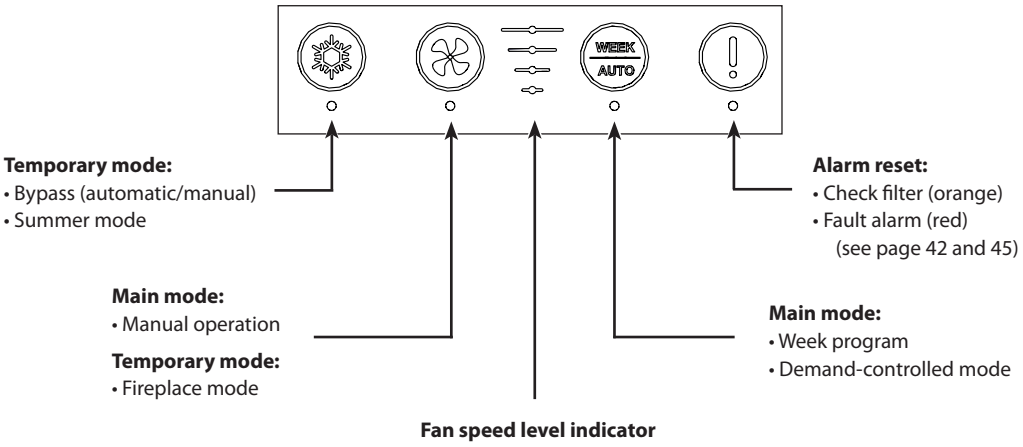

Fig. 1

Main operating modes

CAUTION

Risk of water damage

- Never turn off the ventilation unit as this may cause condensation and subsequent leaks from the duct system, with the risk of water damage.

Introduction

Decide which of the three main operating modes you want your RCV 320 to run in and adjust the settings as desired via Dantherm PC Tool, Dantherm Residential app or HRC3 remote control. Please note, however, that legislation may prescribe minimum levels of ventilation speed.

Manual operation

Check the fan speed manually. In manual operating mode, the ventilation unit will run at the selected ventilation speed until this is changed manually.

Short press – activates manual operating mode. Each time the button is pressed, the fan speed is increased by one level (level 0–4). After level 4, the fan speed will start from level 0 again.

- **NOTE:** If the unit is running in manual operating mode - level 4 (fan boost) or level 0 (off) it will automatically return to level 3 (nominal mode) after four hours. The function of the auto setback can be customized via PC Tool.
- The fan speed at level 0 can be locked via PC Tool. When level 0 is locked, the fan speed will jump from level 4 to 1 as it increases.

Active manual operating mode is indicated by constant light in the corresponding LED

Week program

When the week program is activated, the unit will automatically adjust the ventilation speed according to a predefined week schedule.

You can activate the week program via the control panel on the unit, but you cannot choose which week program you want to run. Selection between the 11 weekly programs (10 set programs + one adjustable in PC Tool) can only be done using the Dantherm app, the HRC3 remote control or a PC Tool.

Short press – activates the selected weekly program.
The active weekly program is indicated by a constant light in the corresponding LED

Demand-controlled mode

Enable demand-controlled operation for automatic control of indoor air quality. This mode uses readings from VOC, RH and/or CO_2 sensors to control the indoor air quality. It is therefore necessary for the associated sensors to be connected during demand-controlled operation. The CO_2 sensor can only be connected via an installed Accessory Controller (HAC).

Long press (five seconds) - activates demand-controlled operation.
Active demand-controlled operation is indicated by a slow flashing light in the corresponding LED

Temporary modes (override)

Introduction

The temporary modes are activated manually, except for the automatic bypass, and will temporarily override the settings for the selected main mode. The temporary modes are automatically stopped by a timer, but they can also be deactivated manually (except for the automatic bypass).

Bypass mode (Free cooling)

Bypass mode opens the bypass damper, which directs the airflow around the heat exchanger. The outdoor air will thus be supplied to the house without heat recovery. Bypass mode can be activated in two ways:

- Automatic bypass
- Manual bypass

Automatic bypass

The automatic bypass opens/closes the bypass damper automatically when the conditions for automatic bypass are met.
You can change the setpoints for min. outdoor temperature (Tmin) (default setting: 15°C) and max. indoor temperature (Tmax) (default setting: 24°C) via PC Tool or the Dantherm HRC3 remote control.

If the conditions for automatic bypass are present, an open damper is indicated by a constant light in the corresponding LED

NOTE

Mandatory conditions for allowing activation of automatic bypass:

- Outdoor air temperature is at least 2 °C lower than the exhaust air temperature
- AND the outdoor temperature is higher than the setpoint (Tmin)
- AND the exhaust air temperature is higher than the set point (Tmax).

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

- Outdoor air temperature is higher than the exhaust air temperature
- Outdoor air temperature is at least 2°C lower than setpoint (Tmin)
- Exhaust air temperature is at least 1 °C lower than setpoint (Tmax)

Energy wasting:
If the bypass temperature settings are set too low, there is a risk that the unit will open the bypass while the central heating system in the house is active.

NOTE

When the automatic bypass is active in the demand-controlled mode the air volume will be adjusted according to the actual cooling need which is decided by the exhaust temperature.

Manual bypass

If bypass/cooling is desired and automatic bypass is not active, the bypass can be activated manually.
The bypass will open if the conditions for manual bypass are met within the defined time period (default setting is six hours). The time period can be changed via PC Tool.

Short press – activates/deactivates manual bypass mode.
Active bypass mode (open damper) is indicated by constant light in the corresponding LED.
NOTE: If bypass mode is activated, but the conditions for open bypass damper are not present, the activated bypass mode will not be visible from the LED.

NOTE

Mandatory conditions for allowing activation of manual bypass (all conditions must be present at the same time. The bypass will otherwise be deactivated):

- Outdoor air temperature is at least 2 °C lower than the exhaust air temperature
- AND outdoor temperature is higher than 9 °C

Summer mode

When summer mode is active, this will stop the supply air fan and only the extract air fan will be in operation. In this case, a fresh air supply can be ensured by opening windows, doors, etc.
NOTE: Summer mode will be deactivated automatically when the outdoor temperature drops below 14 °C.

Long press (five seconds) - activate/deactivate summer mode
Active summer mode is indicated by a flashing light in the corresponding LED

Fireplace mode

Activation of the fireplace mode can be used when you light up the stove. The unit will then run with positive pressure for seven minutes to prevent smoke in the living room. If the fireplace mode is not deactivated manually, it will automatically stop after seven minutes.
d: The fireplace mode is only activated as long as the supply air temperature is above 9 °C.

Long press (five seconds) - activates/deactivates fireplace mode.
Active fireplace mode is indicated by flashing in the three fan speed LEDs

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Maintenance and care

Inspection of the filter

Introduction

Preventive maintenance is necessary at regular intervals if the unit is to operate efficiently and optimally without unintended stoppages, and to ensure the expected service life of at least 10 years.
It is important to notice that intervals between filter maintenance can vary according to the specific environment, and that moving parts are wearing parts, and will need replacement when worn.

The factory warranty only applies if it can be documented that regular preventive maintenance has been carried out as prescribed. The documentation can be a written logbook containing a company stamp or equivalent.

Summary of intervals

The filters are the only parts that the user can maintain himself.
Maintenance of the filter must as a minimum be carried out as shown here:

Interval	Task	To be carried out by:
Six months	Check filters. Replace if necessary	User
Annual	Change filters	User

Other components must be inspected at least every second year by trained professionals (see page 41ff). Remember to contact a trained professional for a service check regularly.

Filters - alarm and inspection (6 months - 1 year)

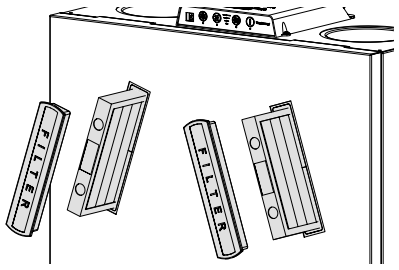
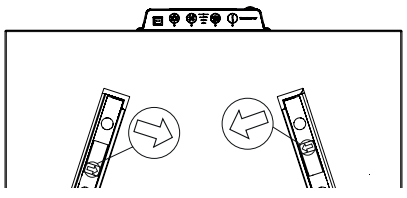
The unit has a built-in timer for its filter alarm (every six months as standard). The timer period for the filter alarm can be changed via the remote control or PC Tool, or it can be reset via the alarm button

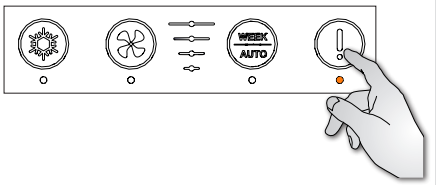
When the timer expires, a filter alarm is triggered. A buzzer will sound and the LED "!" will light up orange. (If the LED lights up red, please see Troubleshooting section on page 45.


Press for 5 sec.

Resets the filter alarm when the alarm is triggered
Resets the filter timer without the timer having expired.

A short beep will sound, indicating that the filter alarm has been reset correctly.

Step	Action	Illustration
1	Remove the filters and inspect them after the filter alarm has been triggered.	
2	Even if only one filter is clogged, we recommend replacing both filters to avoid imbalance in the airflow through the unit. **NOTE:** Replace the filters at least once a year, regardless of whether they are clogged or an alarm has been triggered.	
3	Make sure that the filters are inserted the right way. The arrows on the filter must point in the direction shown here.	

4	When the filters have been replaced, the filter alarm must be reset by pressing the alarm button for 5 seconds. A short beep will sound, indicating that the filter alarm has been reset correctly.	

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INSTALLATION & SERVICE MANUAL FOR PROFESSIONALS

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Introduction

Overview

Target group

This part of the manual, titled INSTALLATION & SERVICE MANUAL, is intended for qualified personnel only.

Safety precautions

It is important to know the correct operating procedure for the residential ventilation system and all its safety measures. Dantherm accepts no liability with regard to lost business or personal injury as a result of non-compliance with safety measures.

Risk of injury

- Installation and repair of the unit must be carried out by qualified personnel only.
- It is the responsibility of the installer to read and understand this service manual prior to initial startup and setup of the RCV unit.

Risk of damage to equipment or property or personal injury

- The RCV MUST be earthed with cables WITH earth wire and an earthed power supply.

Risk of water damage

- Never turn off the ventilation unit to save energy, as this may cause condensation and subsequent leaks from the duct system, with the risk of water damage.

Injury caused by electric shock and risk of damage to the device

Disconnect mains plug from electrical outlet before you perform one of the following actions:

- remove the front cover
- open into the main PCB
  (eg. in order to change operating mode using the A-B function switch)
- install, maintain, repair or dismantle the unit

Transport and unpacking

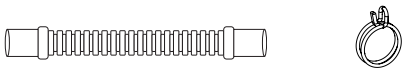
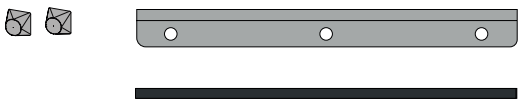
Unpacking

Check for transport damage

Step	Action
1	Report any obvious damage to the carrier, packing company, postal service, etc. immediately after delivery, and note the damage in the consignment or transport documents.
2	Remove the packaging completely (**without using a knife**) and dispose of the material according to local regulations.
3	Check the contents of the box:
4	If transport damage is detected after unpacking the device or if the delivery is incomplete, contact the responsible sales representative or specialised distributor immediately.

Content of the box

Scope of delivery:

Quantity	Description	Illustration
1	RCV Unit	-
1	bag incl. • 1 m water hose • 1x water hose clamp	
1	bag incl. • 2x spacers • 1x wall rail • 1 x vibration damper	
1	bag incl. • 1 x manual • Labels, data sheets, etc. • 1 x cable clamp	

Declaration of Conformity

Dantherm hereby declares that the unit mentioned below:
No.: 352482 Type: RCV 320

– 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
2011/65/EU	RoHS Directive (Restriction of hazardous substances)
1907/2006/EC	REACH Regulation

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

EN 60335-1:2012	Household and similar electrical appliances – Safety – Part 1
EN 60335-2-40:2003	Household and similar electrical appliances Safety - Part 2-40
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
EN 61000-6-3:2007	Electromagnetic compatibility (EMC) - Part 6-3
EN 60730-1:2011	Automatic electrical controls for household and similar use – Part 1
EN 62233: 2008	Methods for measuring electromagnetic fields in 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 301489-1 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 300220-1 V2.4.1	Electromagnetic compatibility & Radio Spectrum Matters (ERM); Short Range Devices
EN 300220-2 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

Skive, 08.07.2021

Product Manager

Managing Director Jakob Bonde Jessen

Product description

General description

Introduction

The RCV product range from Dantherm is a residential ventilation system designed to supply homes with fresh and filtered air, and where the heat in the extract air is transferred to the supply air without mixing the two airflows. This results in energy-efficient ventilation with low heat energy loss.

These units are designed to be installed in environments with temperatures >-12 °C. The compact design allows the RCV unit to be placed in e.g. utility rooms with only a little space or in the attic.

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

Product illustration

This illustration shows the RCV 320 without cover.

Loc.	Part
1	Main PCB
2	Control panel
3	Filter 1
4	Filter 2
5	Fan box 2
6	Fan box 1
7	Heat exchanger
8	Bypass
9	Drip tray 1 (used in mode B)
10	Drip tray 2 (used in mode A)

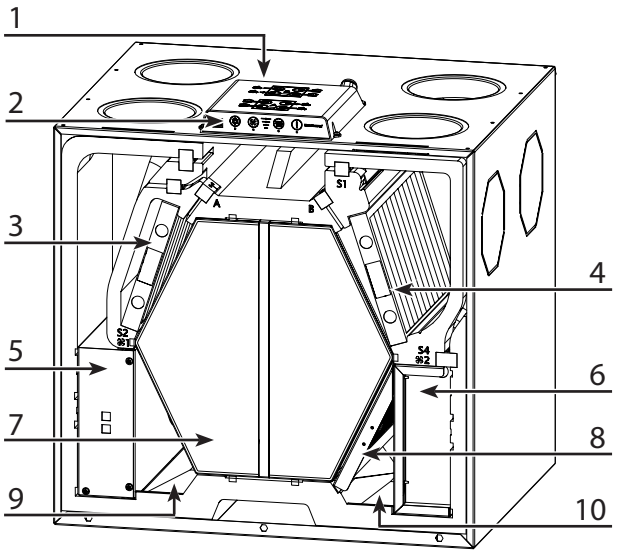


Fig. 2

Airflow direction in mode A/B

This section shows the many possibilities of the air flow through the unit according to operation mode A and B. The ducts at the side and bottom of the unit are closed by default, but can be opened and used in the ways shown below.
When opening the ducts at the side or bottom, the unused corresponding ducts will usually be closed. If required two corresponding ducts can be used simultaneously.
The default operation mode is mode A (see how to change to mode B on page 29).

Mode A

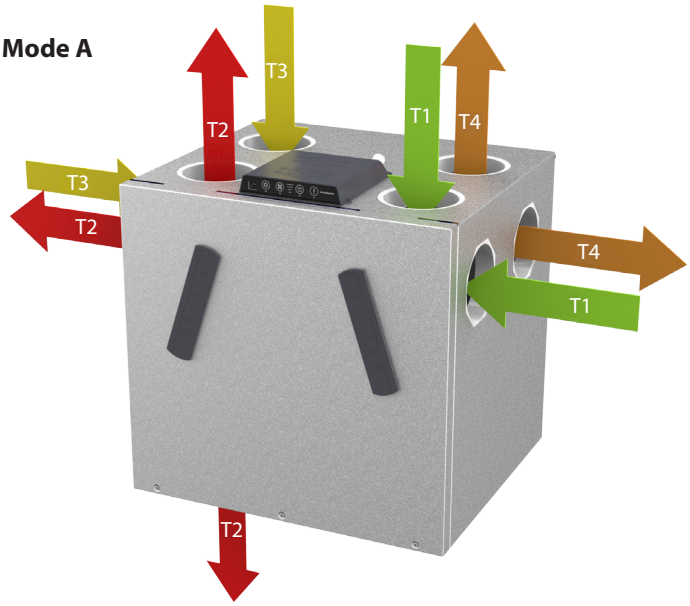


Fig. 3

Colour (arrows)	Term	Description
Green	T1	Outdoor air
Red	T2	Supply air
Yellow	T3	Extract air
Brown	T4	Exhaust air

Mode B

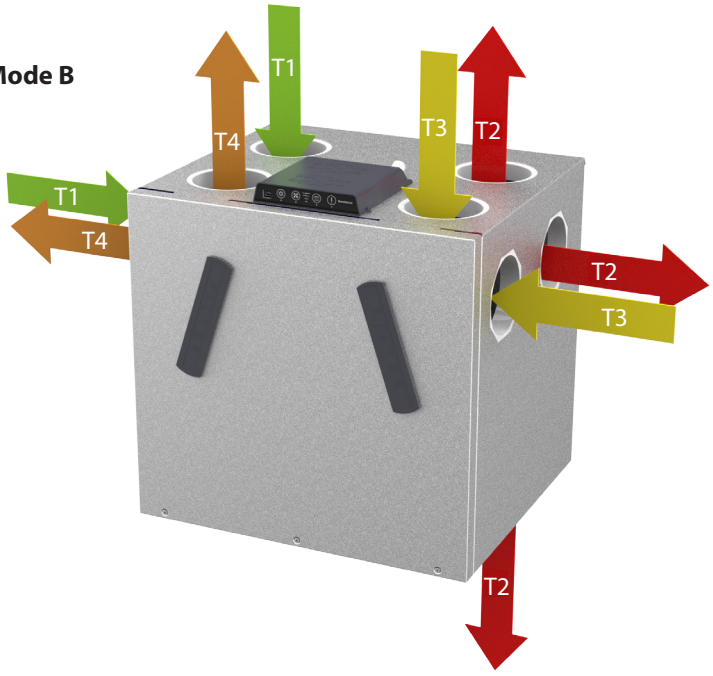


Fig. 4

Description of parts in mode A/B

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

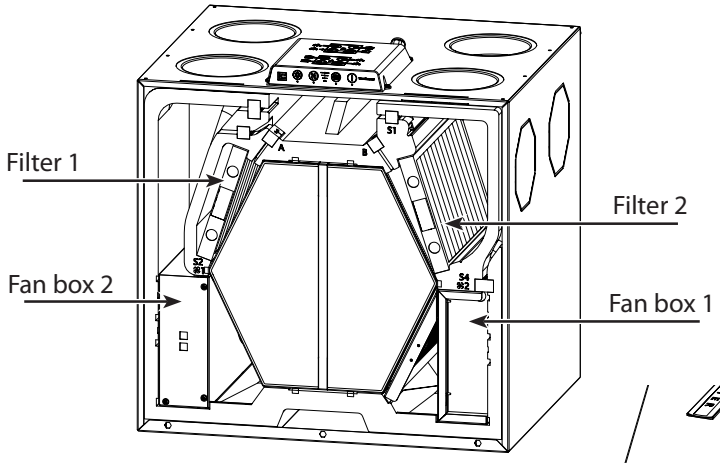


Fig. 5

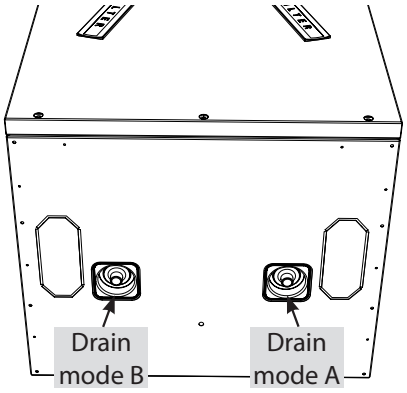


Fig. 6

Part	Mode A	Mode B
Filter 1	Exhaust air filter*	Supply air filter**
Filter 2	Supply air filter**	Exhaust air filter*
Fan box 2	Supply air fan	Extract air fan
Fan box 1	Extract air fan	Supply air fan

* Exhaust air filter is an ISO Coarse 75% filter.
**Supply air filter can be either an ISO Coarse 75% standard filter or a finer ePM1>50% filter.

Component descriptions

Introduction

This section describes the individual components of the RCV units included in the standard delivery.

Cabinet

The external parts of the cabinet are made of aluzink sheet metal. The internal parts of the cabinet are made of polystyrene (EPS). Accessories are installed after the steel front have been removed. The cabinet is sound and heat insulated with fire retardant polystyrene foam. The unit is designed for installation in locations with ambient temperatures ranging from -12 °C to 45 °C.

Filters

The unit is equipped with an ISO Coarse 75% filter as standard. These filters protect the heat exchanger and improve the indoor climate by filtering dust and other particles from the air. An ePM1>50% filter (pollen filter) is available as an accessory. The pollen filter is always located on the supply side - see also page 18.

Heat exchanger

In the counterflow heat exchanger, heat energy is transferred from the extract air to the supply air, thus saving energy for heating.

Fans

The supply fan pulls fresh air from outside through the heat exchanger to the ventilated rooms inside.
The extract air fan extracts stale humid air from the wet rooms in the home.

Bypass damper

The motorised bypass damper overrides the heat exchanger functionality. It is used in summer in warm conditions where the cooler outdoor air can be used to reduce the indoor temperature when the indoor temperature exceeds an upper temperature limit.

Condensate drain and drain hose

The unit is equipped with two outlets for condensate.
One of these must be connected to the drain hose (1 m drain hose is included in the delivery) so that condensate can be led to a drain.
The correct connection to the condensate outlet is shown on page 36 of this service manual.

Wall bracket

The unit is equipped with a wall bracket, for use when the unit is to be mounted on the wall.

Humidity sensor

The humidity sensor will continuously monitor the quality of the extract air and adjust the airflow accordingly. This mode of operation is called demand-controlled mode. If an HRC Remote Control is connected, the level will be shown in the display using the Level 3 icon. Demand-controlled operation will result in the correct ventilation level with the lowest possible electricity consumption.

Control panel

The control panel located on the front of the unit shows the operating mode and the fan speed level in which the RCV is running. Both can be selected and changed via the control panel. The control panel also has other functions as e.g. reset of filter alarm.

Illustration of control parts

This illustration shows the RCV units' control section.

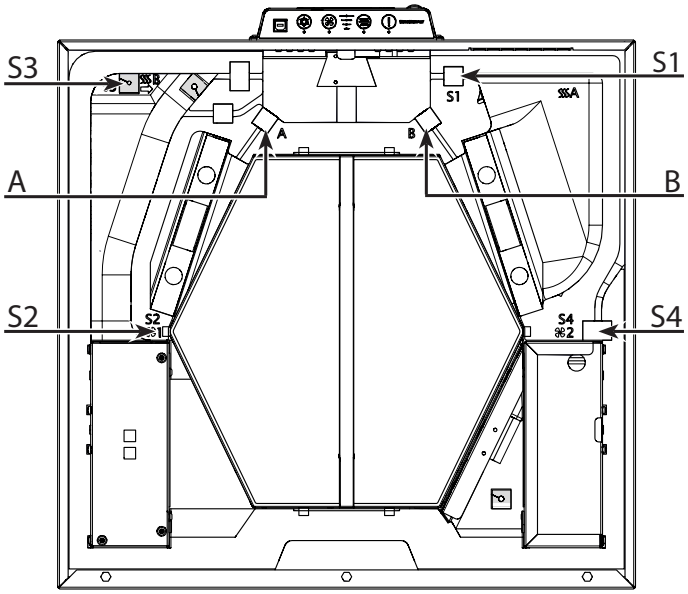


Fig. 7

Loc.	Mode A	Mode B
S1	T1 temperature sensor - outdoor air	T3 temperature sensor - extract air
S2	T2 temperature sensor - supply air	T4 temperature sensor - exhaust air
S3	T3 temperature sensor - extract air	T1 temperature sensor - outdoor air
S4	T4 temperature sensor - exhaust air	T2 temperature sensor - supply air
A	VOC and RH% sensor (accessory)	N/A (blocked)
B	N/A (blocked)	VOC and RH% sensor (accessory)

Accessories

Introduction

The unit is supplied without mounted accessories.
If additional functionality is requested, the accessories must be installed prior to the first installation of the unit or, alternatively, after commissioning.

Electrical pre-heating

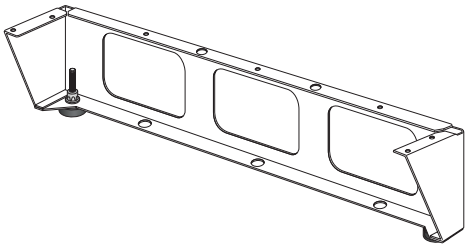
The unit can be equipped with an electrical preheating element that preheats the incoming air. The preheater increases the outside air temperature going into the heat exchanger, and thereby reduces the risk of ice in the heat exchanger in very cold conditions.

Heating coil

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

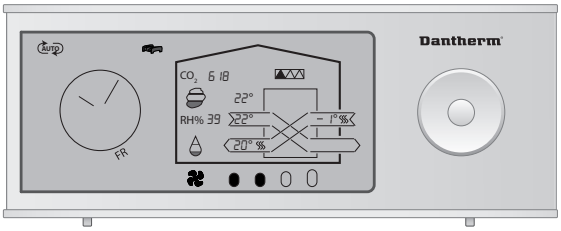
Floor bracket

The unit can be raised up on a floor bracket, when it has to be installed on the floor (e.g. for attic installations).
The floor bracket ensures easy access to the drain.



Handheld remote control (HRC 3)

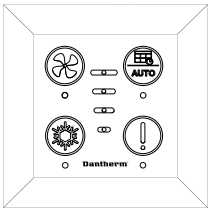
Adjust the ventilation and keep track of the home's humidity and temperature using the large LCD screen on the handheld remote control.
Activate cooling function/bypass.
Select the steps for manual ventilation or relevant weekly programs or set the controller to automatic control.



The remote control can communicate with an RCV unit at a distance of up to 30 metres. The remote control can be placed on horizontal surfaces or hang on the wall.

Wired remote control (HCP 11)

A wired remote control (HCP 11) without display can be connected to the unit if the unit's location makes it difficult to reach the control panel.
The HCP 11 provides the same functionality as the control panel.

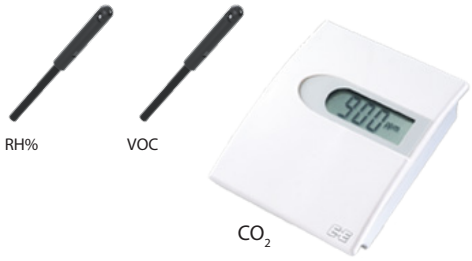


Optional control unit (HAC 2)

Additional accessories can be connected to the RCV unit via an accessory controller: HAC2.

VOC, humidity and CO_2sensor

The unit can be equipped with a VOC (air quality), humidity or CO_2sensor. Mounted sensors will continuously monitor the extract air and adjust the airflow accordingly.
This mode of operation is called demand-controlled mode. If an HRC Remote Control is connected, the level will be shown in the display using the Level 3 icon.



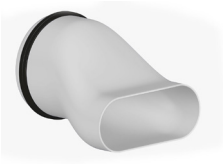
Demand-controlled operation will result in the desired ventilation rate with the lowest possible electricity consumption.

Filters

Replacement filters in sets of two standard filters (ISO Coarse 75%) or of one standard filter plus one ePM1>50% (pollen filter).

Oval duct connection (kit)

Use the oval duct connection kit for the openings in the bottom of the unit. Lip seals on the oval connector provide airtight connections between the unit and the connected ducts.



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Electronic control

Function

The main control system for the unit is located on the main PCB together with other outputs and inputs.
The control panel with LED display is connected to the main PCB with a flat cable.

Illustration

This illustration shows the general architecture of the system control:

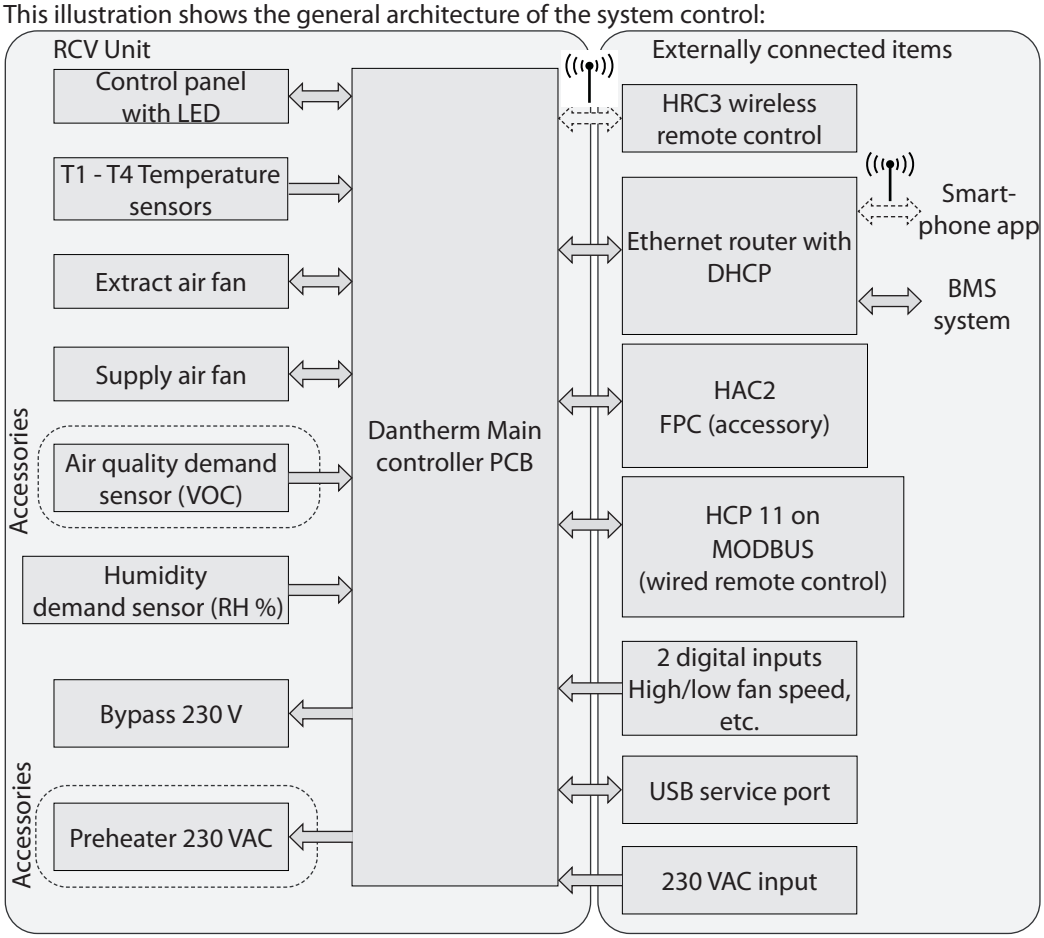


Fig. 8

Illustration of unit's control area

This illustration shows the main PCB and the control panel on the RCV 320.

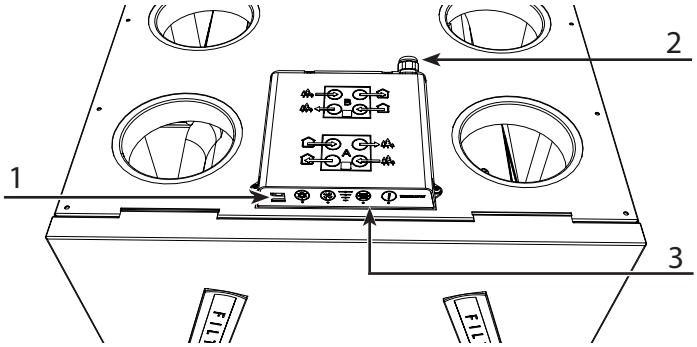


Fig. 9

Loc.	Part
1	USB connection for: • Use of PC Tool for calibration purposes, software update, change of settings, etc. • Readout of error list
2	Power and external connections
3	Main PCB (inside the housing) and control panel.

External connections (Main PCB)

This drawing shows the external connections of the main PCB. Further explanations of how to use the external connections can be found in the section "External connections" on page 40. See also the wiring diagram on page 53, when connecting to the different ports.

Available ports:

- **Dig in:** External digital input, to select specific operations.
- **Antenna:** Wireless connection point for product-specific remote control - HRC3
- **Modbus:** Modbus RTU connection is for internal communication between unit and Dantherm accessories (HAC2 + HCP 11 + FPC) only.
- **Ethernet:** LAN connection

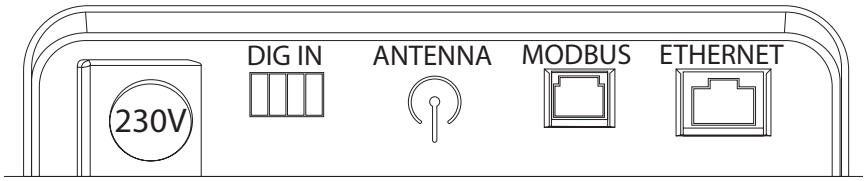


Fig. 10

Accessing the main PCB

Introduction

Depending on the installation site and your preferences, you have three options of accessing the main PCB (see in this section).

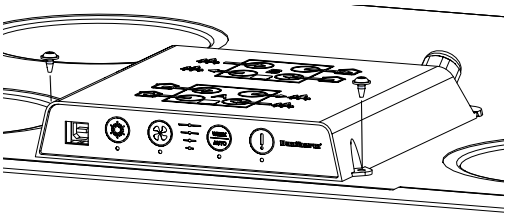
WARNING

Injury caused by electric shock and risk of damage to the device

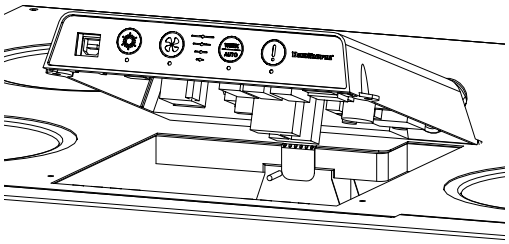
- Always ensure that the mains plug is disconnected from the electrical outlet before you open into the main PCB.

Option 1

Tilt the housing



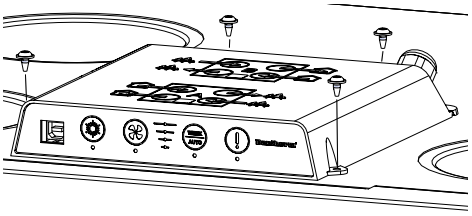
Release the two screws at the side of the housing.



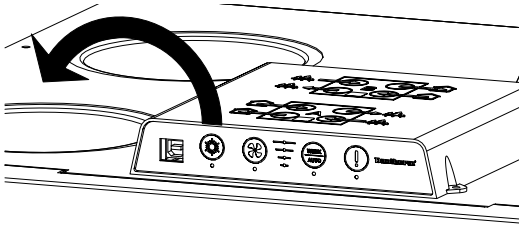
Tilt the housing up in order to access the main PCB.

Option 2

Disassemble the complete housing



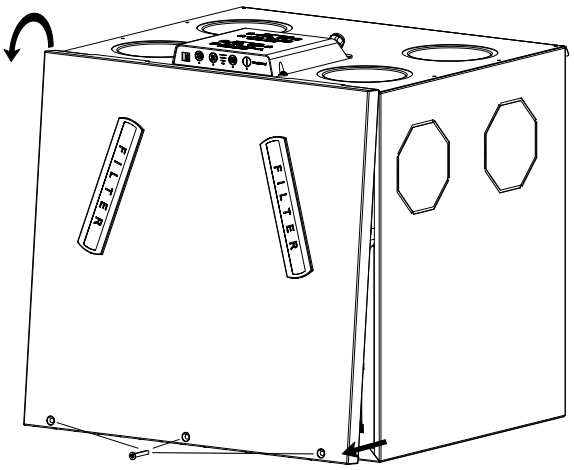
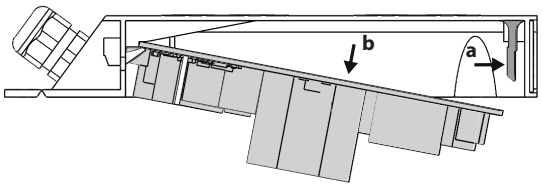
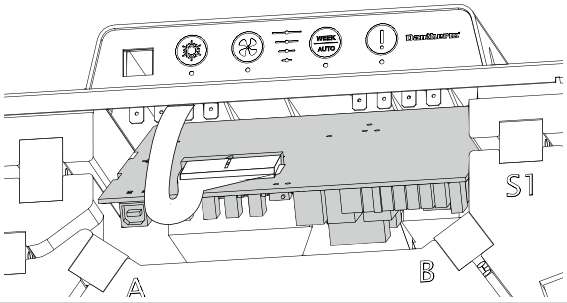
Disassemble the housing from the unit by releasing the four screws.



Turn around the housing in order to access the main PCB.

Option 3

Access main PCB through the inside of the unit

Step	Action	Illustration
1	Release the three screws from the front at the bottom of the unit and remove the front cover.	
2	Behind the control panel you find a pin/ lock, which keeps the main PCB in place. a) Push in the pin/ lock in order to b) release the main PCB from the housing.	 

Control system strategy

Introduction

This section describes the control system strategy under different conditions.

Preheat

If a preheater is installed, the unit can add electrical heating to T1 outdoor air to reduce defrosting situations and increase the supply air temperature. However, in situations where the preheater is not able to keep the heat exchanger frost proof, the unit will start defrosting.

- Preheating is controlled according to a complex algorithm where, e.g several sensors are involved. They constantly measure the temperatures, while the system limits the energy consumption to a minimum.
- The outdoor air is raised just enough to maintain the air flow and avoid defrosting if possible.
- The preheating effect will increase/decrease by 10% every 60 seconds depending on temperature conditions.

The set points for the temperatures during operation with an active preheating surface are fixed and cannot be changed.

Defrosting mode

In cold conditions where T1 outdoor air is below -3 °C, and condensate could build up ice in the heat exchanger, the unit will start defrosting.

NOTE

The defrost operating mode is a safety mode, and during defrost the unit cannot switch to another operating mode until the defrost has ended. When defrosting is active HRC 3 will show "dEF" in the display.

There are two different defrosting strategies:

1. No fireplace in house (default setting)
2. Fireplace in house

You can change the defrosting strategy via PC Tool. However set points for defrosting cannot be changed.

Default defrosting strategy

1. No fireplace in house is the default defrosting strategy:

- The supply air fan speed will slowly decrease until the minimum RPM is reached
- After 10 seconds, the supply air fan will stop completely while the extract air fan continues to run continuously to remove any ice.
- When the defrosting is done, the supply air fan will start at minimum RPM and increase speed until the originally requested speed is reached.

NOTE

The defrost operation will lead to a negative pressure inside the house. Depending on the airtightness of the building envelope it will lead to the following:

1. When the building envelope **is not completely airtight** the "missing" supply air will enter through small leaks in the building envelope. The defrost operation has the right conditions.
2. When the building envelope **is completely airtight** and the "missing" supply air cannot enter through alternative ways, the defrosting will not be as efficient and only work under conditions with low freezing temperatures.
   NOTE: Under such conditions we highly recommend a preheater.

Alternative defrosting strategy

2. Fireplace in house is the alternative defrosting strategy, that can be chosen via PC Tool.

- Both the supply and exhaust air fan speed will slowly decrease until the minimum RPM is reached
- After 10 seconds both fans will stop completely for four hours.
- When the defrosting is done both fans will start at minimum RPM and increase speed until the originally requested speed is reached.

Operation stop

If the outdoor temperature is ≤ -13 °C for more than 4 minutes 25 seconds and you do not have a preheater installed, the unit will stop all operation for 30 minutes. This will happen even with defrost mode activated.
After 30 minutes the unit will attempt to start up - activating the previous operating mode.

If however an electrical preheater is installed, this safety operation stop is automatically disabled.

Installation Options

Switching between modes A and B

Introduction

The RCV 320 has the option of swapping the duct connections according to the description in section "Product description" -"General description". This section will guide you through the process of switching from operating mode A to B.

WARNING

Injury caused by electric shock and risk of damage to the device

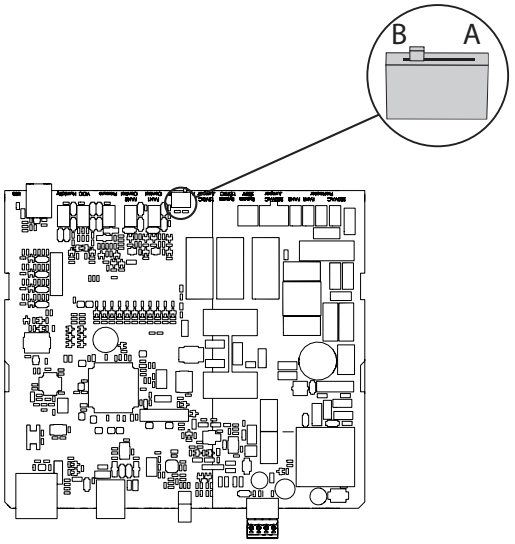
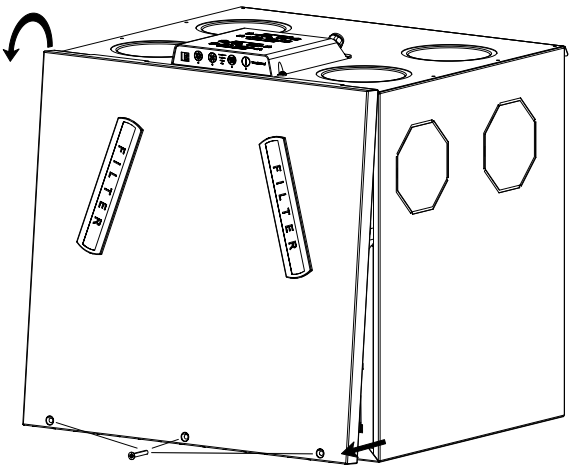
- Always ensure that the mains plug is diconnected from the electrical outlet before you open into the main PCB and change the operating mode using the A-B function switch.

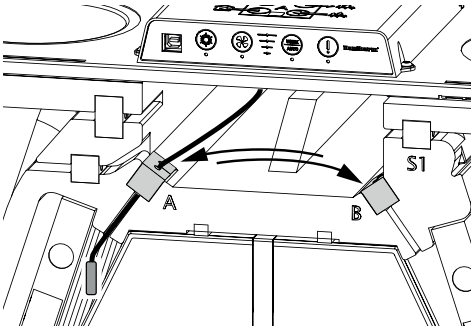
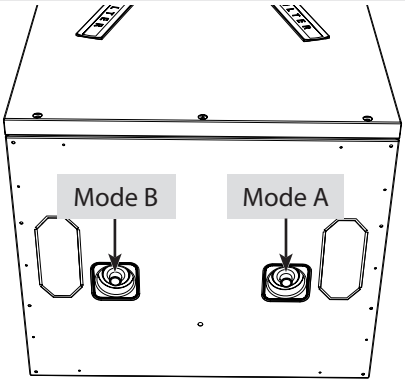
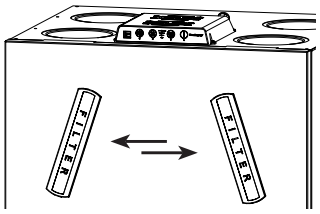
Selection Mode

The air ducts leading the air into the house can be connected as shown on page 17. Mode A is the default setting.
If the installation requires mode B, follow the procedure below AND check the label to make sure the water outlet is connected correctly.

Change to mode B

Follow these steps when switching the mode:

Step	Action	Illustration
1	Access the main PCB • see how to do in section "Accessing the main PCB" on page 25f.)	
2	Switch to mode B by using the A-B function switch on the main PCB.	
3	Remove the front cover, if not already done: Release the three screws from the front at the bottom of the unit and remove the front cover.	

4	Move the cable port, incl. humidity sensor (and VOC sensor, if present), to the sensor position for mode B. ⚠ **CAUTION** **Insufficient device performance and ventilation effect** To ensure optimal device performance, all wired accessories must be fitted correctly. • Make sure that the distance between the sensor head and the cable port is 50 mm to ensure correct measurements of humidity level (and air quality). • All other wired accessories must be swapped/installed according to the current operating mode A/B.	
5	Refit the main PCB and housing and the front cover.	
6	Switch the drain hose and set it to mode B as indicated. For a further description of how to install the drain hose, see page 36.	
7	Change the filter (ONLY if the optional pollen filter ePM1>50% is used). • Check the table on page 18 to determine the correct position of the ePM1>50% filter in mode A/B.	
8	Decide if you want to use the side or bottom outlet (described on page 31) and then continue following the instructions of the section "Installation" on page 32ff.	

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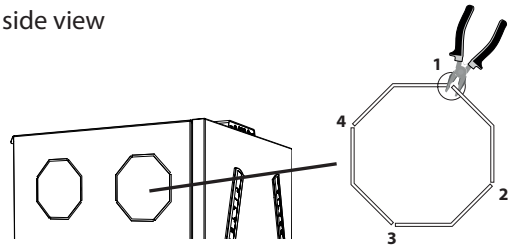
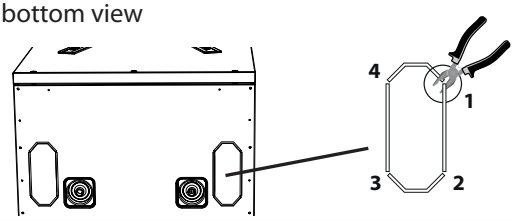
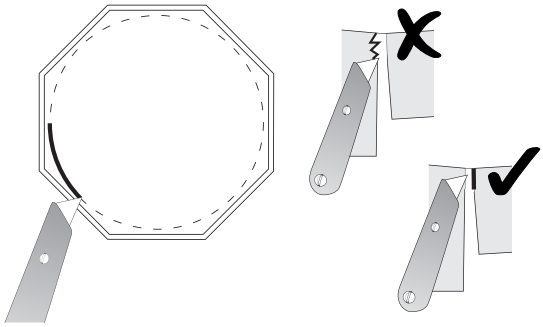
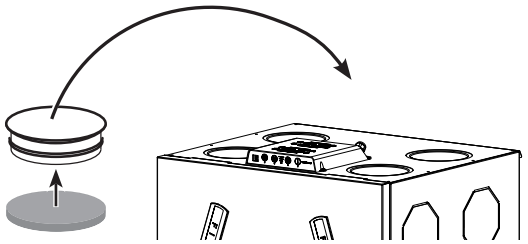
Using the side or bottom spigots (optional)

Introduction

This section will guide you through the process of opening the spigots at the side or bottom of the unit and closing the corresponding duct connection at the top.

Using bottom spigot

Step	Action	Illustration
1	Open the desired duct connection(s) at the bottom or side of the unit with a side cutting plier. Remove the excess metal. **WARNING** **Take care not to cut yourself on any sharp edges of the metal** • Use gloves, when cutting out the duct connections	side view  bottom view 
2	Cut a hole in the insulation along the indentation (dotted line) to create an opening into the unit. Try to cut along the inside line of the indentation to avoid damaging the duct connection. Do not attempt to break the indentation and ensure a complete cut through the material has been achieved.	
3	Connect the ducts as described in the section “Connecting the ducts” on page 38.	
4	You can use two corresponding duct connections at the same time. If you only want to use the duct connection(s) at the side or bottom, you have to close the corresponding duct connection(s) at the top. • Place an insulating block in a closure cap. • Close the corresponding duct connection at the top of the unit with the isolating closure cap.	
5	Proceed by following the instructions of the section “Installation” on page 32ff.	

Installation

Location Considerations

Warranty claims

Use of an appliance outside the specified conditions and contrary to its intended use will result in loss of all warranty claims. The warranty is limited to devices installed solely by trained and certified personnel.

Location requirements

The following should be considered when selecting the appropriate location for installation:

- Confirm whether installation mode A (default) or B (optional) is possible at the installation site. If mode B is preferred, follow the replacement procedure on page 29.
  Note: The function for switching between modes A and B allows the duct pair (outside or inside) to be directed towards the unit from the left OR right according to the construction of the building and room. See the difference between the two modes in the "General description" on page 17f.
- RCV 320 P2 units are designed to be installed in environments with temperatures >-12 °C. The compact design allows the RCV unit to be placed in e.g. utility rooms with only a little space or in the attic.
- Provide additional space to ensure proper installation and service access (see "Positioning the device" on page 32).
- Ensure that the wall structure is sufficient to support the weight of the unit regardless of the wall bracket type.

Positioning the device

Minimum space always required for service access (top view):

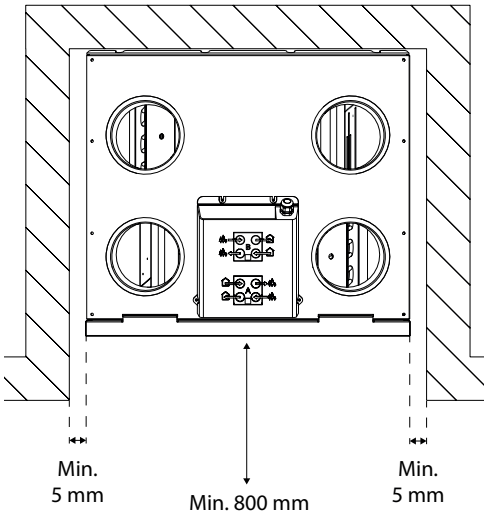
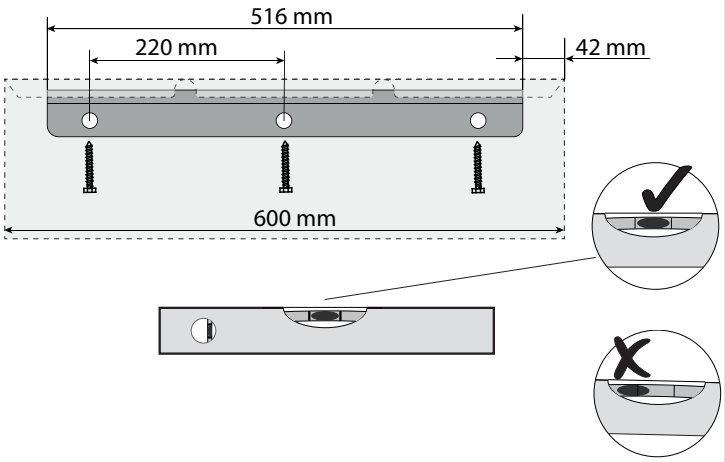
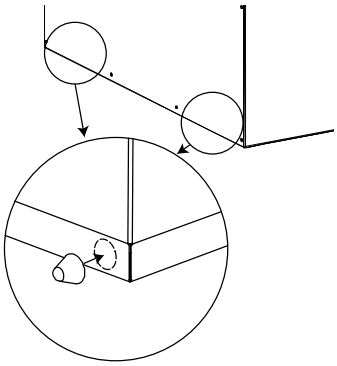
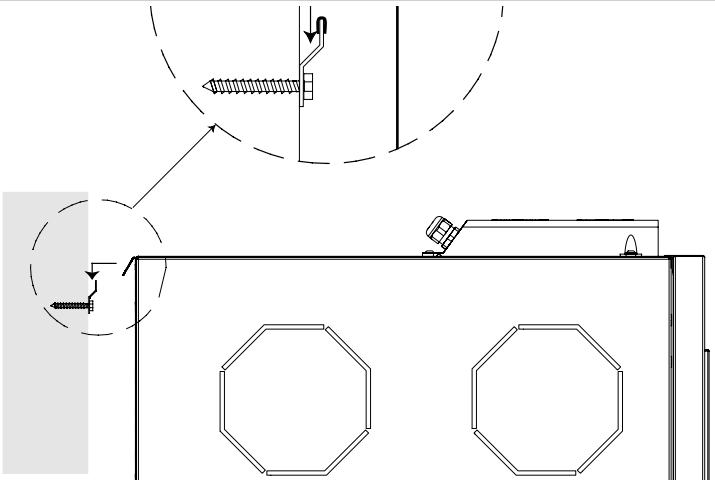


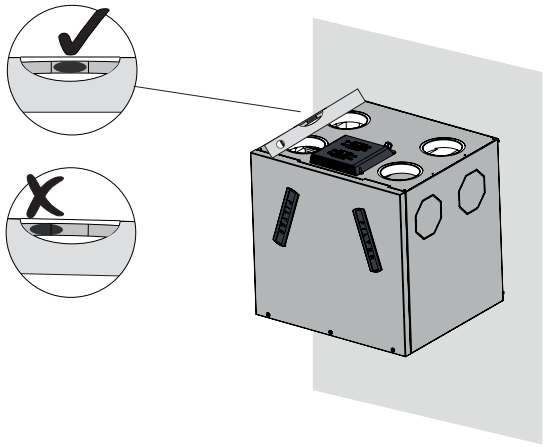
Fig. 11

Mounting the device

Wall mounting

Follow these steps when mounting the RCV 320 on the wall.

Step	Action	Illustration
1	Fix and level the wall rail using these measurements. Make sure that you use appropriate screws and rawl plugs.	
3	Mount the two spacers at the bottom and rear of the unit.	
4	Mount the vibration damper on the wall rail and lift the unit onto the wall rail.	

5	Make sure the unit is levelled or tilts backwards. **CAUTION** **If the unit tilts forwards, there is a risk of water damage.** • Make sure the unit is levelled or tilts back-wards.	

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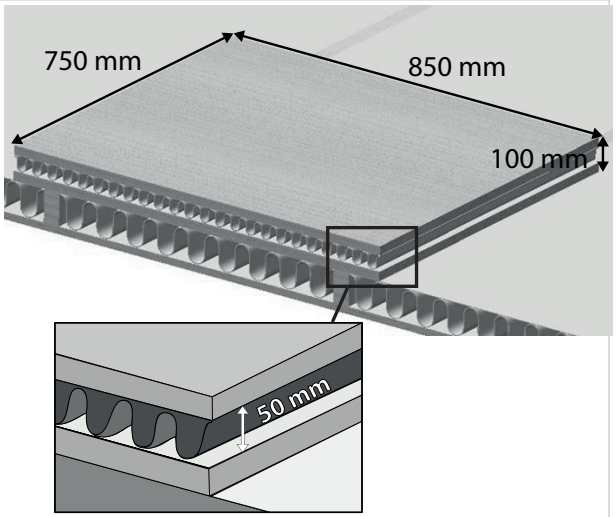
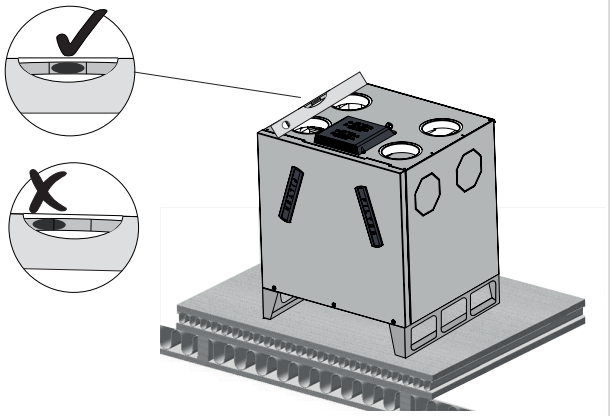
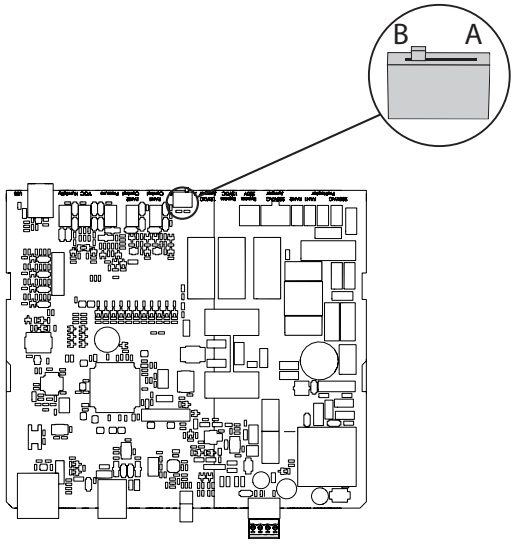
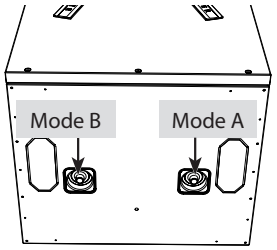
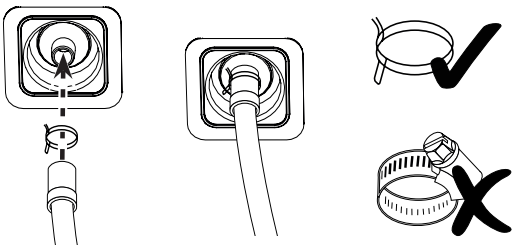
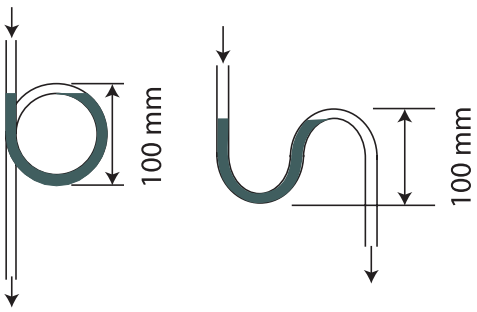
Floor mounting

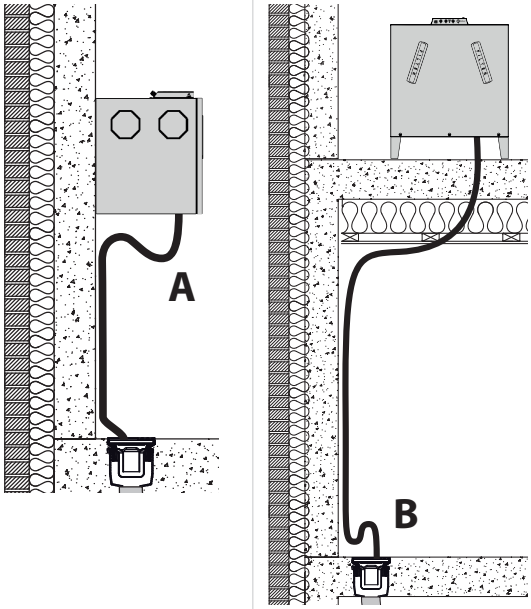
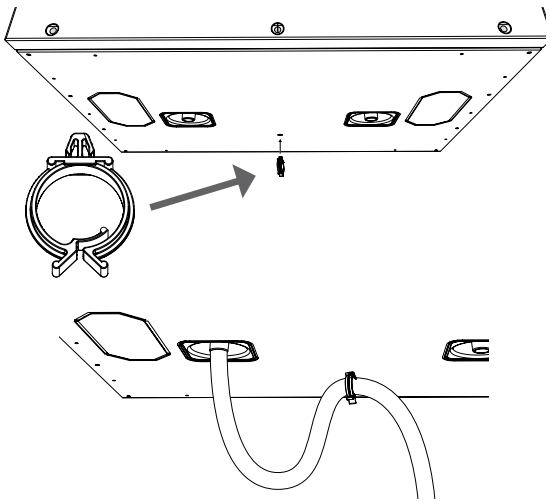
Follow these steps, when mounting the RCV 320 on the floor.

Step	Action	Illustration
1	**This first step is for installations in attic only (skip this step for other installation sites)** Build a wood construction with the shown measurements and make sure it is levelled in both directions. Ensure the following: • The construction must be made of plates that can sustain the weight of the unit. • A minimum of 50 mm compressed insulation between the two plates is required to prevent any vibrations from the unit to be transferred to the building.	
2	Install the Dantherm approved floor brackets (accessory) on the RCV unit to ensure that the system is raised from the floor in a safe manner. **Note:** Dantherm accepts no liability to floor brackets from other suppliers. Use of other (non-Dantherm) constructions is at your own risk.	
3	Place the unit on the construction and make sure it is levelled. **CAUTION** **If the unit tilts forwards, there is a risk of water damage.** • Make sure the unit is levelled or tilts backwards.	

Drain/condensate drain

The unit is equipped with a blanked-off drain. Connect the drain hose to the correct condensate outlet at the bottom of the unit.

Step	Action	Illustration
1	Check the ventilation system's mode (A/B) on the main PCB. (see also "Accessing the main PCB" on page 25)	
2 !	Make sure that the plug is fitted in the unused condensate outlet. **Note:** Otherwise, condensation water cannot be drained from the unit and this will result in an inadvisable accumulation of water in the unit with the risk of water entering the house!	 Drain outlet in use (open) The CLOSED drain outlet (plug must be fitted) 
3 !	Connect the drain hose to the drain outlet in use and secure the connection with the supplied hose clamp. **Note:** Never use a metal clamp, which you have to tighten with a screwdriver.	
4	The drain hose must be fitted with one of the illustrated siphons of min. 100 mm.	

	The siphon can be made in two ways: A) just below the unit (suitable for the majority of wall installations) or alternatively B. at the end of the drain hose (suitable for floor installations) Make also sure that you: • route the hose to a drain and ensure that it is not exposed to frost. • fill the siphon with min. 0.5 L water. • let the drain hose drop with 1% (1 cm/ meter) all the way from the unit to the drain.	
5	**Optional use of clamp:** If you make the siphon just below the unit, you may like to use the cable clamp included in delivery. • Mount the cable clamp in the hole in the bottom of the unit • Pass the drain hose through the cable clamp to form a siphon.	
6	**Attic installation only:** If the RCV unit is installed in surroundings with low temperature the drain hose must be insulated. • Insulate the drain hose completely including the drain outlet.	

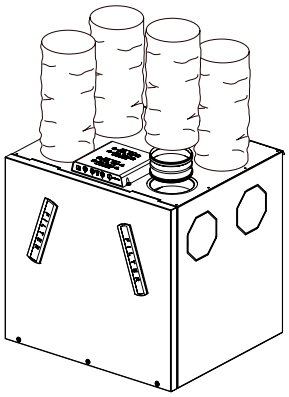
WARNING

Material damage (e.g. water damage)
Heat recovery of air with a high moisture content leads to condensation in the heat exchanger. Condensate must be led into a drain, as it otherwise may damage the floor under the unit.
- Make sure that the drain hose is installed according to the current operating mode.

WARNING

Material damage (e.g. water damage)
Frozen water in the hose can damage the drain hose, thus causing a water damage at the installation site.
- Insulate the drain hose completely in order to ensure that the installation always is frost-proof.
- If the insulation can't be done in a way that ensures a frost-proof drain hose, we recommend to connect a heating cable around the drain hose.

Connecting the ducts

Step	Action	Illustration
1	Connect the ducts to the desired duct connections at the unit - either at the • top (standard) • side or bottom (optional) (see also "Using the side or bottom spigots (optional)" on page 31) **Note:** Make sure that the ducts, which you connect to the unit, have the same or a larger diameter in comparison with the connector. (The measurements can be seen in the Technical Data section on page 53.)	
2	All four ducts must be wrapped completely in a minimum of • 50 mm insulation - for installations in heated rooms • 100 mm insulation - for installations in the attic/ low temperature surroundings	
3	Determine the correct duct connections (A/B mode) on page 17 in order to know, where to lead the different ducts. **Note:** The installation of the ducts incl. duct dimensions, sound absorbers and insulation must be done in accordance with national standards and building regulations. Make sure always to calculate how much insulation is needed in the current installation. Contact your Dantherm distributor for further information. Dantherm accepts no liability to water damages caused by an inappropriate duct installation.	

WARNING

Dust hazard
Ducts and connectors must be protected and kept closed until the house is ready to be occupied. This is to ensure that no moisture, dirt or dust enters the ducts, which may cause problems at a later stage.

Calibration of airflow

Introduction

In order to achieve the correct comfort level, as well as to control humidity levels, it is important to adjust the amount of supply air entering the house, as well as the exhaust air from the house.
This is done by adjusting the fan speed level in a nominal mode corresponding to level 3.

NOTE

Pour 0.5 L water into the siphon to prevent leakage from the drain prior to calibration.

Calibration process

During the initial part of the calibration process, the total (main) airflow must be measured on the external duct system with suitable equipment and simultaneously adjusted to target value by using either PCTool or control panel.

In the main and vital part of the calibration, the valves in all rooms have to be adjusted until the required airflow for respective rooms has been achieved.

NOTE

Please be aware of the following:

- The required airflow for each room has to be in accordance with national ventilation standards and/or building regulations.
- Major valve adjustments may greatly affect the main flow and therefore the main flows need to be checked and if necessary adjusted. It is of crucial importance for stabile operation to ensure that the final total extract airflow achieved under the calibration is at least 5% higher than the achieved total supply airflow in order to create conditions for mass balance in the system as a whole.

External connections

Connecting to LAN

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

The device will be accessible via the smartphone app (IOS and Android) if your device is connected to the same network via WiFi.

IP address allocation status	Description
Dynamic IP	If the unit is connected to a router with built-in DHCP server it will fetch the IP address itself from the router when the unit starts up.
Static IP	With PC Tool it is possible to allocate a static IP address to the device.

MODBUS

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

NOTE

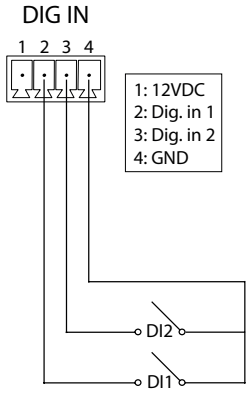
Important! External BMS cannot be connected as Modbus RTU via the RS485 port or via Dantherm accessories. (HAC, FPC, or HCP11)

Modbus TCP/IP: The Dantherm ventilation units have the opportunity to communicate Modbus TCP/IP via the Ethernet port. This is used for Building Management Systems (BMS) or communication with smartphone apps.

Dig. input

The unit is fitted with two override inputs, also called digital inputs. These inputs can be used to select a different fan speed or to activate alarms. The default setting for digital input is:

- Dig. input 1: Ventilation step 2
- Dig. input 2: Ventilation step 4



How it works (example to the right):

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

Dig. input can be used for:

- Ventilation steps from 0 - 4
- Safety shutdown
- High water level sensor.
- Kitchen hood boost
- Other options

Find relevant information and settings in PC Tool under External Control System.

Operation

Operating the device

See user manual section "Operation" on page 7.

Maintenance and care

Preventive maintenance

Introduction

Preventive maintenance is necessary at regular intervals if the unit is to operate efficiently and optimally without unintended downtime and to ensure the expected service life of at least 10 years.
It is important to notice that intervals between filter maintenance can vary according to the specific environment, and that moving parts are wearing parts, and will need replacement when worn.

The factory warranty only applies if it can be documented that regular preventive maintenance has been carried out as prescribed. The documentation can be a written logbook containing a company stamp or equivalent.

Summary of intervals

Maintenance must at minimum be carried out as shown here:

Interval	Task	To be carried out by:
Six months	Check filters. Replace if necessary	User
Annual	Change filters	User
2 years	Inspect and clean fans	Trained professionals
	Inspect and clean electrical preheater	Trained professionals
	Inspect and clean heat exchanger	Trained professionals
	Clean the internal air direction	Trained professionals
	Inspect and clean drip tray, drain and drain hose	Trained professionals
	Inspect and clean bypass	Trained professionals

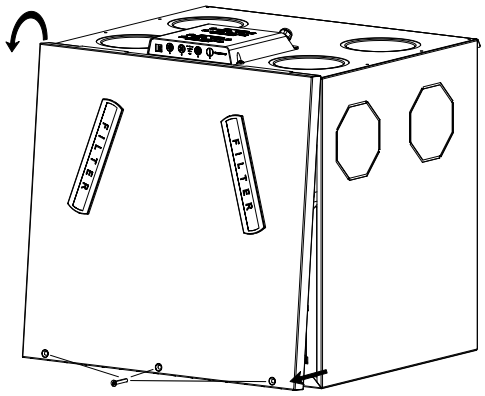
WARNING

Injury caused by electric shock and risk of damage to the device

- An inspection must be carried out every two years by trained professionals only.
- Disconnect mains plug from electrical outlet before carrying out maintenance or repair.
- If the power supply cable is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Preparation for inspection

Remove the front cover for inspection.

Step	Action	Illustration
1	Release the three screws from the front at the bottom of the unit and remove the front cover.	

Filters - alarm and inspection (6 months - 1 year)

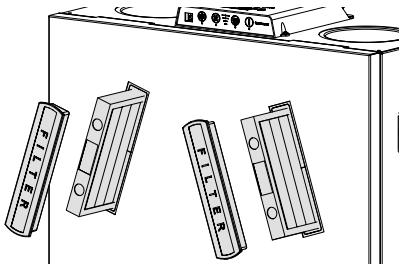
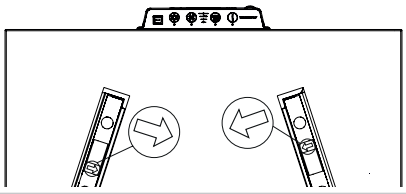
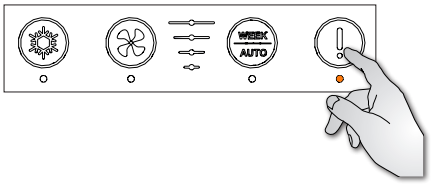
The unit has a built-in filter alarm timer (every six months as standard). The timer period for the filter alarm can be changed via the remote control or PC Tool, or it can be reset via the alarm button

When the timer expires, a filter alarm is triggered. A buzzer will sound and the LED "!" will light up orange. (If the LED lights up RED, please see Troubleshooting on page 45.)

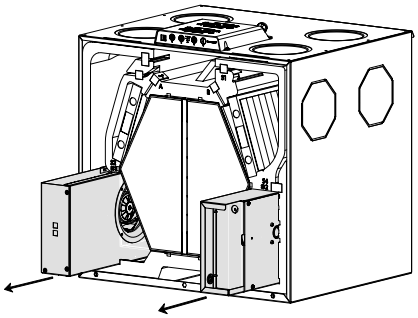

Press for 5 sec.

Resets the filter alarm when the alarm is triggered.
Resets the filter timer without the timer having expired.

A short beep will sound, indicating that the filter alarm has been reset correctly.

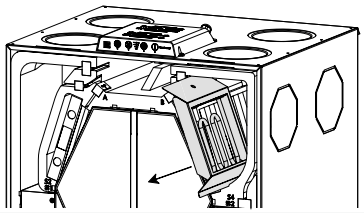
Step	Action	Illustration
1	Remove the filters and inspect them after the filter alarm has been triggered.	
2	Even if only one filter is clogged, we recommend replacing both filters to avoid imbalance in the airflow through the unit. **NOTE:** Replace the filters at least once a year, regardless of whether they are clogged or an alarm has been triggered.	
3	Make sure that the filters are inserted the right way. The arrows on the filter must point in the direction shown here.	
4	When the filters have been replaced, the filter alarm must be reset by pressing the alarm button for 5 seconds. A short beep will sound, indicating that the filter alarm has been reset correctly.	

Fans (2 years)

Step	Action	Illustration
	**WARNING** **There might be sharp edges on the fan boxes, which implies a risk of cutting yourself.** • Wear protective gloves while inspecting and cleaning the fan boxes.	
1	Remove one of the fan boxes. • Pull out the left with a pincer • Pull out the right with the hand (remember to wear gloves).	
2	Carefully clean the fan's blades with compressed air or a brush through the opening at the base of the fan box. All blades must be clean to maintain ventilator balance. Be careful not to remove the small metal balancing pieces on the fan blades as this may cause vibrations.	
3	Turn the fan with your fingers and listen for buzzing sounds from the bearing. If this occurs, the fan probably needs replacing.	
4	Refit the fan box and repeat steps 1–5 with the other fan box.	

Electric preheater (2 years)

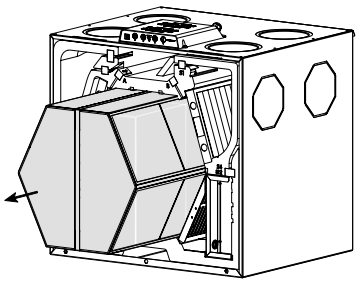
Follow this procedure, if the unit is equipped with a heating element:

Step	Action	Illustration
1	Make sure the heating element is completely cooled before cleaning.  **WARNING** **The heating element can become very hot. If it does not cool down completely, there is a risk of severe skin burns.** • Disconnect mains plug from electrical outlet and wait for 10 minutes in order to ensure that the heating element is completely cooled.	
2	Remove the heating element.	
3	Clean with a brush and inspect for visible damage.	
4	Refit the heating element.	

Bypass (2 years)

Inspect and clean the bypass with a brush, if needed.

Heat exchanger (2 years)

Step	Action	Illustration
1	Remove the heat exchanger from the unit.	
2	Clean the heat exchanger with a soft brush and a vacuum cleaner at all four inlets. In special cases, for example, if there are clear traces of accumulated, dirty condensed water in the heat exchanger, it will be necessary to clean the heat exchanger with soapy water outside the unit.	
3	Wait until the heat exchanger is completely dry and reinstall it.	

Internal cleaning (2 years)

Remove the fan boxes, heat exchanger and filters and visually inspect the ducts and internal surfaces inside the unit for dirt. If the ducts or surfaces are dirty, clean them with a wet cloth, brush, vacuum cleaner or similar.
Refit the fan boxes, heat exchanger and filters when you have finished cleaning.

Drain and drip tray (2 years)

Step	Action	Illustration
1	Remove the extract air fan box (and bypass, if the unit runs in mode A) to inspect the drip tray. • Check that the condensation outlet is not blocked in the drip tray. • Clean the drip tray with soapy water and a brush/cloth. Reinstall the fan box (and bypass).	
2	Check drain hoses for damage and correct installation. See the optimum installation on page 36. • Make sure that the water hose has a minimum fall of 1% towards the drain • Ensure that the water hose is protected against frost from the unit to the drain • Ensure that there is water in the siphon. • Check the siphon regularly, especially during the summer, and make sure it is filled with water as recommended.	

End inspection

When the service is completed, close the unit again.

Step	Action	Illustration
9	Check that all connections are securely fixed to the PCB.	
10	Mount the front cover with the three screws.	

Troubleshooting

Introduction

This section shows you how to recognize and understand possible operating errors.
For correct fault tracing Dantherm strongly recommends connecting a remote control or PC with installed PC Tool or the Dantherm App, that works with the unit.

Error messages on the remote control LCD panel

Errors are displayed on the HRC3 remote control with "E" + a number. The issue can then be looked up in the troubleshooting overview and in the control panel manual to correct the fault.

PC Tool

Operation warnings and faults are logged in the controller memory. Connect a computer with PC Tool installed via USB to get detailed information from the log file.

Error signaling

Possible faults are shown on:

Appliance	Signal
Unit	Acoustic buzzer signal from the main PCB. Connect a remote tool or PC Tool to view the specific error. Filter reset LED
Handheld remote control	Acoustic buzzer signal and display of a specific error code.
Wired remote control (HCP11)	Audible buzzer signal and flashing LED. The number of flashes corresponds to an error code followed by a pause of 5 seconds.
PC Tool	Display of error numbers and ability to log specific operation over a longer period of time.
Smart phone app	Display of a specific error code.

Error list

Errors shown on the display contain three numbers or letters. E.g. "E12" means error number 12.

How to read the error list:

Column	Description	Code	Meaning
A	Number of flashes on the display (wired control)	-	-
B	LED on control panel	Y	Yellow LED flashes
		R	Red LED flashes
C	Noise	0	No beep
		1	One beep/hour
		2	One beep/sec.

Resetting errors

After completed inspection or repair of possible faults, the unit can be reset by disconnecting/reconnecting the 230 V AC power supply. This resets the controller and the unit starts normal operation and also restarts a new search for possible errors.
This can take up to 15 minutes.

Error list

See the list below for a complete description:

A	B	C	Error code	Error	Possible cause	Action required	Reset
-	Y	1	-	Filter alarm	Filter period expired	Dismount filters and inspect for dirt Replace filters and reset alarm	Reset alarm and reset filter by pressing and holding alarm button for 5 seconds Press and hold the centre button on the wireless remote control for 10 seconds The same procedure can be used to reset the filter before the alarm is triggered.
					The filters are not soiled, so the filter period is too short	Extend the filter timer period	
					The filters are soiled	Replace filters and reset alarm	
					Filters are clogged, filter period is too long	Replace filters and reset alarm Shorten the filter timer period	
1	R	1	E 1	Extract air fan No feedback about rotational speed (tacho) from extract air fan	Extract fan power cable not connected	Connect the power cable to the extract air fan	Perform a manual reset by pressing the alarm button on the control panel or by turning the unit off/on
					Extract air fan control cable not connected	Connect control cable to extract air fan	
					Extract air fan not working	Replace extract air fan	
				Extract air fan unable to operate at the desired speed	Fan speed setpoint too high	Decrease fan speed setpoint	Automatic reset after 140 seconds, but the alarm reappears if the problem is still present
					Fan defective	Replace fan	
2	R	1	E 2	Supply air fan No feedback about rotational speed (tacho) from supply air fan	Power cable to supply air fan not connected	Connect the power cable to the supply air fan	Perform a manual reset by pressing the alarm button on the control panel or by turning the unit off/on
					Supply air fan control cable not connected	Connect the supply air fan control cable	
					Supply air fan not working	Replace supply air fan	
				Supply air fan unable to run at desired speed	Fan speed setpoint too high	Decrease fan speed setpoint	Automatic reset after 140 seconds, but alarm reappears if problem persists
					Fan defective	Replace fan	

A	B	C	Error code	Error	Possible cause	Action required	Reset
3	R	0	E 3	Bypass damper does not close as expected	Selector switch position A: Bypass is closed, but supply air temperature is lower than expected	Check if Bypass is enabled in PC Tool	Automatic reset if efficiency is high enough for 30 seconds
						Check if bypass is blocked	
						Check the mechanical connection between the bypass actuator and the bypass valve	
					Selector switch position B: Bypass is closed, but exhaust air temperature is higher than expected	Check electrical connection between controller and bypass	
						Check controller output	
				Bypass damper Reduced heat recovery due to low exhaust airflow	A clogged extract air filter	Change filters	Automatic reset if efficiency is high enough for 30 seconds
					Poor balancing of airflows	Adjust the system	
					An extract fan in the bathroom is creating negative pressure in the house	Remove extract fan from the bathroom and instead connect the extract air from the bathroom to the fan system	
					An extract air fan in the kitchen is creating negative pressure in the house	Ensure that warm make-up air can reach the cooker hood. If this is not possible, open a window/door while the cooker hood is running	
					A cooker fan is creating negative pressure in the house	Contact your flue/ stove supplier for information about safety precautions	
3	R	0	E3	Bypass is closed, but supply air temperature is lower than expected The airflows are out of balance. There is more extract air than supply air	A clogged supply air filter	Change filters	
					Poor balancing of airflows	Adjust the system	

A	B	C	Error code	Error	Possible cause	Action required	Reset
4	R	1	E 4	Extract air temperature sensor (T1) The control panel measures that the temperature sensor is either open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensors correctly	Automatic reset if temperature is within normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensors	
					Temperature sensor resistance is OK	Replace control panel	
5	R	1	E 5	Supply air temperature sensor (T2) The control panel measures that the temperature sensor is either open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensors correctly	Automatic reset if temperature is within normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensors	
					Temperature sensor resistance is OK	Replace control panel	
6	R	1	E 6	Extract air temperature sensor (T3) The control panel measures that the temperature sensor is either open or short-circuited	Temperature sensors are not mounted correctly	Mount temperature sensors correctly	Automatic reset if temperature is within normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high	Replace temperature sensors	
					Temperature sensor resistance is OK	Replace control panel	
7	R	1	E 7	Exhaust air temperature sensor (T4) The control panel measures that the temperature sensor is either open or short-circuited	Temperature sensors are not mounted correctly	Fit temperature sensors correctly	Automatic reset if temperature is within normal range for 30 seconds
					Resistance in one of the temperature sensors is too low or too high.	Replace temperature sensors	
					Resistance in temperature sensors is OK	Replace control panel	
8	-	0	E 8	Room air temperature sensor (T5)	Shown only on wireless remote control		Automatic reset
9	-	-	E 9	Not used			
10	R	0	E 10	Outdoor air temperature < -13°C	-	-	Automatic re-start after 1800 seconds

A	B	C	Error code	Error	Possible cause	Action required	Reset
11	R	0	E 11	Supply air temperature < +5 °C Reduced heat recovery due to low extract air temperature	Low temperatures pulled out of unheated rooms	Ensure all ventilated rooms are heated Alternatively, close the dampers in unheated rooms	Perform a manual reset by pressing the alarm button on the control panel or by switching the unit on/off Firmware version 2.9 and up also has automatic restart after 600 seconds
					Poorly insulated ducts in cold environments	Improve duct insulation	
				Reduced heat recovery due to low exhaust airflow	Clogged extract air filter	Change filters	
					Poor balancing of airflows	Adjust the system	
					An extract fan in the bathroom is creating negative pressure in the house	Remove extract fan from the bathroom and connect extract air from bathroom to ventilation system	
					An extract air fan in the kitchen is creating negative pressure in the house	Ensure that warm make-up air can reach the cooker hood. If this is not possible, open a window/door while the cooker hood is running	
					A cooker fan is creating negative pressure in the house	Contact your chimney/stove supplier for safety precautions	
12	R	2	E 12	Overheating One of the internal sensors is measuring a temperature > 70 °C.	Overtemperature caused by fire inside or outside the ventilation system	Check ventilation system and surroundings for fire	The alarm display can be reset by pressing the alarm button or by turning the unit off/on. However, the unit cannot be started until the alarm conditions have disappeared
					Overtemperature caused by the combination of a preheater or afterheater and too low an airflow	Check ventilation system and surroundings for fire	
						Check which sensor is measuring a high temperature. Check if the airflow is blocked and if the filters are clogged. Raise the minimum airflow setting if necessary	

A	B	C	Error code	Error	Possible cause	Action required	Reset
13	-	0	E 13	Communication error / poor signal Shown only on wireless remote control			Try again every 5 minutes or if a button is pressed
				No wireless signal	The ventilation unit is switched off	Turn on the ventilation system	
				Wireless signal is too weak	Antenna not mounted on unit	Install antenna	
					The remote control is too far from the ventilation system	Move it closer to the ventilation system	
						Install antenna extension cable	
14	R	2	E 14	Fire alarm Duct-connected fire thermostat (accessory) Input is normally closed (NC) but is now open	Fire or smoke sensor connected to this input is active	Check for smoke or fire	The alarm display can be reset by pressing the alarm button or by turning the unit off/on. However, the unit cannot be started until the alarm conditions have disappeared
						Check if sensor and connection are OK	
					Nothing connected to this input	Install short circuit accessory	
15	R	1	E 15	High water level sensor (accessory) Water level too high	Water outlet is clogged	Clean the water outlet	Automatic reset when input is closed again
					The water outlet is installed incorrectly	Check that the water outlet is mounted on the correct side and that the pipes are not above the drain level.	
					Auxiliary drain pump not running.	Check the pump	
						Inspect fuse	
				The water level is not too high	Water level sensor disconnected	Check wiring	
					Water level sensor normally open (NO)	Configure or replace the water level sensor so it is normally closed (NC).	
					Digital input configured incorrectly	Check the configuration of the digital input using PC Tool	

A	B	C	Error code	Error	Possible cause	Action required	Reset
16	R	2	E16	Firmware 2.9 and up: FPC fault (option) Only active if the "Fire Protection Controller" accessory is connected to the unit. No communication with the fire protection controller	Fire protection controller with this address has previously been installed but can no longer be reached	Check connection to fire protection controller	Perform a manual reset by pressing the alarm button on the control panel or by turning the unit off/on
				There is no position feedback for fire dampers	A fire damper is closed, but should be open	Check power supply to fire dampers	
						Check fire dampers internal fire detector	
				Error in monthly, weekly or manual test of fire dampers	Fire damper stuck in either open or closed position	The fire damper is blocked.	
						Fire dampers are connected incorrectly	
						Fire damper defective	

Spare parts

Introduction

Spare parts for the RCV 320 are available via the webshop: shop.dantherm.com.

Appendix

Technical data

Data sheet
RCV 320 P2

Specification	Abbr.	Unit	RCV 320 P2
Max. flow at 100Pa	V_{100Pa}	m³/h	320
Max. rated flow at 100Pa	$V_{max.nom}$	m³/h	200
Operating range DIBt	V_{DIBt}	m³/h	70-225
Operating range Passivhaus at 100Pa	V_{PHI}	m³/h	70-160
EN 13141-7 reference flow at 50Pa	V_{ref}	m³/h	140
Performance			
Thermal efficiency in accordance with EN13141-7	η_{SUP}	%	89
Leakage (external and internal) in accordance with EN 13141-7	$L_W(A)$	dB(A)	<2% (Class A1)
Filters in accordance with ISO16890	class	-	ISO Coarse 75% (optional on supply: ePM1>50%)
Filters in accordance with EN779:2012	-	-	G4 (optional on supply: F7)
Installation surrounding temperature	t_{SURR}	°C	-12 to +45
Outdoor temperature without preheater installed	t_{ODA}	°C	-12* to +40
Outdoor temperature with preheater installed	t_{ODA}	°C	-20 to +40
Maximum absolute humidity of extract air	x	g/kg	10
Cabinet:			
Dimensions (with wall bracket)	w x h x d	mm	600 x 603 x 548
Spigots/ducts connections	Ø	mm	ø125 - female**
Weight		kg	32
Thermal conductivity - polystyrene insulation	λ	W/(mK)	0.031
Heat transition figures- polystyrene insulation	U	W/(m²K)	U<1
Fire classification of the polystyrene insulation	-	-	DIN 4102-1 class B2 EN13501 class E
Drainage hose included	Ø/length	"-m	ø¾" – 1 m
Cabinet colour	RAL	-	no paint/ galvanized steel
Electrical			
Voltage	U	V	230
Max. power consumption (without/ with preheater)	P	W	170/1070
Frequency	f	Hz	50
Protection class	-	-	IP21

* The use of preheating coil is recommended when outdoor temperature is below -3°C to ensure balanced operation.

** Optional supply air connections in the bottom: oval 68 x 163 female

Illustrations

Illustration with wiring diagram

This illustration shows the wiring diagram for the unit

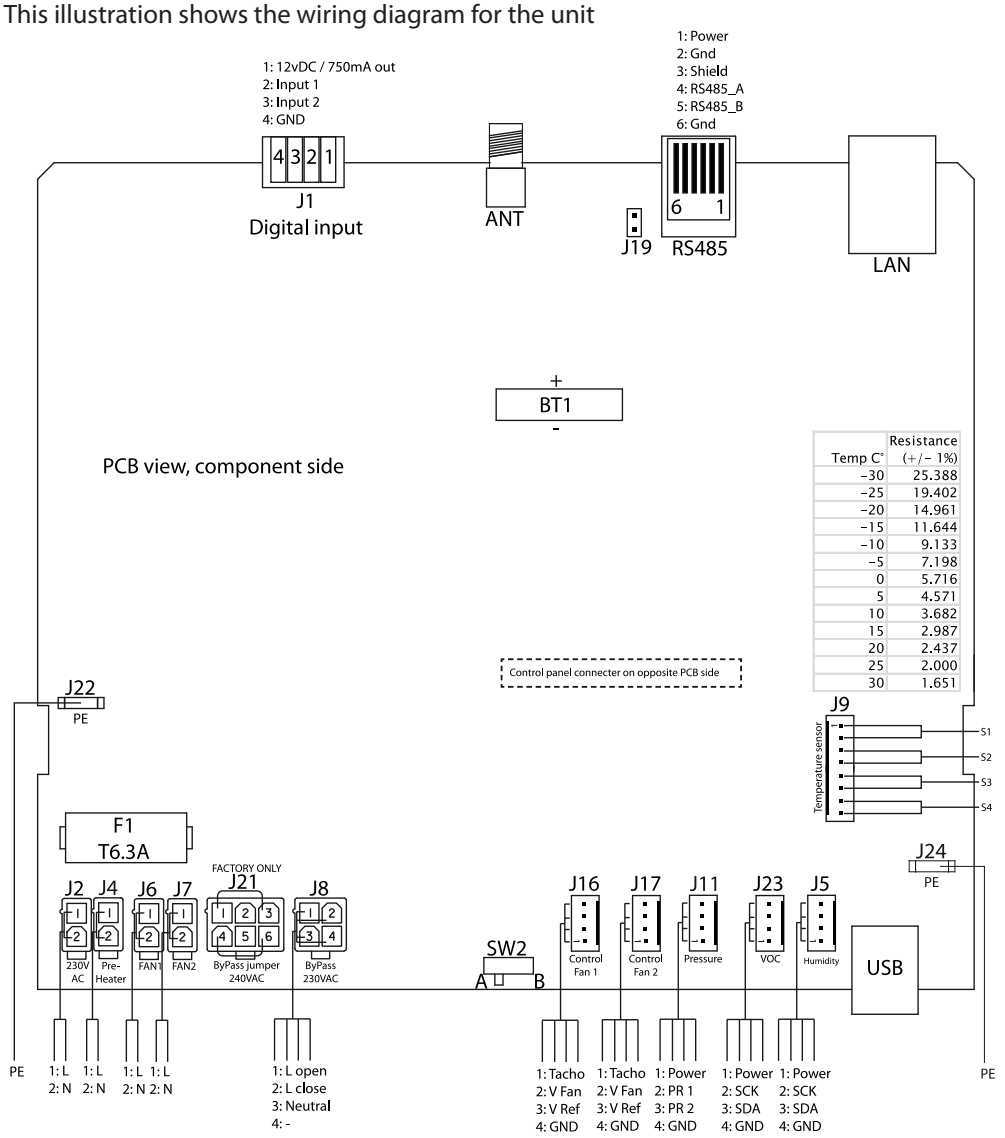


Fig. 12

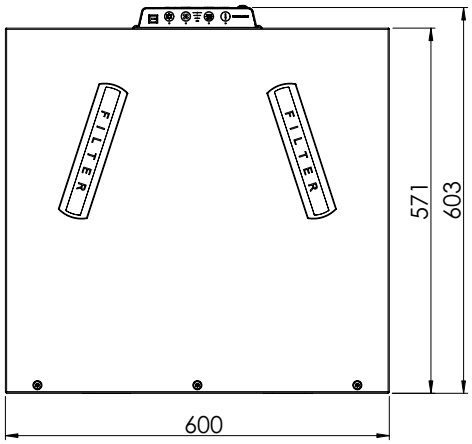
Dantherm®
CONTROL YOUR CLIMATE

en

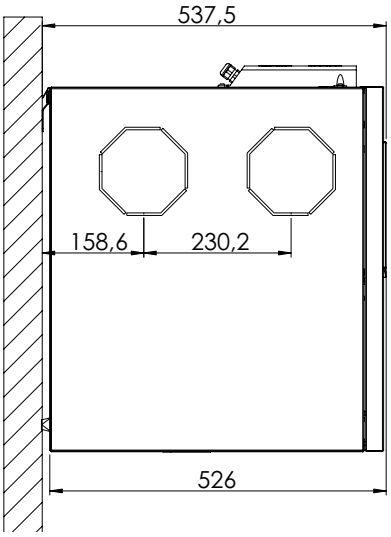
Cabinet dimensions

RCV 320
Dimensions

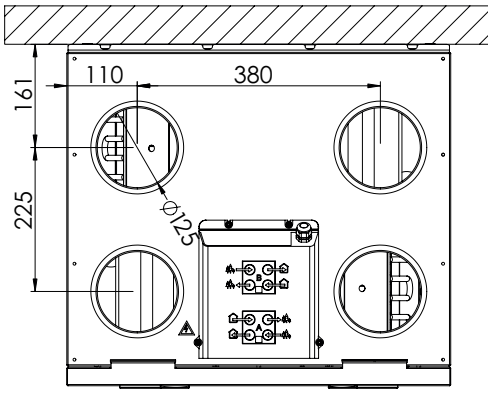
Front View



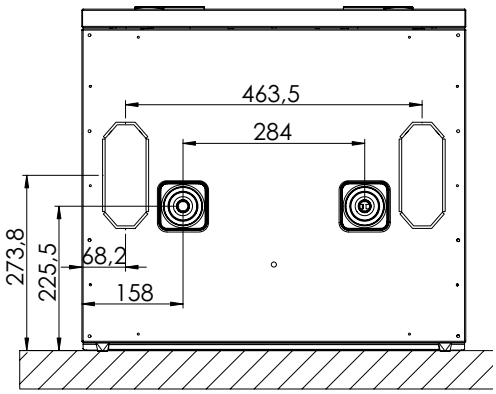
Side view



Top view



Bottom view



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Dantherm can accept no responsibility for possible errors and changes (en)
Dantherm kan inte ta något ansvar för eventuella fel och förändringar (se)
Der tages forbehold for trykfejl og ændringer
Irrtümer und Änderungen vorbehalten
Dantherm n'assume aucune responsabilité pour erreurs et modifications éventuelles
Dantherm is niet verantwoordelijk voor mogelijke fouten en wijzigingen (nl)
Dantherm no pude aceptar ninguna responsabilidad por posibles errores y cambios (es)