

Introduction

Overview

Introduction This is the installation and service guide for the home ventilation units HCV 3 and HCV 5 from Dantherm Air Handling. The table of contents below lists the sections in this guide.

Serial number For any future inquiries regarding e.g. spare parts we kindly ask you to make a note of the serial numbers of the units here: _____
 This guide covers units with serial numbers higher than: xxxxxx1128910


Warning  The ducting system must not be mounted until the unit is ready to operate. The power must not be connected until the ducting system has been mounted.
 The ventilation unit should not be used to dry newly built houses during construction or immediately after construction.
 The ducts must be dimmed and the units must not be connected until the house is ready for occupation, which means that the house is clean and dry. This is to prevent any construction dust and condensed water from depositing in the ducting system and to prevent any sanitation inconveniences from the ventilation units later on.
 If above mentioned warnings are disrespected, the warranty of the unit will be annulled and any kind of maintenance will be done at the customers own expense.

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General information

Introduction	This section gives you the general information about this guide and about the unit.																										
Guide, part no.	Part number of this installation guide is 060783.																										
Target group	The target group of this guide is technicians who install and balance the unit, carry out preventive maintenance and change malfunctioning parts of HCV 3 and HCV 5.																										
Copyright	Copying of this installation guide, or part of it, is forbidden without prior written permission from Dantherm Air Handling.																										
Reservations	Dantherm Air Handling reserves the right to make changes and improvements to the product and the installation guide at any time without prior notice or obligation.																										
EC-Declaration of Conformity	<p>Dantherm Air Handling A/S, Marienlystvej 65, DK-7800 Skive hereby declare that the units mentioned below:</p> <p>352421/352422 HCV 3 and HCV 5</p> <p>are in conformity with the following directives:</p> <table> <tr> <td>2006/42/EC</td><td>Machine safety</td></tr> <tr> <td>2006/95/EC</td><td>LVC-directive(low volt)</td></tr> <tr> <td>2004/108/EC</td><td>EMC-directive</td></tr> <tr> <td>2002/95/EC</td><td>RoHS-directive</td></tr> <tr> <td>2002/96/EC</td><td>WEEE-directive</td></tr> </table> <p>- and are manufactured in conformity with the following harmonized standards:</p> <table> <tr> <td>EN 12100</td><td>Machine safety</td></tr> <tr> <td>EN 60 335-1</td><td>Low voltage</td></tr> <tr> <td>EN 60 335-2</td><td>Low voltage</td></tr> <tr> <td>EN 61 000-6-1:2007</td><td>EMC Immunity</td></tr> <tr> <td>EN 61 000-6-3:2007</td><td>EMC Emission</td></tr> <tr> <td>EN 55 014-1:2007</td><td>EMC Emission</td></tr> <tr> <td>EN 55 014-2:1997</td><td>EMC Immunity</td></tr> <tr> <td>EN 55 022:2006</td><td>Radio interference</td></tr> </table> <p>Skive, 28.05.2009</p>	2006/42/EC	Machine safety	2006/95/EC	LVC-directive(low volt)	2004/108/EC	EMC-directive	2002/95/EC	RoHS-directive	2002/96/EC	WEEE-directive	EN 12100	Machine safety	EN 60 335-1	Low voltage	EN 60 335-2	Low voltage	EN 61 000-6-1:2007	EMC Immunity	EN 61 000-6-3:2007	EMC Emission	EN 55 014-1:2007	EMC Emission	EN 55 014-2:1997	EMC Immunity	EN 55 022:2006	Radio interference
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EN 55 014-2:1997	EMC Immunity																										
EN 55 022:2006	Radio interference																										
Recycling	The unit is designed to last for many years. When the time comes for the unit to be recycled, the unit should be recycled according to national rules and procedures to protect the environment.																										

Product description

Introduction

This section gives a description of the unit.

The use of HCV 3 and HCV 5

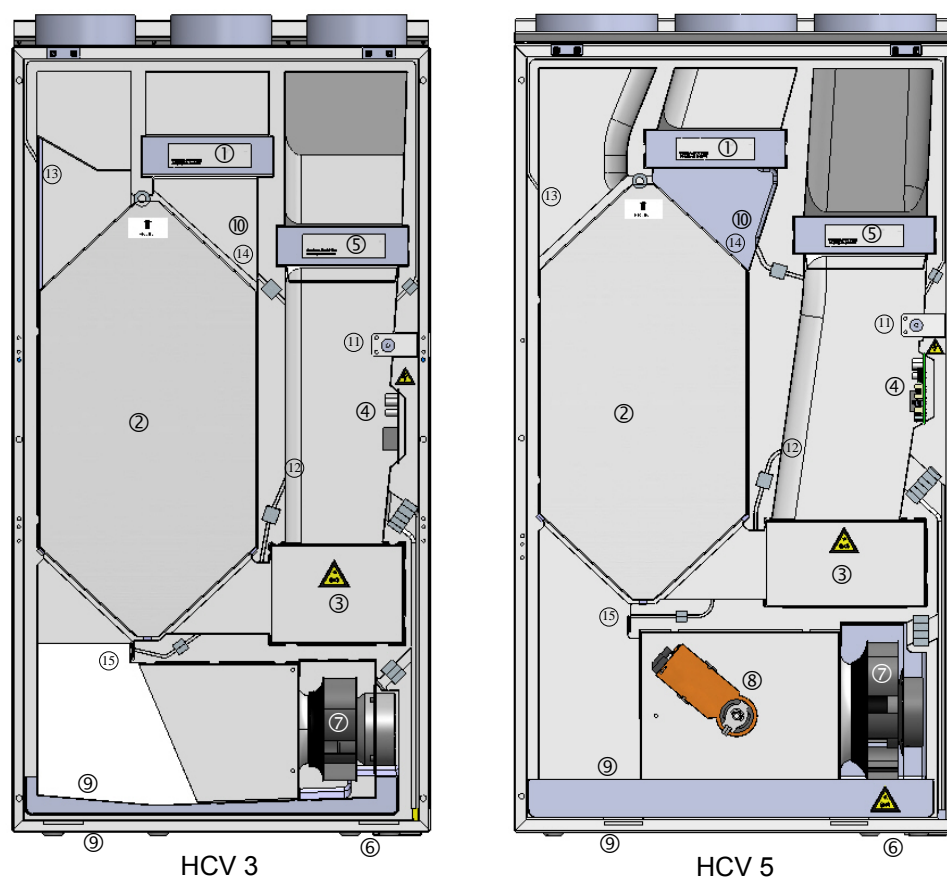
HCV 3 and HCV 5 are used for ventilation of private houses.

The units provide fresh heated outside air through the unit into the house.

Polluted air and warm extract air is used to heat up the outside air by the means of heat exchange.

Illustration, internal

The illustration shows the different parts of the unit seen from the internal side:



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Product description, *continued*

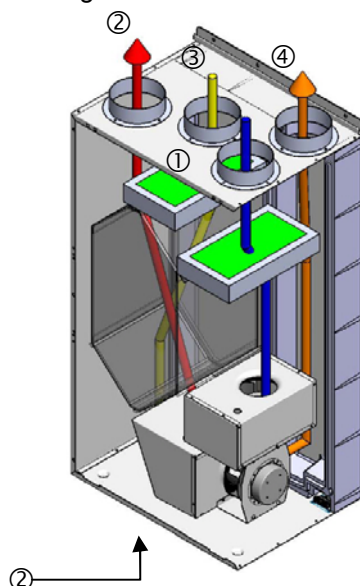
Parts

The table shows the main parts in the unit:

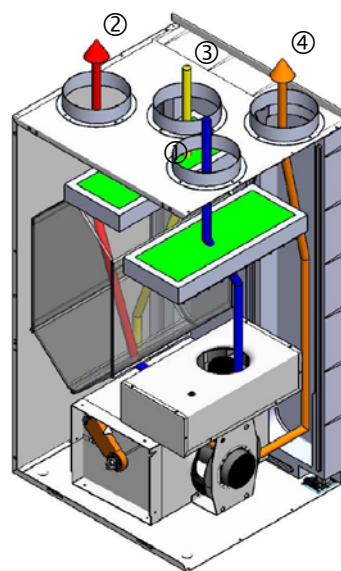
No.	Part	No.	Part
1	Exhaust filter (G4)	9	Drain/drip tray
2	Heat exchanger	10	Humidity sensor
3	Supply air fan module	11	Reset button for filter timer
4	Controller	12	Temperature sensor, T1
5	Supply air filter (G4/F7) G4 filter is standard, F7 filter for pollen is accessory	13	Temperature sensor, T2
6	Data plate	14	Temperature sensor, T3
7	Exhaust fan module	15	Temperature sensor, T4
8	Bypass module (HCV 5 only)		-

Air flow

The following describes and illustrates the air flow in HCV 3 and HCV 5:



HCV 3



HCV 5

② Possibility for supply air outlet in the bottom of the HCV 3.

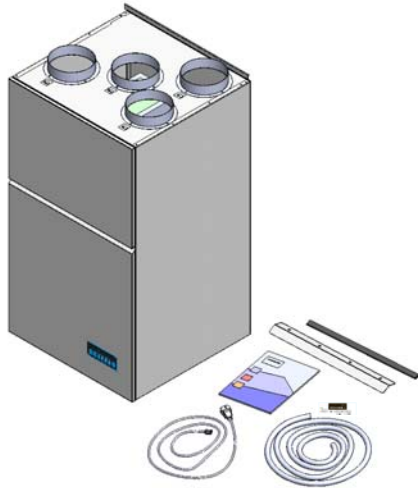
No.	Description	
①	Outside air (T1)	Outside air which enters the heat exchanger is ready to be heated by the extract air from the house. (③)
②	Supply air (T2)	The supply air is heated by the means of heat recirculation from the extract air. (③)
③	Extract air (T3)	"Polluted" and warm exhaust air is used to heat up the outside air (①) by the means of heat exchange in the heat exchanger.
④	Exhaust air (T4)	The heat of the extract air is used to heat up the cold outside air (①). The exhaust air is led out of the house.

Fittings and installations

Introduction This section guides you through fitting and installation of HCV 3 and HCV 5.

Important Only trained and certified installers are allowed to install the unit!

The content of the box Follow this procedure to check the content of the box:


Step	Action
1	Unpack the unit carefully.
2	<p>Check the content before mounting the unit.</p> <ul style="list-style-type: none"> • Power cable set • Mounting bracket with rubber band • Two pieces of distance blocks • 2 m drainage hose • User's guide, installation and service guide • HCV 3 or HCV 5 • Quick guide 

Ducts

The ducts connected to the unit must minimum have the same size as the duct flanges or bigger. Measurements are on the dimension sketches in the section "Technical data" on page 70 and 71.

Dimensioning of the ducts and sound mufflers must be in conformity with national standards and guidelines directives in applicable current building act. For any kind of support and instructions contact your Dantherm-distributor.


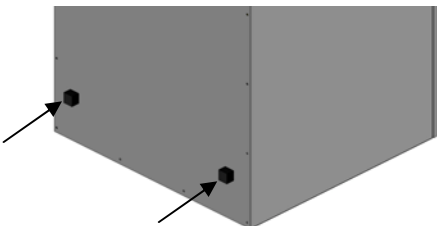

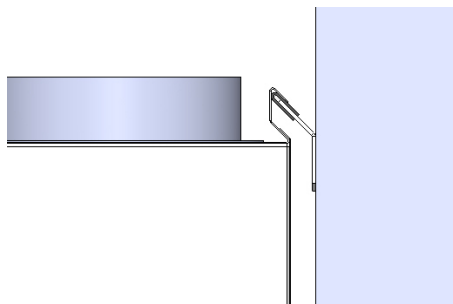
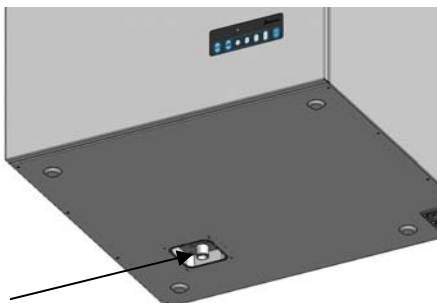
Noise and vibrations from the unit to the ducts must be minimized. This can be done by installing sound mufflers on both supply and exhaust air sides.

 The ducts must be dimmed and the units must not be connected until the house is ready for occupation, which means that the house is clean and dry. This is to prevent any construction dust and condensed water from depositing in the ducting system and to prevent any sanitation inconveniences from the ventilation units later on.

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Fittings and installations, *continued*

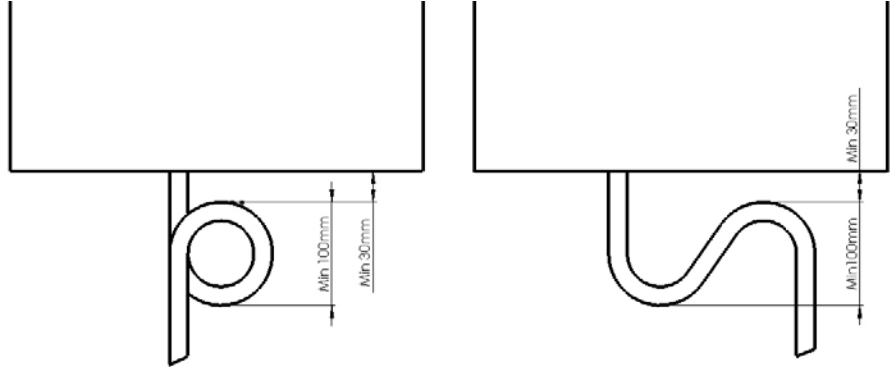
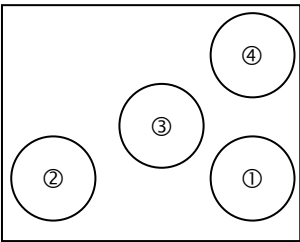
Mounting the unit Follow this procedure to mount the unit:

Step	Action	
1	<p>Mount the mounting bracket horizontally on the wall with four screws suiting the wall's material and thickness and mount the rubber band on the rail as shown on the illustration.</p> <p>The screws' minimum breaking strength must not be less than 365 N (HCV 3) and 540 N (HCV 5).</p> <p>NB: Note that Dantherm Air Handling is able to supply a special suspension, which minimizes the depth of the unit, if the HCV 5 needs to be built into a cupboard with a cupboard door</p>	
2	<p>Mount the two distance blocks on the backside of the unit as shown on the illustration.</p>	
3	<p>Lift the unit on to the mounting bracket</p> <p> Due to the weight of the unit, two persons are required to lift and place the unit.</p>	
4	<p>Mount the drainage hose on the flange underneath the unit. Use lubricant if necessary.</p>	

Continued overleaf

Fittings and installations, *continued*

Mounting the unit, *continued*

Step	Action										
5	<p>Make a water trap which meets the measurements on the illustration and pour water in it. Alternatively you can use the water trap from Dantherm Air Handling (accessories):</p> 										
6	<p>Connect the hose to the drain. The drain pipe must be kept frost proof all the way to ensure that the water can run unhindered. The drain pipe must at least fall by 1% all the way from the unit to the drain outlet.</p>										
7	<p>Dantherm Air Handling recommends isolated flex ducts when connecting to flanges. The ducts must be completely stretched to avoid unnecessary loss of pressure. Mount the ducts on the unit. Make sure you connect the ducts to the right flanges:</p> <p>HCV 3 also has a supply air outlet in the bottom which can be used in stead of the one in the top. The unused outlet must be covered.</p> <table border="1" data-bbox="513 1256 971 1496"> <thead> <tr> <th>No.</th><th>Duct</th></tr> </thead> <tbody> <tr> <td>①</td><td>Outside air T1</td></tr> <tr> <td>②</td><td>Supply air T2</td></tr> <tr> <td>③</td><td>Extract air T3</td></tr> <tr> <td>④</td><td>Exhaust air T4</td></tr> </tbody> </table> 	No.	Duct	①	Outside air T1	②	Supply air T2	③	Extract air T3	④	Exhaust air T4
No.	Duct										
①	Outside air T1										
②	Supply air T2										
③	Extract air T3										
④	Exhaust air T4										
8	<p>Insulate the entire duct system with 100 mm insulation. For example, place the ducts below the insulation of the ceiling. If the insulation is wrapped around the tube, it is recommended to apply two layers of foil.</p>										
9	<p>Wrap the two layers staggered, and tape the area where the two layers meet until air tight.</p>										
10	<p>Insulate all flex ducts as well as the entire duct system. It is important that especially the exhaust air duct is insulated, to avoid the possibility of condensation inside the duct, which can lead to water in the unit</p>										
11	<p>Choose the right power supply cable matching the regulation in the actual country and connect the cable's IEC plug to the unit and connect the unit to 230 V AC.</p>										
12	<p>Balance the unit according to the instructions on page 49.</p>										

Continued overleaf

Fittings and installations, *continued*

Drifting snow and driving rain

Air inlets and outlets T1 and T4 must be mounted with ducts falling at least fall 1 % away from the unit to prevent drifting snow, driving rain and condensation from entering the unit causing faults and further damaging the installation and the building.

The warranty does not cover damages to the unit/building parts/insulation, which is caused by accumulated snow/water in the ducts.

Accessories

In order to mount and install accessories from Dantherm Air Handling A/S, follow the instruction delivered with the accessory.

How to balance the unit

Introduction This section will guide you through balancing HCV 3 and HCV 5.

Important Only trained and certified technicians are allowed to balance the unit!

Legislation Regulation of the air flow rates must always be carried out according to the national legislation.

Only nominal air flow rate must be balanced. The nominal air flow rate corresponds to Fan Step 3 in Manual Operation Mode on the control panel. See the other set points in the section "Set points and control strategies" on page 53 and "Description of the control panel" in the user's guide.

When Balancing of the unit must take place in the following situations:

- Before the first operation of the unit
- If the size of the house has been changed
- If the house is renovated and the ducting system is affected by it
- If the filter type is changed e.g. in connection with the pollen season

Before you start All air dampers in the ducting system must be installed according to manufacturer recommendations before balancing of HCV 3 and HCV 5 take place.

Make sure that you have the following equipment ready before the installation starts:

- Pressure manometer with approx. 5 mm diameter hose matching the pressure adapter on the unit, which is 6 mm in diameter
- Screwdriver with hex lobular pan head 25

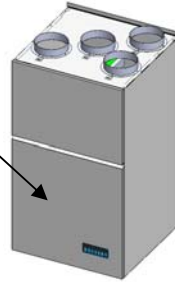
Balancing the air flows When balancing the air volumes of HCV 3 and HCV 5 it is important to ensure that the airflows are of equal mass flow!



Important:

The supply air flow (T2) must under no circumstances be higher than the extract air flow (T3), as this can cause humid air to be pressed into the building construction, with destructive, negative, effects on the building, if the vapour shield is not 100 % air tight



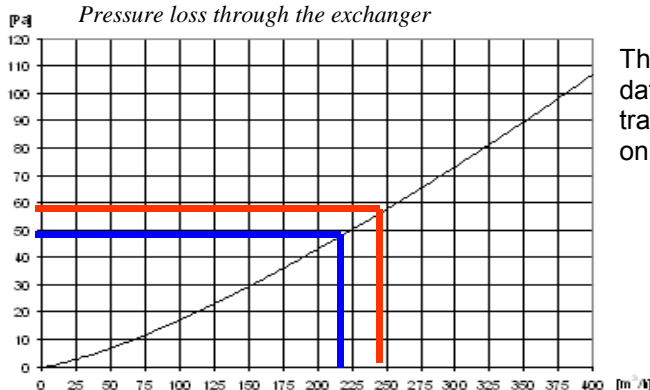
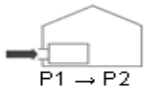

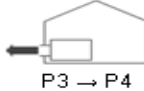

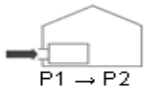

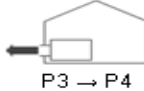

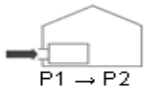

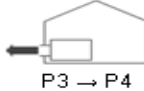

Procedure Follow this procedure to balance the unit:

Step	Action
1	<p>Dismount the bottom part of the front. Make sure that the insulating cover plates in front of the filters are correctly mounted with the soft side towards the filter. Push the sheets against the filter to avoid any air being sucked in that way</p> 

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How to balance the unit, *continued*

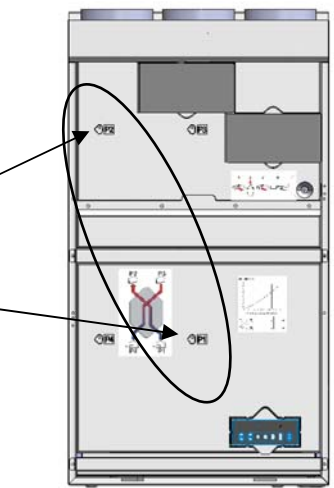


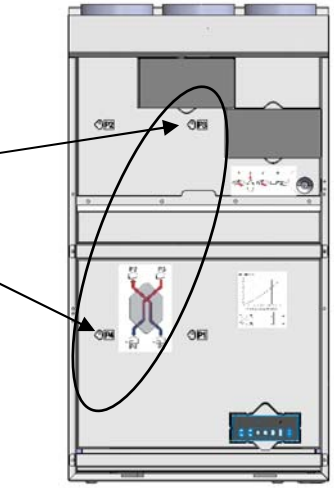
Procedure, *continued*

Step	Action																		
2	Turn off the power supply to the unit and wait for ten seconds. Then turn the power supply back on.																		
3	Activate Installation Mode by pressing Manual  + Auto  for 6 seconds. After this, Fan Step 3 illuminates constantly. NB: Installation Mode is active for one hour. In Installation Mode are bypass, protection against frost and compensation of filter flocculation switched off in order to prevent interruption during balancing the unit on Fan Step 3.																		
4	<p>How to set the desired airflow rate:</p> <p>Dantherm HCV 5</p> <p><i>Pressure loss through the exchanger</i></p>  <p>The handwritten data are for illustrative purposes only.</p> <p>Einregelung / Balancing / Indregulering</p> <table><tr><td> P1 → P2  (41-96)</td><td>3) 50</td><td>2) 48 [Pa]</td><td>1) 216[m³/h]</td></tr><tr><td> P3 → P4  (41-96)</td><td>58</td><td>58 [Pa]</td><td>230 [m³/h]</td></tr></table> <p>P1 - P2 Supply air P3 - P4 Exhaust air</p> <p>Set a desired air flow rate according to national regulations, which corresponds to the size and air usage of the house:</p> <table><tr><th>Step</th><th>Action</th></tr><tr><td>1</td><td>Write down the values of supply and exhaust air flow rates in the graph above.</td></tr><tr><td>2</td><td>Read and write down the corresponding pressure loss through the heat exchanger.</td></tr><tr><td>3</td><td>Balance the unit.</td></tr><tr><td>4</td><td>Write down the settings of the two potentiometers in the table, later in this procedure.</td></tr></table>	 P1 → P2  (41-96)	3) 50	2) 48 [Pa]	1) 216[m³/h]	 P3 → P4  (41-96)	58	58 [Pa]	230 [m³/h]	Step	Action	1	Write down the values of supply and exhaust air flow rates in the graph above.	2	Read and write down the corresponding pressure loss through the heat exchanger.	3	Balance the unit.	4	Write down the settings of the two potentiometers in the table, later in this procedure.
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How to balance the unit, *continued*



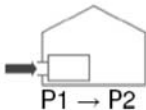

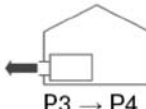

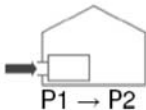

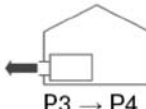

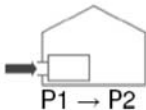

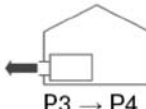

Procedure, *continued*

Step	Action	
5	Connect the pressure manometer to pressure adapter P1 and P2 and measure the pressure difference on the supply air side over the heat exchanger.	 <p>P2</p> <p>P1</p>
6	<p>Balance the nominal air flow rate on the supply air side by adjusting the potentiometer for the supply fan until the pressure difference determined on the graph is achieved. The potentiometers are placed on the back of the control panel.</p> <p>Wait approximately two minutes before the next adjustment of potentiometers, in order to let the unit stabilise the air flows.</p> <p> Strong wind against the building might affect balancing the unit.</p>	
7	Connect the pressure manometer to pressure adapter P3 and P4 and measure the pressure loss on the exhaust air side over the heat exchanger.	 <p>P3</p> <p>P4</p>



Continued overleaf

How to balance the unit, *continued*

Procedure, *continued*

Step	Action														
8	<p>Balance the nominal air flow rate on the exhaust air side by adjusting the potentiometer for the exhaust fan until the pressure difference determined on the graph is achieved. The potentiometers are placed on the back of the control panel.</p> <p>Wait approximately two minutes before the next adjustment of potentiometers, in order to let the unit stabilise the air flows.</p> <p> Strong wind against the building might affect balancing the unit.</p>														
9	Check the pressure difference over heat exchanger on the supply air side one more time, as it might has changed due to the adjustment on the exhaust air side. Make an adjustment if necessary.														
10	Adjust the balancing of the valves in every room in order to make sure that the desired air flow rate can be supplied in every room.														
11	Check the nominal air flow rates based on earlier instructions in this procedure as radical adjustments (balancing) will influence the nominal air flow rates.														
12	<p>Write down the final set-ups for the potentiometers, pressure losses over the heat exchanger and air flow rates in the table <i>on the unit</i>.</p> <table><tr><th colspan="4">Einreglung / Balancing / Indregulering</th></tr><tr><td> P1 → P2</td><td> (41-96) _____</td><td>_____ [Pa]</td><td>_____ [m³/h]</td></tr><tr><td> P3 → P4</td><td> (41-96) _____</td><td>_____ [Pa]</td><td>_____ [m³/h]</td></tr></table>			Einreglung / Balancing / Indregulering				 P1 → P2	 (41-96) _____	_____ [Pa]	_____ [m ³ /h]	 P3 → P4	 (41-96) _____	_____ [Pa]	_____ [m ³ /h]
Einreglung / Balancing / Indregulering															
 P1 → P2	 (41-96) _____	_____ [Pa]	_____ [m ³ /h]												
 P3 → P4	 (41-96) _____	_____ [Pa]	_____ [m ³ /h]												

After balancing

Deactivate Installation Mode by pressing Manual  + Auto  for 6 seconds.

The operational modes are described closely in the user's guide.

Set points and control strategies

Introduction

This section describes the different factory settings for HCV 3 and HCV 5 and the possibilities for adjustments on the control panel and the remote control.

Factory settings

Default factory settings:

Set points	Factory setting	Setup range	
		HCP 4 Control panel	HRC 2 Remote
Fan Step 0	Off	-	-
Fan Step 1	Gear 14	Gear 1 - 41	Gear 1 - 71
Fan Step 2	Gear 39	Gear 21 -66	Gear 36 -81
Fan Step 3	Gear 64	Gear 46 - 91	Gear 46 - 91
Fan Step 4 (maximum speed)	Gear 100	Gear 100	From Fan Step 3 to Gear 100 10 – 30 gears
'OFFSET' (gears between Fan Step1-2-3)	25 gears	-	-
Automatic cooling/bypass			
Bypass, Tmax (extract temperature, T3)	$T3 \geq 24\text{ °C}$	-	*Of/22-30 °C
Bypass, Tmin (outside temperature, T1)	$T1 \geq 15\text{ °C}$	-	Of/8-15 °C
Automatic Demand Mode (RH%)	45%	45%	35-65%
Filter duration	180 days	180 days	90-360 days
Frost protection, exchanger (see below)	$T4 \leq + 2\text{ °C}$	-	-
Frost protection, after-heat	$T2 \geq + 5\text{ °C}$	-	-

^{*)} Selecting 'of' eliminates automatic bypass.

Frost protection

The unit's frost protection works as follows:

1) Frost protection of the exchanger.

The control strategy has a built-in frost protection preventing ice building up in the heat exchanger.

If the exhaust air temperature (T4) is below + 2 °C for 1½ hours or longer, the unit starts reducing the flow rate of supply air (i.e. RPM of the supply fan is reduced) until the exhaust air temperature reaches + 2 °C. Frost protection normally starts when outdoor temperature (T1) reaches ÷ 6 - ÷ 7 °C, or below.

2) Unit shuts down at an outside temperature below ÷ 13 °C

If the outside temperature (T1) is below ÷ 13 °C for more than 5 minutes, the unit will stop operating for 30 minutes to prevent ice from building up. If the outside temperature does not reach a temperature above ÷ 13 °C, the units shots down for another 30 minutes, etc.

Continued overleaf

Set points and control strategies, *continued*

Frost protection, *continued*

3) Recommendation

To secure a balanced air flow with out intentional shut-down, Dantherm Air Handling A/S recommends installing pre-heat in areas where temperatures during longer periods of time is below $\pm 6^{\circ}\text{C}$.

In areas where temperatures constantly are below $\pm 13^{\circ}\text{C}$, installing pre-heat is a must to secure optimal operation.

Preventive maintenance

Introduction

To make sure that HCV 3 and HCV 5 operates optimally and safely, it is necessary to carry out preventive maintenance.

Preventive maintenance must be carried out periodically to maintain a good indoor climate, to avoid brake downs or ineffective operation, and to maximize the durability. It is important to mention that intervals between maintenances can vary according to the environmental conditions, where the unit has been installed.

Warning

- Turn off the power supply before applying any work on the unit!
- Only trained and certified technicians are allowed to service the fans. Users are allowed to change filters.
- Make sure that all work has finished and the styrene plate and front cover plates are fully mounted before turning on the power supply again.

Parts

The following parts must be checked and/or changed when needed:

The following parts must be checked and cleaned if necessary. Necessity takes place if the unit suddenly has unstable operation, vibrates, leaks, makes noise or if any other malfunction occurs, which is described in the section "Fault finding instruction" on page 63.

- Filters
- Fans
- Bypass module
- Drip tray and internal surfaces
- Drain and drain hose
- Heat exchanger
- Controller

Filters and external cleaning

The filters must be checked and/or changed twice a year.

The time intervals for filter changes should be regulated based on house requirements for ventilation, also level of environmental pollution and smog should be taken into consideration. However, Dantherm Air Handling recommends that filters are changed at least once a year.

Change the filters when the filter alarm flashes yellow on the control panel and a beep-sound (once an hour) sounds. Always reset the filter timer after changing the filters. See the section "Preventive maintenance" in the user's guide.

The unit must always be kept clean to ensure an error free operation and a good hygiene. Clean the external surface of the unit with a wet cloth.

Fans

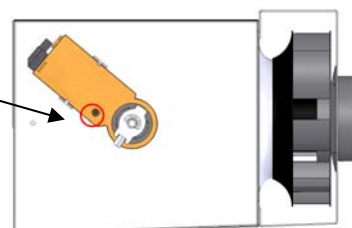
Clean the fan blades every second year with compressed air or with a brush.

Every fan blade has to be clean in order to keep the fans balanced. Be careful not to remove the balancing pieces which are mounted on the fan blades.

Bypass

Check that the bypass module is well functioning. Try to open/close the damper manually with the trigger (requires a magnet) to check functionality.

The bypass module shall only be checked when an error occurs or if the unit is open e.g. in connection with another service.



Continued overleaf

Preventive maintenance, *continued*

Drip tray	Make sure that the condensate drain is not clogged in the drip tray and clean the drip tray with soapy water and a brush or a cloth every second year to ensure good hygiene inside the unit.
Internal cleaning	The unit must be kept clean to ensure error free operation and good hygiene. Internal cleaning are only necessary if the unit is open e.g. in connection with service. Check the internal surface in the unit. If it is dirty, clean with a wet cloth, brush, vacuum cleaner or the like.
Drain, external connection and duct flow	Drain, external connections and hose installations must be checked once a year before the risk of frost occurs. Make sure that the hose is firmly connected to the unit and that the water trap is filled with water. Make sure that the hose is not broken and that the hose drops minimum 1% toward the drain, and that the hose is protected against frost from unit to drain.
Heat exchanger	Check the heat exchanger for dirt every second year. Clean the heat exchanger with a soft brush and a vacuum cleaner at all four inlets, In special cases, e.g. if there are clear traces of accumulated, dirty condensate water in the heat exchanger, it is necessary to remove the heat exchanger from the unit and clean the exchanger with soapy water.
Controller	The controller must only be checked if an error occurs on the unit. Make sure that all connections are all right and that the controller is clean and free with out dust or moisture.
Service intervals	The below table gives an overview of the service intervals for the different parts.

Part	Function	Service interval
1	Filter	Twice a year
2	External drain	Once a year
3	Heat exchanger	Every second year
4	Fans	Every second year
5	Drip tray/internal drain	Every second year
6	Internal air channels	Every second year
7	Bypass module	Every second year
8	Controller	Only when errors occurs

Continued overleaf

Preventive maintenance, *continued*

Tasks

The following must be checked closely in connection with a preventive maintenance visit:

- Change the filters and reset the filter timer
- Clean the fan blades every second year with compressed air or a brush
- Make sure that the damper in the bypass module is opening/closing manually with the trigger
- Clean the drip tray with soapy water and a brush or a cloth
- Check the internal surface inside the unit. If it is dirty, clean with a wet cloth, brush, or vacuum cleaner
- Make sure that:
 - the hose is firmly connected to the unit
 - the water trap is filled with water
 - the hose is not broken
 - the outlet falls 1 % all the way
 - the drain is protected against frost all the way
- Clean the heat exchanger with a soft brush and a vacuum cleaner at all four inlets,
- Make sure that all connection are all right and that the controller is clean and free from dust or moisture
- Turn on power supply, start up the unit and test all fan speeds. Observe that the unit operates correctly without faults

Terms of warranty

The factory guarantee is only valid when preventive maintenance can be proven. Preventive maintenance must be carried out with a minimum time interval of six months. The documentation of the maintenance should be a written log/journal.

Service journal

Fill in the journal at every service visit:

Date	Description of the fulfilled service/replacement of parts.	Technician/init.

Continued overleaf

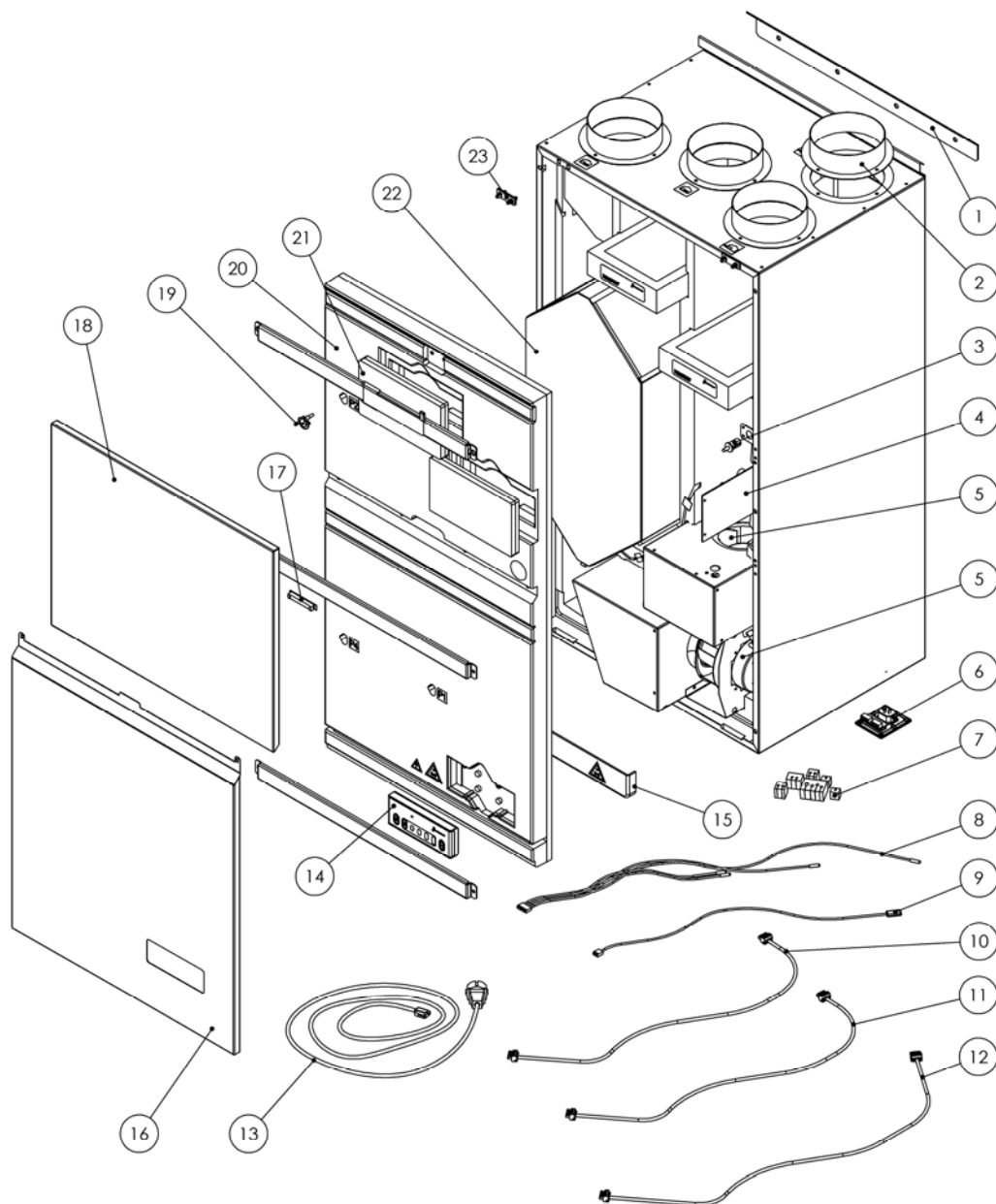
Preventive maintenance, *continued*

Service journal,
continued[illegible]

List of spare parts, HCV 3

Illustration

Spare parts for HCV 3



List

List of spare parts including item numbers:

Pos.	Item number	Description
1	063680	Mounting bracket
2	062025	Inlet duct ILU w/ four holes, top 125 mm
3	062064	Reset button for filters, FRB
4	062060	Print MPCB

Continued overleaf

List of spare parts, HCV 3, *continued*

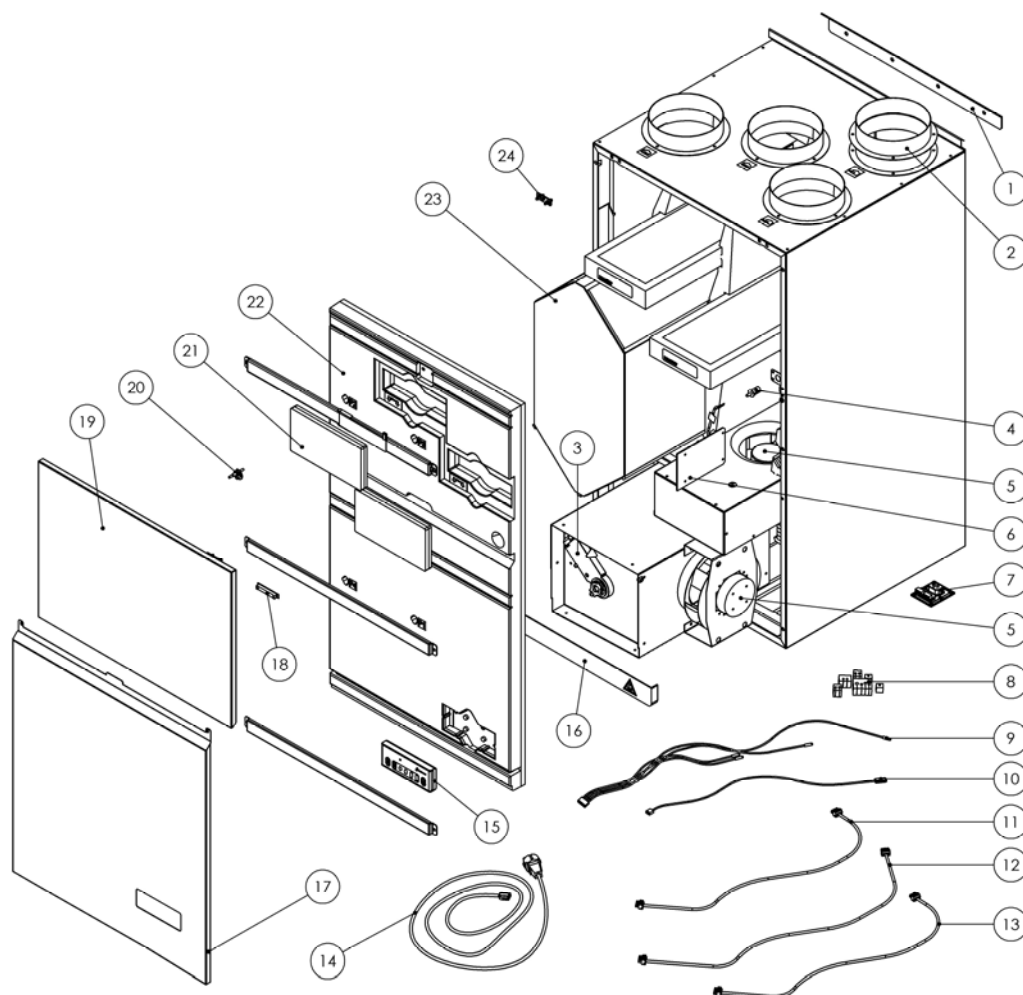
List, *continued*

Pos.	Item number	Description
5	062019	Fan, top 133 mm, 650 mm cable
6	062062	Connector panel, CP: IEC plug
7	062026	Wire fittings, complete set
8	062047	Temperature sensor, duct set, wall
9	062061	Humidistat sensor, HS:SHT 15
10	062044	Modbus cable with plug, 950 mm
11	062045	Power supply cable with plug, 1150 mm, P1150
12	062046	Modbus cable with plug, 1150 mm, MC1150
13	062063	Power cable, 230 V AC
14	062059	HCP4 control panel
15	062023	Rail for drip tray, 475x50 mm
16	063367	Front cover plate, bottom
17	062066	Magnet, 64x10 mm, 8 kg
18	063366	Front cover plate, top
19	062065	Pressure tube fitting for pressure measurement
20	062018	Styrene front panel, complete
21	062694	Filter insulating cover plate
22	062021	Heat exchanger, 255 mm with insulation
23	064405	Hinge, 10 pcs.

List of spare parts, HCV 5

Illustration

Spare parts for HCV 5



List

List of spare parts including item numbers:

Pos.	Item number	Description
1	063680	Mounting bracket
2	062056	Inlet fitting ILU w/ four holes, top160 mm
3	062031	Damper motor, 230 V AC 2 Nm 75 sec with blocking bushing
4	062064	Reset button for filters, FRB
5	062028	Fan, top190 mm, 650 mm cable
6	062294	Print MPCB
7	062062	Connector panel, CP: IEC plug
8	062033	Wire fittings, complete set
9	062047	Temperature sensor, duct set, wall

Continued overleaf

List of spare parts, HCV 5, *continued*

List, *continued*

Pos.	Item number	Description
10	062061	Humidistat sensor, HS:SHT 15
11	062044	Modbus cable with plug, 950 mm
12	062045	Power supply cable with plug, 1150 mm, P1150
13	062046	Modbus cable with plug, 1150 mm, MC1150
14	062063	Power cable, 230 V AC
15	062059	HCP4 control panel
16	062057	Rail for drip tray, 539x50 mm
17	063369	Front cover plate, bottom
18	062066	Magnet, 64x10 mm, 8 kg
19	063368	Front cover plate, top
20	062065	Pressure tube fitting for pressure measurement
21	062029	Filter insulating cover plate
22	062027	Styrene front panel, complete
23	063084	Heat exchanger, 400 mm with insulation
24	064405	Hinge, 10 pcs.

Fault finding instruction

Alarms

For easier fault finding, use the remote control, on which all alarms are displayed. See the section "Functional description" in the user's guide on how to activate the different operation modes. Localise the problem in the left column below and follow the instructions in the right column

Alarm	Cause	Action
Yellow light-emitting diode (30/min) and a beep-sound The unit still operates, however the power consumption and the noise levels are increased due to high level of pressure loss in the dirty filter.	The filters need to be checked/replaced.	Replace the filters and reset the filter alarm on the unit. See the section "Preventive maintenance" on page 55.
Red, permanent light-emitting diode and beep-sound. The unit operates in fail-safe mode, (Fail Safe Mode 1) which is similar to nominal operation but without access to cooling function by means of bypass.	T1 outside air sensor or supply air sensor T2 is defective. Note that the bypass damper is always closed, when the unit is operating in fail safe mode.	Check and if necessary replace the sensor set.
Red, flashing light-emitting diode (30/min) and beep-sound. The unit operates in fail-safe mode (Fail Safe Mode 2), during which the supply fan operates only at lowest speed (Fan Step 1) and the exhaust fan operates at Fan Step1/ Fan Step2.	One of the following components are defective or has a bad connection: <ul style="list-style-type: none"> • T3 extract air sensor • T4 exhaust sensor • The built in RH sensor Or: One of the two fans is not able to reach the desired speed.	Check and if necessary replace the sensor set. Check that the fans are able to rotate untrammelled and that the cable has not lost the connection.
Red, flashing light-emitting diode (120/min) and beep-sound. The unit has stopped and the bypass-damper is closed because this type of malfunction can cause a safety risk.	One of the temperature sensors has detected a critically high temperature above 70 °C. T2 Supply air sensor has measured a temperature below 5 °C, at which there is a risk of frost damages on the reheating coil (accessory). The ducts are not insulated properly. Very low outside temperatures < + 10°C. The building is not heated. The unit is not balanced correctly.	Make sure that there is no fire or other sources of heat which might be heating up the ducts to a temperature above 70 °C. Check the reason for the low supply air temperature and adjust it. Re-insulate channels. Install preheat. Carry out correct regulation of the unit. Activate Installation Mode by pressing Manual + Auto for 6 seconds. See "How to balance the unit" on page 49

Continued overleaf

Fault finding instruction, *continued*

Malfunctions

Localise the problem in the left column and follow the instructions in the right column

Malfunction	Cause	Action
The unit does not operate, and there is no light in the control panel.	The power supply is not connected.	Make sure that the power supply cable is mounted correctly.
There is water around/beneath the unit.	A water trap has not been mounted on the drain as described.	Check and mount a water trap as described.
	The drain studs on the unit or on the drain hose is frozen.	Secure the drain studs on the unit and all the way to the drain against freezing, if necessary use a heater cable (accessory).
	The unit is mounted slantwise due to which water from the drain comes up into the unit.	Straighten the unit so that it is placed/hanged vertically/horizontally.
	The drain is clogged in the hose or in the drip tray inside the unit.	Check that the drain is not clogged and if necessary clean it with water and detergent.
	The styrene front panel and/or the front plastic panel of the drip tray has not been mounted correctly.	Check that the front plastic panel of the drip tray and the styrene front panel are mounted correctly and firmly.

Inconvenience


Localise the problem in the left column and follow the instructions in the right column

Inconvenience	Cause	Action
Abnormal noise from the unit.	The unit is running on Fan Step 4 (only suited for shorter duration of use).	Turn the unit back to Fan Step 1, 2, 3 or activate Automatic Demand Mode.
	The filter is blocked.	Check and if necessary replace the filter.
	The installation has not been done correctly. The air flow channels might be partly blocked.	Make sure that the ducts are led correctly and that the air flows are not blocked. Balance the air flow rate as shown in the section in the section "How to balance the unit" on page 49.
	The unit has not been balanced correctly.	

Continued overleaf

Fault finding instruction, *continued*

Inconvenience, *continued*

Inconvenience	Cause	Action
The unit is not cooling sufficiently.	The unit is a HCV 3, which does not have a built-in bypass-module.	There are no malfunctions.
	The outside air might be heated up before entering the house.	If necessary, move the inlet grille to the north side of the building.
	The temperatures are exceeding the established limits, which must be met in order to achieve cooling by means of bypass. See the section "Set points and control strategies" on page 15.	Push the manual bypass button and cooling will be active for the next 6 hours.
	The bypass-damper is stuck or the damper motor is defective.	Check the bypass module and replace the damper motor if necessary.
Unstable operation, with a wide variation of air flow rates.	The unit is probably set to Automatic Demand Mode which is varying the air flow rate according to the needs in the need of the house and the indoor humidity level. There is no malfunction on the unit.	It is recommended to set the unit in Manual Operation Mode and choose the fan step which meets the demands most optimal (normally Fan Step 3). It is not advisable to operate at air flow rates beneath the defined flow rate demanded in the house, which have a reference to national law regulations; otherwise there might be a risk of damage from damp and reduced air quality.
The house is being unnecessarily dried out.	The unit might be operating with too high level of air exchange compared to the size and needs of the house.	Check if the air flow rates correspond the size of the house and ventilation load, do this by controlling the air flow rates, which is described "How to balance the unit" on page 49.
	The unit has been set to operate at the nominal air change (Fan Step 3) in Manual Operating Mode. Low level of humidity can be observed especially during winter when the outside air is very dry.	Switch to Automatic Demand Mode or set the air flow rate at Fan Step 2 or 1 in Manual Operation Mode.  Using Fan Step 2 or 1 is only recommended for a short period of time.

Continued overleaf

Fault finding instruction, *continued*

Inconvenience, *continued*

Inconvenience	Cause	Action
There is damp on the inside of the windows and other cold surfaces (autumn, winter and spring)	The air change is too low or the air distribution is unfortunate which causes too low air change in critical rooms.	<p>Accurately adjust the air flow rates and its distribution through balancing the valves to ensure the air change in critical places. Set the unit to Automatic Demand Mode so it automatically keeps the humidity on a suitable level.</p> <p>Do not let the unit operate constantly on Fan Step 1 or 2 in Manual Operation Mode as it does not guarantee keeping the humidity level in the house down, when the moisture load of the house is high.</p>
The unit is always operating at the same speed.	The unit is set to Manual Operation Mode at one fixed speed.	Switch to Automatic Demand Mode after which the unit is going to adjust to air flow rates according to the need of the house.
The display goes out after a short period of time, after which only the green light-emitting diode is on.	The display goes into Energy Saving Mode after 2 minutes to effect power save.	The unit is operating correctly.

Service agreement

Introduction	<p>The unit includes mechanical and electrical parts and the unit is often placed in a rough environment where the components are exposed to different climate conditions. Therefore the unit needs preventative maintenance on a regular basis.</p>
Hotline	<p>The After Sales Support department of Danttherm Air Handling A/S is ready to help you in case of a problem.</p> <p>To be able to offer quick and efficient help, please have the following information ready when contacting Danttherm Air Handling A/S:</p> <ul style="list-style-type: none"> • Name • Phone no. • Site/location (unit) • Company • Email • Serial no/order no. • Country • Type (unit) • Description of the problem <p>Contact Danttherm Air Handling A/S, ask for After Sales Support, and help will be provided as soon as possible:</p> <p>Phone: +45 96 14 37 00 Fax: +45 96 14 38 00 Email: service@danttherm.com</p>
Preventive maintenance	<p>Danttherm Air Handling A/S offers to do the preventive maintenance on the units so that they at all times will operate according to factory standards.</p>
Corrective and emergency repair	<p>In case of malfunctions of the product Danttherm Air Handling A/S offers to do emergency repair on the climate units. Agreements will be made with the customer on response time and price.</p>
Setup	<p>Danttherm Air Handling A/S has established a network of service partners to do the preventative maintenance. The partner is trained and certified on the actual climate units. The partner will also carry an adequate number of spare parts – so that any repairs can be made during the same visit.</p> <p>The agreement will be made with Danttherm Air Handling A/S – and the overall responsibility for the agreement belongs to Danttherm Air Handling A/S.</p>
Further information	<p>For further information about a service agreement in your country or region, please contact:</p> <p>Henrik Hersted After Sales Support Manager Danttherm Air Handling A/S Phone: +45 9614 4767 Mobile: +45 2399 4066 Email: heh@danttherm.com</p>

Technical data

Performance data The table shows the technical performance data for HCV 3 and HCV 5.

Specification	Unit	HCV 3	HCV 5
Max. air volume, free blowing	(m ³ /h)	330	520
Heat exchanger	Dantherm Alu. Counterflow Heat Exchanger		
Temperature efficiency	%	Up to 95 ¹	
Filter class supply air/exhaust, standard		G4/G4	
Operational temperature range without pre-heat	°C	÷13 ² to + 50	
Operational temperature range with pre-heat	°C	÷ 30 to + 50	

Cabinet data The table shows the technical cabinet data for HCV 3 and HCV 5.

Specification	unit	HCV 3	HCV 5
Height	mm	1005	1055
Width	mm	530	590
Depth (Standard mounting rail/rail for plan mounting)	mm	434/419	584/569
Duct connection	mm	125	160
Weight, unit	kg	33	45
Weight including packaging	kg	43	57
Dimensions including packaging (HxWxD)	mm	H: 654 W: 1076 D: 435	H: 723 W: 1124 D: 600
Outer cabinet material	Aluzink		
Colour	RAL	9010	
Cabinet insulation, styrene	mm	32	
Insulation factor, cabinet	W/m ² x °K	0,97	
Fire classification, polystyrene cabinet	DIN 4102 class B1		
Fire class, the whole unit	EN 13501 class E		
Protection class	IP		20

Continued overleaf

¹ Condensing operation.

² Dantherm Air Handling recommends preheating at temperatures under -6°C to ensure a balanced operation.

Technical data, *continued*

Electrical data

The table shows the technical electrical data for HCV 3 and HCV 5.

Specification	Unit	HCV 3	HCV 5
Integrated control panel HCP 4 in front cover	-	Yes	
Supply voltage		1x230 V, 50 Hz	
Max. current consumption, w/o pre-heat and afterheat	A	0,4	0,7
Max. power consumption, w/o pre-heat and afterheat	W	88	154

Cabinet, sound data

The table shows the technical sound data for HCV 3 and HCV 5.

Specification	Unit	HCV 3		HCV 5	
	m ³ /h	140		220	
External pressure	Pa	70	100	70	100
Sound power level, cabinet	Lw dB(A)	51	53	54	56
Sound pressure, cabinet at 1 metre ³	Lp dB(A)	47	49	50	52

Duct, sound data

The table shows the technical sound data for HCV 3 and HCV 5.

Specification	unit	HCV 3		HCV 5	
63 Hz (supply/extract)	Lw dB(A)	34/35	36/37	37/38	38/39
125 Hz (supply/extract)	Lw dB(A)	40/38	42/40	42/41	44/43
250 Hz (supply/extract)	Lw dB(A)	43/40	45/43	53/50	55/52
500 Hz (supply/extract)	Lw dB(A)	44/44	47/47	42/42	45/45
1000 Hz (supply/extract)	Lw dB(A)	36/41	38/43	41/36	43/38
2000 Hz (supply/extract)	Lw dB(A)	27/33	29/33	39/34	40/35
4000 Hz (supply/extract)	Lw dB(A)	19/24	21/26	27/20	29/22
Sound power level, supply air duct	Lw dB(A)	57	59	57	59
Sound power level, extract air duct	Lw dB(A)	56	58	56	58
Sound pressure, supply air duct, 1 metre ²	Lp dB(A)	43	45	43	45
Sound pressure, extract air duct, 1 metre ²	Lp dB(A)	42	44	42	44

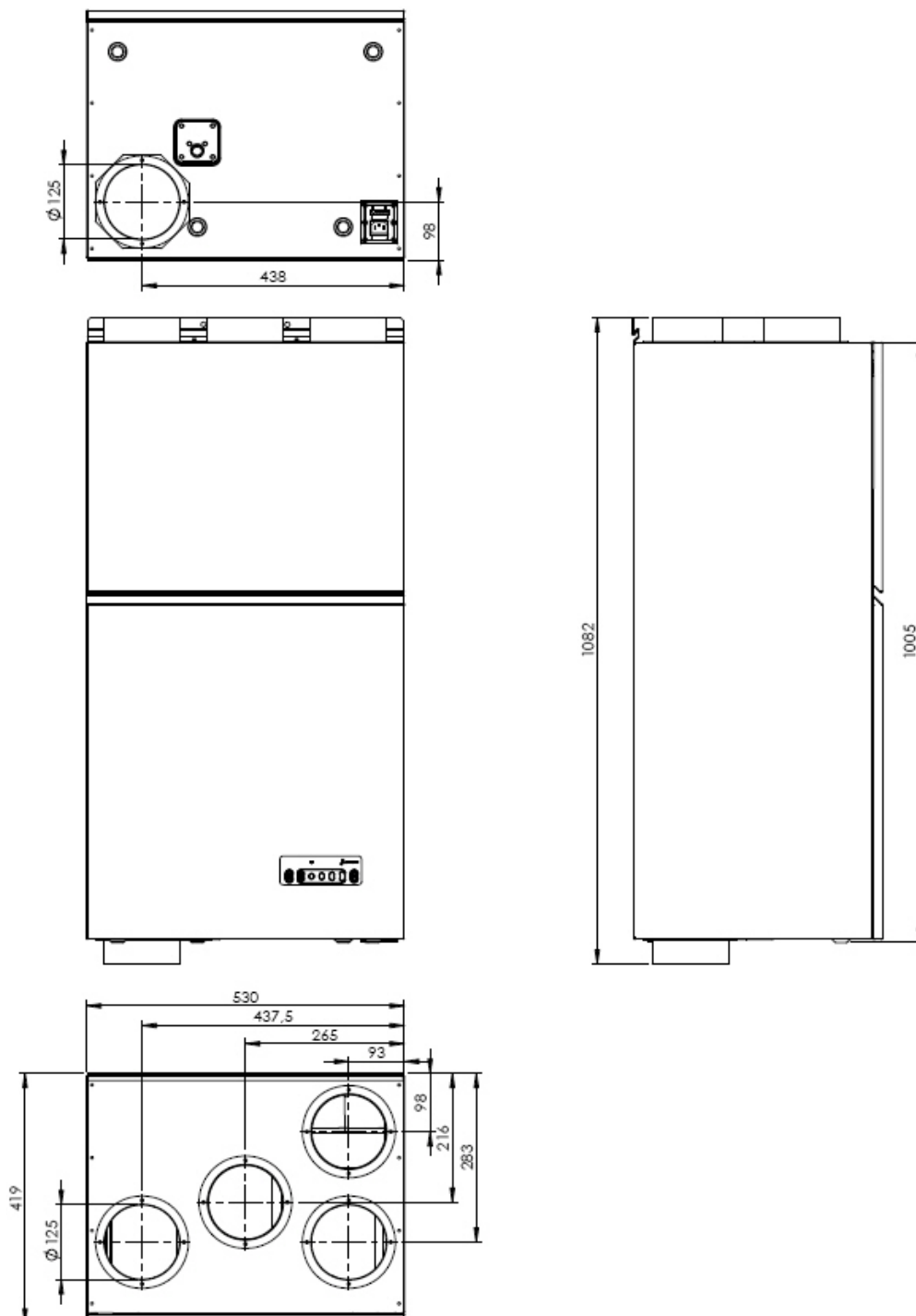
³ Measured in a hard room of approx. 10 m², with 2,5 metres to ceiling and medium absorption.

² Measured at 1 metre distance in free area.

² Measured at 1 metre distance in free area.

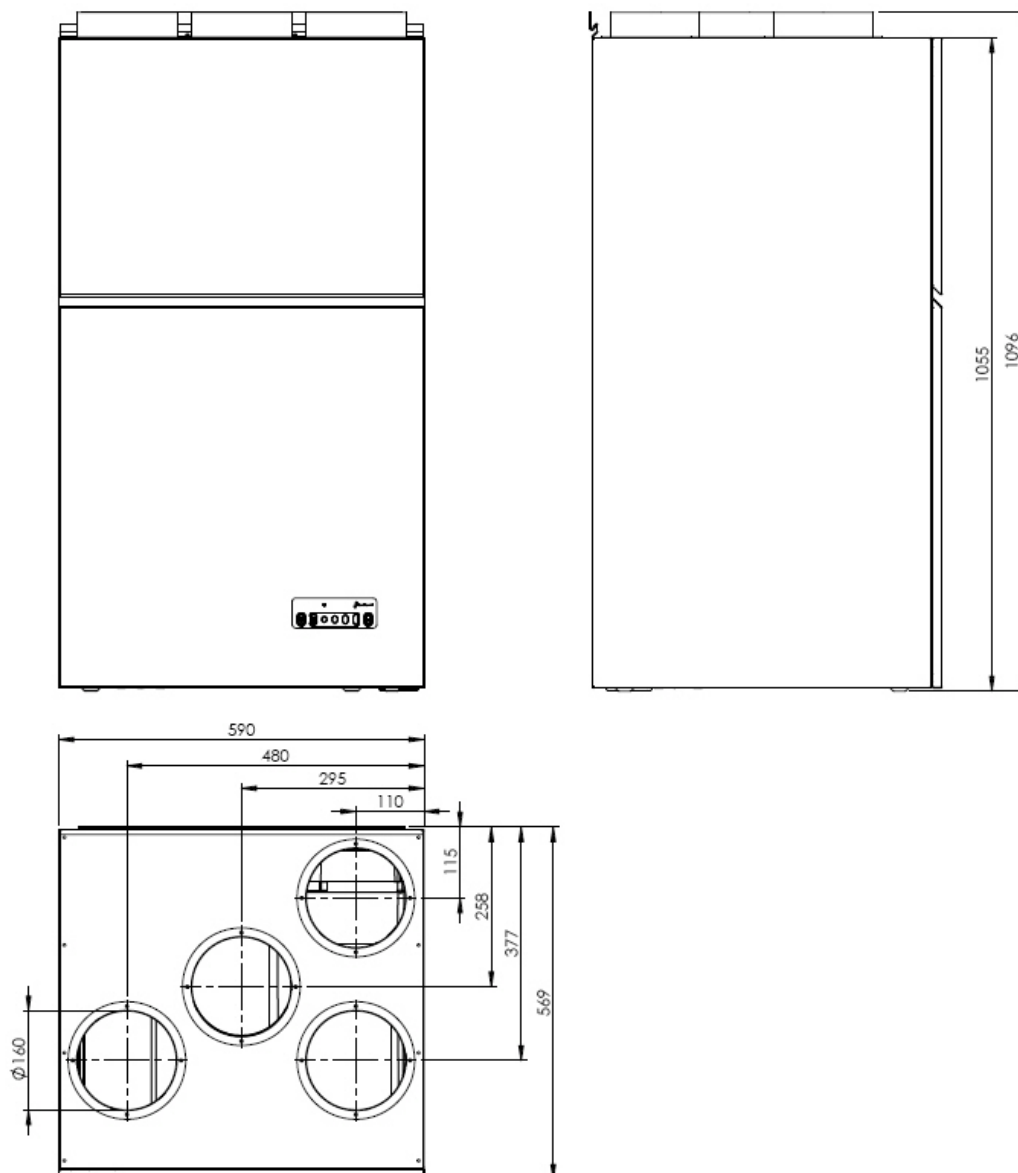
Dimensions, HCV 3

Dimensions of the unit The illustration shows the dimensions of the HCV 3:



Dimensions, HCV 5

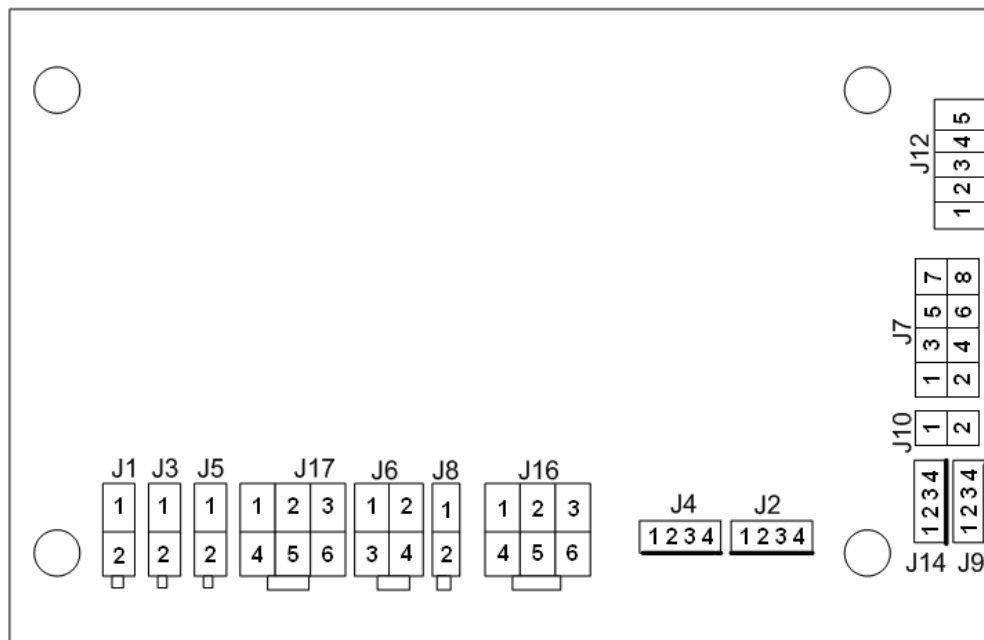
The dimensions of the unit The illustration shows the dimensions of the HCV 5:



Wiring diagram

Diagram

This is the wiring diagram for HCV 3 and HCV 5:



No.	Description	No.	Value
J1	AC Power Input	1	L – 230 VAC +/-15%, 50/60 Hz
		2	N – 230 VAC +/-15%, 50/60 Hz
J2	Exhaust Fan Control	1	Tacho 1
		2	PWM 1
		3	10 V DC
		4	0 V
J3	Exhaust Fan Power	1	L – 230 VAC +/-15%, 50/60 Hz
		2	N – 230 VAC +/-15%, 50/60 Hz
J4	Supply Fan Control	1	Tacho 2
		2	PWM 2
		3	10 VDC
		4	0 V
J5	Supply Fan Power	1	L – 230 VAC +/-15%, 50/60 Hz
		2	N – 230 VAC +/-15%, 50/60 Hz
J6	By-pass AC Power output	1	L – Forward
		2	L – Reverse
		3	N – Jumper
		4	NC
J7	Temperature sensors	1	T1 – NTC – 2kΩ @ 25°C
		2	T1 – NTC – 2kΩ @ 25°C
		3	T2 – NTC – 2kΩ @ 25°C
		4	T2 – NTC – 2kΩ @ 25°C
		5	T3 – NTC – 2kΩ @ 25°C
		6	T3 – NTC – 2kΩ @ 25°C
		7	T4 – NTC – 2kΩ @ 25°C
		8	T4 – NTC – 2kΩ @ 25°C

Continued overleaf

Wiring diagram, *continued*

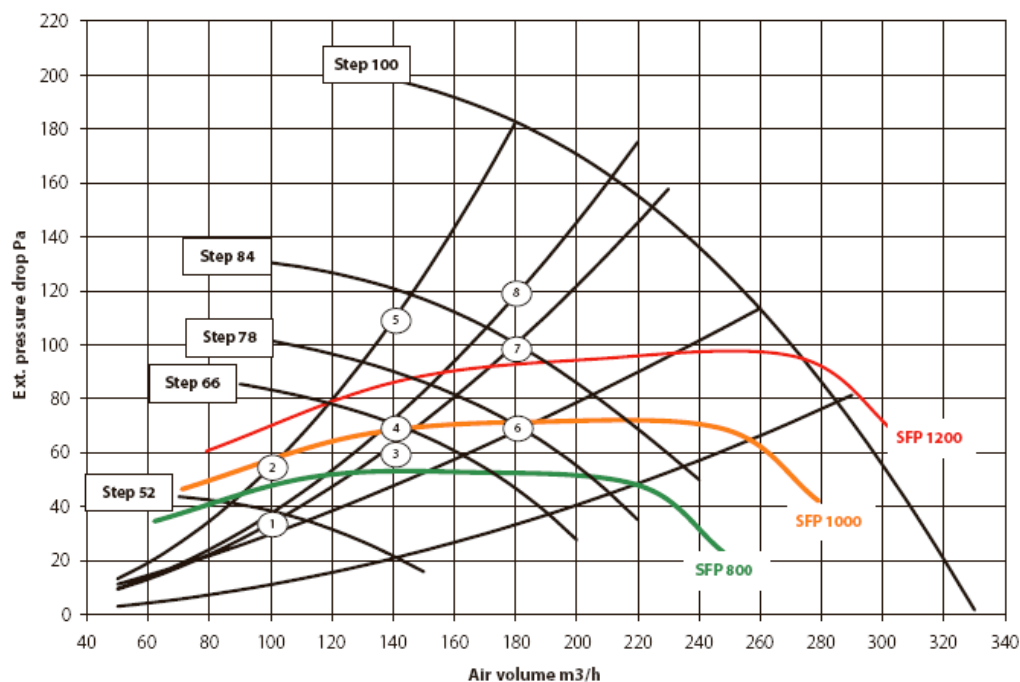
Diagram, *continued*

No.	Description	No.	Value
J8	By-pass DC Power output	1 2	12 V / 0 V 12 V / 0 V
J9	Optional Collector	1 2 3 4	NC NC NC NC
J10	Filter Reset	1 2	+12 V Ext Reset
J12	RS-485 Interface (Modbus)	1 2 3 4 5	+12 V Ext 0 V Ext Earth RS-485 Data + RS-485 Data -
J14	Humidity Sensor RH3	1 2 3 4	+3,3 V SCK (Serial Clock) SDA (Serial Data) 0 V
J16	By-pass Power Jumper (DC)	1 2 3 4 5 6	+12 V for By-pass NC +12 V from Main Board 0 V Ext NC 0 V By-pass
J17	By-pass Power Jumper (AC)	1 2 3 4 5 6	L – 230 VAC for By-pass NC L - 230 VAC from Power Supply N - 230 VAC for By-pass NC N – 230 VAC from Power Supply

Appendix A – Performance and specific fan effect

HCV 3

Performance curve HCV 3



Work items

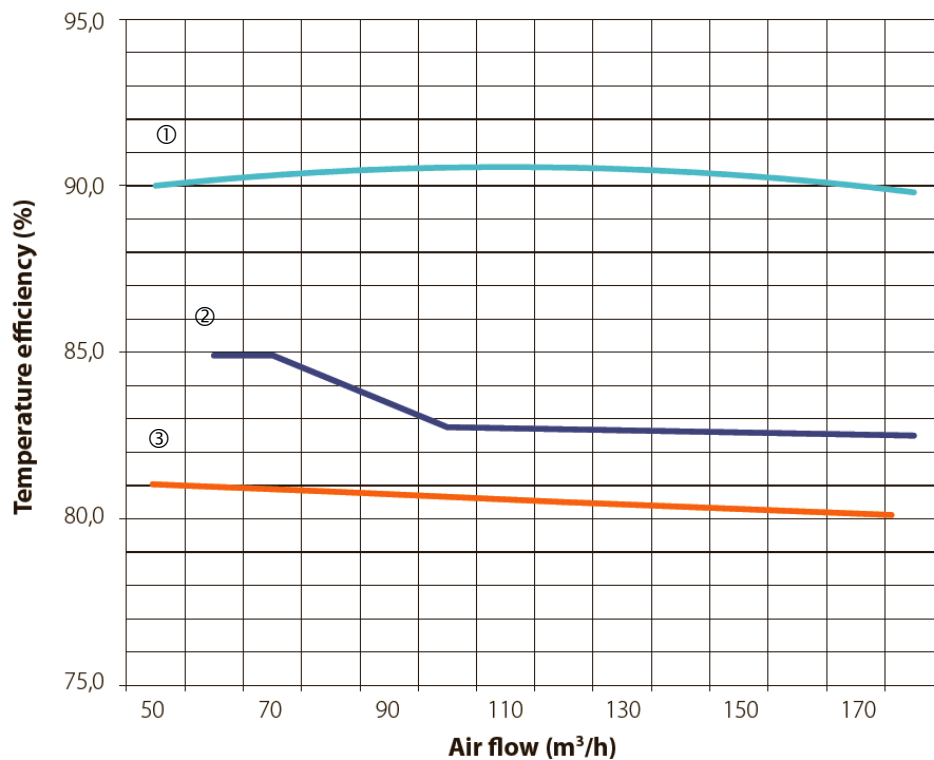
Work item	Air volume m³/h	External pressure loss Pa	Fan step Extract/Supply	SFP J/m³	Power consumption W
①	100	35	49/49	720	20
②	100	55	56/56	864	24
③	140	60	64/62	951	37
④	140	70	66/66	1029	40
⑤	140	110	82/82	1363	53
⑥	180	70	78/76	1000	50
⑦	180	100	84/84	1300	65
⑧	180	120	88/88	1400	70

Continued overleaf

Appendix A – Performance and specific fan effect, *continued*

HCV 3, *continued*

Temperature efficiency HCV 3



① ■
 Temperature efficiency with condensate.
 Extract air = 25°C/55%RH
 Outdoor air = -10°C/50%RH
 Balanced mass flow

② ■
 Temperature efficiency (DiBt).
 Extract air = 21°C/37%RH
 Outdoor air = -3°C/85%RH
 Balanced mass flow

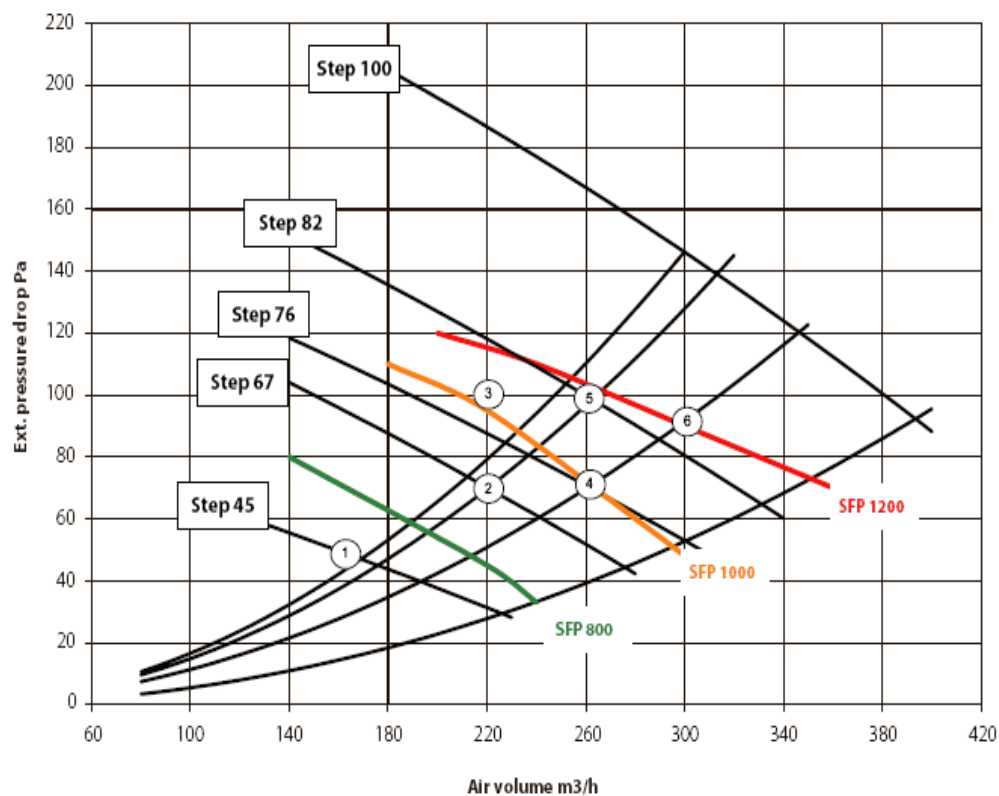
③ ■
 Temperature efficiency (Passivhaus)
 Extract air = 21°C/32%RH
 Outdoor air = + 4°C/90%RH
 Balanced mass flow

Continued overleaf

Appendix A – Performance and specific fan effect, *continued*

HCV 5

Performance curve HCV 5



Work items

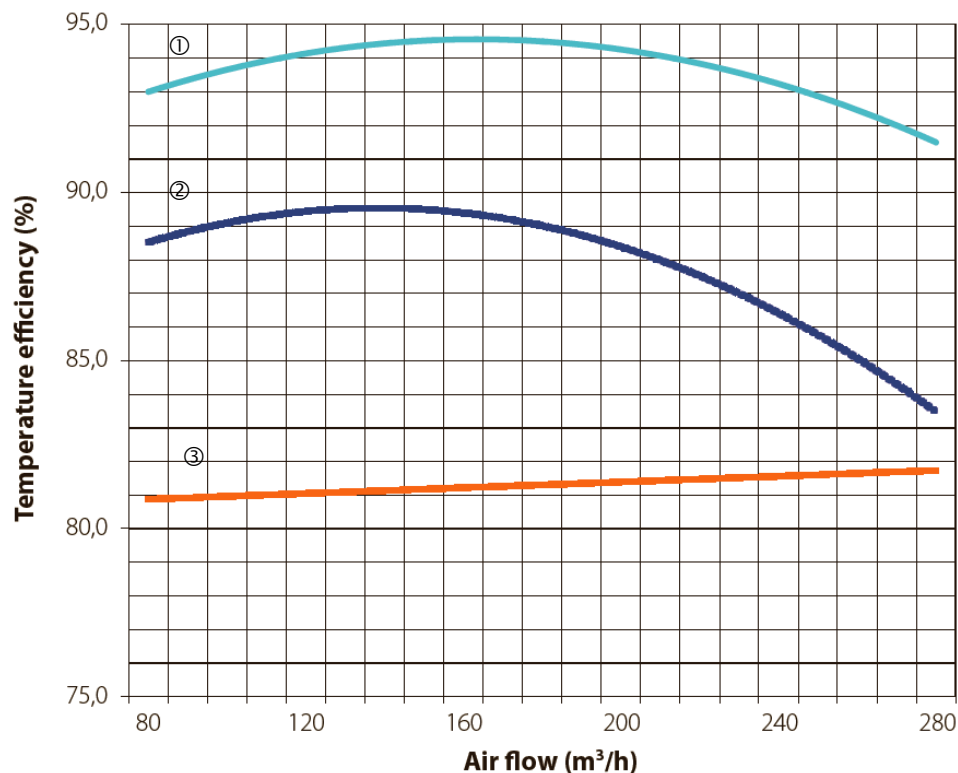
Work item	Air volume m³/h	External pressure loss Pa	Fan step Extract/Supply	SFP J/m³	Power consumption W
①	160	50	45/39	720	32
②	220	70	67/61	867	53
③	220	100	78/72	1047	64
④	260	70	76/70	997	72
⑤	260	100	82/76	1163	84
⑥	300	90	84/78	1200	100

Continued overleaf

Appendix A – Performance and specific fan effect, *continued*

HCV 5, *continued*

Temperature efficiency HCV 5



① ■
 Temperature efficiency with
 condensate.
 Extract air = 25°C/55%RH
 Outdoor air = -10°C/50%RH
 Balanced mass flow

② ■
 Temperature efficiency (DiBt).
 Extract air = 21°C/37%RH
 Outdoor air = -3°C/85%RH
 Balanced mass flow

③ ■
 Temperature efficiency
 (Passivhaus)
 Extract air = 21°C/32%RH
 Outdoor air = +4°C/90%RH
 Balanced mass flow

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