FC6000

EN

No. 014952 • rev. 1.1 • 04.04.2006

Introduction

Overview

Introduction

This is the service manual for the Dantherm Air Handling FC6000 unit.

The table of content below gives you an overview of the main sections. Please see the complete table of content for further information about the sections.

Table of contents

This service manual covers the following main topics:

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Table of content

Introduction

This is the complete table of content covering all sections in this service manual.

Each main section will begin with an introduction including a separate table of content covering the exact section.

Table of content

This service manual covers the following topics:

General information

Introduction

This section gives the general information about this service manual and about the unit.

Manual, part no.

Part number of this service manual is 014952.

Target group

The target group for this service manual are the technicians who install and maintain the FC6000 unit.

Copyright

Reservations

Dantherm Air Handling reserves the right to make changes and improvements to the product and the service manual at any time without prior notice or obligation.

EC-Declaration of Conformity

CE

Dantherm Air Handling A/S, Marienlystvej 65, DK-7800 Skive hereby declare that the units mentioned below:

Product No.:	**Product name:**
360012	FC6000
360013	FC6000

are in conformity with the following directives:

98/37/EEC	Directive on the safety of machines
73/23/EEC	Low Voltage Directive
89/336/EEC	EMC Directive
97/23/EEC	The Pressure Equipment Directive

- and are manufactured in conformity with the following standards:

EN 292	Machine Safety
EN 60 335-1	Low Voltage
EN 60 335-2	Low Voltage
EN 61 000-6-2	Immunity
EN 60 000-6-3	Emission

Skive, 30.10.2003

Managing director Per Albæk

Project manager

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

Overview

Introduction

This section will give you a description of the FC6000 and its functionality.

Content

This section covers the following topics:

General description

General description

The FC6000 unit is a mono block microprocessor controlled Heat Management System especially designed for cooling of electronic equipment and for outdoor installation. The unit requires access to the enclosure through slots on the backside of the unit.

The unit contains heater and fan. This ensures that the unit will work in extreme temperatures ranging from -40 °C and up to +55 °C for both versions.

The unit must under no conditions be used for other purposes and should be installed and placed according to the instructions in this manual.

Active parts

The active parts that are controlled by the control board are:

- Heater element
- Damper
- Fan

Function

The controller will operate these elements mainly based on the temperature reading of the return air sensor. This sensor is placed in the return air duct giving a good representation of the enclosure temperature.

Definitions

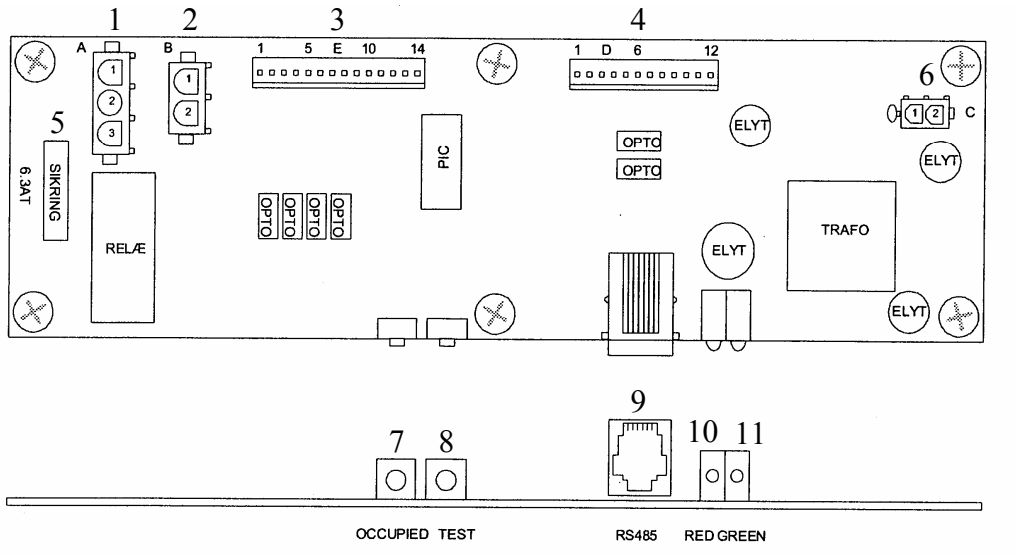
The following terms for temperatures are used in this manual:

- Ambient temperature is the outside air temperature
- Return Air temperature is the temperature of the air entering the FC6000 from the electronic equipment

Indicators and connections

Drawing

The drawing contains numbers that corresponds to the table above.



Buttons , indicators and fuses

The table contains numbers that corresponds to the drawing below:

Ref.	Description
1	3 pin connector: Pin 1: Mains live, Pin 2: Unused, Pin 3: Mains neutral
2	2 pin connector: Pin 1: Heater live, Pin 2: Heater neutral
3	14 pin connector: Pin 1,2: Alarm 1 NC, Pin 3,4: Alarm 2 NC, Pin 5,6: Alarm 3 NC, Pin 7,8: Split cooling NO, Pin 9,10: Close damper input NO, Pin 11,12: Smoke alarm input NO, Pin 13,14: Occupied NO
4	12 pin connector: Pin 1, 2: Return sensor, Pin 3,4: Ambient sensor, Pin 5,6: Filter guard NO, Pin 7: Damper supply 0 VDC, Pin 8: Damper direction control, Pin 9: Damper supply 48 VDC +, Pin 10: DC fan 0V, Pin 11: DC fan RPM output, Pin 12: DC fan PWM input
5	Fuse: 6.3 A for heater
6	2 Pin connector: Pin 1: 48 V DC +, Pin 2: 0 V DC
7	Occupied button – see section “Product description”, page 6 for details
8	Test button – see section “Product description”, page 6 for details
9	RS485 connector: Pin 1: 24VDC+, Pin 2,5: RS485B, Pin 3,4: RS485A, Pin 6: 0 VDC
10	Red LED – lit in case of fault. See section “Fault finding guide”, page 38 for details on faults
11	Green LED – lit under normal conditions, flashing during start-up sequence

Test facility

Test function

A push button – reachable from the internal side – is supplied for a quick test. This will help to identify faulty components. Once pressed, a 4 stage test is performed as described in the table below:

Step	Heater	Damper	Fan	Alarm 1-3 Split output	Duration
1	ON	CLOSING	1400 RPM	Deactivated	40 sec.
2	OFF	CLOSING	600 RPM	Deactivated	25 sec.
3	OFF	OPENING	1470 RPM	Deactivated	35 sec.
4	OFF	OPENING	600 RPM	1 Jingle with 2 sec. interval	20 sec.

Occupied function

Beside the test button an occupied button is present.

The occupied facility is used when the controller is placed in a telecom shelter. Once activated for 1-2 sec. the set points for heater is fixed at 18 °C – to make a comfort climate in the shelter. The internal fan strategy will also change to reduce the noise.

The occupied mode will be activated for an hour but can be terminated if the function again is activated shortly. If the occupied control is permanently activated it will last as long as activated.

Control strategy

Strategy

This is the strategy after which the unit controls:

Designation	[°C]	Up	Down	[°C]	Designation
Control temperatures are return air – warm air from the shelter.					
	70			70	
	60			60	
	55			55	
	50			50	
	45			45	
High temperature alarm	40			40	
	38			38	High temperature alarm off
	35			35	
	30			30	
Signal to start split unit (If present)	25			24	Plit unit stop (if present)
Internal fan max speed	24			24	Internal fan starts reducing speed
Internal fan ramp up	21			21	Internal fan idle 600 rpm
Damper open (if outside temperature is lower than inside)	20			18	Damper close
Heater off	12			10	Heater on
Low temperature alarm cleared	6			5	Low temperature alarm
	-5			-5	
	-10			-10	
	-15			-15	
	-20			-20	
	-25			-25	
	-30			-30	
Internal fans idle speed - 600 rpm	-33			-33	

Get ready for use

Overview

Introduction

This section contains both a description on how to mount and how to connect the unit.

How to mount the unit

Unpacking

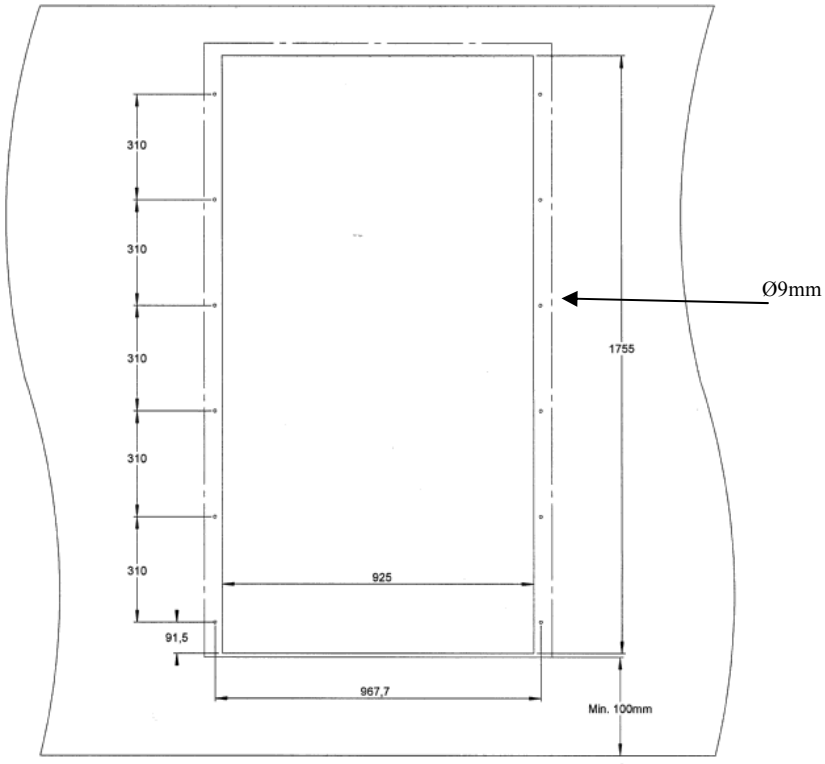
The unit is delivered in a cardboard box on a pallet. The units must be unpacked carefully and before installation the following must be checked:

That the voltages on the label of the unit corresponds to the voltages available in the shelter.

That all terminal screws in the unit are tightened. Especially the screws connecting the AC and DC mains and the relays to the compressor and heater might have gone loose due to transportation.

Mounting: Making slot

The first step is to make the hole (slot) in the wall for the air in- and outlet. The following sketch illustrates this:

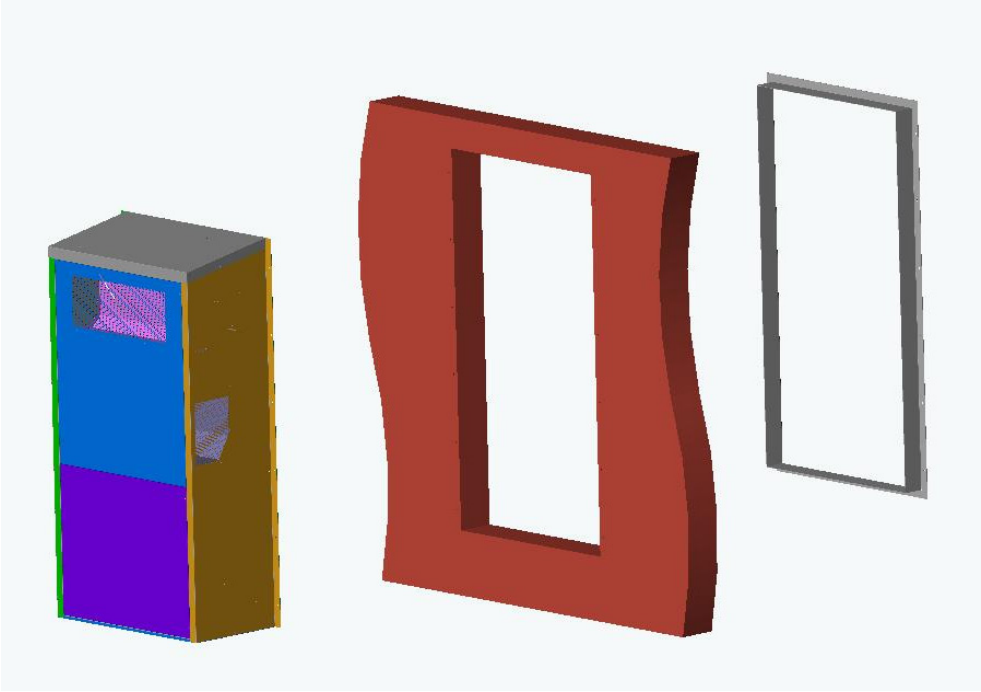


Continued overleaf

How to mount the unit, *continued*

Mounting: louver

The louver should be mounted as illustrated here. A sealing around the unit must close the gab between the wall and unit completely:



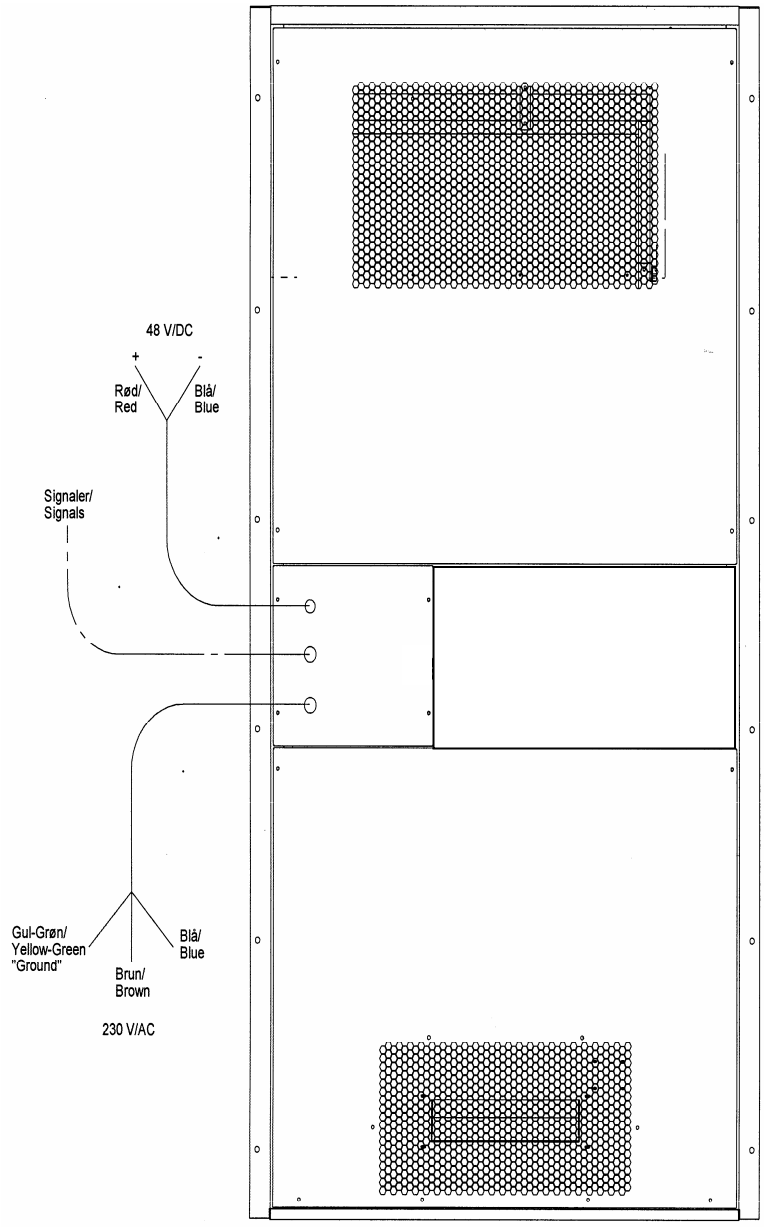
NOTE!

The external covers are fastened with security torx screws. A special bit is included.

How to connect the unit

Connections

The unit is equipped with cables for signals, AC and DC supply, as shown below.



CAUTION!

The unit must be equipped with a circuit breaker. Discarding this could damage the unit. See section called “Technical information’s - Technical data” for details.

Continued overleaf

How to connect the unit, *continued*

Signals

This scheme describes the signal cable.

Colour	Application
White	Alarm 1 - Normally Closed function: Filter clogged
Brown	
Green	Alarm 2 - Normally Closed function: Low return temperature (5 °C below heater set point) High return temperature (Higher than 39.9 °C) High ambient temperature (Higher than 39.9 °C)
Yellow	
Grey	Alarm 3: DC fan fail (Missing rotational pulses) Smoke alarm Return sensor fail (Missing or short circuited) Ambient sensor fail (Missing or short circuited)
Pink	
Blue	Split-cooling output. Normally open function.
Red	
Black	Close damper input. +24V DC
Purple	Close damper input GND
Grey/Pink	Smoke alarm input. +24V DC
Blue/Red	Smoke alarm input GND
White/Green	Occupied input. +24V DC
Brown/Green	Occupied input. GND

Service guide

Overview

Serial numbers

All requests for information, service or parts should include serial number.

Product model and serial numbers are available from the nameplate, which is located on the outside of the unit.

Product No.:	Product name:
360012	FC6000

Contents

This section covers the following topics:

Preventive maintenance

Introduction

The air conditioner contains moving mechanical parts. Also the units are often placed in rough environments, with high temperatures, humidity and dirt. To keep the air conditioner in a shape where it will meet the specifications, preventive maintenance has to be carried out.

Caution!

Do not start working on the unit before both the DC and AC supply are safely switched off. Do not switch it on before all the work has been performed and the unit is ready for the computer test.

Necessary tools

When performing preventive maintenance the following tools should be used:

Use a…	To…
Vacuum cleaner or compressed air	Carefully clean the unit
Soft bristle brush	Remove dirt that the vacuum cleaner or compressed air could not remove
Screwdriver and torx	Tighten loose screws

Interval

Like a car the units needs to be maintained at regular intervals to prevent an overheated situation causing the electronic to shut down. The lack of maintenance could also cause pollution to the environment.

The interval between the preventive visits should not exceed 6 month. The planning of the visits should insure that a visit is done before and after the hot season. This will insure that the air conditioner will be ready when the demand for cooling is high.

Condition for warranty

The factory warranty is only valid if documented preventive maintenance has been carried out with an interval of maximum 6 month. The documentation could be in form of a written log on the site, or a report from the computer test program.

Recommended approach

The recommended approach when performing a preventive maintenance visit is:

Step	Action
1	Make sure that the power to the unit is safely switched off
2	Clean the unit carefully: • Air ducts • Fan • External filters
3	Perform the ”tasks” using the checklist
4	Switch the unit on again
5	Perform a computer test simulating all temperatures within the specified temperature range. Alternatively a self-test can be performed by pushing the test button and making sure that the unit performs corresponding to the test specifications. See “Functional description - Test facility” for details

Continued overleaf

Preventive maintenance, *continued*

Tasks

The following must be checked when performing the preventive maintenance visit:

Item	Yes	No
Are the fans clean and free of corrosion?		
Is the fan mounted securely and free of excessive vibration?		
Are all fan blades free of obstruction, cracks, missing blades and in balance?		
Do the fans rotate freely and are they free from excessive vibration or noise?		
Is all wiring and insulation free of damage?		
Are all connectors sealed properly and in good condition?		

Computer test

A computer test has been developed to test the unit. Please see the manual included with the test equipment.

Leaving the site

Before leaving the site, make sure that there are no alarms and that the BTS is in operation.

Spare parts

Overview

Introduction

This section gives you a list of all available spare parts and under which number, they should be ordered.

Furthermore the section contains an instruction in replacing the spare part.

Contents

This section contains the following topics:

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Spare parts list

Spare parts

The following table concludes all spare part numbers for FC6000:

Spare part	Order number
External filter, side	296014
External filter, front	296015
Filter	296017
Fan	296016
External controller for fan	296019
Control board	296018
Damper motor	296020
Heater element	296021
Sensor	010532

How to replace the filter

Introduction

The purpose of the filter is to ensure that dirt and humidity from the ambient air is not let through to the electronic equipment.

When to replace

The filter must be replaced with a maximum of 6 month interval

Before you start

Make sure that you have the following available before you start:

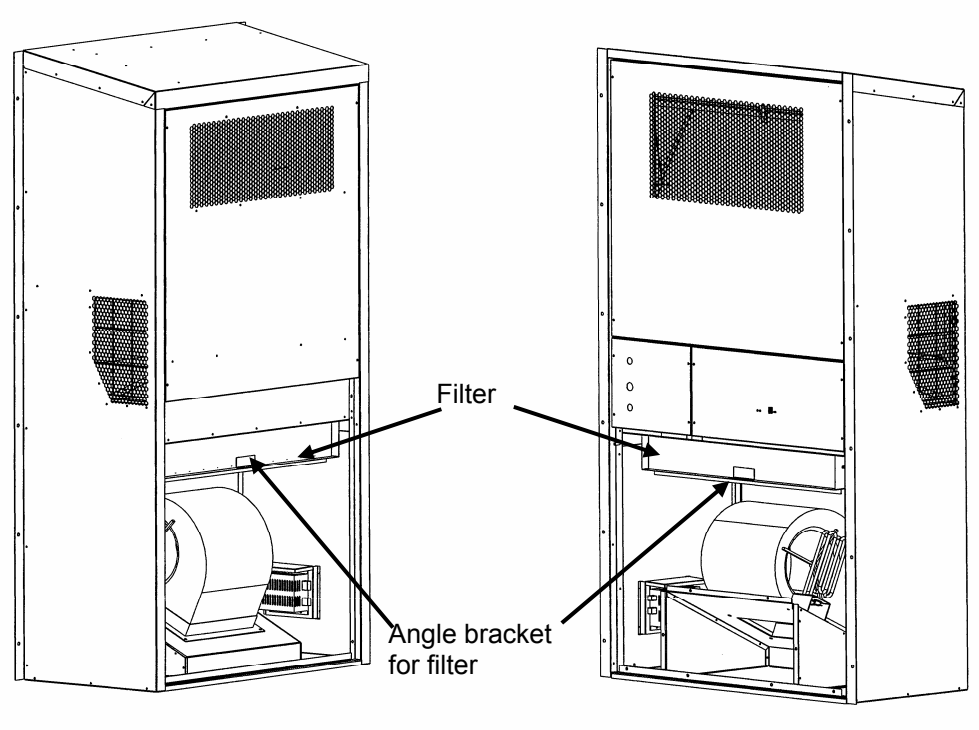
- A torx 25 safety screwdriver

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the filter is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the filter:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Switch off all power to the unit</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>From the internal side</th><th>From the internal side</th></tr>
<tr><td>Unscrew the 4 safety torx 25 screws holding the internal top cover in place and remove it</td><td>Unscrew the 4 torx 25 screws holding the top front cover in place and remove it</td></tr>
<tr><td colspan="2">Remove the angle bracket holding the filter in place. It is mounted with a single torx 25 screw</td></tr>
<tr><td colspan="2">Remove the old filter by sliding it back from the brackets</td></tr>
<tr><td colspan="2">Slide the new filter in the brackets; make sure that it is fully in place</td></tr>
<tr><td colspan="2">Mount the angle bracket</td></tr>
<tr><td>Remount the internal top cover</td><td>Remount the external top cover</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Switch on power</td></tr>
<tr><td>4</td><td>Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual</td></tr>
</table>

How to replace the frontal external filter

Introduction

The purpose of the filter is to ensure that snow from the ambient air is not let through to the unit.

When to replace

It is not necessary to change the filter unless it is damaged

Before you start

Make sure that you have the following available before you start:

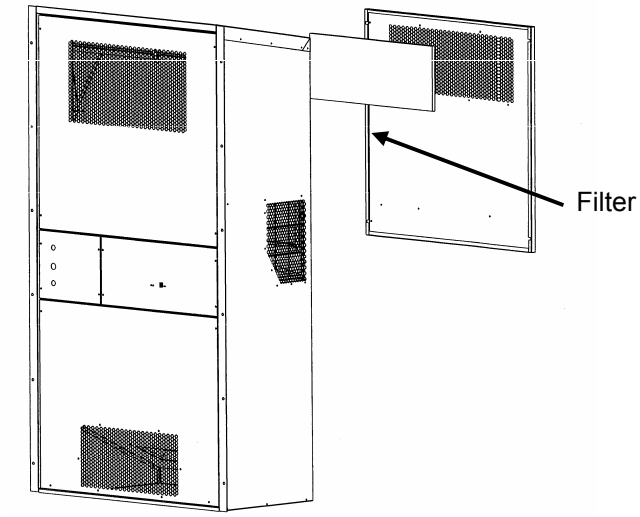
- A torx 25 safety screwdriver
- A filter

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the filter is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the filter:

Step	Action
1	Switch off all power to the unit
2	Unscrew the 4 safety torx 25 screws holding the internal top cover and place it on a table
3	Remove the 2 safety torx 25 screws holding the frame containing the filter in place from the outside.
4	Remove the frame
5	Replace the filter with a new one
6	Remount the frame by performing step 2 – 3 in reverse order.
7	Switch on all power to the unit
8	Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual

How to replace the side external filter

Introduction

The purpose of the filter is to ensure that snow from the ambient air is not let through to the unit.

When to replace

It is not necessary to change the filter unless it is damaged.

Before you start

Make sure that you have the following available before you start:

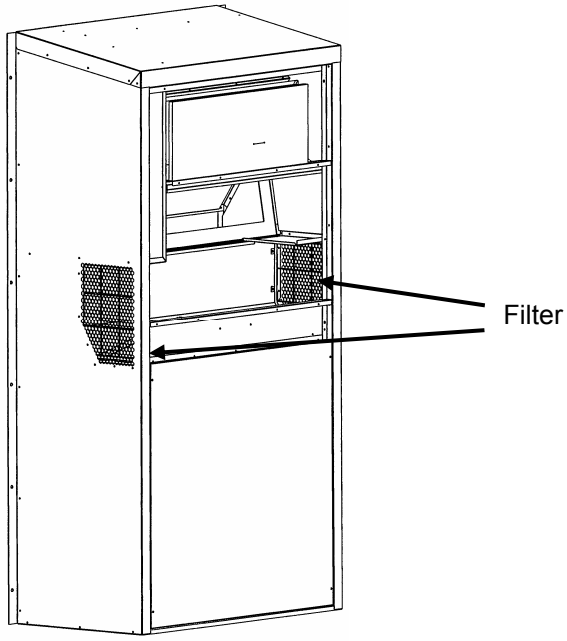
- A torx 25 safety screwdriver
- A filter

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the filter is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the filter:

Step	Action
1	Switch off all power to the unit
2	Unscrew the 4 safety torx 25 screws holding the internal top cover in place and remove it
3	Remove the 4 torx 25 screws holding the frame containing the filter in place
4	Remove the frame
5	Replace the filter with a new one
6	Remount the frame by performing step 2 – 3 in reverse order
7	Switch on all power to the unit
8	Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual

How to replace the internal fan

Introduction

The fan is placed behind the cover at the bottom of the FC6000. It can be reached from either side of the unit. It has the purpose of circulating the air inside the indoor enclosure or cool with ambient air through a filter.

When to replace

The fan only needs to be replaced when it is faulty or as part of a long time replacement plan. The recommended is after app. 5 years.

Before you start

Make sure that you have the following available before you start:

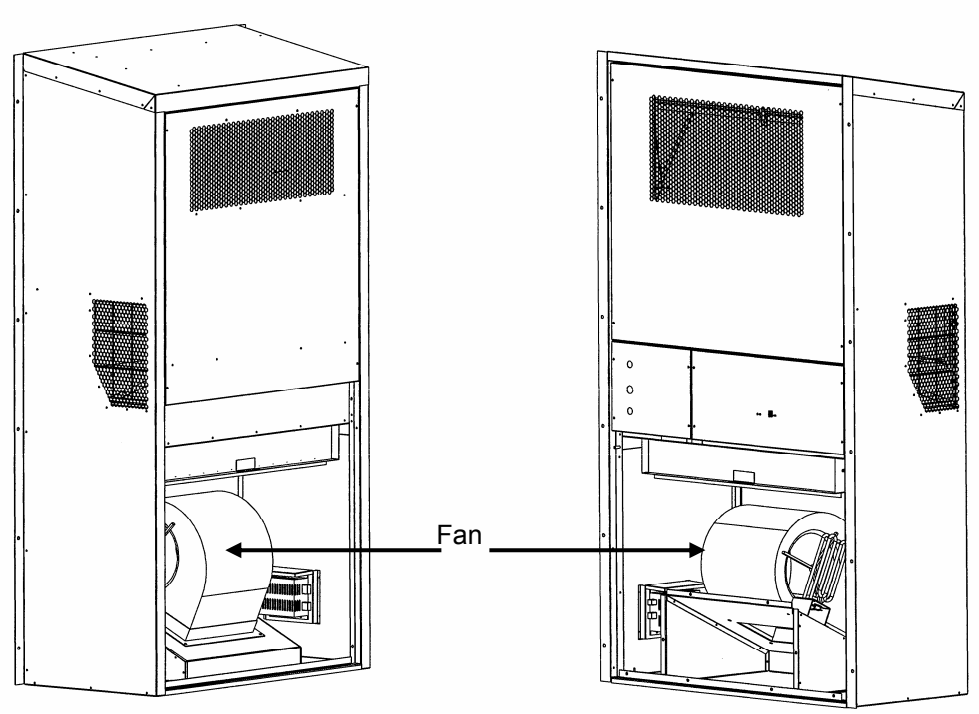
- A safety torx 25 screwdriver
- A new internal fan

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the fan is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the fan:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Switch off all power to the unit</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>Replacing from internal side</th><th>Replacing from external side</th></tr>
<tr><td>Remove the internal bottom cover mounted with 10 torx 25 screws.</td><td>Remove the external bottom cover mounted with 4 safety torx screws.</td></tr>
<tr><td>Remove the filter. See section called “Replacing the filter”</td><td>-</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Unplug the two connectors</td></tr>
<tr><td>4</td><td>Unscrew the 4 10mm bolts holding the fan in place</td></tr>
<tr><td>5</td><td>Remove the fan</td></tr>
<tr><td>6</td><td>Mount the new fan by performing step 2 – 4 in reverse order</td></tr>
<tr><td>7</td><td>Switch on all power to the unit</td></tr>
<tr><td>8</td><td>Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual</td></tr>
</table>

How to replace the external controller for the internal fan

Introduction

The external controller is placed near the fan in the bottom section of the unit. It can be replaced from both sides of the unit.

When to replace

The external controller only needs to be replaced when it is faulty.

Before you start

Before you start make sure that you have the following available:

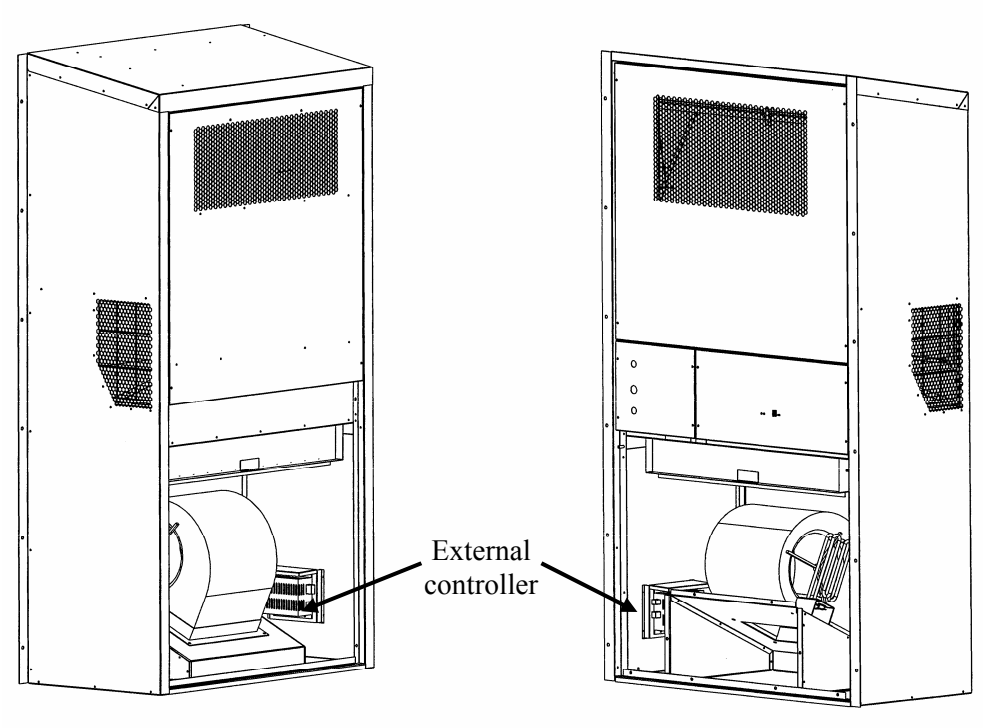
- A Torx 25 screwdriver
- A new external controller

Caution!

Only trained and certified technicians are allowed to carry out replacement of parts Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the external controller is placed:



External side Internal side

Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the extern electronic:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Switch off all power to the unit</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>Replacing from internal side</th><th>Replacing from external side</th></tr>
<tr><td>Remove the internal bottom cover mounted with 10 torx 25 screws.</td><td>Remove the external bottom cover mounted with 4 safety torx screws.</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Unplug the 4 connectors</td></tr>
<tr><td>4</td><td>Unscrew the 4 torx 25 screws</td></tr>
<tr><td>5</td><td>Remove the box</td></tr>
<tr><td>6</td><td>Mount the new box by performing step 2 – 4 in reverse order</td></tr>
<tr><td>7</td><td>Switch on all power to the unit</td></tr>
<tr><td>8</td><td>Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual</td></tr>
</table>

How to replace the control board

Introduction

The control board is a microprocessor equipped PCB with input/outputs to all the electrical part of the FC 6000. It controls the fan based on inputs from 2 sensors placed in the unit.

When to replace

The control board only needs to be replaced when it is faulty.

Before you start

Before you start make sure that you have the following available:

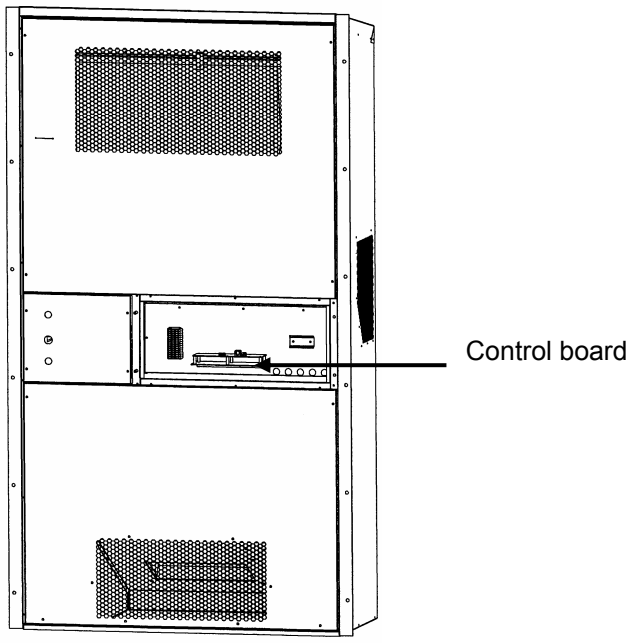
- A torx 20/25 screwdriver
- A new control board

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the control board is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the control board:

Step	Action
1	Switch off all power to the unit
2	Remove the right internal middle cover mounted with 4 torx 25 screws
3	Unplug the 5 connectors and the ground connector
4	Remove the control board by unscrewing the 6 torx 20 screws using a right-angled screwdriver
5	Replace the control board by performing step 2 – 4 in reverse order
6	Switch on all power to the unit
7	Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual

How to replace the heater element

Introduction

The purpose of the heater elements is to keep the temperature on an adequate level at low ambient temperatures.

When to replace

Only faulty heater elements need to be replaced.

Before you start

Make sure you have the following available before you start:

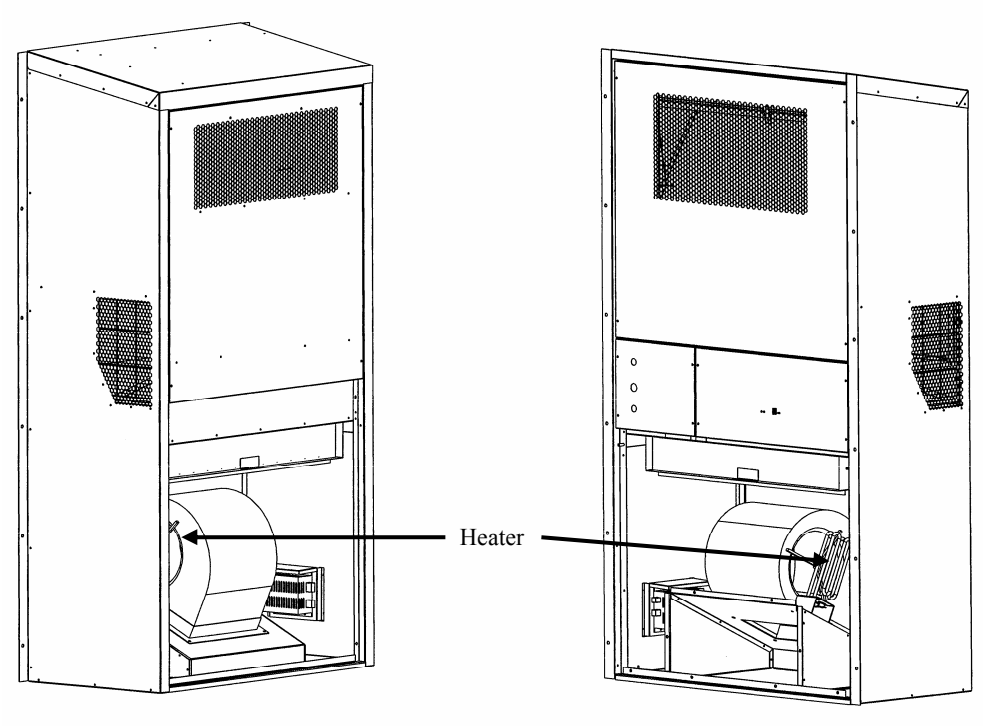
- A torx 25 screwdriver
- A new heater element

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the heater element is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the heater element:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Switch off all power to the unit</td></tr>
<tr><td>2</td><td>
<table>
<tr><th>Replacing from internal side</th><th>Replacing from external side</th></tr>
<tr><td>Remove the internal bottom cover mounted with 10 torx 25 screws.</td><td>Remove the external bottom cover mounted with 4 safety torx screws.</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>The heater is mounted on a consol. Remove the 4 torx 25 screws holding the consol</td></tr>
<tr><td>4</td><td>Turn the heater and consol upside down and unplug the connectors</td></tr>
<tr><td>5</td><td>Replace the heater by performing step 2 - 4 in reverse order</td></tr>
<tr><td>6</td><td>Switch on all power to the unit</td></tr>
<tr><td>7</td><td>Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual</td></tr>
</table>

How to replace the damper motor

Introduction

The damper motor opens and closes the damper as determined by the control board.

When to replace

The damper motor only needs to be replaced when it is faulty. The typical fault would be that the damper does not move at all.

Before you start

Make sure that you have the following available before you begin:

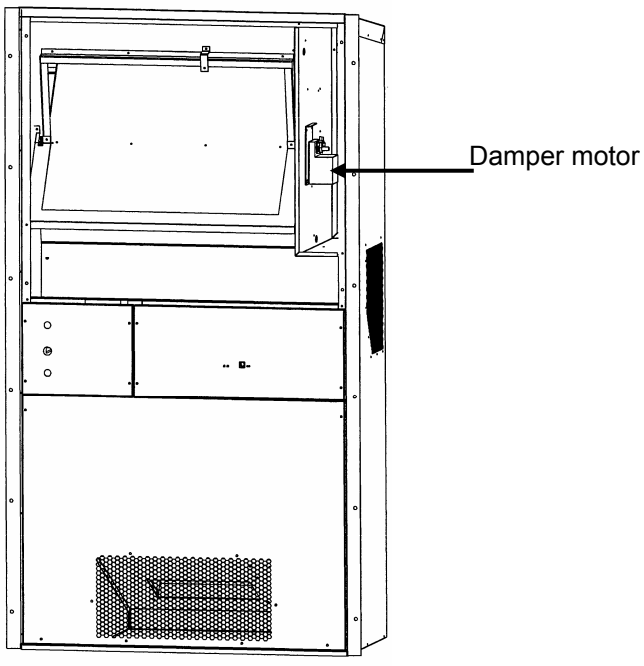
- A torx 25 screwdriver
- A 10 mm wrench
- A PZ2 screwdriver
- A new damper motor

Caution!

Only trained and certified technicians is allowed to carry out the replacement of parts. Remember that all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Illustration

This illustrates where the damper motor is placed:



Continued overleaf

How to replace the filter, *continued*

Procedure

Follow these steps to replace the damper motor:

Step	Action
1	Switch off all power to the unit
2	Pull the Danline out from the wall
3	Unscrew the 4 torx 25 screws that keep the internal back cover in place
4	Loosen the two 8 mm nuts holding the damper motor fastened to the shaft for the damper
5	Pull the damper motor up and back
6	Mount the new damper motor, by following the steps from 2 to 5 in reverse order
7	Switch on power
8	Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual

How to replace the sensors

Introduction

The 4 sensors mounted in the FC6000 unit is:

- Ambient sensor
- Return air sensor
- Supply air sensor
- Condenser sensor

All the sensors are part of the cable set and are mounted without any separate connector. Therefore the replacing a sensor is done by cutting the sensor and solder a new one on.

When to replace

The sensor only needs to be replaced when faulty.

Caution!

Replacement of parts must only be carried out by trained and certified technicians and all power to the unit must be switched OFF or disconnected before starting any service work on the unit.

Before you start

Before you start replacing any of the sensors make sure that you have the following available:

- A torx 25 screwdriver
- A pair of cutting pliers
- A soldering iron with solder
- A new sensor

Procedure

Follow this procedure for replacing any of the sensors:

Step	Action
1	Switch off all power to the unit
2	Locate the sensor and use the pliers to cut it off, close to the sensor
3	Solder a new sensor on and make sure that the wires do not short circuit and that the isolating cable is put back in place
4	Switch on power again
5	Perform a self-test by pushing the test button and making sure that the unit performs corresponding to the test specifications in the manual

Fault finding guide

Introduction

This section will give you an instruction in locating the fault, when the fail LED on the control panel is active.

Signalling lamps

The green LED illuminates as soon as the controller is powered up.

The red fail LED will only illuminate in case of a detected fault. Several types of indication are shown. For further information see the fault detection paragraph.

Sensor failure alarm

Temperature measurements are performed in the range from ÷ 40 °C to + 99 °C. Readings outside this range is regarded as a sensor failure. ÷ 40 °C is regarded as a short-circuit and + 99 °C is regarded as a missing sensor or open loop.

Return air sensor:
A faulty return air sensor will result in the main controlling sensor being regarded as supply sensor with a possible offset. The real measurement of the supply sensor is used during heating. An offset of 10 °C is added during active cooling.

Supply and ambient air sensor:
The ambient air is always regarded as efficient if the supply or the ambient air sensor is defective.

Condenser sensor:
A faulty condenser sensor will result in a fixed medium speed of the condenser fan when operated.

Warning detection

The control board is equipped with three failure or alarm relays giving alarms depending on the degree of the alarm. The Alarm status LED will light up if an alarm, a fault or a warning occurs. Lowest is the WARNING alarm, Alarm 1, activated on the following event:

- Filter clogged

Fault detection

The FAULT situation, Alarm 2, will be initiated by one of the following incidences:

- Low return temperature – 5 °C below heater set point. Cleared 4 °C below
- High return temperature – 40 °C or more. Cleared at 38 °C.
- High ambient temperature – 40 °C or more. Cleared at 38 °C

Alarm detection

The ALARM situation will be initiated by the following incidences:

- The fan is stopped – no rotational pulse
- Smoke alarm input activated
- Fail on the return air sensor – open or short
- Fail on the ambient air sensor – open or short

Hotline

Introduction

The After Sales Support Department of Dantherm Air Handling A/S is ready to help you in case of a problem.

Information

Please help yourself and us by having the following information prepared before making the call:

Your name			
Company name		Country	
Phone number		Email	
Type (unit)		Serial/order No.	
Site/location (unit)			

Description of the problem

Here you can write down a description of the problem:

Contact

Contact Dantherm Air Handling A/S, ask for the service department and help will be provided as soon as possible:

Phone: +45 96 14 37 00

Fax: +45 96 14 38 00

Email: service@dantherm.com

Service agreement

Introduction

The unit includes mechanical parts such as fans, dampers, compressors etc. The unit is often placed in a rough environment where the components are exposed to different climate conditions. Therefore the unit will need preventative maintenance on a regular basis.

Dantherm Air Handling A/S offers to do this maintenance as well as corrective and emergency repair on the units so that they at all times will operate according to factory standards.

Preventative maintenance visit

A preventative maintenance visit is a planned visit on a site. The visit could include the following:

- An initial computer test, simulating various temperatures
- Cleaning of the unit
- Visual inspection of the unit – checking for leakages, corrosion etc.
- A final computer test of the unit
- Completion of a inspection report

Some of the activities above are not relevant for your product. The visit can also include other activities, for example battery checks.

Corrective and emergency repair

In case of malfunctions of the product Dantherm Air Handling A/S offers to do corrective as well as emergency repair on the climate units. Agreements will be made with the customer on response time and price.

Setup

Dantherm 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.

The agreement will be made with Dantherm Air Handling A/S – and the overall responsibility for the agreement will be Dantherm Air Handling A/S's.

Further information

For further information about a service agreement in your country or region, please contact:

Henrik Hersted
After Sales Support Manager
Dantherm Air Handling A/S
Phone: +45 9614 4767
Mobile: +45 2399 4066
heh@dantherm.com

Technical information

Overview

Introduction

This section contains the technical data for FC6000.

Technical data

Performance

This table shows the performance of the unit:

Specification		Unit	Designation	Data
Load:	total	kW	Heat load, int. fan, solar gain	5,88
	heater	kW	Heat dissipation at nominal voltage	1,0
Flow:	max	m^3/h		2200
Pressure:	operating	kPa	Operating pressure	70-106
Temp.:	ambient	°C	$t_{operate}$	-20 to 35
Noise:	full speed	Db(a)	Sound press. measured 3 meters outside enclosure	47

Cabinet

This table shows the data on the cabinet:

Specification	Unit	Designation	Data
Dimensions:	mm	Height, width, depth	1788x920x487
Weight:	Kg	Weight of unit	100
Material:	mm	Aluzinc with powder paint	0,9 and 2,0
IP-rating	IP	External to internal path (IEC 529)	54

Electrical

This table shows the electrical data of the unit:

Specification		Unit	Designation	Data
DC:	nominel supply	V		48
	range supply	V		36-56
	start current	A	Internal fan	15
	max current	A	Internal fan	7,5
AC:	AC supply	V	AC supply voltage	230
	max current	A	Maximum nominal running current	4,4
Circuit breaker:	DC supply	A		13
	AC supply	A		10

Caution!

It is highly recommended to insert a reparation switch near the unit to insure the safety of a technician working on it.

Storage

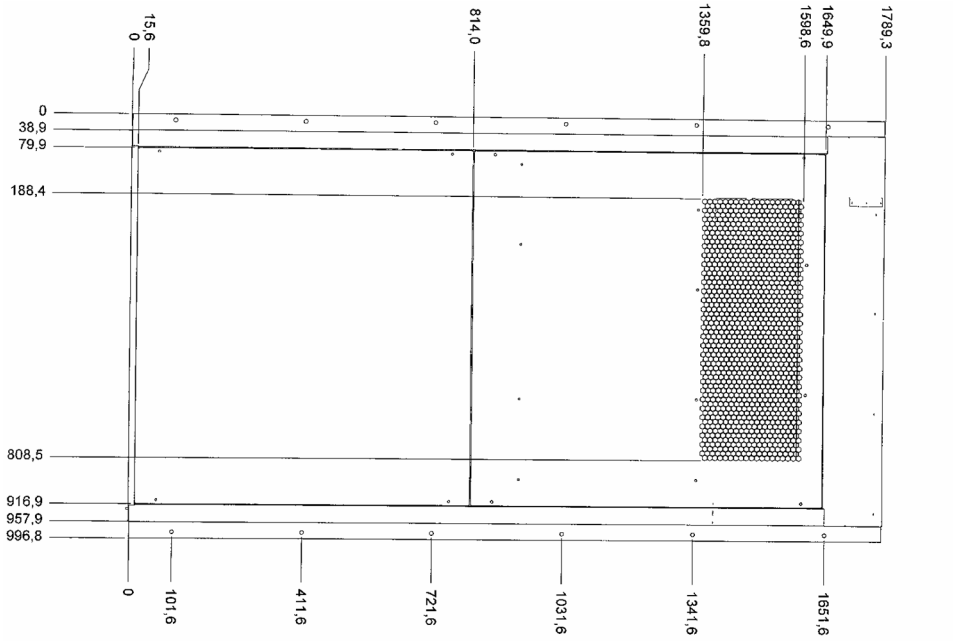
If the unit is stored in a warehouse the following conditions apply:

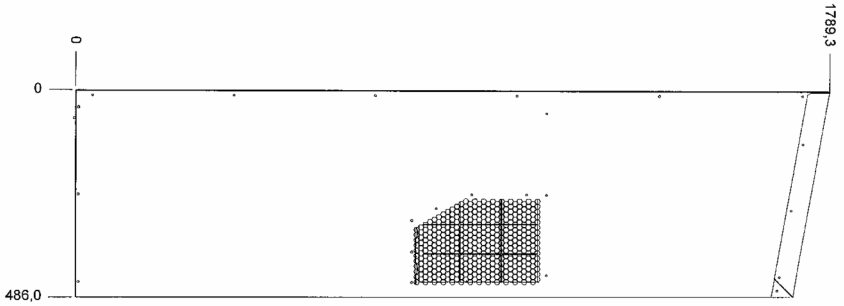
- Temperature range between – 30 °C to +40 °C.
- Relative humidity max. 80 %.
- The unit must be stored in an upright position.

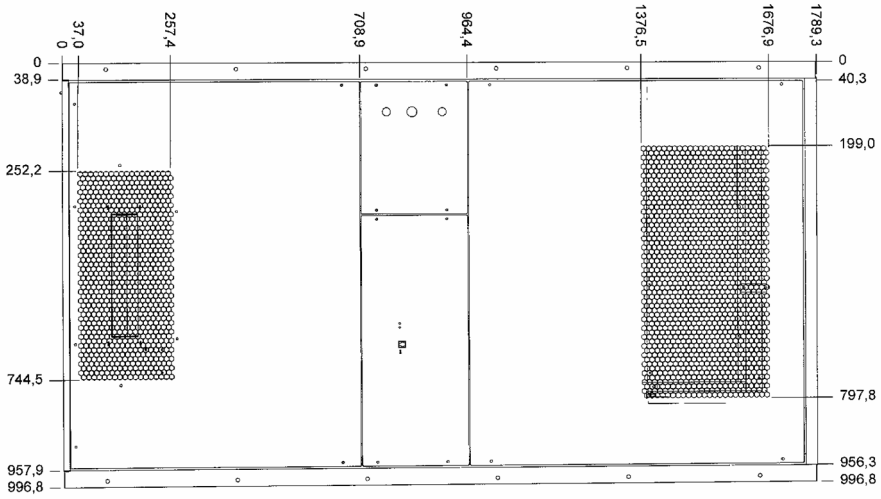
Dimensions

Drawing

The drawing shows the dimensions of the unit. All measurements are in millimetres.



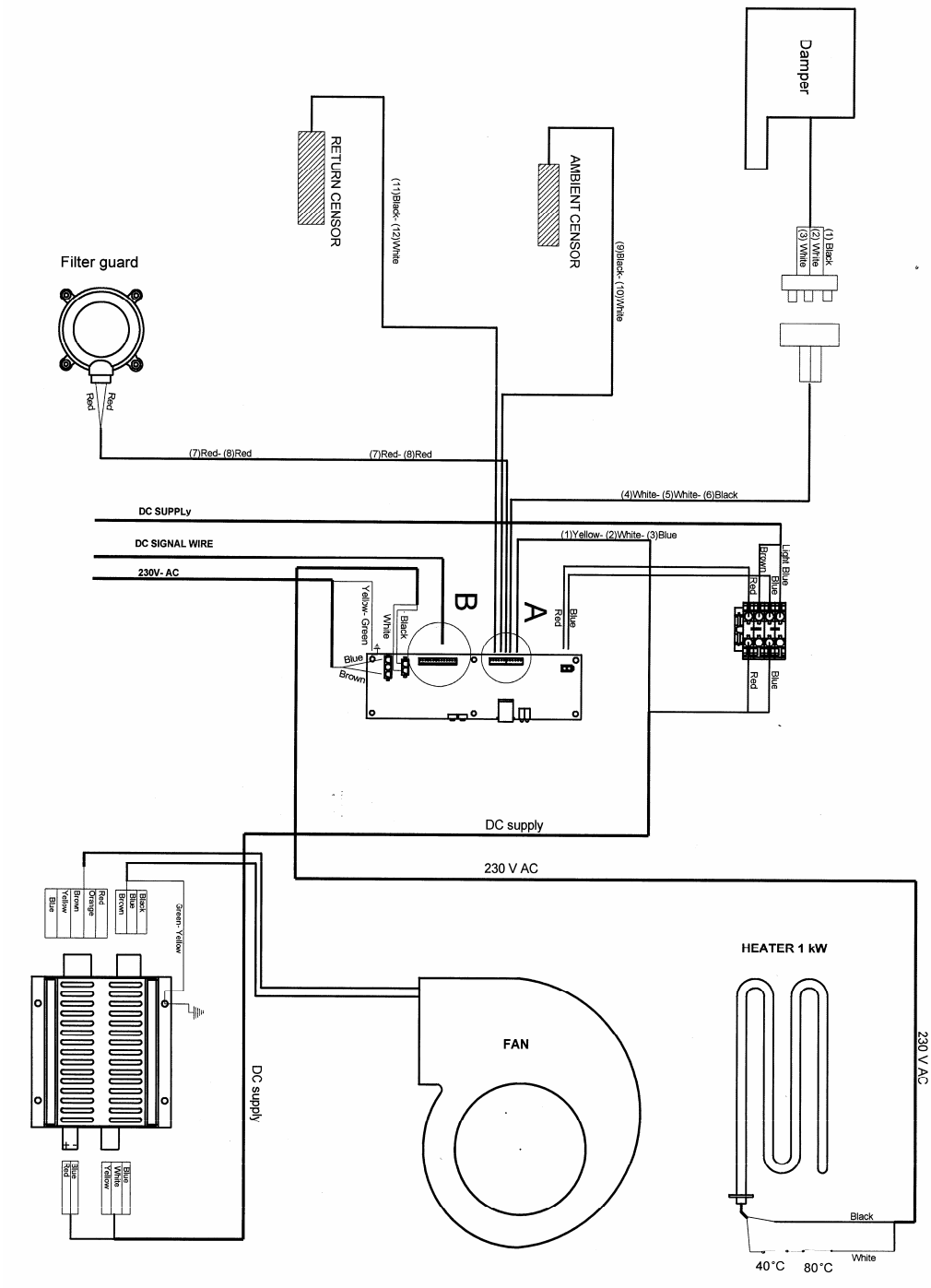




Wiring diagram

Diagram

The letters A and B corresponds to a scheme on the next page.



Continued overleaf

Technical information, *continued*

A

This table corresponds to the letter A on the wiring diagram.

Pin number	Wire colour	Application
1	Yellow	Return temperature sensor
2	White	
3	Blue	Ambient temperature sensor
4	White	
5	White	Filter guard
6	Black	
7	Red	Damper 0V
8	Red	Damper direction control
9	Black	Damper +24V DC
10	White	DC fan 0V
11	Black	DC fan RPM output
12	White	DC fan PWM input

B

This table corresponds to the letter B on the wiring diagram.

Pin number	Wire colour	Application
1	White	Alarm 1 - Normally Closed function: Filter clogged
2	Brown	
3	Green	Alarm 2 - Normally Closed function: Low return temperature (5°C below heater set point) High return temperature (Higher than 39.9 °C) High ambient temperature (Higher than 39.9 °C)
4	Yellow	
5	Grey	Alarm 3: DC fan fail (Missing rotational pulses) Smoke alarm Return sensor fail(Missing or short circuited) Ambient sensor fail (Missing or short circuited)
6	Pink	
7	Blue	Split-cooling output. Normally open function.
8	Red	
9	Black	Close damper input. +24 V DC
10	Purple	Close damper input GND
11	Grey/Pink	Smoke alarm input. +24 V DC
12	Blue/Red	Smoke alarm input GND
13	White/Green	Occupied input. +24 V DC
14	Brown/Green	Occupied input. GND

014952 • Version 1.1 • 04.04.2006