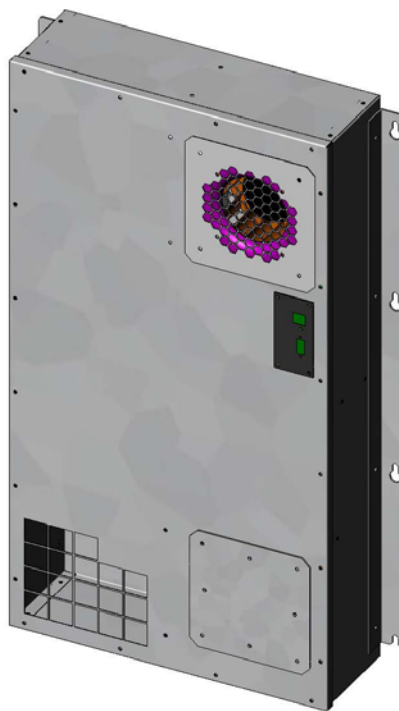


HEX 30

Service manual

EN

No. 061629 • rev. 1.0 • 25.02.2008



Der tages forbehold for trykfejl og ændringer
Dantherm can accept no responsibility for possible errors and changes
Irrtümer und Änderungen vorbehalten
Dantherm n'assume aucune responsabilité pour erreurs et modifications éventuelles

Introduction

Overview

Introduction This is the service manual for the Dantherm Air Handling HEX 30 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.

Serial number This manual covers units with serial numbers equal or higher than:
xxxxxx1131132

Table of contents This service manual covers the following main topics:

Topic	See page
Table of content, complete	next page
General information	5
Product description	6
Mounting and installation	11
Service guide	12
Technical information	23
Index	26

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:

Topic	See page
Introduction	3
Table of content	4
General information	5
Product description	6
Description of the HEX 30 and its parts	7
Control board	8
Functional description	9
Mounting and installation	11
Service guide	12
Preventive maintenance	13
Spare part list	14
How to replace the heat exchanger	15
How to replace the internal fan	16
How to replace the external fan	18
How to replace the control panel	20
Fault finding guide	21
Service agreement	22
Technical information	23
Technical data and dimensions	24
Wiring diagram	25
Index	26

General information

Introduction	This section gives you the general information about this service manual and about the unit.																		
Manual, part no.	Part number of this service manual is 061629.																		
Target group	The target group for this service manual are the technicians who install and maintain the HEX 30 unit as well as the users of the unit.																		
Copyright	Copying of this service manual, 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 service manual 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 style="text-align: center;">352909 HEX 30</p> <p>are in conformity with the following directives:</p> <table border="0"> <tr> <td>98/37/EEC</td> <td>Directive on the safety of machines</td> </tr> <tr> <td>73/23/EEC</td> <td>Low Voltage Directive</td> </tr> <tr> <td>2004/108/EF</td> <td>EU EMC Directive (December 2004)</td> </tr> <tr> <td>94/62/EC</td> <td>Packaging Directive</td> </tr> </table> <p>- and are manufactured in conformity with the following harmonized standards:</p> <table border="0"> <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 61 000-6-2</td> <td>Immunity: 2001</td> </tr> <tr> <td>EN 61 000-6-3</td> <td>Emission: 2001</td> </tr> </table> <p>Skive, 14.01.2009</p>	98/37/EEC	Directive on the safety of machines	73/23/EEC	Low Voltage Directive	2004/108/EF	EU EMC Directive (December 2004)	94/62/EC	Packaging Directive	EN 12100	Machine safety	EN 60 335-1	Low Voltage	EN 60 335-2	Low Voltage	EN 61 000-6-2	Immunity: 2001	EN 61 000-6-3	Emission: 2001
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EN 60 335-2	Low Voltage																		
EN 61 000-6-2	Immunity: 2001																		
EN 61 000-6-3	Emission: 2001																		
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 HEX 30 and its functionality.

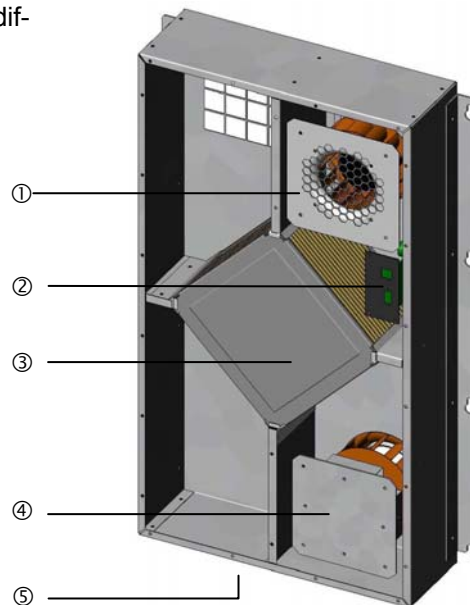
Content This section covers the following topics:

Topic	See page
Description of the HEX 30 and its parts	next page
Control board	8
Functional description	9

Description of the HEX 30 and its parts

Usage of HEX 30 The HEX 30 is used for ventilation of enclosures with electronics.
The unit cools down the air in the enclosure by letting the cold outdoor air cool down the air flow from inside the enclosure. The cooling takes place in a heat exchanger.

Illustration, internal This drawing illustrates the unit with its different parts, visible from the internal:



Parts This table gives an overview of the main parts of the unit:

No.	Part	No.	Part
①	Internal fan	④	External fan
②	Control board with temperature sensor	⑤	Drain hole (at the back of the unit)
③	Heat exchanger	-	-

Cabinet The cabinet is made of made of alu zinc sheet steel.

Heat exchanger The heat exchanger ensures that outdoor air is used to cool down warm internal air, when both air flows passes each other.

Fans There are two fans in the unit. The purpose of the fans is described below.

Internal fan

The internal fan draws air from the enclosure through the heat exchanger where the heat is removed.

External fan

The external fan draws fresh outdoor air through the heat exchanger to cool down the internal air.

Drain The drain is placed in the bottom of the cabinet, where water is let out of the unit.

Control board

Control system

The HEX 30 is controlled via a controller that controls the speed of the fans.

The key features of the controller are:

- Onboard temperature sensor (NTC type)
- Microprocessor based control in accordance with pre-selected strategy
- Minor and major alarm output
- Polarity protection
- Input voltage ÷ 40 V DC to -60 V DC
- Both alarm outputs are “Normally closed” (NC)
- Minor alarm is high temperature inside the cabinet >60 °C
- Major alarm is when the internal, external or the temperature sensor fails



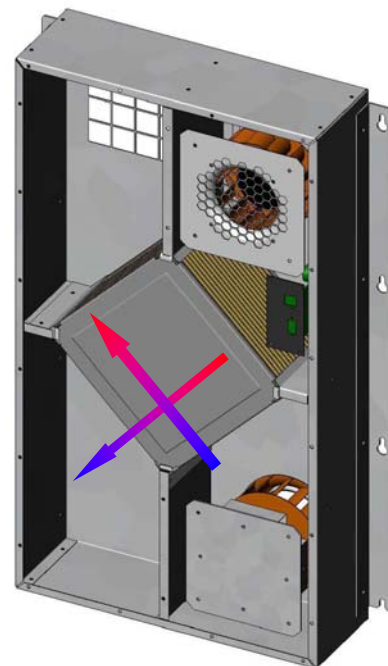
Part	Function
RS 232	To be used for factory testing or to get further information from the controller
Alarm LED	Gives signal about alarms: <ul style="list-style-type: none"> • Flashing = minor alarm (high temperature) • Constant = major alarm (fan or sensor failure) Both alarms can be monitored (potential free contact) on the power/alarm plug. See more about fault finding in section “Fault finding guide”, page 21
Sub-D 9 pin, male	Power and alarm plug Pin designation: <ul style="list-style-type: none"> 1 N/C 2 + 48 V DC 3 + 48 V DC 4 Minor alarm + 5 Major alarm + 6 0 V DC 7 0 V DC 8 Minor alarm ÷ 9 Major alarm ÷

Functional description

Important The ventilation system should operate continuously!
It is not advisable to stop ventilation.

Function The HEX 30 is designed to control the internal temperature of a universal shelter or room with respect to climate, moist and airborne.
The HEX 30 removes excess heat from electronic equipment and is especially suited in applications where the equipment requires to be maintained within defined temperature limits to achieve optimum performance and to maximize component lifetime.

Two separate air flows The two air flows (internal/external) are totally separated. The external air is only used to cool down the internal air via the heat exchanger. The air flows are never mixed.
This illustrates the air flow of the HEX 30:



Internal air flow The warm internal air is sucked from the enclosure into the internal fan at the top of the HEX 30 and let through the heat exchanger, where it is cooled down.
After the cooling in the heat exchanger, the air is let back into the enclosure.

External air flow The cold external air is sucked into the external fan at the bottom of the HEX 30 and let through the heat exchanger, where it is cooling down the internal air.
After having passed through the heat exchanger, the air is let back to the external environment at the top of the unit.

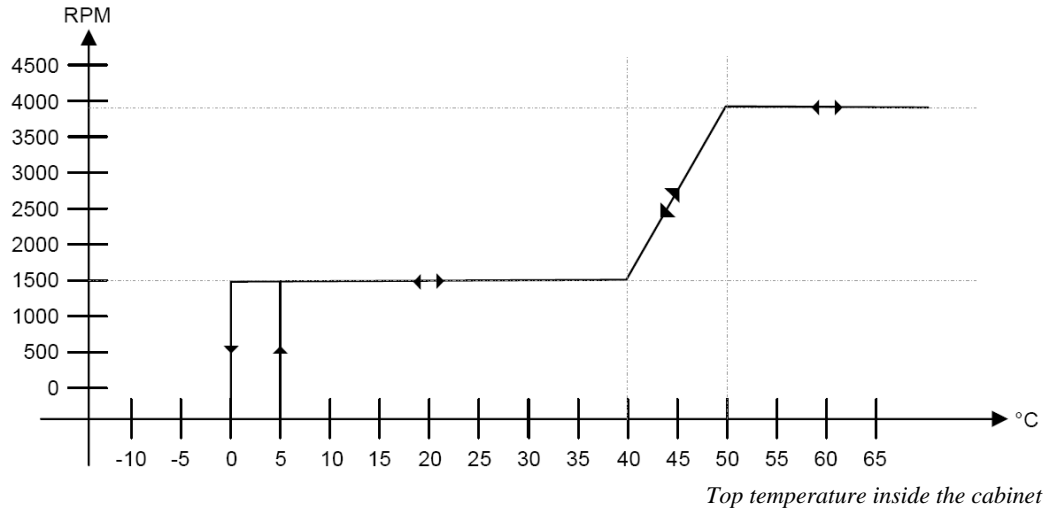
Control strategy The control board controls the fans according to the temperature of air in the top cabinet.
The higher temperature the higher fan speed.

Continued overleaf

Functional description, *continued*

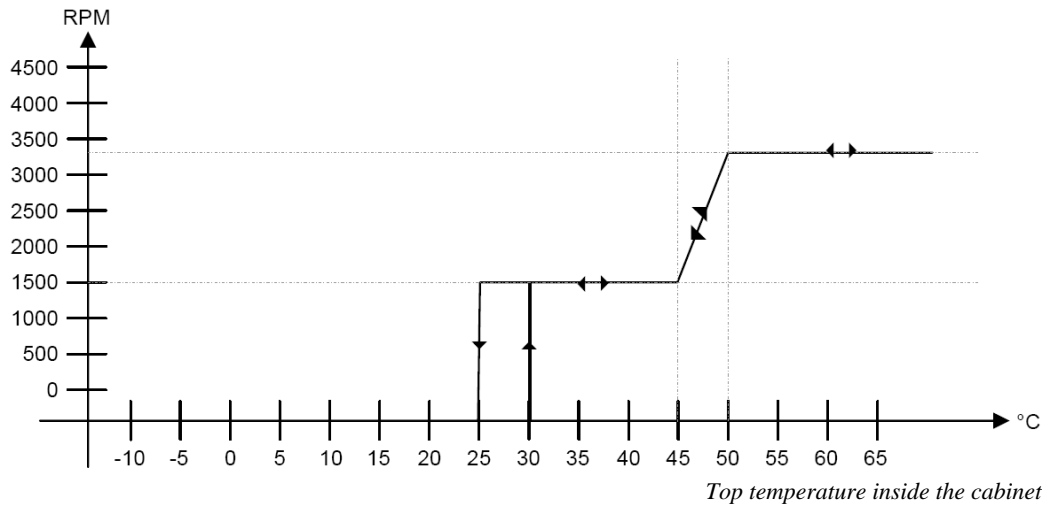
Internal fan strategy

See the speed of the **internal** fan according to different temperatures on this drawing:



External fan strategy

See the speed of the **external** fan according to different temperatures on this drawing:



Mounting and installation

Introduction

This section will guide you through the mounting and installation of the HEX 30.

Caution!

- Only trained and certified technicians are allowed to replace parts
- Switch of the DC supply before working on the unit
- Make sure that all work has been performed before switching on the power again

Before you start

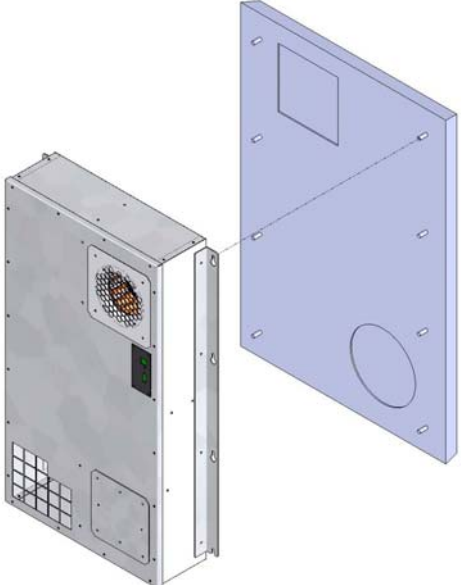
Make sure you have the following available before you start the installation:

- 8 M6 nuts
- Cable with Sub-D 9 pole plug

Mounting

Follow this procedure to mount the unit to the inside of the enclosure door:

Step	Action
1	Mount 8 M6 nuts on the mounting door without fastening them
2	Mount a gasket between the HEX 30 and the door; this is the IP barrier against the outdoor environment
3	Place the HEX 30 on the door and fasten the nuts
4	Connect power (48 V DC) to the unit



Service guide

Overview

Introduction This section gives all relevant information about servicing, spare parts and faultfinding.

Serial numbers All requests for information, service or parts should include serial number.
Product model and serial numbers are available from the nameplate.

Contents This section covers the following topics:

Topic	See page
Preventive maintenance	next page
Spare part list	14
How to replace the heat exchanger	15
How to replace the internal fan	16
How to replace the external fan	18
How to replace the control panel	20
Fault finding guide	21
Service agreement	22

Preventive maintenance

Introduction To keep the heat exchanger fit to meet the specifications, preventive maintenance has to be carried out.

The unit needs preventive maintenance with specific intervals to avoid breakdown or inefficient operation and to maximize the lifetime. It is important to notice that interval between maintenance can vary depending on the specific environment.

The following parts need preventive maintenance:

- Heat exchanger
- Fans

The maintenance instructions are listed later in this section.

Caution

- Only trained and certified technicians are allowed to service the fans
- Switch of both the DC and AC supply before working on the unit
- Make sure that all work has been performed before switching on the power again

Intervals The recommended preventive maintenance intervals should not exceed 6 months.

Preventive maintenance Please follow this procedure to carry out the preventive maintenance:

Step	Action
1	Clean the fans, either vacuum clean or use compressed air with caution
2	Check the fans and the fan blades for cracks and abnormal noise – exchange if necessary Clean the fan blades with compressed air or with a brush. Each blade has to be so clean that the fan stays balanced. Take care not to remove the balancing pieces attached to the fan blades.
3	Clean the cross heat exchanger: If the cell is contaminated clean with a brush and a vacuum cleaner
4	Switch on the power again. In case of an alarm signal, please see section “Fault finding guide”, page 21

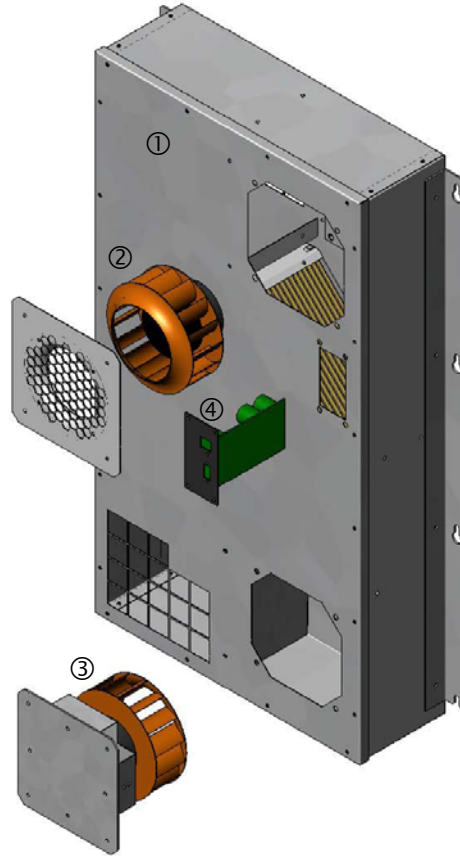
Drip tray Make sure that the water outlet is not clogged.

Condition for warranty The factory warranty is only valid if documented preventive maintenance has been carried out with an interval of maximum 6 months. The documentation could be in form of a written log.

Spare part list

Illustration

Available spare parts for HEX 30:



List

List of spare parts including spare part numbers:

Pos.	Dantherm no.	Description
1	061589	Complete unit
2	061535	Internal fan
3	061533	External fan
4	061541	Control board

How to replace the heat exchanger

Introduction This instruction guides you through the exchange of the HEX 30 unit.

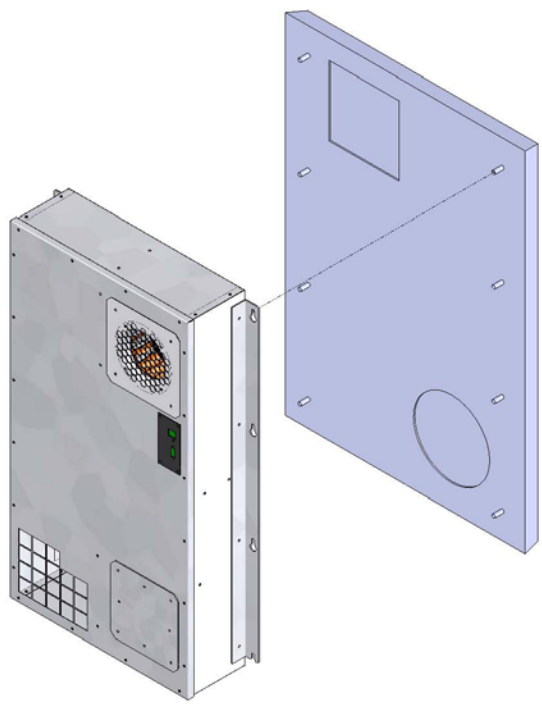
- Caution!**
- Only trained and certified technicians are allowed to replace parts
 - Switch of the DC supply before working on the unit
 - Make sure that all work has been performed before switching on the power again

When to replace it In many cases it is more effective to replace the whole unit in stead of just replacing the fans etc. This should be estimated from case to case.

- Before you start** Before you start to replace the fan, make sure that you have the following ready:
- A torx 20 screwdriver

Mounting Follow this procedure to replace the unit:

Step	Action
1	Disconnect all power to the unit by removing the plug from the front
2	Loosen the 8 nuts and lift of the unit
3	Place the new HEX 30 on the 8 nuts and fasten the nuts again
4	Reconnect the power plug



How to replace the internal fan

When to replace The internal fan only needs to be replaced when it is faulty or as a part of a long time replacement plan, e.g. after approximately 5 years.

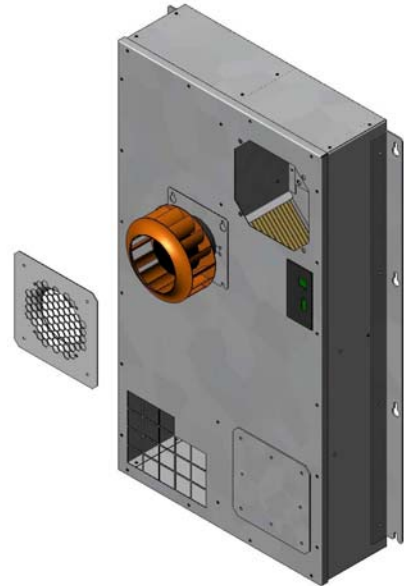
Caution!

- Only trained and certified technicians are allowed to replace parts
- Switch of the DC supply before working on the unit
- Make sure that all work has been performed before switching on the power again

Tools Make sure you have the following tools available before you start:

- Torx 25 screw driver

Illustration This drawing illustrates the internal fan and where the fan is placed in the unit:



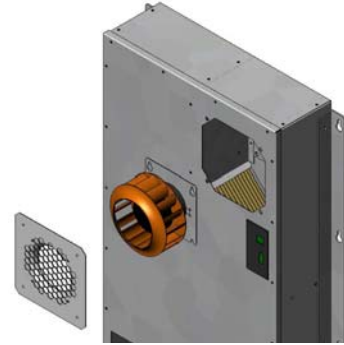
Continued overleaf

How to replace the internal fan, *continued*

Procedure

Follow these steps to replace the internal fan:

Step	Action
1	Disconnect all power to the unit by removing the plug from the front
2	Remove the 4 torx 20 screws that holds the front cover plate and remove the front cover plate
3	Loosen (do not unscrew) the 4 torx 25 screws that hold the fan and lift off the fan
4	Take out the fan
5	Disconnect the 4-way multi plug from the fan
6	Mount a new internal fan by following step 2 to 5 reversed and in opposite order
7	Connect the power



How to replace the external fan

When to replace The external fan only needs to be replaced when they are faulty or as a part of a long time replacement plan, e.g. after approximately 5 years.

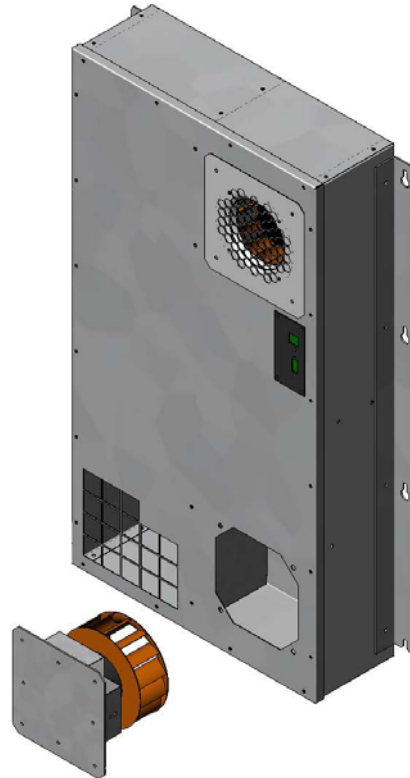
Caution!

- Only trained and certified technicians are allowed to replace parts
- Switch of the DC supply before working on the unit
- Make sure that all work has been performed before switching on the power again

Tools Make sure you have the following tools available before you start:

- Torx 20 screwdriver

Illustration This drawing illustrates the external fan and where the fan is placed in the unit:

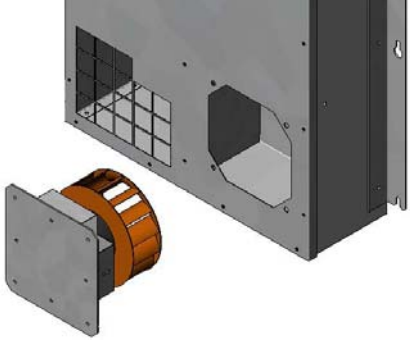


Continued overleaf

How to replace the external fan, *continued*

Procedure

Follow these steps to replace the external fan:

Step	Action
1	Disconnect all power to the unit by removing the plug from the front
2	Remove the 4 torx 20 screws that holds the fan assembly 
3	Disconnect the 4-way multi plug from the fan assembly
4	Reconnect the multi plug to the new fan assembly
5	Mount the new fan with the 4 torx 20 screws
6	Connect the power

How to replace the control panel

When to replace The control board only needs to be replaced when it is defect.

Caution!

- Only trained and certified technicians are allowed to replace parts
- Switch of the DC supply before working on the unit
- Make sure that all work has been performed before switching on the power again

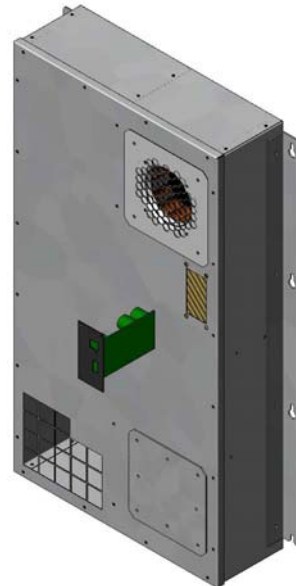
Before you start

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

- Torx 20 screw driver
- Straight slot screw driver for power plug

Illustration

This drawing illustrates the control board and where it is placed in the unit:



Procedure

Follow these steps to replace the control board:

Step	Action
1	Disconnect all power to the unit by removing the plug from the front
2	Remove the 4 torx 20 screws to remove the controller
3	Pull out carefully the controller and disconnect the two cable plugs
4	Fit the two plugs to the new controller and tighten it with the 4 screws
5	Connect the power

Fault finding guide

Fault finding

Operating errors may occur.

Locate your problem in the left column and follow the instructions to the right:

Problem	Cause	Solution
The red LED illuminates constantly	Too high temperature in the shelter, above 60 °C or a fan failure	Replace the fan
The red LED is flashing	The on board sensor has been disconnected/shorted	Replace the controller
The internal fan runs at low speed	The temperature in the shelter is below 20 °C	This is due to the control strategy
The external fan runs at low speed	The temperature in the shelter is below 30 °C	This is due to the control strategy

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 will need preventative maintenance on a regular basis.</p>
Hotline	<p>The After Sales Support Department of Dantherm 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 Dantherm 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 Dantherm Air Handling A/S, ask for the After Sales Support department 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@dantherm.com</p>
Preventive maintenance	<p>Dantherm 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 Dantherm 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>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.</p> <p>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.</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 Dantherm Air Handling A/S Phone: +45 9614 4767 Mobile: +45 2399 4066 Email: heh@dantherm.com</p>

Technical information

Overview

Contents

This section covers the following topics:

If further technical details are requested, please contact Dantherm Air Handling A/S.

Topic	See page
Technical data and dimensions	Next page
Wiring diagram	25

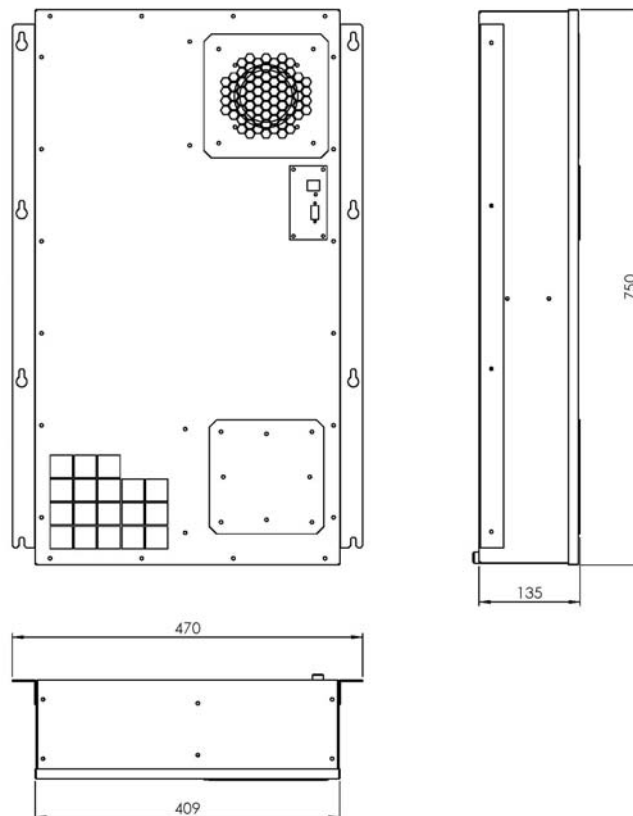
Technical data and dimensions

Data

The below table gives the technical data of the HEX 30.

Specification	Unit	Value
Operating range - humidity	% RF	5-99 non condensing environment
Operating temperature (ambient) (Cold start -30 °C)	°C	+45 - +55
Power supply	V DC	40-60 Nominal 48
Power consumption	W	80
Performance	W/K	30
Air output	M ³ /h	250
Capacity, ΔT =20K	W	600
Weight	kg	18
Dimensions, H × W × D	Mm	750 x 410 x 135
Safety class, mounted on door	IP	55
Max. sound pressure 1m daytime, max ambient temperature 40 °C	dB(A)	63

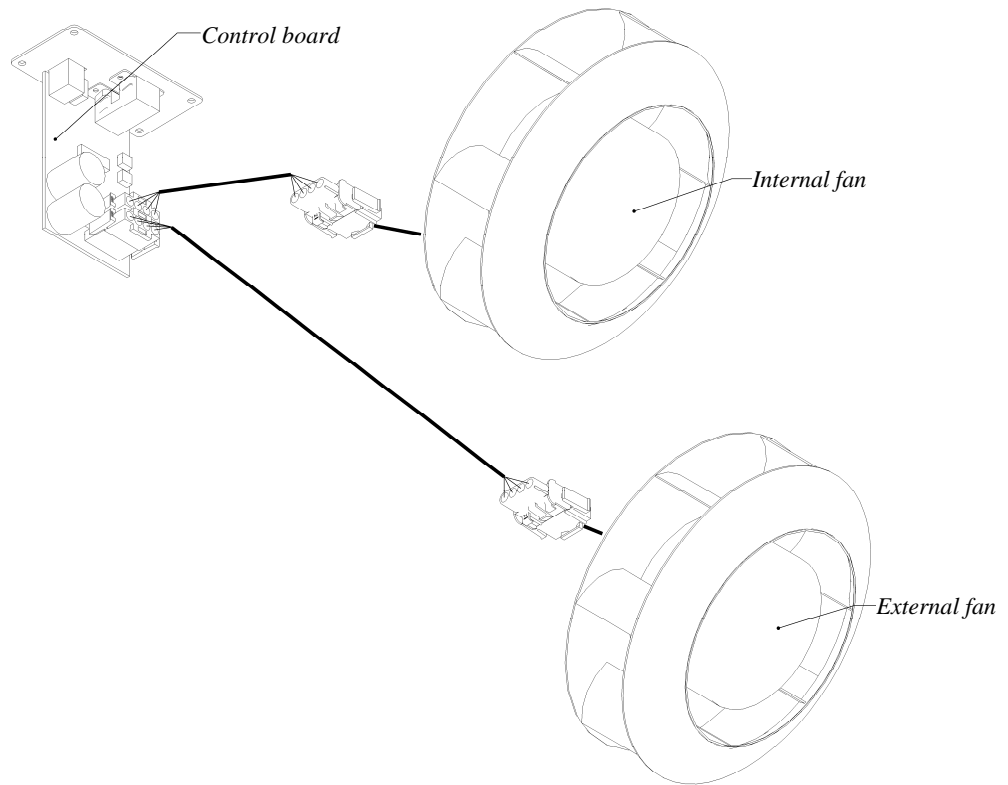
Dimensions



Wiring diagram

Diagram

This is the wiring diagram for the HEX 30 :



Index

A

air flow	9
alarm LED	8

C

cabinet	7
complete unit	14
contact Dantherm Air Handling	22
control board	7;8;14
control strategy	9
copyright	5

D

declaration of conformity	5
dimensions	24
directive	5
drain	7
drain hole	7

E

external air flow	9
external fan	7;14

F

fan	7
fan strategy	10
fault finding	21
functional description	9

G

general description	7
---------------------------	---

H

heat exchanger	7
----------------------	---

I

internal air flow	9
internal fan	7;14

L

LED illuminates constantly	21
----------------------------------	----

LED is flashing	21
-----------------------	----

M

maintenance intervals	13
manual part no.	5
mounting	11

P

preventive maintenance	13
product description	6

R

recycling	5
reservations	5
RS 232	8

S

serial number	3;12
service agreement	22
service department	22
service guide	12
spare part	
control panel	20
external fan	18
heat exchanger	15
internal fan	16
spare parts	14
standards	5
sub-D	8

T

table of content	4
target group	5
technical data	24
technical information	23

W

warranty	13
wiring diagram	25