

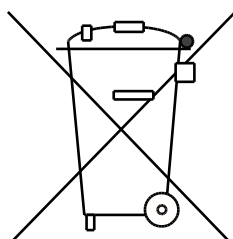
# DanX Pool AF

User Manual

Rev. 2.3 – 961405

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1.1 Introduction

The DanX - AF equipment is designed mainly for the use for ventilation, humidity and temperature control in private and public swimming pool areas. The use of the unit includes the required inspection and maintenance for these units, which is described in the back of this manual.



Unloading, transportation, assembly, connecting of the DanX modules should only being carried out by trained specialists or by people supervised by authorized staff. It is the responsibility of the fitter to read and understand this guide and other given information.

1.2 Foundation for the unit

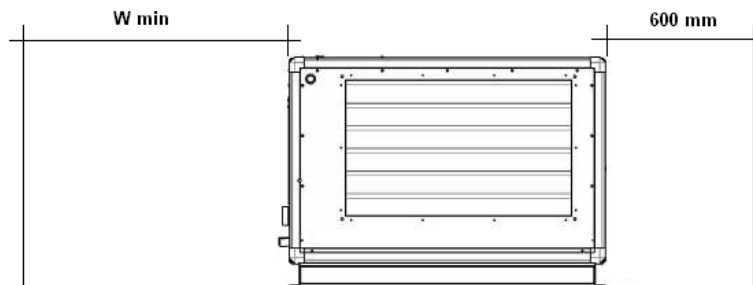
The DanX unit must be installed in a location that meets the following requirements:



- The supporting structure must be flat and stable.
- The supporting structure must be able to bear the weight of the unit.
- The deflection of the substructure should be max. 1 mm/m.
- For the connection of the condensate drain, it is necessary that the height between condense outlet of the unit and the substructure is at least the required height for the water trap.
- If the unit is mounted on a roof, the bearing ability of the roof and its support structure has to be examined.

1.3 Minimum distances

For the operation, maintenance and servicing of parts as heating coils, dampers and others a minimum clearance between inspection side of the unit and the rear wall should be the width of the unit. It is recommended also have a minimum clearance between the rear wall and the rear of the unit providing at least 600 mm for service and installation purposes.



Model	W min [mm]	Model	W min [mm]
AF 3/6	900	AF 7/14 s	1900
AF 5/10	1400	AF 12/24	2200
AF 5/10 s	1400	AF 12/24 s	2200
AF 7/14	1900		

### 2.1 Unloading

The unit is normally delivered in separate modules placed on wooden cross beams or a wooden pallet. Each part is wrapped in protective packing. The following steps should be taken when unloading the modules:



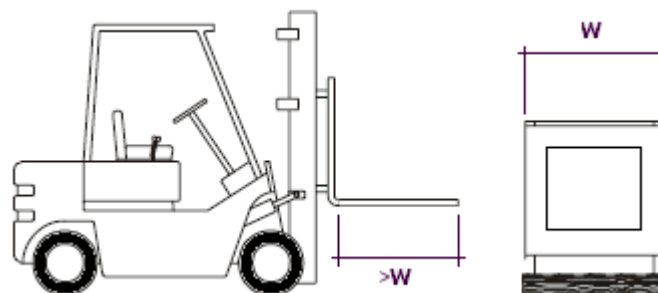
- Find a suitable place for unloading as modules can be very heavy (up to 1300kg).
- Unload the modules with a forklift or crane (see instructions below).
- Do not tilt modules with integrated refrigeration system (compressor) or laid them to the side!
- Check the packing and modules for transport damage and report immediately any damage to the driver and to Dantherm Air Handling.
- Retain the packing until the sections/modules are placed on the mounting location to avoid damages on cabinet parts or connecting pieces that overhang.
- If the unit is delivered with a separate control panel, it should be handled with special caution and stored in a safe and dry location until the installation is carried out.

### 2.2 Lifting with a forklift



If a fork-lift is being used it must be ensured that the forks are long enough to reach all through under the unit so that the bottom of the cabinet is not damaged. Rough and incorrect handling can damage the unit and hereby result in glitch.

Make sure that the modules centre of gravity is always in the centre of the two forks, so the module can be transported stable. Be extra careful when transporting short but high and wide units.



Depending if the module is short or long there are two ways to lift. Long modules with a base frame and wooden cross beams or without a base frame on a pallet, should always be lifted from the inspection or backside of the unit, never in the longitudinal direction, as the base frame or pallet is not designed for this.

Short modules (475 up to 600 mm) with or without a base frame will always stand on a pallet and can only be lifted in the longitudinal direction as they are too short for lifting from the inspection or back side.

### 2.3 Lifting with a crane



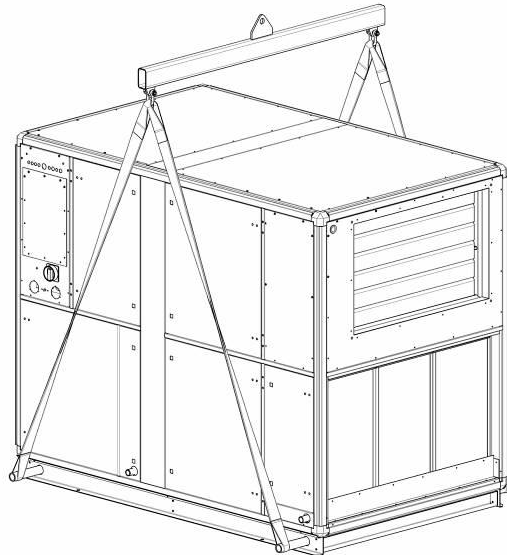
Never stand under a module when it is lifted with a crane as there always is a risk that the crane or helping material can be damage! Serious injuries or death can be the result!

When lifting the modules with a crane, be aware of the following general points:

- Only use a hoist that can manage the weight of the module!
- Never use a hoist which is damaged!
- Use soft straps!
- Lift the module cautiously, without jerky movements!
- Do not touch down hard!

Lifting is done the following way:

- Insert 2 bars of round iron (min. 1 ½") in the holes of the base frame and secure them.
- Use four soft straps, push them over the iron bars and put them together in the crane hook.



### 2.4 Storage

If the unit is not installed at once but should be stored, note the permissible storage conditions:



- Do not leave the unit standing outside, but in a building.
- Do not remove the original packaging.
- Protect the unit until the installation from dust, dirt and damage.
- The air temperature in storage should be between 5 °C to 40 °C.
- The storage should be in a non-condensing atmosphere.

If the unit is delivered with a separate control panel, it should be handled with special caution and stored in a safe and dry location until the installation is carried out.

#### 3.1 Introduction

Because of the modular design and different components used, we can only show below the basic structure of the DanX AF unit. If you are in doubt how to assemble the different modules, please ask our distributor for an exact drawing of the unit. Please refer to the type plate on the inspection side of the unit to find out what type of unit you have to install.



The units shown in the drawings are all left hand units. If you have a right hand unit all components of the unit are the other way around.



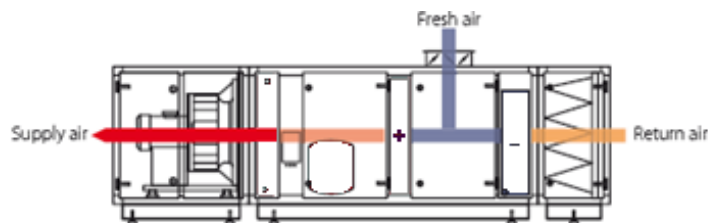
Assembly of the DanX modules should only be carried out by trained specialists or by people supervised by authorized staff. It is the responsibility of the fitter to read and understand this guide and other given information.

#### 3.2 Unit construction and function

The DanX - AF consist of a compressor driven heat pump with only one air direction. The cooling circuit is ready mounted, filled with refrigerant and do not need any extra installation. If the unit is ordered with an outdoor air intake, a damper is mounted on the top of the AF module as shown in the drawing.

The DanX - AF is mainly used as a recirculation system with a minimum outside air mixed into this air stream, which is required for hygienic reasons for the swimming pool hall. To run this system an extra extract fan is required to avoid overpressure in the swimming pool hall. The dehumidification is mainly done in the cooling circuit's evaporator, but assisted by the fresh air entering the swimming pool through the AF system. The energy which is extracted in the evaporator is again added to the swimming pool air in the cooling circuit's condenser, just after been mixed with the outside air.

For further explanations about the controls of this unit, please refer to the manual of the control panel.



From left to right the following components/modules have to be installed:

- 1) Supply air fan.
- 2) AF module with heat pump and heating coil.
- 3) Return air filter\*.

\*If a panel filter is installed, the filter will be built in into the AF section, why there will be no separate filter section.

If the DanX - AF is delivered with an outside air damper a separate fan (not delivered by Dantherm) has to be mounted to extract the same amount of air from the swimming pool hall as the DanX - AF takes in through the outside air intake in the top of the unit to keep the air volume in the swimming pool hall in balance. At the same time an outside air filter (not delivered by Dantherm) should be mounted in the outside duct system to avoid dirt coming into the DanX - AF unit.

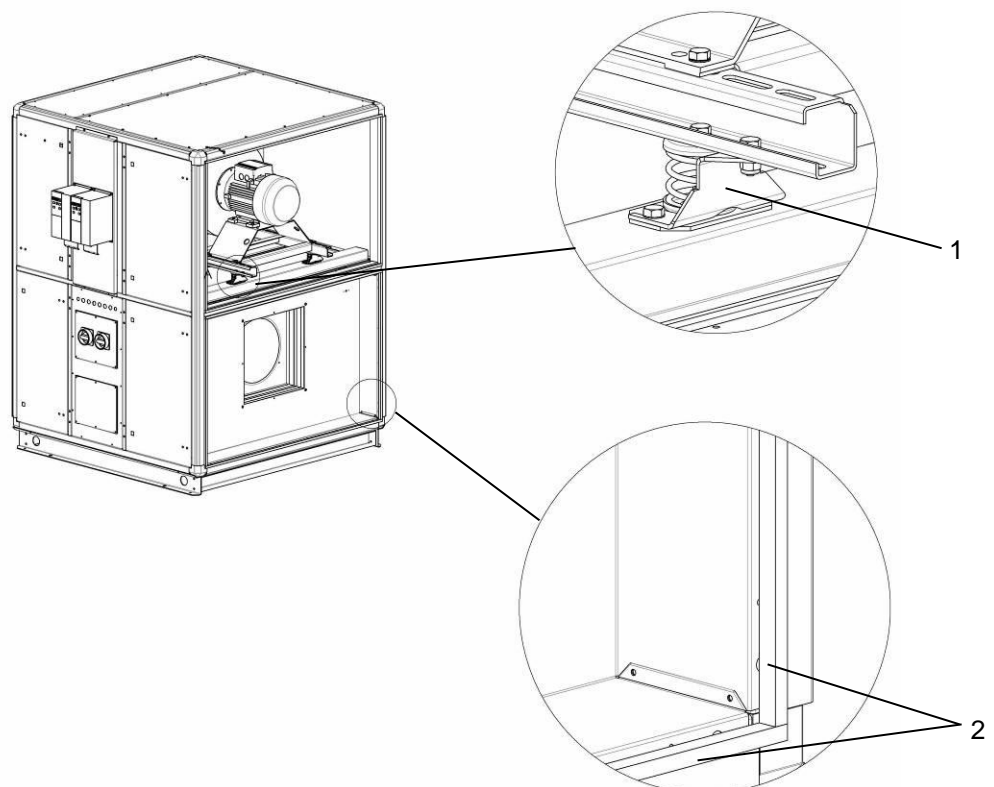


#### 3.3 Installation of modules

Before placing the single modules in the right order, accordingly to chapter 3.2 the wooden crossbeams or pallets have to be removed and the separate delivered feet mounted on the base frame. To do so the following has to be done:



- Unwrap the module, open the inspection door and take out the separate box with the feet and the assembly rails for the unit.
- On the fan module remove the transport brackets (1) which are holding the fan (spring vibration dampers only) as it is easier now then after the unit has been assembled (see drawing).

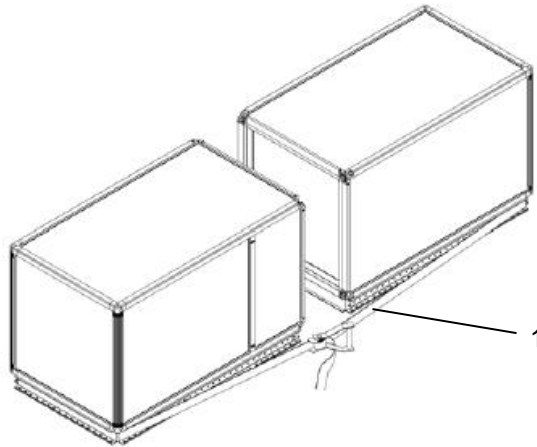


- Check the rubber sealing's (2) at the end of each module that they are not damaged or loose. This is very important, as it is impossible to replace the sealing's after the modules have been assembled!
- Lift the unit with a fork lift or pallet lift and unscrew the wooden cross beams.
- Screw the feet's to the base frame and place the module as close as possible together where they should be installed. When the feet are mounted it is only possible to move the section for a few millimetres, otherwise the feet can bend or break. If you have to move the sections more, then use a fork lift or pallet lift.

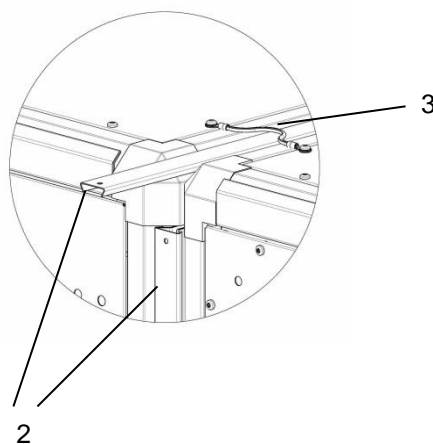
After placing all modules in the right order on the floor, the modules have to be assembled. Follow the following points to mount the modules:



- Adjust the height of the modules with the help of the adjustable feet, so that all modules are in level and in same height.
- Use straps (1) to move the modules the last few millimetres. Straps should only be mounted at the bottom or/and top of the modules.



- Connect the single modules with the assembly rails (2) which are pushed from the top over the outside of the frame profile all the way around the unit. The assembly rail can at difficult accessible space be divided in smaller pieces, which are then inserted over the frame profiles.

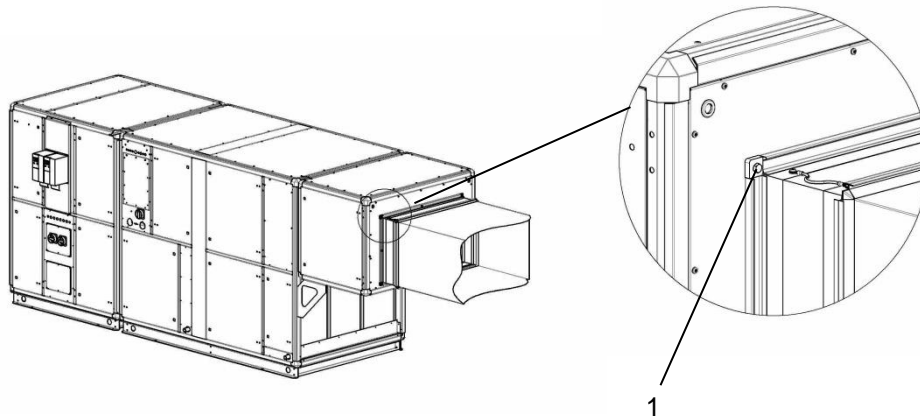


- To finish the installation all modules have to be connected with the green/yellow earth connection (3) at the top of the modules.

#### 3.4 Duct mounting

The ducts connected to the AHU have to be suspended or underpinned with support elements as the duct connection panel of the unit is not strong enough to hold the duct work.

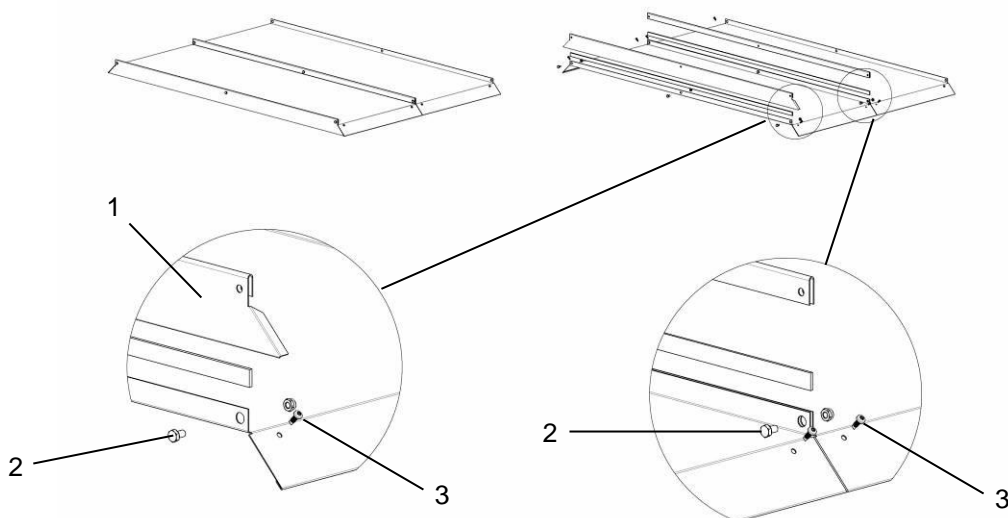
The ducts can be connected to the DanX with flexible connections (optional accessory) to suppress vibrations of the unit. Flexible connections are equipped with flanges and can be fastened to the unit with four bolts (1), one on each corner. It is important that the flexible connection is not totally stretched to work properly. When a flexible connection is used an earth lead has to be mounted between unit and duct work.



#### 3.5 Outdoor unit

In principle the installation of an outdoor unit is done the same way as described in chapter 3.2, but often the unit comes completely assembled on one base frame, ready to be lifted in one piece on to the roof. Either way the unit has to be covered by a roof cover, which is supplied loose together with the unit. Depending on the units length, the roof cover consists two gable ends and one or more middle parts.

- Assemble the roof panels with the rails and bolts delivered with the roof as shown in the drawing.
- Finish the installation by securing the assembled roof with self cutting screws to the upper frame of the units as shown in the drawing.



#### 3.6 Installation and connection of components

Before starting up and commissioning the DanX AF unit it is important to have installed all components of the air handling unit correctly.



All installation and connection work should only be carried out by trained specialists or by people supervised by authorized staff. It is the responsibility of the fitter to read and understand this guide and other given information.

##### 3.6.1 Condense water outlet

Drainage from the condensate tray is taking place through a connection in front of the inspection side through the cover panel. On AF units we will see one outlet on the exhaust side (negative pressure). There are two different types of water traps available.

###### Drain trap with ball valve

This drain trap should only be installed where there is negative pressure in the drain system as the ball valve will open on positive pressure. The inserted float ball prevents the intake of air under dry operation, where in a traditional drain trap you have to refill water to avoid air being sucked into the unit. At the same time you need less space in height than on a traditional drain pipe. This drain trap can be used up to -900 Pa.

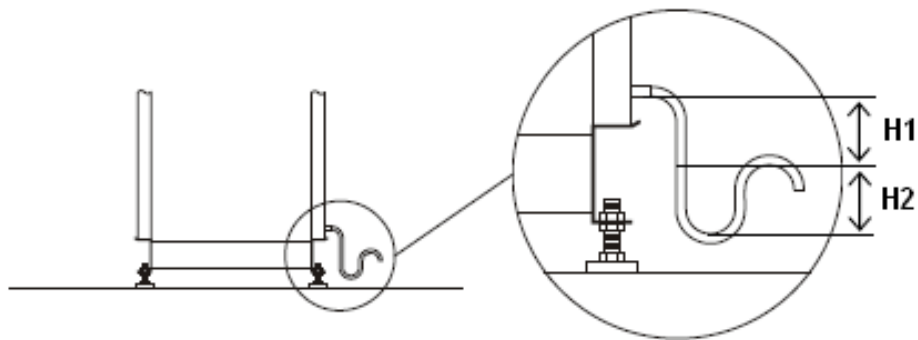
###### Normal drain pipe

The normal drain pipe with screw cap for filling with water and check can be used for negative and positive pressure. The length of the pipe can be calculated the following way.



Negative pressure :  $H1 = \Delta p + 50 \text{ mm}$      $H2 = \Delta p / 2 + 50 \text{ mm}$

$\Delta p$  = pressure in mm WS (100 Pa = 10 mm WS)



##### 3.6.2 Fresh air damper

The damper motor is installed and pre wired and connected to the terminal strip of the AF unit. For further information's see the electrical diagram of the unit.

#### 3.6.3 Water cooled condenser

As an option the heat pump in a DanX AF unit can be fitted with a water-cooled condenser, so that any surplus heat, which can not be used for heating up the supply air, can be transferred to the pool or sanitary water.

NB!

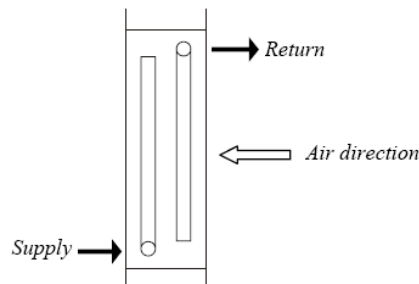


It is important that the material which is used to connect the water cooled condenser is suitable for chlorine water. It is also important that no more than the specified water volume (see table below) is pumped through the system, as a too high water velocity can destroy the water cooled condenser and cooling circuit of the DanX unit.

AF	3/6	5/10	5/10s	7/14	7/14s	12/24	12/24s
Max water L/h	1250	1900	1900	2500	3800	3800	5500

#### 3.6.4 LPHW coil

Connect 1 and 2 row LPHW coils always in the bottom with the supply and with the outlet in the top, as these makes it easier to bleed the coil for air. If the coil is larger than 2 rows connect the coil in that way that the water flow is against the air flow (counter flow) to get the calculated heat capacity out of the coil.



NB!



When connecting the heat exchanger, counter hold with a suitable tool in order to avoid any damage to the pipes. Mount the connections in a way that it is possible to access the heat exchanger for maintenance afterwards.

### 3.7 Installation of electrical components

If the DanX AF unit is equipped with an MVC 80 electrical panel, the component has to be installed in the following way. The functions of the MVC 80 panel are explained in a separate instruction manual.

#### 3.7.1 Supply air temperature duct sensor

The supply air duct sensor has to be installed after connecting the DanX unit to the duct system. You find the coiled up (10m) sensor on the top deck of the unit.

The duct sensor is installed in the **supply air duct** of the swimming pool, after the heating coil in the following way.

- Drill an 8 mm hole in the supply air duct at least 1.5 m from the last component of the unit.
- Place the sensor in the hole.
- Fasten the sensor housing to the duct with two screws and close the sensor.

#### 3.7.2 Return air humidity / temperature duct sensor

The return air temperature and humidity sensor has to be installed after connecting the DanX unit to duct system. You find the coiled up (10m) sensor on the top deck of the unit.

The duct temperature / humidistat sensor is installed in the **return air duct** from the swimming pool. Please follow the instructions, following with the duct sensor.

#### 3.7.3 Room air humidity / temperature sensor

If you have ordered a room thermostat / humidistat sensor instead of a duct mounted on, this will only be connected to the terminal strip of the unit with a short cable to test the function. When installing the unit you have to replace this cable with a cable of the right length, to connect the room temperature / humidistat sensor between the pool room and the unit.

The room temperature/humidistat sensor should be installed at a height of minimum 2,5m and not above doors where people entering or leaving the pool hall. Secondly the sensor should not be placed where heating, ventilation or the sun can have an influence on the measuring result. Otherwise please follow the instructions, following with the room sensor.

#### 3.7.4 Frequency inverter for AC fan motors



The voltage of the frequency inverter is dangerous whenever the equipment is connected to mains. Incorrect installation of motor or frequency inverter may cause damage to the equipment, serious injury or death. Touching the electrical parts may be fatal - even after the equipment has been disconnected from mains: Wait at least 4 minutes for current dissipates. Installation must comply with the instructions in this manual and the separate manual for the frequency inverter as well as national and local legislation and safety regulations.



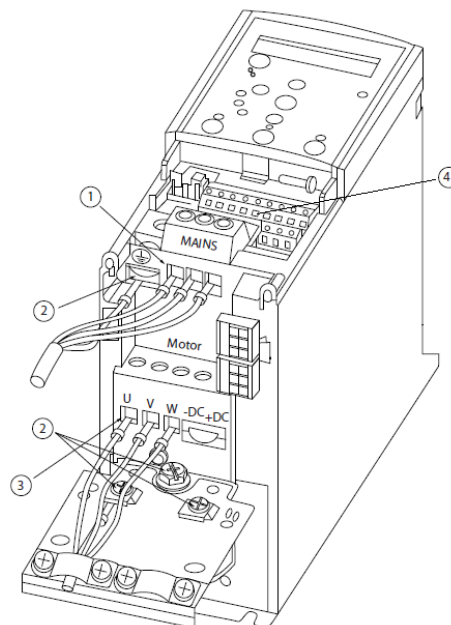
**NB!**

It is the responsibility of the user or installer to ensure correct earthing and protection in accordance with national and local standards.

Frequency inverters delivered by Dantherm Air Handling are found in the fan section, where they are stored under transport. Unpack the frequency inverters and mount them either on a special framework on the fan section or in another place next to the DanX unit, depending on what has been ordered.

If the frequency inverters are mounted on the fan section, all cabling in the DanX unit has been done from the factory and only the following steps should be done to finish the installation:

- Remove the lower plastic protection for the frequency inverter terminals.
- Connected the control current cable to the frequency inverters terminals (4) accordingly to the DanX wiring diagram.
- Connected the prewired cables for mains (3)
- Connected the prewired cables for the motor (1).



If the frequency inverters are mounted separately from the DanX unit all cabling has to be done according to the wiring diagrams and the inverters handbook supplied with the DanX unit and the separate handbook for the Danfoss inverter.

### 4.1 Introduction



When working on air-handling unit always turn off the electricity on the main switch and repair switch (complete shut) and secure for reconnection from unauthorized persons. Only open the inspection doors when the unit is totally stopped and the fans have come to a stand still. After switching off the unit the fan impeller will run for about 1 to 3 minutes before stopping totally. The fan wheel must never be stopped by hand or with an object.

Commissioning, maintenance and repair work should only be carried out by trained specialists or by people supervised by authorized staff. It is the responsibility of the fitter to read and understand this guide and other given information.

### 4.2 Centrifugal fan



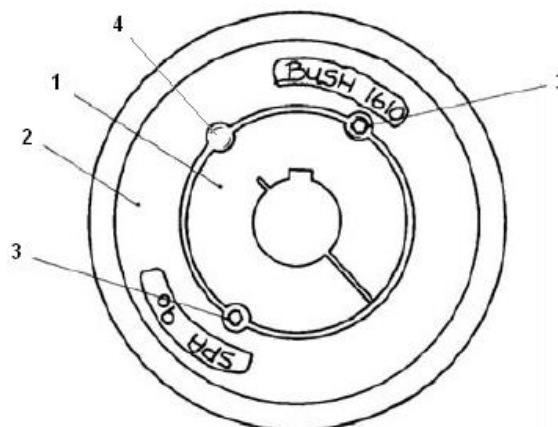
To commission the centrifugal fan for the first time, the following actions have to be taken:

- Check if the transportation brackets have been removed.
- Check by hand if the fan wheel is turning freely.
- Check the duct system that all dampers are open.
- Check if the duct system is clean and not blocked by any parts.
- Start up the fan for a few seconds and check if the fan wheel turns in the right direction (see arrow on fan casing). If this is not the case stop the unit, switch off the main current and change two phases of the fan on the terminal strip.
- Close all inspection doors start up the fans and measure the running current of the motors. If the running current is higher than on the type plate of the motors stop the unit and check the air volume.

#### 4.2.1 Air volume setting

If the measured air volume does not correspond to the type plate data, or when the measured running current of the motor is too high, the fan transmission has to be changed. After calculating the right pulley sizes the pulleys can be changed in the following way.

- Unscrew the two Allen screws (3) and pull off the pulley (2) by screwing one Allen screw into the thread (4)
- Remove the bush (1) from the fan shaft if the new pulley needs a different bush
- Refit the new pulley
- Check if both pulleys are in line and tight the belt.





### 4.3 Plug fan



To commission the plug fans for the first time, the following actions have to be taken:

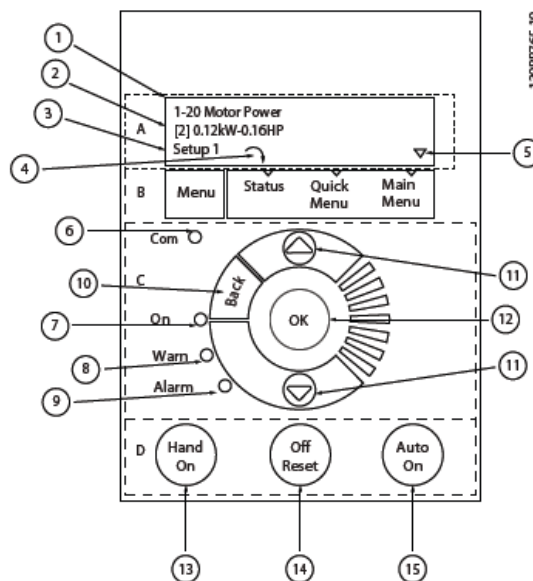
- Check that the four measuring probes below the pressure transmitter are blanked.
- Check if the transportation brackets have been removed.
- Check by hand if the fan wheel is turning freely.
- Check that all dampers in the duct system are open.
- Check if the duct system is clean and not blocked by any parts.
- Start up the fan for a few seconds and check if the fan wheel turns in the right direction (see arrow on fan casing). If this is not the case stop the unit, switch off the main current and change two phases of the fan on the terminal strip.

#### 4.3.1 Frequency inverter setup (if installed)



All frequency inverter parameters are set by the factory. For a list of parameters please refer to chapter 8. For change of settings of the most important parameters, please refer to the Danfoss Quick Menu booklet.

The display of the inverter I divided into four functional sections:



(A) Alphanumeric display:

1. Parameter number und name
2. Parameter value
3. Active set up number
4. Motor running direction

(B) Menu key:

5. Use the MENU key to select one of the three menus

(C) Navigation key and indicator lights

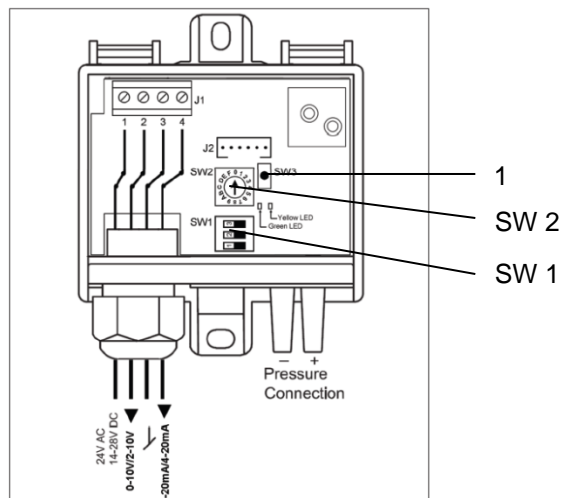
- 6. Not used in DanX
- 7. Inverter working LED
- 8. Warning LED
- 9. Alarm LED
- 10. Moving one step back
- 11. Manoeuvring between parameters
- 12. Selecting and accepting parameters

(D) Operation keys and indicator lights

- 13. Hand on enables the control over the inverter over the panel
- 14. Stops the motor
- 15. Inverter is controlled by the DanX controller

4.3.2 Pressure transducer

The pressure transducers for the supply and exhaust fan are installed in a separate box below the electrical connection box for the fan motors. The transducer factory settings should normally not be changed.



After installing the unit and before the first start, it is recommended to zero-set the transducer. After the power supply is established (green LED on) press the zero-set button (1) and the yellow LED will flash for 3 seconds. After this the pressure transducer is reset.

There are two LED lamps on the printed circuit board, which are indicating the following:

LED	On	Flashing	Off
Green	OK	Pressure outside set range	No power supply
Yellow	>50Pa	Zero setting in progress	<50Pa

If the yellow LED is ON when the fans are stopped, please check if the tubes to the fans are bended or pressed. The yellow LED must be OFF when the fans are stopped to have the pressure transducer work properly!

If the green LED is flashing the reason could be that the + and – tube have been switched when connecting to the pressure transducer. Please check this first. Another reason for the green LED flashing can be that the pressure range setting is wrong. Change of setting can be done with the potentiometer (SW2).

Pressure range	SW2
0..+500 Pa	0
0..+1000 Pa	1
0..+1600 Pa	2
0..+2000 Pa	3
0..+2500 Pa	4
0..+3000 Pa	5
0..+4000 Pa	6
0..+5000 Pa	7

The DIP switches (SW1) are factory set as follows and should not be changed:

DIP 1	DIP 2	DIP 3
OFF (0-10V signal)	OFF (Damping 0,4s)	OFF (No function)

#### 4.3.3 Air volume check



If you want to check the air volume of the unit with a differential pressure meter, the two measuring probes (+/-), which are located beneath the pressure transducer, can be used. The differential pressure, measured at these two points, compares the static pressure in front of the inlet ring with the static pressure in the inlet ring of the narrowest point. The differential pressure between the static pressures is related to the air volume via the energy conservation rate as follows:

$$V = k * \sqrt{\Delta P_w}$$

Where k takes into account the specific ring characteristics.

Model	K nozzle coefficient	Model	K nozzle coefficient
DanX 3/6	154	DanX 12/24 (EC fans)	616
DanX 5/10	197	DanX 12/24 (AC fans)	490
DanX 5/10 (2 x 2.4 kW)	308	DanX 12/24 (AC fans)	490
DanX 7/14	308		
DanX 7/14 (2 x 5.2 kW)	394		

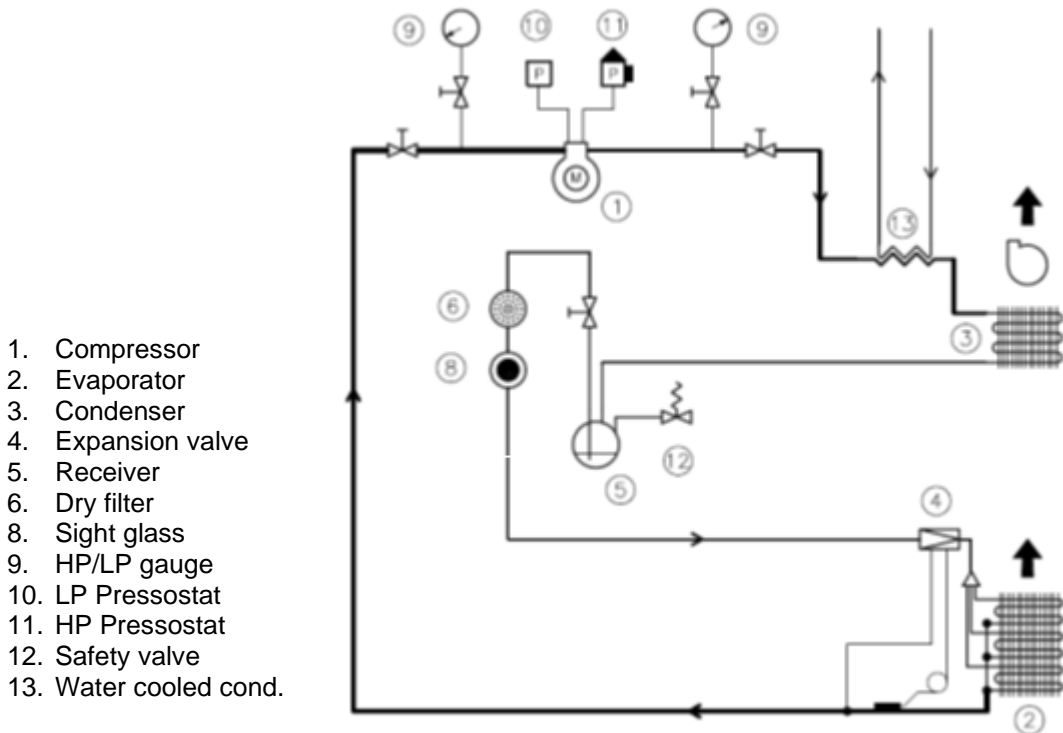
EXAMPLE: If you have measured a static pressure difference of 700 Pa for a DanX 5/10 then the air volume will be:

$$V = 197 * \sqrt{700} = 5212 \text{ m}^3/\text{h}$$

### 4.4. Cooling circuit

To commission the cooling circuit for the first time, the following actions have to be taken:

- Check if the drain pipes have been installed correctly (see 3.6.1) and if the drip tray inside the unit is clean.
- Check that all loss parts/accessories have been removed from the inside of the unit.
- Start up the compressor(s) and check if the HP and LP gauge are showing reasonable temperatures.
- Check the sight glass of the cooling circuit if there is enough refrigerant in the unit. If refrigerant is missing stop the compressor(s) at once and check for a leakages / damages.



1. Compressor
2. Evaporator
3. Condenser
4. Expansion valve
5. Receiver
6. Dry filter
8. Sight glass
9. HP/LP gauge
10. LP Pressostat
11. HP Pressostat
12. Safety valve
13. Water cooled cond.

#### 4.4.1 Air volume over evaporator

Over the evaporator you will find a hand operated air damper, which gives you the possibility to regulate the air volume over the evaporator which has an influence on the evaporating temperature. If you run the unit without an outdoor damper and the standard air volume, please open the damper over the evaporator fully. If you use an outdoor damper please do the following to find the right damper position over the evaporator:

- Run the unit with the outdoor air damper closed and the damper over the evaporator fully open for about 5 minutes. Read the evaporation temperature / pressure on the LP gauge.
- Open now the out door damper, run the unit again for 5 minutes and watch the LP gauge. If the evaporation temperature / pressure have fallen you have to close the damper over the evaporator slowly until you have reached about the same temperature / pressure as with the out door damper closed.

5.1 Introduction



For optimum operation conditions and a long life it is necessary to perform preventive maintenance on the various unit parts within the stipulated intervals (see 5.2). When working on air-handling unit always turn off the electricity on the main switch and repair switch (complete shut down) and secure for reconnection from unauthorized persons. Only open the inspection doors when the unit is totally stopped and the fans have come to a stand still. After switching off the unit the fan impeller will run for about 1 to 3 minutes before stopping totally. The fan wheel must never be stopped by hand or with an object.

Commissioning, maintenance and repair work should only being carried out by trained specialists or by people supervised by authorized staff. It is the responsibility of the fitter to read and understand this guide and other given information.

5.2 Maintenance plan

Component	Ref	Every 3 month	Every 6 month	Every 12 month
Cabinet	5.3	X		X
Centrifugal fan	5.4	X	X	X
Plug fan	5.4	X	X	X
Filter	5.5		X	X
Heating coil	5.6			X
Fresh air damper	5.7		X	X
Cooling circuit	5.8			X

5.3 Cabinet

The following steps should be taken to maintain the cabinet of the unit:

- Check the inside of the cabinet for dust or dirt. If necessary, clean either dry or wet (every 3 months).
- Clean all drip trays, either dry or wet, and check if condense water can run out freely (every 3 months).
- Check for paint damage and rust. Clean the damaged/rusting part and protect it with new paint (every 3 months).
- Check all gaskets on the service doors for leaks and damage. Replace damaged gaskets where necessary (every 12 months).
- Lubricate door locks and hinges (every 12 months).



Do not under any circumstances use strong solvents or solutions containing, chlorinated Hydrocarbons, esters, ketones or abrasive cleaner or polish.

### 5.4 Fans

The following general steps should be taken to maintain the centrifugal or plug fans of the unit:

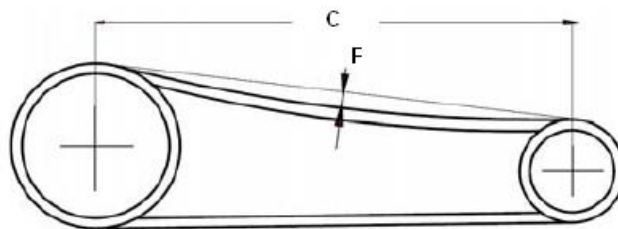
- Check the fan wheel for unbalance (every 3 month).
- Check the fan and motor bearings for unusual noise (every 3 month).
- Check vibration dampers for damage (every 3 month)
- Clean the fan wheel if it is necessary, either dry or wet (every 12 month).
- Check all flexible connections for damage/leakage (every 12 month).
- Check if all mounting bolts are tight (every 12 month).

For more specific maintenance of either the centrifugal or plug fan see 5.4.1 or 5.4.2.

#### 5.4.1 Centrifugal fans

Every 3 month the transmission of the belt driven centrifugal fans should be checked in the following way:

- Check that the pulleys are placed correctly and in line. Check if all bolts of the pulley are fastened.
- Check the belts on wear and damage. When replacing belts on a transmission with more than one belt, all belts have to be changed.
- Check the belt tension by controlling the deflection (F) in the following way.



Belt profile	Centre distance C (mm)	Deflection strength (kg)	Deflection F (mm)
SPA / XPA	500 - 600	2.7	11
SPA / XPA	600 - 800	2.7	13

#### 5.4.2 Plug fans

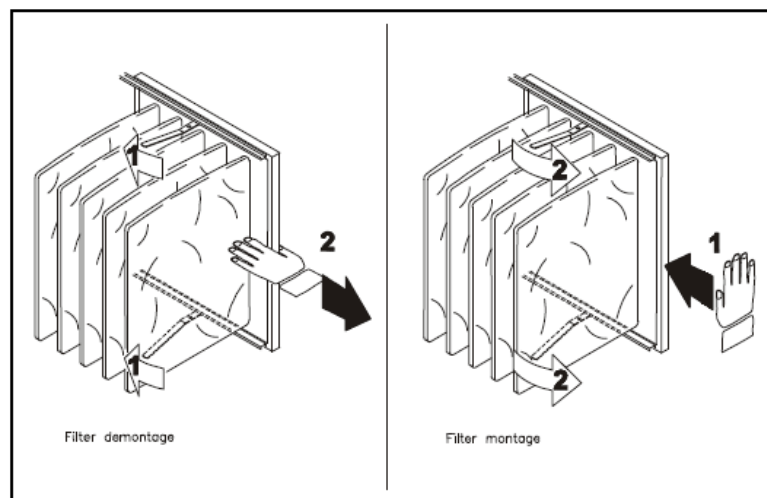
The following steps should be taken to maintain the plug fans of the unit:

- Check if all bolts of the fan wheel pulley are fastened (every 3 month).
- Check the pressure hoses from the pressure transmitter to the fan for leakage or damage (every 3 month).

### 5.5 Filter

Every 6 month the filters should be checked on damage/leakages and dirt. The following steps should be taken:

- Check the filter for dirt and damage.
- Measure the pressure loose over the filter which should not be higher than 150 Pa (G3/G4) or 250 Pa (F5/F7). If the pressure loose is higher the filters have to be changed.
- Open the filter rail with the help of the blue handles.
- Take out the filters and check the gasket on the filter rail for damage.
- Clean the filter rail and reinstall the old/new filters.



### 5.6 Heating coil

The following steps should be taken to maintain the heating coil of the unit:

- Check the coils for dust or dirt. If necessary, clean the aluminium fins by a soft brush or a vacuum cleaner.
- Straighten any bent slats using appropriate tools
- Air the coil circuits through the exhaust valves of the pipe system (air in the pipe system may reduce the capacity)
- Check that the frost sensor is properly fixed.

### 5.7 Fresh air damper

The following steps should be taken to maintain the fresh air damper of the unit.

- Check that the damper louvers can rotate when the damper motor is running and that they close/open completely (every 6 month).
- Check the fixing of the motor/damper shaft (every 12 month).
- Clean the damper louvers if necessary either dry or wet (every 12 month).
- Check the rubber gaskets on damage (every 12 month).

### 5.8 Cooling circuit

The following steps should be taken to maintain the evaporator and condenser coil of the cooling circuit:

- Check the coils for dust or dirt. If necessary, clean the aluminium fins by a soft brush or a vacuum cleaner.
- Straighten any bent slats using appropriate tools.

The following steps should be taken to check the cooling circuit:

- Close all inspection doors and start up the unit. Wait for a few minutes and check the LP/HP gauges. The HP gauge should show between 35-50 °C and the LP gauge about 5-10°C, depending on the running and outside conditions.
- Keep the unit running, open the inspection door by the receiver and check if there is enough refrigerant in the receiver and if the sight glass of the refrigerant circuit is free of bubbles.



If you are in doubt about the condition of the cooling circuit, stop the compressor at once to avoid damage and call a cooling technician or the Dantherm service.



### 6.1 Introduction

Normally a fault of the unit will be shown in the display of the electric panel. Depending on which panel has been delivered these alarm messages can be called differently. Please refer to the manual of the electric panel for more details. If the frequency inverter for the fan is showing an alarm, please refer to the manual of the frequency inverter.

### 6.2 Fault finding

Function	Problem	Cause	Action
Fan fault (red LED)	Thermo relay switched off	<ul style="list-style-type: none"> <li>• Fan motor broken</li> <li>• Phase missing</li> <li>• Fan belt broken</li> <li>• Thermo relay broken</li> </ul>	<ul style="list-style-type: none"> <li>• Change/Repair motor</li> <li>• Connect all phases correct</li> <li>• Change belt</li> <li>• Change thermo relay</li> </ul>
Fan not running (no red LED)	Fire thermostat (accessory) has switched off	<ul style="list-style-type: none"> <li>• Supply air over 40°C</li> </ul>	<ul style="list-style-type: none"> <li>• Check supply air temperature</li> </ul>
	Frost thermostat (accessory) has switched off	<ul style="list-style-type: none"> <li>• Coil off temperature below 5°C</li> </ul>	<ul style="list-style-type: none"> <li>• Check LPHW valve</li> <li>• Check hot water</li> </ul>
Compressor fault (red LED)	HP pressure over 24 bar	<ul style="list-style-type: none"> <li>• Air volume too small</li> <li>• Blockage in cooling circuit</li> <li>• Temperature too high</li> <li>• Solenoid valve not open</li> </ul>	<ul style="list-style-type: none"> <li>• Check air volume</li> <li>• Check/Repair cooling circuit</li> <li>• Reset pressure switch</li> <li>• Check/Repair valve</li> </ul>
	LP pressure under 1.5 bar	<ul style="list-style-type: none"> <li>• Leakage in the cooling circuit</li> <li>• Evaporator iced up</li> </ul>	<ul style="list-style-type: none"> <li>• Repair cooling circuit</li> <li>• Deice evaporator/Check de-icing function</li> </ul>
Compressor not running (no red LED)	Flow guard (accessory) activated	<ul style="list-style-type: none"> <li>• Fan motor broken</li> <li>• Phase missing</li> <li>• Fan belt broken</li> <li>• Thermo relay broken</li> </ul>	<ul style="list-style-type: none"> <li>• Change/Repair motor</li> <li>• Connect all phases correct</li> <li>• Change belt</li> <li>• Change thermo relay</li> </ul>
	Thermo relay switched off	<ul style="list-style-type: none"> <li>• Compressor broken</li> <li>• Phase missing</li> <li>• Thermo relay broken</li> </ul>	<ul style="list-style-type: none"> <li>• Change compressor</li> <li>• Connect all phases correct</li> <li>• Change thermo relay</li> </ul>

### 7.1 Disposal of the unit



Removal and disposal of the unit may only be performed by appropriate personnel! Before decommissioning and dismantling the equipment you have to shut down all supply lines like electricity and hot water. Make sure that there is not water-glycol mixture leaking out.

Empty the heating coil for the water-glycol mixture before removing it from the unit.

Empty the refrigerant circuit for oil and refrigerant before dismantling.

Recycle all material according to national rules and procedures to protect the environment.

## 8. Parameter settings FC 101

Parameter	Description	Value	Function / unit	Comment
1-00	Configuration	0	Process open loop	
1-03	Torque characteristic	1	Variable torque medium	
1-20	Motor power	*	kW	* See motor plate
1-22	Motor voltage	400	V	
1-23	Motor frequency	50	Hz	
1-24	Motor current	*	A	* See motor plate
1-25	Motor speed	*	rpm	* See motor plate
1-90	Motor protection	2	Thermistor trip	With thermistor
	Motor protection	4	ETR Trip	No thermistor
1-93	Connection	6	Digital input 29	With thermistor
	Connection	0	No thermistor	No thermistor
3-02	Minimum Reference	0	Hz	
3-03	Maximum Reference	*	Hz	* Max motor frequency
3-41	Ramp up time	150	Sec	
3-42	Ramp down time	100	Sec	
4-12	Motor Speed low	15	Hz	
4-14	Motor Speed high	*	Hz	* Max motor frequency
4-19	Max Output Frequency	*	Hz	* Max motor frequency
5-40	Relay output 1-3	9	Alarm	
6-10	Low voltage	0	V	
6-11	High voltage	10	V	
6-15	Terminal 53 High Ref.	*	Hz	* Max motor frequency
6-19	Terminal 53 mode	1	V	
** Thermistor connection at terminal 29 and 50				
All other parameters are standard Danfoss factory settings.				







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