



Danfoss Air

**User manual for Danfoss
Air a², a³, w¹ and w²**

Contents

1.0 System overview	4
2.0 Main functions	
2.1 Away	5
2.2 Bypass	5
2.3 Info	5
2.4 Boost	6
2.5 Operating mode	6
2.6 Menu structure	8
2.7 Settings	10
3.0 Maintenance	
3.1 Replacing filters	14
3.2 Replacing Air Dial batteries	15
3.3 Cleaning the unit	15
4.0 Options	
4.1 Replacement filters	17
4.2 Controlling the system by PC	17
4.3 Heat surfaces	18
5.0 Troubleshooting	21

Thank You for Buying a Danfoss Product



Air unit w²



Air unit a³



All Danfoss Air units are
Passive House certified by
The Passive House Institute
in Darmstadt



Air Dial



CCM module



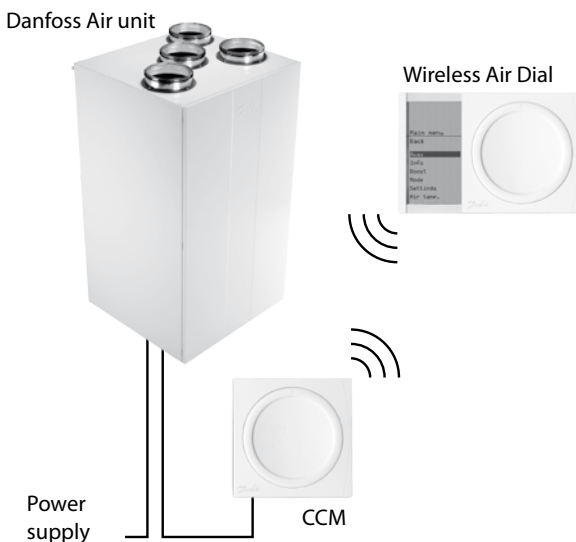
The Danfoss Air system uses Z-Wave wireless technology. Find more information on our website www.air.danfoss.com on the possibilities with Danfoss Air and Z-Wave technology.

1.0 System overview

Congratulations on purchasing Danfoss Air, one of the most advanced, efficient and quiet ventilation systems with heat recovery on the market.

On the following pages, we will take you through the steps needed to operate your system successfully as well as show you the few steps needed to maintain the system.

The operation of your system is all collected in one control panel, the Danfoss Air Dial. You have the entire system under control by rolling and pushing the dial, whilst the necessary information is shown in the display.



2.0 Main functions

2.1 Away



"Away icon"

Main menu > Away

Use this command when you leave your house for a prolonged period of time. The **Away** command reduces the air volume in the system to an absolute minimum, inside a defined interval. The unit will automatically assume normal operation when the **away** period is over.

Note: If a heating surface is installed (optional), it is turned off during the **away** mode (for financial reasons).

GB

2.2 Bypass (not available on w¹ units)



"Bypass icon"

Main menu > Bypass

The bypass function is a cooling function which opens a passage parallel to the heat exchanger. This stops the heat exchange process. When the bypass is open, outdoor air is led directly into the house. The bypass can be activated in two ways:

1. **Manually**, by pressing the **bypass** command. This will start the **bypass** function for 3 hours (the run time can be changed in the **settings** menu). The **bypass** will not activate if the outdoor temperature is lower than +5°C.
2. **Automatically** if the outdoor air and room temperature are above the selected level. In the **Settings** menu you can set the temperatures at which the system is to activate an automatic bypass. The bypass automatically closes again when one of the two temperatures is lower than required.

2.3 Info

Main menu > Info

The **info** command shows a list, showing the present status of your unit. Here you can see all measured temperatures, fan steps, relative humidity in the room, and much more...

2.0 Main functions

2.4 Boost

Main menu > Boost

The **boost** command can be used in situations where you require a higher air volume than normal. Use it if you are having a party, if you are cooking something with a strong odour, if someone is smoking, etc. The **boost** function is timer-based, and as default runs for 3 hours (**boost** duration can be changed in the **Settings** menu). In **boost** the unit runs at 100% speed.

If it is not required that the system run at maximum capacity with boost, the maximum boost step can be set in the **Settings > Boost > Max.** menu. **Boost step**. In this menu you can also switch the **Autoboost** function on or off.

Autoboost is a function which automatically increases air flow if sudden humidity arises (bathing activity or cooking) - the function is active for an hour after activation after which the system returns to the original air flow.

2.5 Mode

Main menu > Mode

With the **Mode** command you can change how the ventilation system is controlled. Each **Mode** has its unique traits - choose the one that suits you the best:

Mode > Manual



"Manual icon"

In manual mode the air volume is kept constantly at the level you have selected (fan step 1 to 10). The control of the bypass function (see 2.2) is usually automatic, but if you do not require this, the automatic

bypass function can be switched off in: **Settings > Bypass > Automatic bypass: On/Off**.

It is also possible to switch the Autoboost (see 2.4) on/off so that the system runs constant air volume normally and only increases the air volume if significant moisture develops in the house (during a bath or cooking).

Control of the Autoboost function is usually automatic, but if you do not require this, the Autoboost function can be deactivated in: **Settings > Boost > Autoboost: On/Off**

2.0 Main functions

Mode > Demand



"Demand icon"

In the *demand mode* the built-in humidity sensor ensures that the air volume is regulated. At low outdoor temperatures at which the relative air humidity in the house becomes too low (= "too dry"), the system

reduces the air volume automatically. At those times of year when it can become too humid indoors, the system will work with a higher air change. This takes place automatically according to the season - the user does not have to worry about anything.

Note: Outside the heating season, when the outdoor air contains more moisture than in the winter period, the air flow will remain more or less constant, at a rate equivalent to the set basic step - this ensures maximum comfort in the part of the season where heat loss is negligible.

Mode > Programme

PROG

"Programme icon"

In *program mode* a pre-defined family profile is chosen. Based on the profile, ventilation rate is high during the periods when the house is occupied and less when the house is empty. Periods of higher air change have also been included for when baths are taken or cooking takes place.

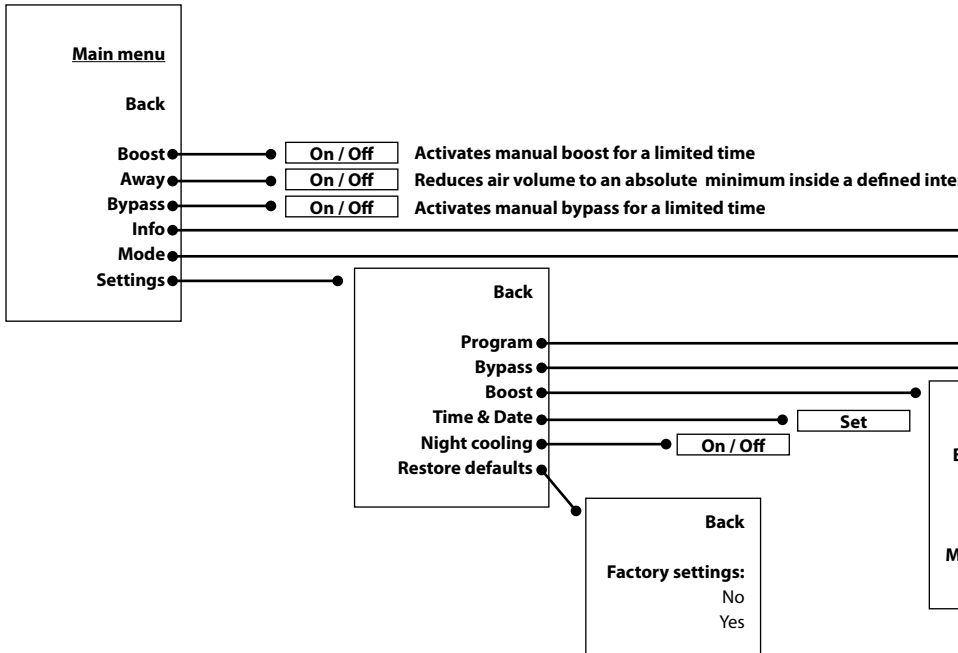
If none of the five pre-defined family profiles suits your requirements, you can download (as freeware) a pc-tool that includes the option of creating your own user profile. See installation manual for more info, or go to www.air.danfoss.com.

The default profile is no. 1 so this profile is active if you choose "program mode".

GB

2.0 Main functions

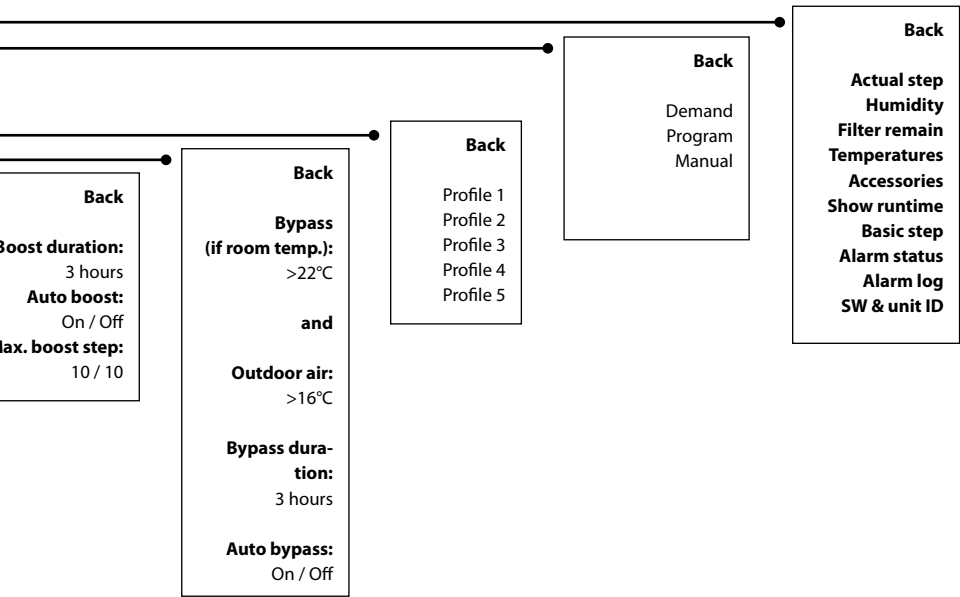
2.6 Menu structure



Note: w^l systems are not equipped with the bypass function. Bypass-related menu items are therefore not visible when operating a w^l system.

2.0 Main functions

erval



2.0 Main functions

2.7 Settings

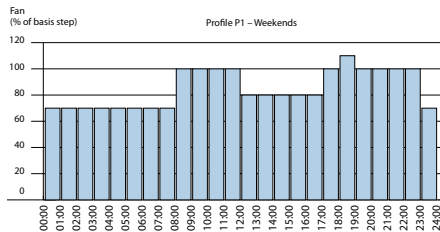
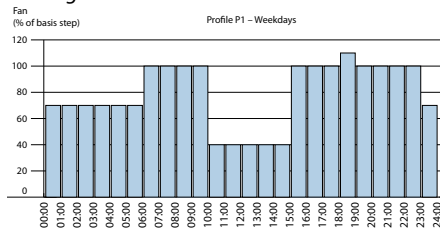
Main menu > Settings

In the *settings* menu, you can access a range of **default settings**, and thus customise the system to your demands. Here are the *settings* that can be changed, and a short description of the effect changing the *setting* has:

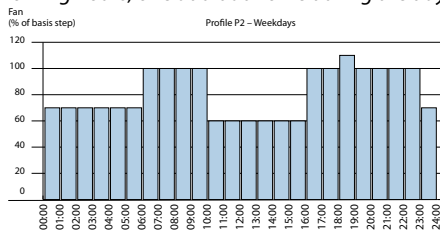
Main menu > Settings > Weekly programme > Choose profile 1-5

Tell the system what kind of family you have, and it will react accordingly.

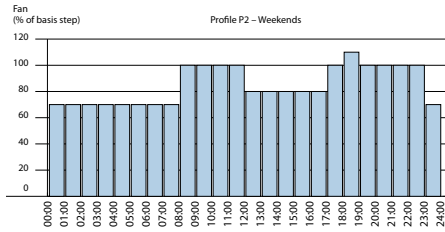
Profile 1: Family with children, both adults working normal working hours.



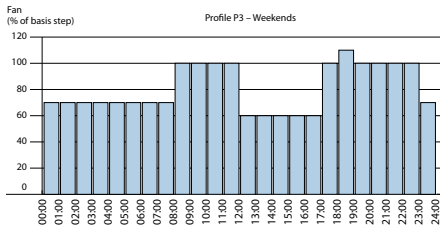
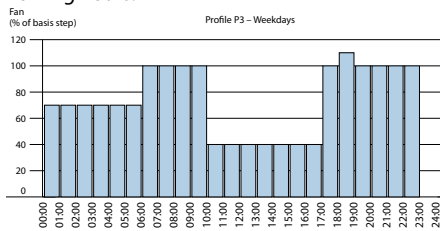
Profile 2: Family with children, one working adult, normal working hours, one adult at home during the day.



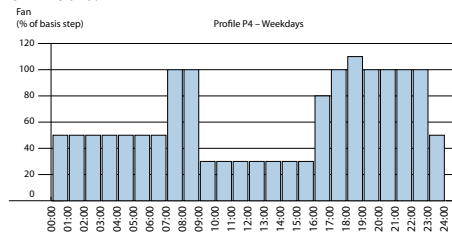
2.0 Main functions



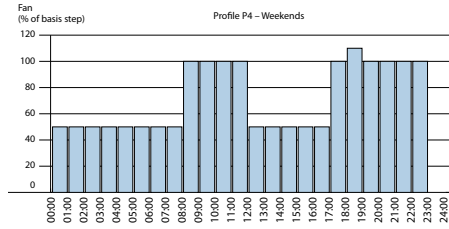
Profile 3: Couple without children, both working adults, normal working hours.



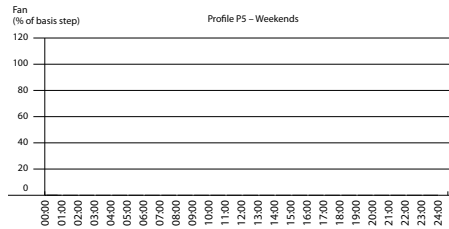
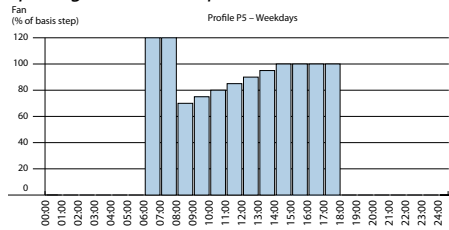
Profile 4: Single person (working adult), no one at home during work hours.



2.0 Main functions



Profile 5: Small commercially used office or sales outlet area. Opening times 8 am-4 pm, closed at weekends.



Main menu > Settings > Program > Choose profile 1-5

In the event that you did not find a profile that matches your demands, or if you simply like to experiment with the profiles, please download the PC tool from www.air.danfoss.com which will allow you to customize a program to suit your demands.

If a custom programme was created using the PC-tool, it will be visible in the menu as:

Main menu > Settings > Profile > User defined.

Main menu > Settings > Bypass

Here you can set the conditions under which the automatic bypass damper should open. Bypass means that we use the

2.0 Main functions

outside air to cool (see 2.2 in these instructions). The bypass function is released when the outdoor temperature exceeds the limit you set and if the room temperature is too high. If only one of the conditions is present, the automatic bypass is not released.

If you wish to force the bypass to open, this should be done in the main menu. The function is active in the time period chosen in *Main menu > Settings > Bypass > Timer* (default setting is 3 hours).

Main menu > Settings > Boost

In this menu you can customise the boost function to match your requirements. If you use the manual boost - i.e. if you want to activate boost in the main menu - the function will run on a timer. This timer can be set here:

Main menu > Settings > Boost > Boost duration.

In the *Boost menu* you can also choose whether to switch the *autoboost* on or off (see Point 2.4 for an explanation of *autoboost*). If *autoboost* is switched on, it is active in all modes.

In certain systems, the boost function can become too powerful (the default boost setting is that the fans run up to 100 % output). If this is the case, the maximum boost step can be reduced here: *Main menu > Settings > Max. Boost step*

Main menu > settings > Time & date

Here you can adjust the time and date of your system.

Main menu > Settings > Night cooling

Here you can define whether or not you will allow night cooling (disabled as default). Night cooling is a form of automatic bypass, that can be used in the summertime. The system automatically detects if it was a warm day, and only then will it be activated. The night cooling function will allow the supply air to be +10 °C or higher. The function runs from midnight until 6 am, and automatically stops if the outdoor air is colder than +10 °C or if the extract air temperature drops below +18 °C.

Main menu > Settings > Restore default

Restores all user settings to factory default values.

3.0 Maintenance

3.1 Replacement of filters

Your Danfoss Air unit was designed to assure an absolute minimum of maintenance. Maintenance is limited to 1-2 filter replacements a year depending on the air volume and air pollution levels in the area in which you live. In industrial areas, and in areas with a high pollen content in the outdoor air, the filters will be clogged faster than in a typical suburban environment.

When the unit gives the filter alarm (audible alarm from the Air Dial + message in display)

- Go to the Air unit.
- Remove the front panel. There is no need for tools. Just lift the panel off the unit.



- Pull out the filters and inspect visually (if filter is only lightly fouled/discooured, you can attempt to clean it, using a vacuum cleaner equipped with a brush. But most often this will *not be worthwhile nor recommended*).



- Fit new filters and reattach foam covers.

If you have bought a special pollen filter, it should be fitted in the filter slot to the right (on all models) as this is the filter that filters the outdoor air.



- Press the filter reset button on the front of the unit.

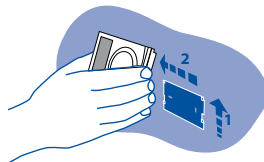
Observe filter replacements to get the maximum out of your ventilation system.

Note: The fans use more power when the filters are enabled so it is not a good idea to attempt savings here. Standard filters and optional pollen filters (F7 class) can be purchased from your installer.

3.0 Maintenance

3.3 Replacement of Air Dial batteries

When the Air Dial needs a new set of batteries, indicated by an audible alarm. Lift the Air Dial of the wall bracket, remove the batteries and replace with new batteries. The Air Dial uses 4 x AAA batteries.



GB

3.2 Cleaning the unit

You should clean the inside of the unit every other year.

1. **Disconnect power** ⚠️ and remove the front panel.



2. Unscrew the six screws holding the three metal rails (using the correct size torx key).



3. Then remove the front foam panel



4. You now have access to the parts inside the unit.



3.0 Maintenance

5. Pull the thick round seal over the heat exchanger out sideways.



6. The heat exchanger can now be lifted/pulled carefully out of the core.



Pour a mild soapy solution through the four open sides of the heat exchanger (use standard washing-up liquid). Let it soak for 5-10 minutes and then rinse under running water. Dry the exterior of the heat exchanger, and gently slide the heat exchanger into the unit again.

When remounting the exchanger, the round seal should be inserted last. This is best done by 'locking in the two ends' first and then pushing the rest of the seal into place.

Clean interior surfaces of the unit with a wet sponge or cloth (use a mild soapy solution).

UNDER NO CIRCUMSTANCES use solvents to clean the foam parts as solvents can dissolve the special foam material.

Avoid spraying water onto the main circuit board. If you do happen to spill water onto the circuit board, tap the circuit board lightly using a dry cloth. Leave to air dry for min. 24 hours before reconnecting the power.

Assemble the unit in reverse order:

- install the foam front panel
- secure the panel with the three metal rails
- tighten torx screws
- reinstall the front panel

You are now ready for another 2 years of troublefree service again.

4.0 Options

4.1 Replacement filters



G4 standard filter



F7 pollen filter

Replacement filters for your Danfoss Air unit can be purchased from your installer. The standard filters used in our units is G4 class for supply and discharge air. A G4 filter will provide basic filtration of particles larger than 10 µm. Use this filter for supply and discharge air, if you do not suffer from allergy.

Ordering standard filter sets (sets of two)

- G4/G4 standard filter set for w1089F0238
- G4/G4 standard filter set for w2089F0239
- G4/G4 standard filter set for a2089F0236
- G4/G4 standard filter set for a3089F0237

If you or members of your family suffers from **allergy**, choose a pollen filter set that will effectively filter out pollen. The discharge air filter does not affect the indoor air quality, so should remain G4 class.

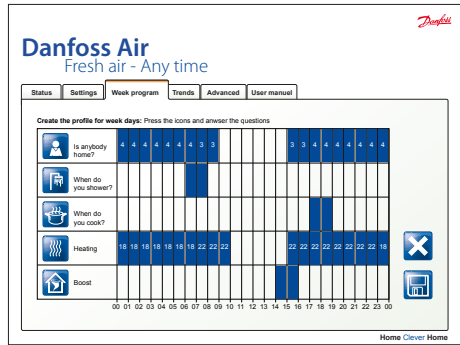
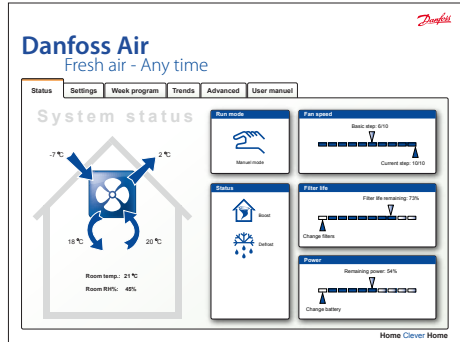
Ordering pollen filter sets (sets with one pollen filter, one standard filter)

- G4/F7 pollen filter set for w1089F0242
- G4/F7 pollen filter set for w2089F0243
- G4/F7 pollen filter set for a2089F0240
- G4/F7 pollen filter set for a3089F0241

4.2 Controlling the system by PC

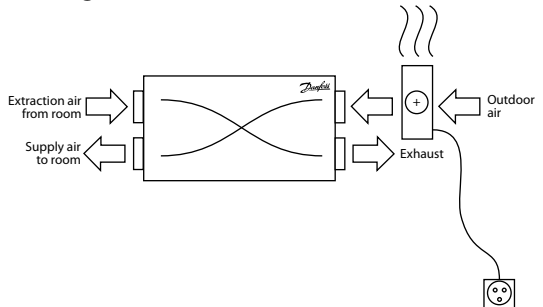
- Freeware, you can download the program for free at www.air.danfoss.com
- Control your DANFOSS AIR system from you PC screen via Ethernet (Standard for all Danfoss Air units - at no extra cost!)
- Make customised weekly programmes with the user-friendly week programme editor.
- Monitors and displays all temperatures and relative humidity in the house, in a single screenshot
- See trend curves for the last 14 days, all relevant sensors are logged hourly
- Easy access to advanced settings, all functions are described in a short and easy to understand text.

4.0 Options



4.3 Heating surfaces

Preheating surface, electric



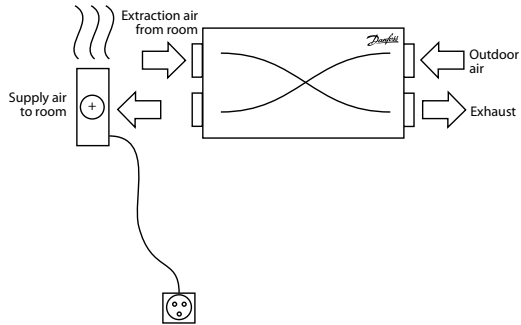
The electric preheating surface is used to protect the system against icing up at low outdoor temperatures. Before the outside air reaches the system, it is heated up from the current outside temperature to -2 °C (which makes frost forma-

4.0 Options

tion in the exchanger impossible). This solution ensures a permanent balance between the supply and extraction air. Adjustment is 100% stepless to ensure the lowest possible power consumption during operation. No settings are required on an electric preheating surface.

Afterheating surface, electric

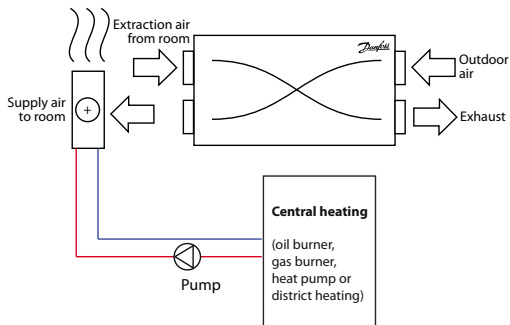
GB



The electric afterheating surface is used to ensure a minimum supply temperature before the air is blown into the room. The ventilation system will usually heat the outside air up to a temperature that is very close to room temperature so the electric afterheating surface is only used to give the supply temperature a little lift. Adjustment is 100% stepless to ensure the lowest possible power consumption during operation.

The required supply temperature can be set from the Air Dial in *Main menu > Settings > Temperature > Supply*

Afterheating surface, water-based



The water-based afterheating surface is (most often) used to ensure a minimum supply temperature before the air is

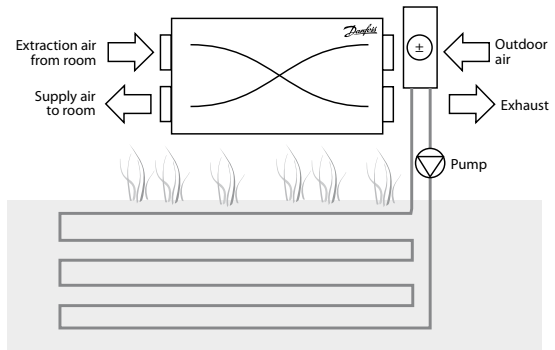
4.0 Options

blown into the room. The ventilation system will usually heat the outdoor air up to a temperature that is close to room temperature so the water-based afterheating surface is only used to give the supply temperature a little lift. 100% stepless control is carried out via the built-in motor valve.

The required supply temperature can be set from the Air Dial in *Main menu > Settings > Temperature > Supply*

The afterheating surface can also in special cases be used as total heating in passive or 0 energy houses if all parts of the system have been dimensioned for it. If this setting is selected, the required room temperature can be set in the main menu.

Geothermal preheating/cooling



The geothermal surface is able either to preheat or precool the outside air depending on the season. The control automatically determines what is required and controls the surface in and out of operation as required. The geothermal surface is provided with 'anti-freeze' (brine) which is circulated in a buried ground pipe using a circulation pump. This means that it is 'free renewable energy' that can be used with a clean conscience.

In the winter, preheat can be used to prevent the system from going into frost protection mode and in the summer it can provide pleasant additional cooling by cooling the air before it reaches the system. When the geothermal surface is cooling, the ventilation system's bypass of course opens automatically.


5.0 Troubleshooting

Symptom	Cause	How to solve
Alarm beeper active on Air Dial remote control + text in display.	The cause of the alarm can be read on the display. Press or rotate dial to enter alarm screen. The alarm screen will indicate what type of alarm is present.	Depending on the alarm. Follow the instructions below. End with OK for alarm on Air Dial remote control.
Alarm: Filter error	Air filters are dirty.	Exchange air filters, see chapter 3.1 for instructions
Alarm: Battery low	Battery voltage is too low in the Air Dial remote control.	Replace batteries (4 x AAA) in Air Dial. See instructions in Chapter 3.2.
Alarm: No connection to CCM	Communication between the Air Dial remote control and the CCM module has failed. The cause is typically that an obstacle has been created in the vicinity of the CCM module. An obstacle could be steel piping, other steel objects, or insulation material clad with aluminum foil. Another cause can be other wireless appliances that does not conform to wireless standards (radio noise).	If an obstacle has been identified, move it, if possible. If this is not practical, relocate the CCM module to a better location with a free 'line of sight'. If the error occurs due to other wireless appliances in your house, try switching these off in turn to identify the faulty device. If none of the above helps, please contact your installer.
Alarm: No connection via modbus	The cable from the CCM module to the unit has been unplugged or is defective.	Check cable and reconnect if necessary. If cable is connected, but error still occurs - contact your installer.
Alarm: Room air too cold	The central heating system in the building is not supplying heat. The room temperature is dropping, so the unit turn off to reduce involuntary heat loss. Alarm active if the Air Dial measures a room temperature below +10°C	Check if heating system is functional. If the problem can not be solved, contact the plumber/installer responsible for your heating system. When the error on the heating system has been remedied, the ventilation system should be shut down and power switched on again to resume normal operation. The power can be disconnected by pulling the power cable out of the system.

5.0 Troubleshooting

Symptom	Cause	How to solve
Alarm: Fire	One of the four temperature sensors in the Danfoss Air unit, or the temperature sensor in the Air Dial remote control has detected a temperature higher than +70°C! Unit turns off, and does not continue operation again before the all sensors indicate < +70°C.	Examine all rooms, leave the premises. If there is no longer an emergency/ the system is ready for operation, the ventilation system should be shut down and power switched on again to resume normal operation. The power can be disconnected by pulling the power cable out of the system.
Alarm: Sensor error	One of the sensors in the Danfoss Air unit, or the temperature sensor in the Air Dial is defective.	Contact your installer. The system continues to run, but with limited functionality.
Abnormally large negative pressure inside the house, doors binding	Discharge air flow is larger than supply air flow. Either balancing has not been carried out correctly during set-up of the system (if negative pressure was always present) or the unit is in extreme defrost conditions (can occur at outdoor temperatures < -12°C).	There should exist a flow imbalance of 4-10% (in favour of the discharge air), but if you experience a permanent problem with doors binding, contact the installer. If the problem only arises under extreme winter condition, it is due to the integrated defrost controller that reduces the supply air (hence not a defect, but an expected, and very rare occurrence).
Condensation in window frames occurs	Condensation occurs as a result of low surface temperatures (i.e. cold window frame or window glass) and humid air. Typically occurs in areas with local high humidity, i.e. bathrooms or utility rooms where clothes are drip drying. A little condensation in a bathroom following a shower is normal, but it should disappear within half an hour.	The air exchange is too low to remove the humidity. Increase fan step if in manual mode, or change to either demand mode or program mode. Go into Main menu > Settings > Boost > Autoboot on/off and enable the Autoboot.
The house is too hot	<ul style="list-style-type: none"> The house thermostats are set too high. Bypass is disabled on the ventilation system. 	<ul style="list-style-type: none"> Turn down the thermostats. Enable bypass in Main menu > Bypass > Auto bypass.

5.0 Troubleshooting

Symptom	Cause	How to solve
Noise from the unit	<p>If a-type unit: on rare occasions, vibration can occur if unit is mounted directly onto the joists. Unit should be mounted on a suitable platform.</p> <p>If w-type unit: If the rubber spacers have not been fitted at the rear of the unit or if the silicone strip was not fitted onto the wall bracket.</p> <p>A defective fan bearing will produce a 'grinding noise'.</p>	<p>For a-type models: Check that unit has platform acc. to installation manual.</p> <p>For w-type models: Check that rubber spacers and silicone strip were fitted.</p> <p>If fan ball bearing is suspected to be defective, contact your installer.</p>
Noise from Air valves	<ul style="list-style-type: none"> • Air flow is too high. • Pressure is too high over valve. • No silencer has been fitted to main duct. 	In a correctly sized system, noise will not be a problem. However, if the air valves are accidentally closed during cleaning, this can cause a hissing noise - so avoid turning the valves when cleaning the ceiling.
Frost icon on the display 	Low outdoor temperatures entail a risk of ice forming in the heat exchanger - the system is in defrost mode.	This is not an error, but a standard mode. The function stops automatically when the outdoor temperature rises.

INSTALLER'S STAMP



Danfoss

Danfoss A/S

Ulvehavevej 61
DK 7100 Vejle
Tel: +45 74 88 85 00
Direct: +45 74 88 87 13

www.danfoss.com

