Home Clever Home
Danfoss Air • Ventilation with Heat Recovery
Easy Installation
+ 
Easy Maintenance
+ 
Intelligent Control
+ 
Perfect Comfort
A Better Indoor Climate
Makes a Better Home

In order to conserve energy and reduce impact on the environment modern houses are extremely well-insulated. However, the downside of a well-insulated house is air-tightness. The reduction of the natural airflow necessitates efficient ventilation.

A well-designed ventilation system is energy efficient, quiet, and also aesthetically pleasing. Furthermore, ventilation ensures a healthy indoor climate and helps you avoid problems with e.g. humidity, fungus, and allergy.

The benefits are numerous, and with the Danfoss Air System, you can have it all.

Certificates

Danfoss Air Units are certified for use in passive houses by the Passivhaus Institute in Darmstadt, Germany and certified in accordance with Deutsches Institut für Bautechnik’s • DIBT/LÜ-A 20 standard.
Danfoss Air Flex pipes are Indoor Climate certified in accordance with the Danish Indoor Climate Labelling institute
Complete Solutions for Complete Comfort

Danfoss Air System comprises a complete solution for optimising indoor climate and comfort. Whether you are a house-owner or a technician installing the Danfoss Air System, you can enjoy the benefits.

Danfoss Air System is not merely a standard ventilation system, but rather a complete system solution. That means you get everything from one source: Danfoss.

Once the house-owner has decided on a Danfoss Air System solution, Danfoss carries out the dimensioning and delivery of the complete system – packed and ready for the professional to do the final installation. When installed the system will run unattended – apart from a routine filter exchange, which can be carried out in less than a minute without the use of tools – providing optimum indoor climate for years on end.

Danfoss Air is the system of choice, not only when planning new buildings, but also for installing in existing dwellings. The Danfoss ventilation system designers will design a fully customized system to suit each individual building. Danfoss Air is an energy-efficient way to ensure an excellent indoor climate with minimum environmental impact, and of course the Danfoss Air System complies to the strictest EU standards and regulations.
Healthy Indoor Climate – Healthy Economy

Danfoss Air
Ventilation with Heat Recovery
Comfortable Environment

A healthy indoor climate is very important. So is the global environment, and with Danfoss Air System you can do both a favour. Danfoss Air System helps you reuse heat from your house, thus saving energy and cost, whilst also catering for your well-being.

The requirements of you and your house form the basis, and the system is designed accordingly. Performance is finely tuned to match the house and its occupants, and the intelligent control system provides easy access to day-to-day adjustments.

The result is a ventilation system with Heat Recovery which is finely tuned to optimise both your well-being and your heating economy.

If you compare a new-built house, constructed in accordance with the most recent Danish building standards, to traditional “open windows” ventilation, the savings with a Danfoss Air System are substantial:

*Example: A Danish standard house of 180 m²*

<table>
<thead>
<tr>
<th>Interior size:</th>
<th>180 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Exchange Rate:</td>
<td>0.35 1/sec. per m²</td>
</tr>
<tr>
<td>Air Flow:</td>
<td>227 m³/h</td>
</tr>
<tr>
<td>Choice of Danfoss Air Unit:</td>
<td>Air a²</td>
</tr>
</tbody>
</table>

* Annual electrical consumption for ventilators 550 kWh
** Annual savings on heating 7,130 kWh

Total net energy savings 6,580 kWh

* Electricity consumption calculation is based on a duct system with a total external pressure drop of 100 Pascal including all hoods, grilles, and fresh-air supplies. Calculation is based on constant operation throughout the year.

** Calculations are based on dry thermal efficiency measured by independent 3rd party test facility according to EN 308 standards. Calculations are furthermore based on balanced flow exhaust/supply using Danish climate data. Calculations do not include infiltration of outdoor air and are based on constant operation throughout the year. Annual savings are calculated as the difference between heat loss with the heat recovering system, and heat loss at the same air exchange rate, but without heat recovery system, i.e. natural or mechanical exhaust ventilation.
Everyday Aesthetics

Danfoss Air
Ventilation with
Heat Recovery
Following the best of Scandinavian design traditions, aesthetics and efficiency go hand in hand. The elegant design ensures that the Air Unit will fit into any environment.

It is our philosophy that the range of technical refinements and possibilities don’t need to be visible. They simply need to be present. With the Danfoss Air System they are, and here beauty is not only skin deep.

Even though the Danfoss Air System is extremely efficient, it is barely audible when operating. Fans, ducts, and dampers have all been selected and implemented with performance in mind. The air flow has been carefully designed, filters are large and efficient, and insulation is injection moulded for a perfect fit.

The design and the attention to detail ensure reliable, problem-free operation. In fact, if you choose to set and forget, the only time the system will require a few minutes of your attention, is when the filter change is due.

The Danfoss Air System looks good, speaks softly, and yet works efficiently, ensuring perfect indoor climate.
The **Heat Recovery Principle**

The Danfoss Air System utilises heat from e.g. kitchens and bathrooms to heat supply air to a comfortable temperature. This provides both air renewal and a healthy indoor climate.

The heart of the system is the heat exchange unit which comprises two separate, isolated air circuits. One is connected to the fresh-air supply and the other is connected to the exhaust system which carries heat and humidity from e.g. kitchens, bathrooms, etc.

When the exhaust air reaches the heat exchanger, the heat is transferred to the fresh supply air via a number of thermally-conductive elements.

The Danfoss Air System recycles the energy contained in the exhaust air, thus dramatically reducing energy costs and environmental footprint compared to natural ventilation.

The Danfoss Air System will typically completely replace the air in a house over a two to three-hour period.

**System overview**

Exhaust air outlet  
Heat Recovery Unit  
Fresh air supply  
Living room  
Bedroom  
Hall  
Kitchen  
Bathroom
Perfect Indoor Balance
Comfort Close to You

Danfoss Air
Ventilation with Heat Recovery
Complete Air Control

The Danfoss Air System offers unrivalled ease of use in one beautiful control device. In line with the Air Units the Air Dial also follows our design philosophy. Furthermore, the wireless control unit can be placed almost anywhere for easy access.

The user interface enables you to view system status, activate pre-sets, and boost performance. Simply set and forget, or if desired, control every aspect of operation manually. Or you can choose the built-in Demand Controlled mode, allowing the system to automatically adjust ventilation settings according to input from a moisture sensor. You can even customise the operating profiles, to adapt them precisely to the lifestyle of your family. Simply connect via Ethernet and customise from your pc with the Danfoss Air Control software.

The Danfoss Air System leaves you in complete and easy control of the indoor climate, making your home a truly clever home.
The Danfoss Air System ensures optimum indoor climate both day and night, all year long.

Should you need to give your house an airing, e.g. after cooking, partying, or exercising, Danfoss Air offers the efficient alternative to opening windows and doors: Simply activate the Boost function. This lets the system fans operate at maximum speed for a pre-set period of time, providing you with ample fresh air without adversely affecting the indoor climate.

You’ll be delighted by the swift and efficient re-establishing of optimum indoor climate. The system also offers the so-called “Summer Bypass” mode. Here the exhaust air does not pass the heat exchanger, which means that the supply air enters the room at outdoor temperature. This mode can also be combined with the Boost mode – a particularly useful feature if you want fresh, cool air in your house, e.g. after a party.

A truly pleasant feature is the Danfoss Night Cooling. This feature utilises the cool night air to gently cool down the house – though never cooler than 18°C. The Danfoss Air System checks the outdoor temperature twice a day, and when average daytime temperature reaches plus 20°C, the Night Cooling function is automatically activated. The Night Cooling feature is then active during the night.

Summer Bypass and Night cooling is not available for the Air w System.
Fresh Air – Any Time
Expanding Possibilities

The Danfoss Air system is upgrade-ready, and all optional extras install as plug-and-play for increased comfort and low running costs.

Add a geothermal pre heater

A geothermal pre heater unit comprises a closed circuit of pipes (i.e. a ground collector) containing an anti-freeze liquid. The pipes are buried in the ground at a depth where the temperature typically is in the range +3 to +10°C. A finned coil exchanges the 3 to 10°C to the supply air of the Danfoss Air System, thus providing cool air on warm days. In the winter, the temperature of the pre heater liquid will be above outdoor temperatures, thus reducing heating costs by pre heating supply air. This feature also helps to prevent the heat exchanger from freezing.

Seasonal benefits

- Reduces the temperature of the outside air entering the house
- Energy efficient way of cooling with environmental care
- Integrated condensation drain
- Integrated settings in the Air Dial

- Raises the temperature of the outside air entering the house
- Taking advantages of indirect solar heating in the ground
- Energy efficient frost protection of the heat exchanger
- Integrated settings in the Air Dial
Geothermal Pre Heater
Danfoss Air
Ventilation with Heat Recovery

**Heating Surface**

**Electrical after heating**
- Extract air from room
- Supply air to room
- Outdoor air supply
- Exhaust
- Power supply

**Water based after heating**
- Extract air from room
- Supply air to room
- Outdoor air supply
- Exhaust
- Hot water feed
- Return

**Electrical pre heating**
- Extract air from room
- Supply air to room
- Outdoor air supply
- Exhaust
- Power supply
Expanding Possibilities

Add an electric pre heater
In order to prevent defrost operation from occurring, an electric pre heater may be added to the system. By preventing defrost operation from occurring, the air flow going in and out of the building will always be in perfect balance. The pre heater is particularly suited for use in cold climates. The pre heater is operated by a micro controller and a solid state relay, which ensures optimum operation with minimal power usage.

Add an after heater
The after heater ensures that the supply air always reaches a fixed temperature, equal to- or slightly higher than room temperature. This prevents draught near the supply air valves, and this mode of operation is called “comfort mode”. The after heater, however, is not to be viewed as a complete heating system.

The after heater is available in both an electric version (which offers lower installation cost, but higher running costs) and as central heating version (which offers higher installation costs, but somewhat lower running costs).

In certain cases the central heating version of the after heater can be used as the main heating source in modern low-energy buildings for the so-called “single zone heating”. This method of operation is called “heating mode”, and this use should be planned in cooperation with Danfoss A/S, as there are numerous technical issues to consider.

Heating surface benefits
- After Heaters increase indoor comfort level by eliminating draught
- Pre heaters will ensure perfect air flow balance, even in extreme winter conditions
- All heating options provide plug-and-play installation
- Air Dial remote control will auto-detect any optional devices added
- Heating surfaces can be controlled from the Air Dial remote control
- Heating surfaces have integrated frost or overheating protection
- All heating surfaces are supplied as “ready-to-use” from the factory
Flexibility and Efficiency

In environments where high demands are placed on aesthetics, design, and functionality, the integration of ventilation systems may pose quite a challenge. The new Air Flex pipes, however, mark the beginning of a new era by enabling efficient ventilation in practically any room or building.

The Air Flex pipes are suited for both new buildings and renovations. Since the pipes can be embedded in e.g. concrete walls, plaster board walls, and floors, ventilation systems can even be installed in two-storey-houses and in rooms with cathedral ceilings.

The Air Flex pipes are a part of the Danfoss Air System which is supplied as a complete solution, catering for quick and easy installation. The system may be pre-programmed to supply individual levels of ventilation in different rooms.

The Air Flex pipes carries the “Indoor Climate Certificate” from the Danish Institute of Technology which certifies that the pipes do not emit harmful gases, smell, or particles, and furthermore that the tubes will not damage the environment when disposed of.

The Air Flex system is supplied as a complete package solution comprising e.g. pipes, manifolds, couplings, grills, and sealing rings. This ensures hassle-free installation and a system which is up and running in the shortest possible time.
The Air Flex System

Installed in two-storey-house
Refined Technique

Designing a standard heat recovery system is not necessarily all that difficult, but with the Danfoss Air System we didn’t just choose the simple way. It was our aim to combine efficiency with simplicity, design, comfort, and ease of use. This meant considering various points such as energy consumption, noise level, user interface, choice of materials, installation issues, and after-sales support.

The result is a highly efficient system which ensures optimum indoor climate with minimum environmental impact, ease of installation and use, and practically no maintenance.

State of the art technology

The heat exchanger core is based on so-called counter current flow; i.e. the exhaust air passes a number of thermally-conductive elements which then transfer the heat energy to the supply air passing the elements in the opposite direction. The two air streams are never in direct contact and the efficiency of the heat transfer means that most of the thermal energy is recovered. This means considerable savings and reduced energy consumption for the benefit of the environment compared to natural ventilation.

Plug and Play

“Time is money” – which is why you will probably appreciate that you can forget about using tools once the ducts are mounted and the Air Unit is connected. Simply connect the communication module to the Air Unit with a plug. Once the communication module is connected, the Air system will automatically take you through the process of setting up the complete system solution.

Airline support

Danfoss stands behind its installers – all the way:

- Design of the complete Air system tailored to the individual house and optimized for sound reduction and high performance.
- Complete documentation in complete detail, including drawings of the ducts systems detailed to the level of individual supply and extract valves.
- Set-up software on Memory Stick – including a “Did I remember everything?” check list for the installer.
- Telephone support by experienced Danfoss technicians.
The Complete Airline

The Danfoss Air System is not merely a ventilation system or a heat recovery unit. It is a complete solution which caters for your every need in indoor climate control and comfort. The solution comprises five main areas which cover every aspect of installation, day-to-day operation, and after-sales service and maintenance. There is no need to look elsewhere, and this makes the Danfoss Air System the optimum system, both for installers and home owners.

The Danfoss Air System:

Air Units
The heart of the Danfoss Air System, the unit is available in four different models suited for either wall or attic installation.

Air Dial
The Control Unit provides easy, user-friendly, intuitive, and wireless access to controlling all aspects of operation. The elegant design ensures that the unit will blend in anywhere.

Air Ducts & Air Flex
In order to ensure optimum ease of installation and performance, Danfoss provides a wide range of ducts, pipes, fittings, etc. All you need is included in the package.

Air Heaters
The Danfoss Air System can be expanded with a Heating Surface heated by e.g. electricity, district heating, heat pump, or geothermal pre heating/pre cooling and may be controlled via the Air Dial Control Unit.

Air Sizing
The Danfoss ventilation technicians will tailor each system individually with focus on sound and performance, hence giving the installer the certainty of a optimum solution.
For generations Danfoss has provided solutions for all aspects of heating and cooling, e.g. valves, thermostats and highly advanced control systems. The Danfoss Group comprises a global network of sales companies, agents, and distributors, and Danfoss products are sold, serviced and trusted all over the world. The Danfoss products play an important part in ensuring optimum indoor climate and comfort. This has always been part of our heritage, and the new Danfoss Air System also continues this tradition.

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