

AIR HANDLING UNITS WITH BUILT-IN COOLING



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CONTROL YOUR INDOOR CLIMATE
WITH ENERGY-EFFICIENT
HIGH QUALITY VENTILATION SYSTEM
FROM DANThERM

OPTIMIZE THE SURROUNDINGS WITH CUSTOMIZED AIR HANDLING

A comfortable indoor climate is an important factor for all people. The modular, high-end DanX air handling unit is designed to regulate and control temperatures, humidity and air quality in hotels and office buildings – or anywhere else where the well-being of the occupants is a priority. Based on Dantherm's "all-in-one-box" concept, DanX ensures you a highly reliable and easily operated solution, and offers not only significant heat recoveries but also the possibility of high quality demand management.

People are affected by two main factors when indoors: temperature and air quality. How high or low the temperature should be depends on the activities taking place in the particular room as well as on the outside climate and the season. In choosing the popular DanX for your comfort air handling needs you are not only guaranteed a top-of-the-line solution, but also 50 years of experience within the climate control and air handling business.

Modular design

Based on modularity and a flexible approach, the unique DanX air handling unit allows you to choose the exact level of functionality

required by a specific project. The modules are joined by an unique rail system and with all functionalities contained in just one unit, installation and maintenance have never been easier. The DanX air handling unit is available in 7 sizes with air capacities ranging from 2.000 to 32.000 m³/h.

As individual requirements differ, a long list of components and accessories are available for the DanX unit.

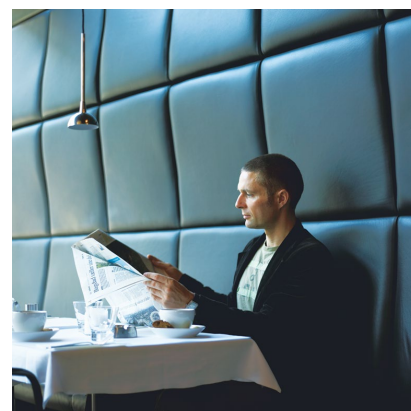
DanX with heat pump

One of the great advantages of the high end DanX unit is the fact that it can be supplied with a built-in reversible heat pump, allowing for cooling in the summer and heating in the winter – and making such things as outside cooling installations redundant. As the heat pump can easily be re-directed, de-icing of the coils is carried out at once within the heat pump circuit. The heat pump consists of a high performance compressor and can be extended with a frequency controller that makes possible exact regulation of the thermal indoor climate.

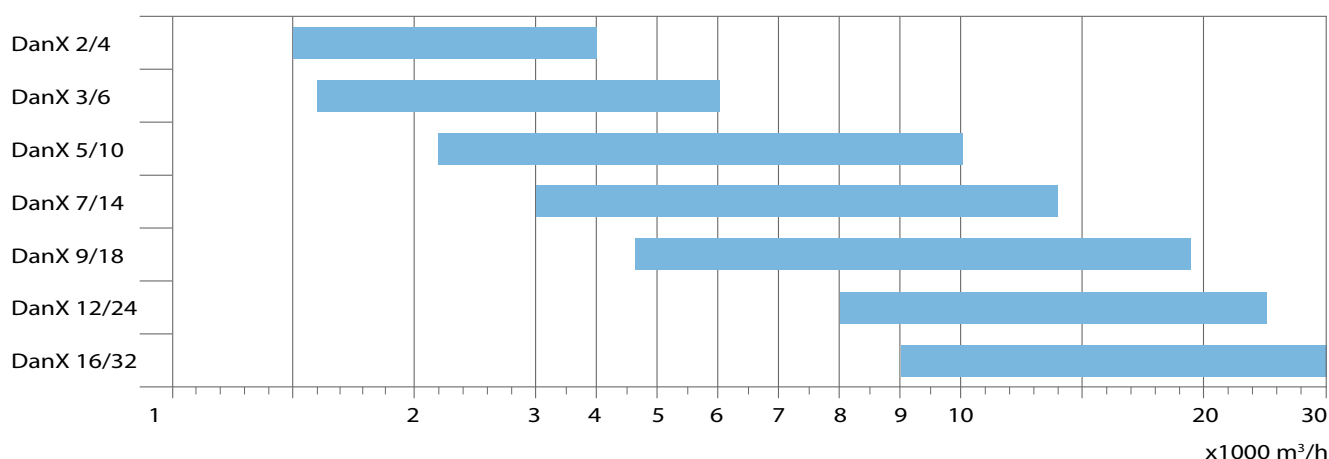
Another option is to supplement the heat pump with a water-cooled condenser for extra cooling capacity. The excess heat can be utilized for heating the water for domestic use.



The DanX Unit can be supplied with a built-in reversible heat pump, allowing for cooling in the summer and heating in the winter. Furthermore the unit can be equipped with components adapted to your specific requirements.



Air flow rates DanX XWP and RWP:



Cost-efficient operations

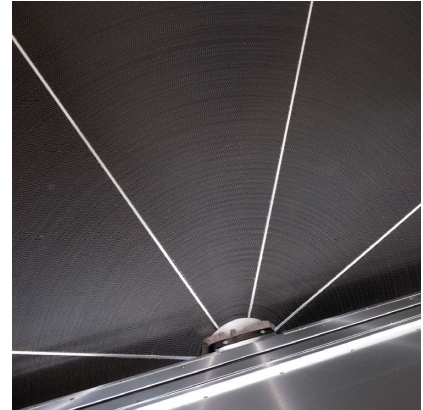
The price of an air handling solution is of great importance, but so is the total life cycle cost and the return on investment speed. DanX takes the widest possible account of economics. Efficient heat recoveries and low pressure losses contribute to cost-efficient operation and ultimately significant energy savings, while durable components ensure long life.

Robust materials

The galvanized DanX units are made from robust materials, designed to ensure reliable operations in every climate in the world. Inspection doors and panels are made of sandwich elements with 50 mm insulation and with strong hinges and handles.

Selection program

Designing an air handling unit can be a rather complex task but at Dantherm we have put every effort into making it as easy as possible for you. For an optimum result a variety of factors need to be taken into consideration and we offer a selection program designed to do just that. Naturally, you can also draw on the knowhow and expertise of our engineers and sales team who are more than happy to help you customize an air handling solution that meets your exact requirements.



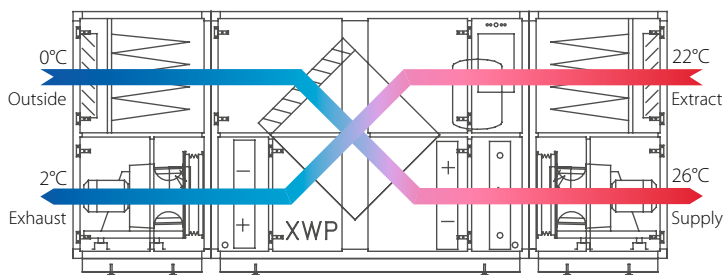
The DanX Comfort unit can be supplied with a rotary heat exchanger, a crossflow heat exchanger or run around coils. They can all be combined with the reversible heat pump.



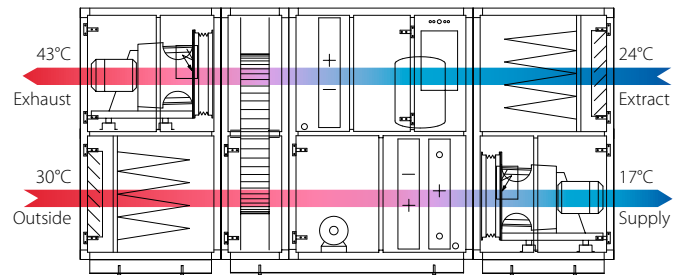
The DanX units are equipped with Heat Exchangers produced by HEATEX who participates in the Eurovent Certification programme for Heat Exchangers. Check ongoing validity of certificate on www.eurovent-certification.com or using www.certiflash.com.



Winter: Example with crossflow heat exchanger



Summer: Example with rotary heat exchanger



The built-in reversible heat pump can run in heating mode during the winter and in cooling mode during the summer, this offers optimum comfort and energy efficiency.

HEATING, COOLING AND VENTILATION - ALL IN ONE BOX -

Well-being, comfort and energy optimizing in combination

It is well-known that a correct temperature is a must for the human well-being. An important, however not always recognized factor, is the supply of fresh air. In other words we accept the "air conditioning" and forget the fresh air. But what should be friendly and accommodating for a customer in a supermarket or a guest in a hotel lobby, must for the owner, and investor, be optimized in energy consumption and at least not more expensive than traditional solutions.

With the PRS units, Dantherm have been the supplier of a range of "all inclusive" solutions for comfort ventilation for a number of years. This solution ensures both a correct temperature, and introduces at the same time a sufficient amount of fresh air. Many years of collecting know-how are built into the control and this is your guarantee for both optimal comfort and running costs.

Combination of functions

The great advantage of Dantherm's solution for comfort ventilation, is the combination of the 3 types of functions: heating, cooling and ventilation in one unit from one supplier. The complete air management is done from one compact unit, which can be placed on the roof, in the basement or somewhere else convenient. This comfort solution is specifically designed for air handling in large open spaces like shopping centres, bowling halls or hotel lobbies.

When sizing the unit

Total volume of the room multiplied by 4 gives the air volume that the unit should be able to handle. In the below table the various units are listed with the nominal air volume. Also the heat load of the building should be taken into consideration, as this is a part of the heating process in the winter as well as it is a part of the demand for cooling in the summer. In a standard shopping center the cooling capacity of the unit is about 60 Watts pr. m². The requested air volume per person varies from country to country.



Shopping center, Gdynia, Poland.



DanX PRS and PRS EC:

Size	Air volume m ³ /h	Supply air temp. summer °C*	Supply air temp. winter °C**
DanX 2/4 PRS	3.300	14,1	22,4
DanX 3/6 PRS	4.500	13,9	23,5
DanX 5/10 PRS	8.300	14,0	23,2
DanX 7/14 PRS	12.000	14,2	22,5
DanX 9/18 PRS	15.500	13,8	24,0
DanX 9/18 PRS EC	15.500	12,5	27,5
DanX 12/24 PRS	21.000	14,0	23,5
DanX 12/24 PRS EC	21.000	12,8	27,5
DanX 16/32 PRS	25.000	15,1	21,8
DanX 16/32 PRS EC	25.000	12,1	26,9

* Room conditions 24°C/50% RH. Outdoor conditions 30°C/45% RH.

** Room conditions 20°C/50% RH. Outdoor conditions -18°C/100% RH.

All mentioned temperatures (after the coil) are based on 30% outside air!

Key components

The solution is based on two key components. A non-mechanical cross-flow heat exchanger, and a reversible built-in heat pump unit. The cross-flow heat exchanger is working as pre-cooler or pre-heater device. The exchanger has no moving parts and is as such extremely reliable, and will be in operation year after year, basically without any service or maintenance.

The heat pump unit, with a COP coefficient of 1 : 5 (or higher) is securing the unit being able to run without additional heating or cooling components installed, even at the extreme temperature range as described.

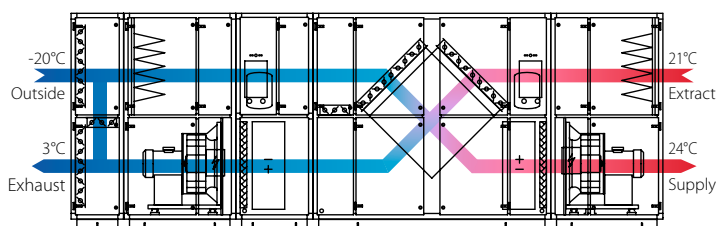
Advantages of the PRS solution:

- Only one compact system servicing the building.
One of the main benefits from having an "all in one box" solution is the elimination of mistakes in the controller correspondence between the various systems from various suppliers. One crew, from one main responsible partner installing one system, it cannot be more optimal.
- Low energy consumption:
The mentioned key components are securing very low energy consumption. Additionally, no energy is used for keeping water (hot or cold) on standby.
- One responsible company for design and function, service and maintenance ensures a perfect and optimised running economy.
- It works rapidly and directly to the actual request and is very efficient in terms of energy.
- No water cooling system
 - No need for insulated pipe installation.
 - No chillers and additional equipment.
 - Less noise emission.
- No water heating system:
 - No need for insulated pipe installation.
 - No boiler and additional equipment.
 - No need for a space taking boiler room.



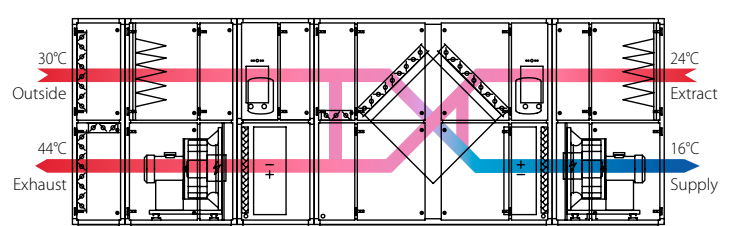
The PRS unit is capable of providing a lower supply air temperature than a standard configured unit, with the same cooling capacity and energy consumption!

Winter:



Heat exchanger pre-heating outside air. Compressor activity 100% (system running in heating mode). Energy saving mode activated.

Summer:



Heat exchanger pre-cooling outside air. Compressor activity 100% (system running in cooling mode). PRS supply air temperature control activated.

INTELLIGENT CONTROL SYSTEM

User-friendly control system

DanX can be supplemented with a unique Dantherm control system. With automatic monitoring and control of temperature, air quality and energy consumption, you are guaranteed a balanced and comfortable indoor climate adapted to your specific requirements. All the important functions are factory-set and tested, just as individual adjustments are easily made and tested.

The DanX unit is supplied ready wired and with all necessary sensors and safety devices installed. All control current components such as temperature sensors, damper motors, solenoid valves, motor valves etc. are connected to a terminal.

To make it as easy as possible to establish the electrical connection between the control panel and the DanX unit, the unit can be delivered with pre-mounted cables.

The control system combines intuitive, hassle-free operation with extremely advanced control and programming options. The result is highly precise demand management – which is the secret to unprecedented low operating costs for the DanX line.

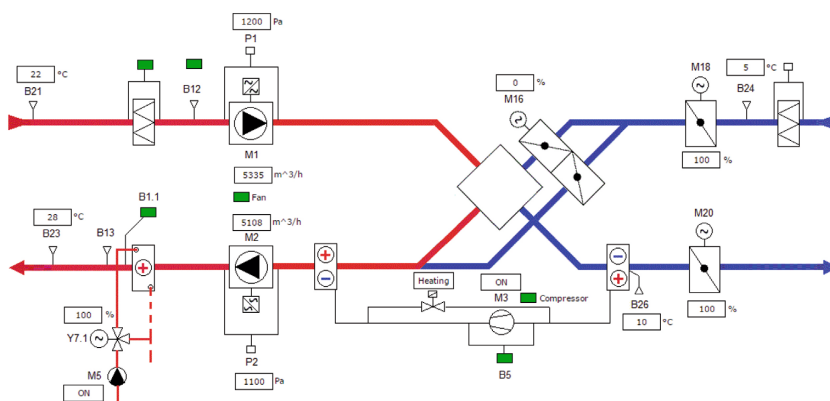
A large, easy-to-read display makes it easy to check settings and current status. And a few simple buttons let you quickly and easily programme the unit to suit your own preferences. Control over every single function is at your fingertips.



Depending on the configuration, Dantherm control systems are capable of communicating with most commonly used protocols like:

- MODBUS RTU
- MODBUS TCP/IP
- BACNET MS/TP
- BACNET TCP/IP

Furthermore the Dantherm control system can be connected to your local network and can be accessed from any computer, laptop or tablet connected to this network via standard web browsers such as



Example of flow diagram for XWP with MVC WEB controller

Features and advantages

- Precise demand control
- Easy to use man/machine interface
- Each DanX unit has its own customized control strategy
- Dantherm control systems can communicate with most commonly used protocols
- Can be connected to your local network
- Alarm messages can be sent to your mail address
- Individually tested together with the DanX unit before delivery