



### Case Study: Danfoss A/S

Munters' FA6 cooling contributes to enormous energy savings

#### Benefits:

- Carbon emission free cooling solution
- No uncomfortable dampness in cooled air
- Simple installation
- Minimal maintenance
- No use of coolants or condensers

## Munters' FA6 cooling contributes to enormous energy savings

NNB Ventilation are specialists when it comes to heat recovery, air conditioning and industrial ventilation. The company is one of Denmark's leading suppliers of cross flow exchangers and heat recovery generators for industrial use. NB Ventilation supplies customised solutions and carries out their own production in Aalborg. Emphasis is placed on the delivery of solutions that

are as close to Plug&Play as possible, in order to minimise difficulties on the part of the customer during the construction and installation period.

With a massive focus on heat recovery and energy-saving ventilation and cooling solutions, NB Ventilation uses Munters' evaporative cooling solutions, for which completely carbon emission

free and indirect evaporative cooling can often be supplied.

This has also been the case at Danfoss A/S, Nordborg, where NB Ventilation has supplied a large number of systems over the last year for ventilation and cooling of both production and office premises.

## Ambitious energy saving targets met way ahead of schedule

Danfoss A/S has set a very ambitious target to halve the energy consumption for the heating of buildings by 2030. In isolation, the largest energy consumer is ventilation and the initial focus was therefore directed at this area. The company already had an air conditioning unit with an embedded FA6 humidifier from Munters and, based on the positive experience, it was natural for NB Ventilation to use this solution in connection with the replacement of older ventilation and cooling systems at Danfoss A/S.

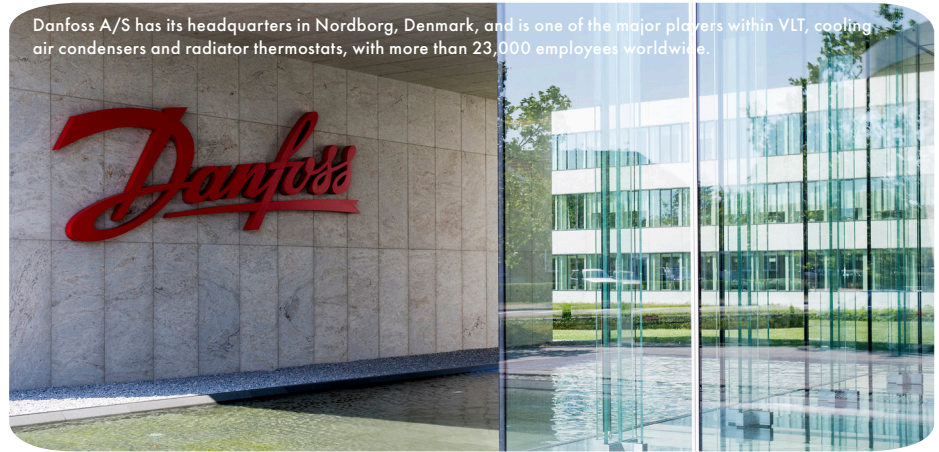
### Simple and highly efficient systems

At Danfoss A/S, NB Ventilation has installed new ventilation systems with double cross flow exchange and indirect evaporative cooling with a total effect of 2MW, distributed across approximately 20 systems. The largest two systems, each at 126,000 m<sup>3</sup>/h have replaced 12 smaller systems, which has resulted in major savings not only in terms of energy but also when it comes to the maintenance of motors, filter replacement, etc.

In connection with the installation of the new system, it has already been possible to reduce energy consumption by 70%, and the 2030 target has already been met in Nordborg, but the upgrade process is continuing. In certain circumstances the systems run entirely without heat consumption all the way down to an outdoor temperature of -2°C, which has resulted in a very short repayment period of 1-3 years.

This has been achieved through:

- collection of waste heat from production processes,
- double cross flow exchangers,
- cooling using FA6 evaporative coolers,
- Large ducts allowing for great variation in air volumes
- VLT-controlled adaptation of air volume and



- 150 mm insulation of ducts, 100 mm insulation of the systems, as they are all located outdoors.

### Cooling solution without any electricity consumption

Waste heat is collected in the production premises and exchanged in the system with an efficiency of 90% during winter. Only when the outdoor temperature drops below -2°C does it become necessary to heat the injection air. Cooling requirements occur during summer, both with regard to employees but also due to the requirements set out in connection with the tolerances associated with certain production processes. In the event that cooling is required, the exhaust air from the premises is not exchanged, but automatic damper controls supply outdoor air via the evaporative coolers, cooling the air flow before it passes through the cross flow exchanger. Some of the advantages of using Munters' FA6 cooling in this way are that the air can be cooled directly, preventing the injection air to office and production premises from becoming damp. The only consumption for the FA6 humidifiers is a small pump and water which is recirculated and treated to prevent limescale deposits. The cooling requirements are covered completely without the use of conventional cooling surfaces and associated energy-intensive air condensers.

### Humidifier/cooling technology:

Munters' FA6 evaporative coolers are designed especially for integration in ventilation systems and are based on nature's own cooling principle: cooling is generated by blowing air across a damp surface. The humidifier blocks are made from a non-organic and non-combustible material (GLASdek) that is sprinkled with water before air is injected through it with an air flow of between 0.5 and 30 m<sup>3</sup>/s. The nominal humidity is 65, 85 and 95% respectively and can be supplied both with and without the drop separation system DropSTOP™. With FA6, there is no risk of excess saturation of the air and legionella cannot occur. FA6 can be used for both direct and indirect evaporative cooling.



One of the two largest plants at 126,000 m<sup>3</sup>/h has replaced 6 smaller plants and ensured major savings.

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