

ENGINEERING  
TOMORROW

*Danfoss*

Case study | Thermocold

# Thermocold customers **save up to 80% on energy** through Danfoss solutions



**Energy label A+**

achieved by  
Thermocold on  
new cooling corner  
solution  
tested by **NEMKO**



## **Three industry giants** came together to implement innovative and test new cooling solutions that will set the trend for the cold rooms and cooling corners of the future.

Thermocold KFD A/S wanted to lead the way for their industry by improving energy efficiency and implementing low-GWP refrigerants in their popular cold rooms and cooling corners for homes, schools, restaurants, hospitals, and industrial settings. Introducing variable speed compressors

with electronic thermostats and switching refrigerant from R134a to R600a (Isobutane) turned out to be a highly effective solution, earning the company's cooling corners an A+ energy label and saving their customers up to 80% on their energy bill.

### **The challenge: Thermocold wanted to optimize energy efficiency and take the lead in climate-friendly solutions**

Refrigerant legislation imposed to combat climate change requires a gradual phase-out of some of the HFCs widely used for domestic cooling solutions. Even though the deadline for the phase-out imposed by the EU F-Gas Regulation is not until 2020, Thermocold took up the challenge early and started investigating how to replace 134a with a natural refrigerant in their cold rooms and cooling corners.

At the same time, Thermocold was looking for how they could save enough energy to qualify their products for the NEMKO A+ energy label. One of the key challenges was to achieve high efficiency at all running conditions while using natural refrigerant R600a, especially when the ambient temperature was high or in situations with frequent door openings.





## The solution: A new compressor and Danfoss electronic thermostat paved the way for climate-friendly and energy efficient cooling units

Having been long-term partners in cooling technology, Thermocold knew they could turn to Danfoss for help configuring the next generation compressor and control solution for their cooling units.

“When Thermocold contacted Danfoss with a wish to improve the energy efficiency of the cooling units, we immediately contacted Nidec as the ideal supplier of best-in-class variable speed compressors for domestic and light commercial applications. In combination with our ERC smart controller, we could offer a winning solution to Thermocold,” says Lars Thuesen, sales director from Danfoss.

After careful testing, monitoring, and evaluation, we arrived at an optimal solution that fulfilled the criteria set up by Thermocold. The solution for the cooling corners consisted of:

- A Nidec XV7.2 compressor with variable speed to ensure significant energy savings. Full load operation is extremely rare in most cooling applications, and the unique technology of the XV adjusts capacity automatically to the actual requirements at any time. This means that the compressor runs at low speed most of the time, minimizing energy consumption.
- The compressor was fitted with a Danfoss ERC electronic thermostat. The digital controller manages energy consumption, defrosting, and fan operation to ensure high efficiency under all load conditions.

The system runs on R600a, a natural refrigerant also known as Isobutane. R600a has become the refrigerant of choice in domestic and small commercial cooling units due to its low environmental impact and excellent thermodynamic performance. The refrigerant is non-toxic with zero ODP (Ozone Depletion Potential) and very low GWP (Global Warming Potential).

At Nidec, the transition to natural refrigerants is running full speed.

“We are in the process of converting our wide compressor program to natural refrigerants, notably Isobutane and Propane. Combined with variable speed, we typically see energy savings of 40-50% with the new refrigerants. This is a win-win for our OEM customers and the end-users,” says Allan Slot, Senior Application Engineer at Nidec.

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## The result: A new competitive, climate-friendly, and highly efficient solution

It took a couple of years of hard work for the three partners Thermocold, Nidec, and Danfoss to find the right solution. According to Thermocold Cooling Manager Jørgen Børresen Johansen, the time spent on finding the perfect configuration was worthwhile:

“After a lot of tests and trials with different components, we finally found the right solution and achieved the NEMKO A+ labelling that we aimed for and an outstanding Energy Efficiency Index of 41.59. We are pleased to be able to offer our customers a sustainable cooling corner that can save up to 80% on their energy bill and still offer unparalleled cooling

capacity compared to other similar products in the market. We will launch the new cooling corners at the beginning of 2018 and we have experienced great interest from the market already,” says Jørgen Børresen Johansen.

He emphasized that the solution is highly competitive in the market and stands out as the first and only solution so far to boast the NEMKO A+ labelling in Norway. The innovative cooling corner will pave the way for new cold room solutions for hospitals, care centers, and other applications.

### Facts about Thermocold

Thermocold is a Norwegian manufacturer of cooling rooms, cooling units, and cooling doors used in private households, shops, hospitals, schools, industrial settings, and more. Thermocold develops and sells high quality products at reasonable prices with a special focus on long service life, environmental protection, and energy savings.



### Facts about Nidec

Nidec develops and sells advanced compressor technologies for household, light commercial, and DC-powered applications around the world. The company is dedicated to supplying intelligent and sustainable solutions that set the standard worldwide.



### Facts about Danfoss Cooling

Danfoss is a worldwide market leader in cooling application solutions, including our quality electronic controls. The wide range of electronic controls include solutions for compressors/condensers, variable speed, evaporators/fans, thermostatic expansion valves, etc.

