



# Danfoss Smart Store Real solutions. Real results.



## In the Danfoss Smart Store the cooling and heating technologies are in operation 24/7

- The installations and technologies in the supermarket are scalable. They can be applied in the smallest store up to the biggest hypermarket
- The supermarket cooling (refrigeration and comfort cooling) systems run exclusively on natural refrigerants (CO<sub>2</sub>)
- The Smart Store application development center is located in Nordborg, Denmark

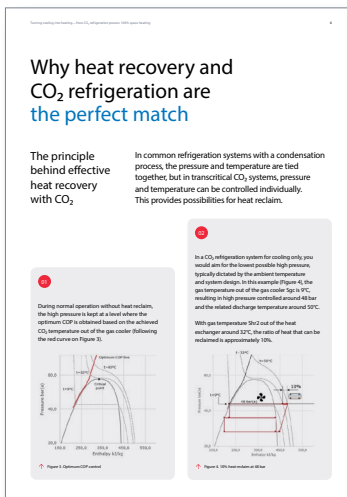
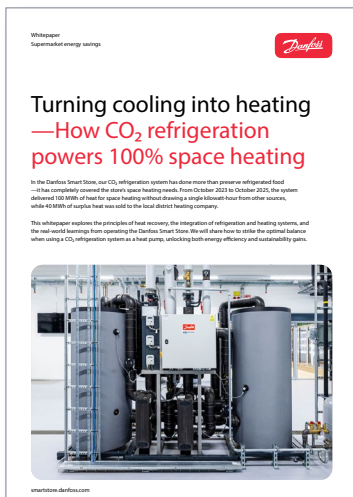
[Find out more](#)



## Journey towards a net-zero supermarket

Discover our innovations for helping you cut energy costs, reduce emissions, and prepare your supermarket for a more energy-efficient future.

[Explore the Smart Store e-book](#)



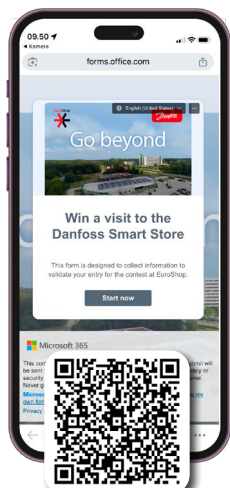
## Turning cooling into heating — How CO<sub>2</sub> refrigeration powers 100% space heating

This whitepaper explores the principles of heat recovery, the integration of refrigeration and heating systems, and the real-world learnings from operating the Danfoss Smart Store.

[Click here to read the whitepaper](#)



# Danfoss Smart Store Unleash your store's potential and optimize food safety



[Click or scan to win a visit to the Smart Store](#)  
The participation is open only to booth visitors and will close Thursday 26th February 2026 at 16:00 CET

## Visit us

We invite you to come and see the Danfoss Smart Store ADC in Denmark.

## How?

First: Fill out an online form, and we will contact you and make an agreement.

Next: Make your way to the Danfoss headquarters in Nordborg, Denmark.

## What can you see on site?

- CO<sub>2</sub> refrigeration
- Propane refrigeration
- Case control
- Semi plug-in/water loop
- Heat recovery unit
- CO<sub>2</sub> condensing unit
- Air handling unit
- Heat pump and much more...

[Contact us now to book your visit](#)



Whisperer  
Supermarket energy savings

## How supermarkets can boost energy savings with proper rail heat control

Rail heat, or anti-sweat, control, has been a part of supermarket control systems for years. But why is this energy saving feature often disabled or poorly set-up?

Learnings from the Danfoss Smart Store show significant energy saving potential all without compromising robust control at high humidity levels. At the same time, data shows that rail heat control alone cannot compensate for deficiencies in the design or control of the building's HVAC-R system.

### How much energy does rail heat consume?

If we look at the Smart Store's total energy consumption, low temperature display cases and low temperature cold room account for 14% of the overall energy used. Rail heaters account for a considerable portion of that 14% (see Fig. 3).

#### Store energy separation (first half 2024)

Category	Percentage
CO <sub>2</sub> indoor	14%
Propane	12%
CO <sub>2</sub> outdoor	12%
CO <sub>2</sub> outdoor (with heat loss)	12%
Lighting	12%
CO <sub>2</sub> outdoor (with heat loss)	12%

**Fig. 3**

In the Smart Store, we've installed 3D energy meters across electricity, hot water (for space heating) and chilled water (for air conditioning), and 1 meters for gas usage. One of the electricity sub-meters is installed in front of the four groups of low temperature display cases (Fig. 1, K25-26) and the low temperature cold room (Fig. 1, K102). This meter measures energy consumption for the fans, defrost, lights, rail heat and the controller valve. By manually switching between 'heat' (100% rail heat) for the four groups of low temperature display cases, we measured the rail heat load at 2.8 kWh. This means that if rail heat is at 100% all year, the energy consumption for these four groups of low temperature display cases would be 22.76 kWh per year!

As mentioned earlier, we need to control rail heat robustly when humidity levels are high. To find the robust setting, we set rail heat to maximum (100%) on two groups of low temperature display cases (Fig. 1, K25-26), who we controlled the other two groups (Fig. 1, K27-28) using dew point control. By regularly comparing the moisture level in the display case where rail heat was set to 100% with the others with dew point control enabled, we could find the robust dew point settings for the minimum and maximum rail heat.

Based on this test, we set up rail heat control with a minimum 20% rail heat at 2°C dew point controlled progressively up to 100% at 11°C dew point. Fig. 4 shows the energy consumption results for the first eight months of 2024.

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