



ENGINEERING
TOMORROW



Case story | RA-DV, Aero™ & Optimal 2

Effective solutions for **energy efficiency** and **comfort**

As a global leader in energy-efficient solutions, Danfoss has consistently strived to enhance performance in residential buildings.

In 2023, Danfoss initiated a collaboration with Willhem, one of Sweden's largest residential property owners, to upgrade the heating systems in two of their buildings in Helsingborg: Belgien Norra 23 and Teglet 19. The purpose of this project was to demonstrate the effectiveness of our latest product innovations: RA-DV, a dynamic radiator valve, and Aero™, a radiator thermostat.

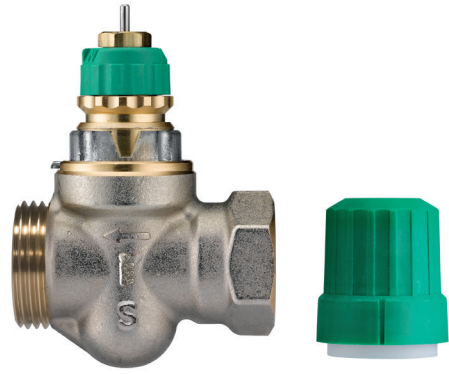


Meet the products:

RA-DV and **Danfoss Aero™**

RA-DV offers fully dynamic flow regulation with a flow range of 9-130 l/h, while the **Aero™** thermostat, which is gas-filled, has achieved the highest performance level according to the EN215 testing standard. One of the most notable advantages of the Aero™ thermostat is its ability to reduce energy consumption by at least 2% compared to equivalent liquid-filled thermostats. To showcase the performance of these products, we chose to carry out the project in these two buildings as reference sites.

Within the scope of this project, we used the **Danfoss Optimal 2** method, a balancing method specifically developed to optimize flow in two-pipe systems. The method only requires that the existing riser valves be fully opened, which simplifies the balancing process and reduces the need for major interventions, such as riser valve replacement or asbestos removal. By using the Optimal 2 method, we at Danfoss can ensure that the heating systems in older buildings are adjusted simply and efficiently, contributing to both energy efficiency and improved comfort for residents.



Project **Implementation**

The selected buildings had older two-pipe systems, making them ideal for testing Danfoss's new products and the Optimal 2 balancing method. The installation phase went very smoothly, and according to the installers, there were few complications. One of the installers commented: "Everything went smoothly, from packaging to materials – very easy to work with."

Communication between Danfoss, the installers, and Willhem was crucial for the project's success. Both involved firms understood the process well thanks to clear instructions and updates from Danfoss, which contributed to a frictionless implementation.



In addition to these temperature improvements, the upgrade resulted in a reduction in energy use of approximately 9%



Results

After implementing the Optimal 2 method along with our new products, the buildings were able to show significant energy savings. At Belgien Norra, an average temperature of 20.9°C was recorded in February, close to the target of 21°C. At Teglet 19, we achieved the exact target level of 21°C. In addition to these temperature improvements, the upgrade resulted in a reduction in energy consumption by approximately 9% kWh/m².

The residents' reactions were predominantly positive. Although some initially reported lower temperatures than desired, these issues were quickly resolved through minor adjustments to the system. The installers noted

that most residents were satisfied, although a few complained of cold in their apartments, which often stemmed from external factors such as open windows or furniture placed in front of radiators.

The installers reported that the residents' reactions were mostly positive after the installation. Vose, who was responsible for the installation at Belgien Norra 23, encountered no issues with the building after the project was completed. Two residents contacted them afterward, and their complaints were due to cold drafts from poorly insulated windows and balcony doors rather than issues with the heating system.



Conclusion

The project has shown that Danfoss products, combined with the Optimal 2 method, can deliver both improved comfort and significant energy savings. The installers appreciated the simplicity of both the installation and balancing processes, and most residents

were satisfied with the results. This successful project confirms our commitment to continuing to develop energy-efficient solutions in collaboration with our customers, such as Willhem.



Belgien Norra 23

Property Type: Residential building with 29 apartments

Year Built: 1979

Number of Radiators: 152

Number of Floors: 6

Installation Phase: Trouble-free, smooth, and quick installation

Balancing Method: Optimal 2 with RA-DV and Aero™ thermostats

Results:

- Average temperature in February: 20.9°C (target 21°C)
- Energy Efficiency: Approximately 9% reduction in kWh/m²

Installer: Vose Systems



“Everything went smoothly, from packaging to materials – very easy to work with.”

Urban Dalhov, Vose Systems



Teglet 19

Property Type: Residential building with 15 apartments

Year Built: 1920

Number of Radiators: 67, plus 1 towel warmer

Number of Floors: 4

Installation Phase: Replacement of 30 radiators and smooth installation of RA-DV

Balancing Method: Optimal 2 with RA-DV and Aero™ thermostats

Results:

- Average temperature in February: 21°C (target 21°C)
- Energy Efficiency: Approximately 9% reduction in kWh/m²

Installer: Enbergers VVS



“Since we conducted a pipe replacement, the conditions for installing RA-DV were optimal.”

Mathias Lundkvist, Enbergers VVS



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