ENGINEERING
TOMORROW

Case Story

# Huge **district cooling substation** for department store in Helsinki

Finland

**Reliable**

**and lasting operations with minimum servicing**


www.districtenergy.danfoss.com


*Picture on the cover and above: Stockmann Oyj Abp*

# District cooling substations - made by Danfoss

Stockmann department store is located in the heart of Finland's capital, Helsinki. It is the largest department store in Finland. It was started in 1930 and the building which is home to the department store has undergone several changes through the years. The most current enlargement project also involved Danfoss who delivered a huge district cooling substation to the department store. District cooling production was started in 1998 in Helsinki.

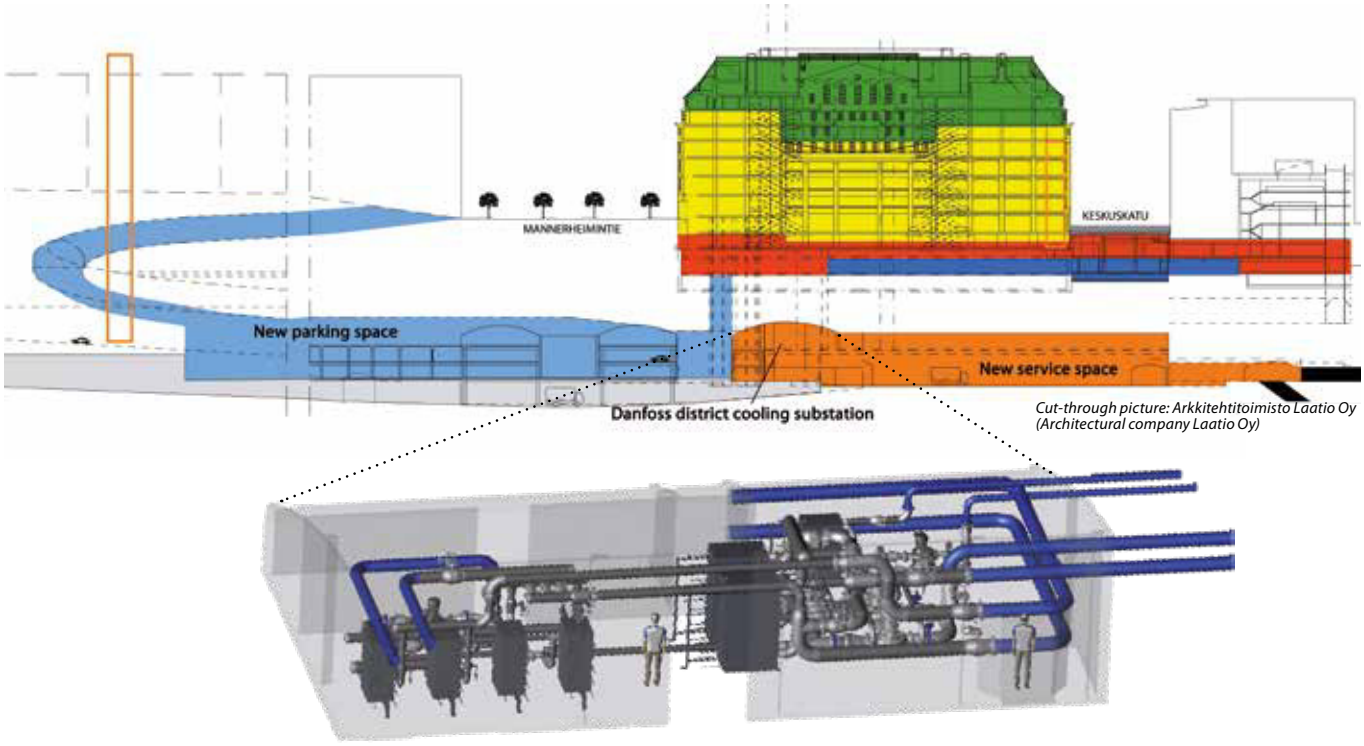
**Largest factory made district cooling substation**

The district cooling substation for the Stockmann department store was produced in January - February 2008 by Danfoss LPM and is the largest factory made district cooling substation ever manufactured in Finland. The cooling substation will supply air ventilation and cooling for the cold storage space in the department store.

**Knowledge and experience**

Export sales manager Juuso Vitikainen at Danfoss LPM was contacted by the contractor for the enlargement project and received the general specifications and requirements for the substation along with information about the planned location for the substation. The substation was to be placed in a machine room located in the underground cave close to the cave roof. The contractor was interested in finding out whether the space was big enough for the substation. If not, they would have to enlarge the space by tearing down surrounding structures.

Danfoss LPM in Finland has many years' experience in manufacturing tailored substations - even as big as this one - thus Danfoss LPM was soon able to dimension a solution based on the particular demands and plan and organize the project. The combination of knowledge and experience convinced the customer from the start.




*Cut-through picture: Arkkitehtitoimisto Laatio Oy (Architectural company Laatio Oy)*

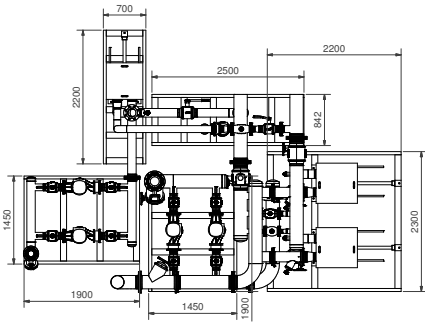
*All logistics and service to the downtown department store are organized underground. The new Danfoss district cooling substation is located in a cave below the department store. The available space is extremely limited but the customized substation was designed to fit into it.*

# It pays off to understand the customer

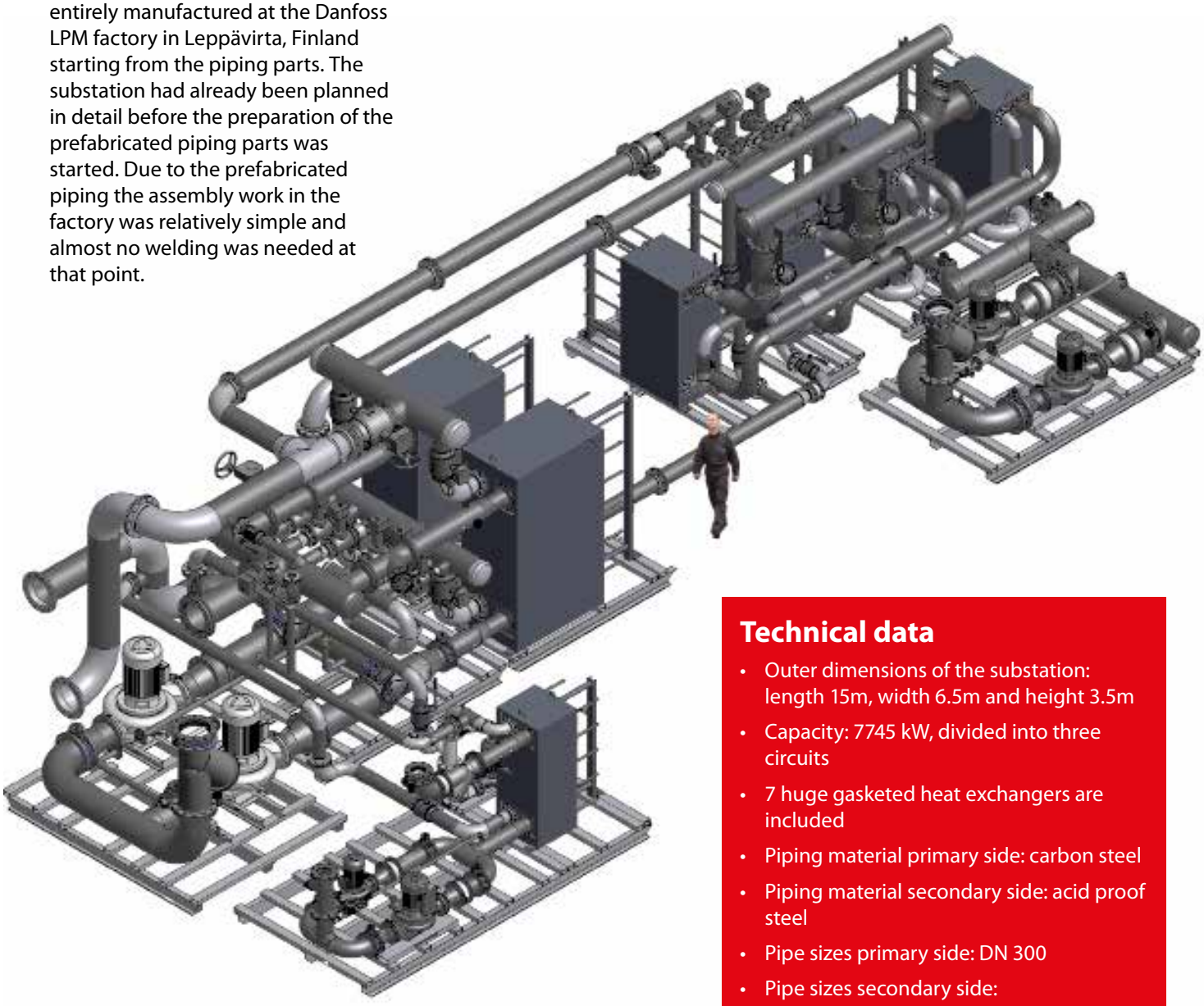
**Customized solutions**
A standard solution cannot be used for this kind of project - instead the substation was planned following the requirements given by the customer. The dimensioning was based on the circuit diagram received from the contractor and on the energy plant's requirements. Due to the size of the project, continuous discussions between the contractor, the department store Stockmann and the energy plant Helsingin Energia were required to find the right solution for the project.

**Professional planning and manufacturing**
The huge cooling substation was entirely manufactured at the Danfoss LPM factory in Leppävirta, Finland starting from the piping parts. The substation had already been planned in detail before the preparation of the prefabricated piping parts was started. Due to the prefabricated piping the assembly work in the factory was relatively simple and almost no welding was needed at that point.

**Another project for the same customer**
Only few months after the delivery of the huge cooling substation for the Stockmann department store, the same contractor ordered another cooling substation. The second cooling substation would not be as big as the first one, but still very big when compared to heating substations. This time space was extremely limited and the substation had to be transferred to the installation place through narrow corridors. This process was successfully handled through detailed 3D planning and careful preparation.




*The space for the second cooling substation was extremely limited; therefore the substation had to be as compact as possible.*



## Technical data

- Outer dimensions of the substation: length 15m, width 6.5m and height 3.5m
- Capacity: 7745 kW, divided into three circuits
- 7 huge gasketed heat exchangers are included
- Piping material primary side: carbon steel
- Piping material secondary side: acid proof steel
- Pipe sizes primary side: DN 300
- Pipe sizes secondary side: DN 150/250/300

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# About district cooling

Danfoss District Energy provides a complete range of automatic controls, heat exchangers and substations needed throughout the process of generating and distributing heat or cooling to homes and buildings.

Danfoss products contribute to individual comfort, reduce energy consumption as well as provide reliable and lasting operations and guarantee minimum servicing.

## What is district cooling? What are the benefits?

District cooling can be defined as centralized production and distribution of cooling energy from the cooling plant to the industrial, commercial and residential buildings to cool the indoor climate. Typical sources for cooling are a combination of sea or lake water, absorption machines and electrical chillers.

District cooling substations are used in the process of distributing cooling energy into the building. Other benefits are:

- Energy efficient solution
- Reduced air pollution
- Decreased emissions of ozone-depleting refrigerants
- Combats global warming
- Easy and comfortable for the end-user

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