Specifying the right district heating substation makes commercial sense

For heating, district heating and domestic hot water applications.

From flat stations to site-specific substations, Danfoss offers you a comprehensive range from a single supplier.

This brochure will give you a clear, practical overview of the full range of Danfoss station solutions. When you are ready to talk specifics, our technical support team will be pleased to help you to design your ideal system. You will find our contact details on the back cover.

Choosing the right heat distribution system for a building or network is influenced by three criteria: technical connection specifications, the heat requirements of the building and the comfort preferences of the building's occupants.

The more accurately you can balance those needs, the better the service you will provide to your end-users and the more energy efficiency you will achieve. Both of these factors are good for your business.

Specifying your system

System size is determined by the potential demand for heating and hot water. The temperature and pressure of the primary heat supply will determine whether a station is operated directly or indirectly.

You will also need to meet the technical criteria of the relevant district heating network. This will influence your choice of control and heat transfer components. Equipment choices will also be affected by the number and type of heating circuits and by the specific form and function of domestic hot water required.

Complete solutions from a single supplier

Our complete solutions cover flat stations and district heating substations in a range from 2 kW to more than 4 MW. Danfoss substations can be directly or indirectly operated via one or more heating circuits, with primary or secondary side DHW heating specified as flow, storage tank or anti-legionella systems.

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Direct heating systems

02

Indirect heating systems

03

Indirect heating site-specific systems

Direct heating

Heating systems with directly connected substations

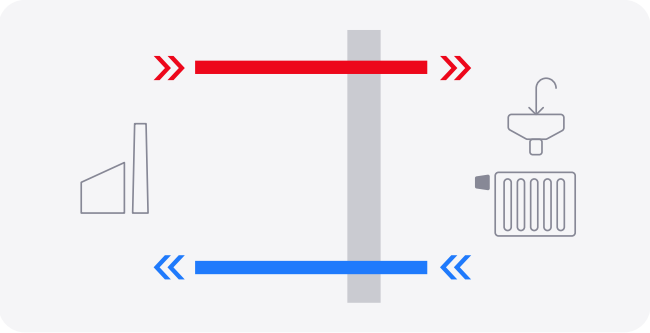
For decentralized domestic hot water (DHW) production and heat distribution.

Conventional heating systems in single-family houses and apartment buildings consist of a central heat source and central DHW production. Today, renovated or new buildings are obliged to make at least partial use of renewable energy sources. All buildings must comply with strict DHW hygiene regulations.

In nearly all cases, it makes financial sense to heat multiple apartments, buildings or houses via a central system rather than individually. Modern central heating systems can use buffer tanks to combine different energy sources.

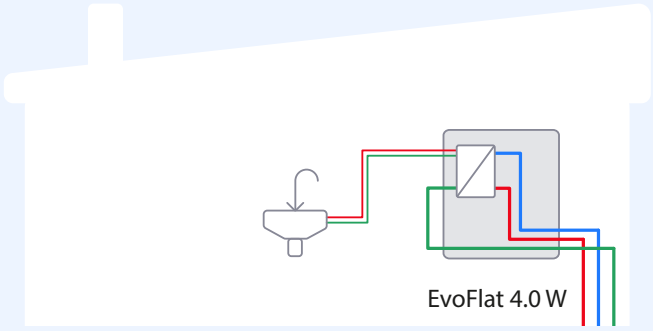
Domestic hot water is produced on demand, without storing

Buildings with decentralized DHW production need only three rather than the usual five supply lines to provide hygienically safe drinking water. If the volume of water held between the water heater and the taps is less than 3 liters, no regular hygienic testing is required.



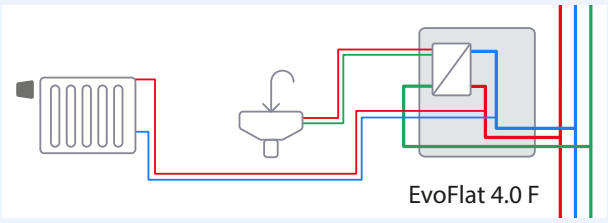
Each building and apartment has a directly connected substation or flat station with integrated production of domestic hot water. Single or multiple heating circuits (e.g. radiator, floor heating system) are supplied with heated water from the central heat source.

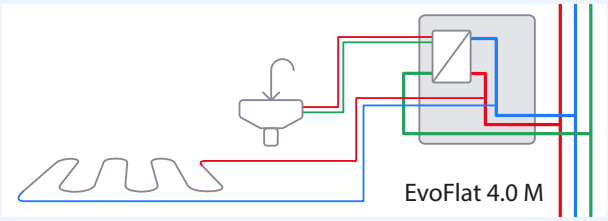
DHW systems	Instantaneous water heaters with an efficient Micro Plate™ heat exchanger. Can be used in single-family houses, apartments and small multi-family buildings. Stainless steel pipes and heat exchanger. DHW control options with pressure and/or thermostatic controller.	EvoFlat 4.0 W Termix Novi Termix One Akva Lux II
Direct flat stations with DHW	For decentralized heating and instantaneous domestic hot water production with an efficient Micro Plate™ heat exchanger. Applicable for use in multi-family houses and apartment buildings. Stainless steel pipes and heat exchanger.	EvoFlat 4.0 M EvoFlat 4.0 F Termix VMTD EvoFlat RENO EvoFlat RENO 2.0
Direct house and flat stations with DHW storage tank	District heating substation for direct heating of apartment buildings or single-family houses. Uses cylinder with thermostatic or electronic control for domestic hot water preparation.	Termix BTD



DHW systems

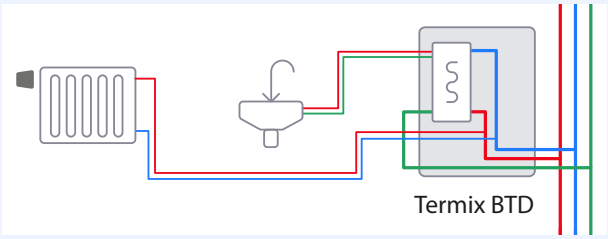
Domestic hot water is produced instantaneously by a water heater using a highly efficient Micro Plate™ heat exchanger. This minimizes the risk of lime scale and bacteria formation.





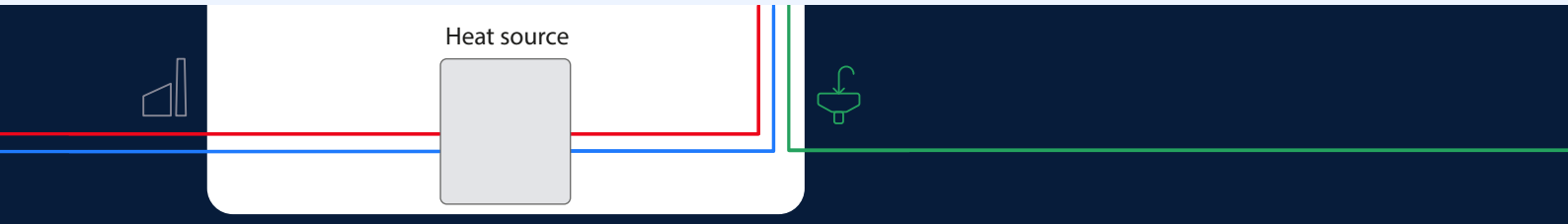
Direct flat stations with DHW

Heating is directly supplied to the apartment's radiator or floor heating system. Domestic hot water is produced instantaneously by the highly efficient Micro Plate™ heat exchanger inside the flat station.



Direct house and flat stations with DHW storage tank

Heating is directly supplied to the apartment's radiator and floor heating system. Domestic hot water is prepared in a hot water tank with a coil.



Direct heating

Indirect heating

Indirect substations

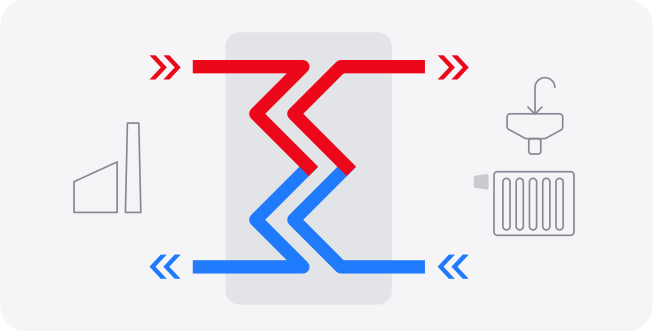
For networks with low-to-medium supply temperature and buildings with small-to- medium capacity requirements.

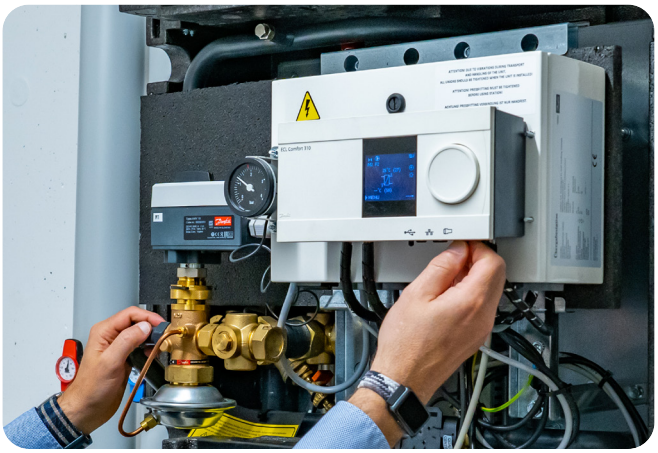
An indirect substation is used when district heating network conditions, such as pressure and temperature, do not allow direct connection. When a substation is connected indirectly, a heat exchanger provides energy-efficient heat transfer. It also ensures that the primary network supply side and the secondary building installation side remain safely separated.

In this way, the building application works regardless of pressure or temperature variations in the district heating network (hydronic balancing) and is safe from pipe breaks or leaks.

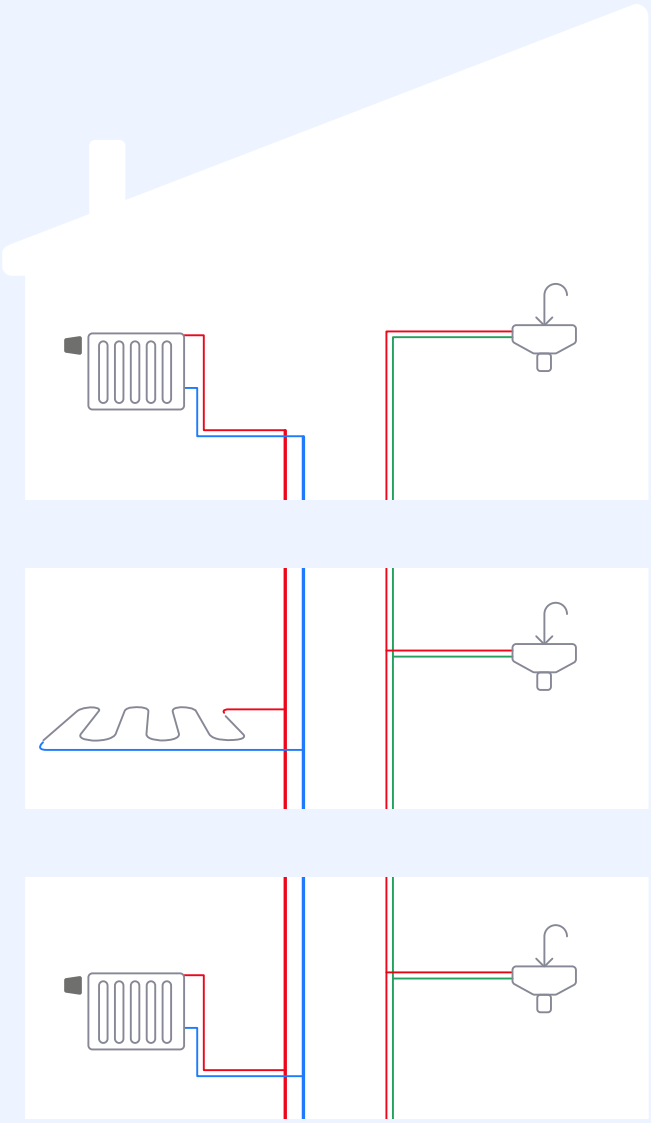
Danfoss indirect substations are self-contained units that are generally wall-mounted. They can support single or multiple heating circuits, with or without DHW production on the primary or secondary side.

These advanced solutions are also available with an electronic controller for weather compensation. This ensures easy and energy-efficient operation while simultaneously allowing central monitoring and energy consumption transparency.





Indirectly connected substations for heating and DHW	Indirect substations with efficient Micro Plate™ heat exchangers and variable connection possibilities for one or several circuits. Applicable for use in single-family houses, semi-detached and terraced residential buildings, as well as in multi-family houses. The substations are wall-mounted.	VX Solo II VXi Solo II VXe Solo
		Akva Lux VX Akva Lux VXi Akva Lux VXe
		DSA1 MINI
		Termix VX
		Termix VVX
		DSA WALL DSA HOME
		Unistat 1016



Indirectly connected substations for heating and instantaneous DHW

Heat from the district heating network is transferred to the building installation by the district heating substation.

The substation supplies heating and domestic hot water to the building's residents.

Indirect heating

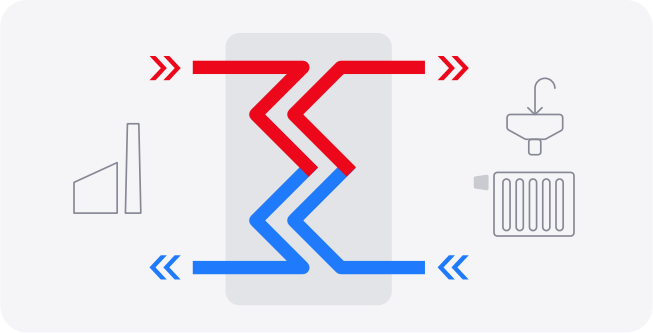
Indirect and site-specific

Modular or site-specific indirect substations

For all networks and for buildings with medium-to-high capacity requirements.

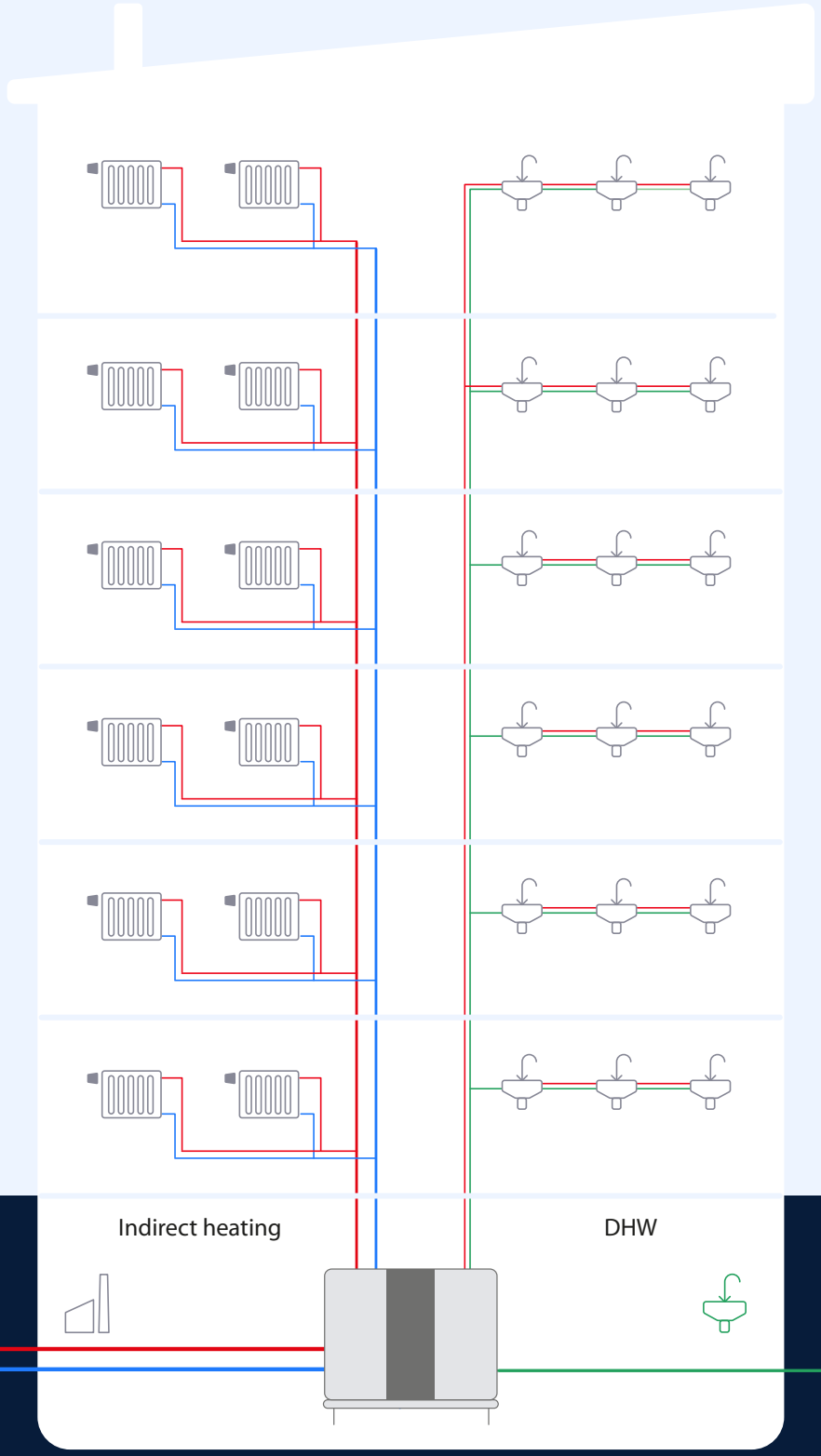
District heating and cooling networks range in size from micro-networks supplied by biomass and other renewable energy sources to large-scale district heating networks.

Larger systems typically use waste heat from combined heat and power production, waste incineration or heat recovery from industrial processes. District heating systems can also be supplied with steam, subject to meeting the relevant technical and safety regulations.



Our wide experience in designing and installing district heating systems ensures that your solution will meet all applicable requirements. From the energy supplier's technical criteria and the needs of the operator, building owner or user, right through to safety, energy efficiency, installation and ease of use.

Indirectly connected substations for heating and DHW in larger buildings	Indirectly connected district heating substations with efficient plate heat exchangers are suitable for: • Universal use in larger buildings • Connection of three or more secondary circuits • Mixing loops • Primary connection for domestic hot water	Termix Compact 28 VX Termix Compact 28 VVX
		DSP 1 MAXI
		DSE DSP MOD@
		DSM (mixing loop)
		DSS (steam)



90% of all technical connection conditions can be covered by modular district heating stations.

Indirectly connected substations for heating and instantaneous DHW in larger buildings

Heat from the district heating network is transferred to the residential or commercial building installation by the indirect district heating substation.

The substation supplies heating and domestic hot water to the building's residents or users.

Danfoss stations are site-specifically designed to meet the precise capacity requirements of each building.

Indirect and site-specific

Quality and reliability are built-in

At Danfoss, we develop and produce all the main components for our heavy- and medium duty substations and light-duty flat stationsin-house.

Complete control of system performance

Because we manufacture the key components ourselves, you will benefit from optimized heat transfer and system control performance. Pressure, differential pressure, temperature and flow are automatically controlled and integrated in nearly all Danfoss substations.

Self-acting controllers, electronic controllers and motorized control valves ensure maximum comfort and energy efficiency. And JIP® ball valves and ultrasonic energy meters enable reliable shut-off and accurate flow or energy consumption data. These components are also ready for integration with our Leanheat® software suite or other SCADA systems.

Choosing the right heat exchanger

Heat exchangers play a crucial role in district heating substations by efficiently transferring thermal energy from the primary network to the building's internal heating system. Two common types used in these applications are brazed plate heat exchangers (BPHEs) and gasketed plate heat exchangers (GPHEs).

Brazed plate heat exchangers are compact, efficient and maintenance-free, making them ideal for smaller substations or installations with space constraints. They are permanently sealed, which ensures leak-free operation and high thermal performance, particularly in domestic hot water and space heating applications.

Gasketed plate heat exchangers, on the other hand, offer greater flexibility and serviceability. Their modular design allows for easy maintenance, cleaning and capacity adjustment by adding or removing plates. This makes them suitable for larger substations or systems with variable load conditions. They also provide high thermal efficiency with low approach temperatures, ensuring effective energy transfer in district heating applications. Additionally, they can be combined with temperature and flow control valves to ensure optimal performance and precise system regulation.

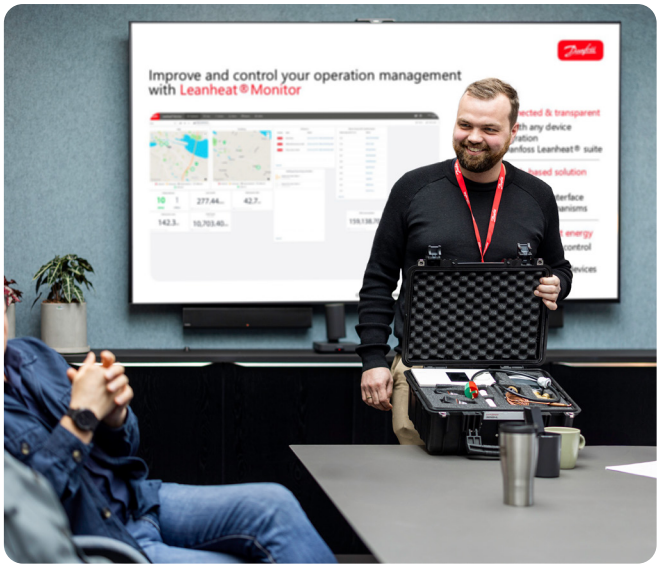
Both types ensure reliable, energy-efficient heat transfer while maintaining separation between the district heating water and the building's internal circuits, which is essential for system safety and performance.

Leanheat® Monitor boosts network and building efficiency

Real-time monitoring of controllers is one of the keys to optimizing your district energy system and improving operational efficiency. Leanheat® Monitor enables you to connect devices within your district energy system, such as substations, controllers, production units, meters, network measurements, as well as third-party sources (e.g. weather forecasts), into one secure system.

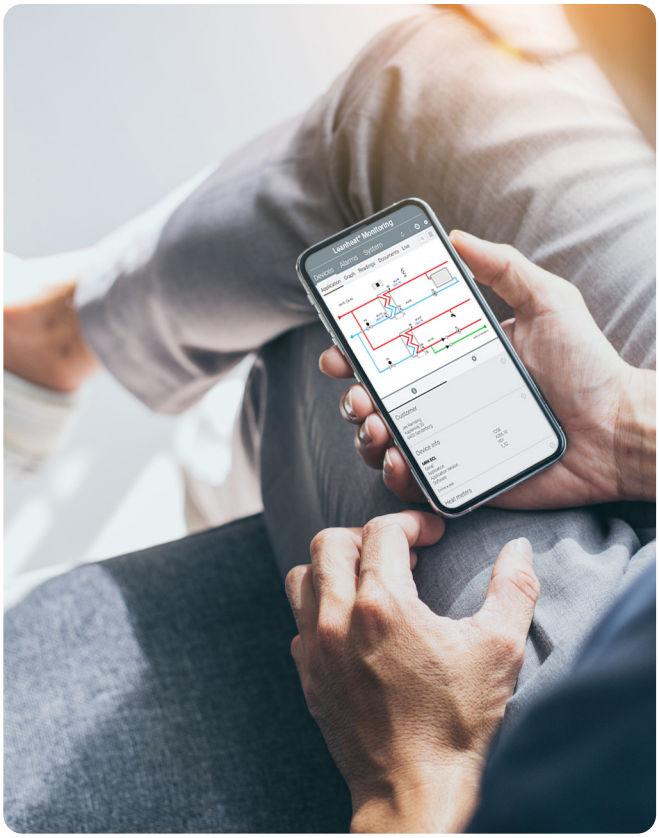
Use Leanheat® Monitor to lower your operation costs, improve efficiency and manage your operations, all while complying with GDPR and other legislative requirements.

You can also pair it with Leanheat® Network, Danfoss' thermo-hydraulic modeling tool, to further plan, visualize and optimize your entire district energy distribution system.



Remote system management

Purpose-designed for Danfoss substations, the Danfoss ECL Comfort 310 controller provides a simple and effective way to control your heating and hot water system in one or several buildings. You can manage your system either directly from your smartphone, via Leanheat® Monitor or by using the ECL controller's highly intuitive interface.



Try it today >

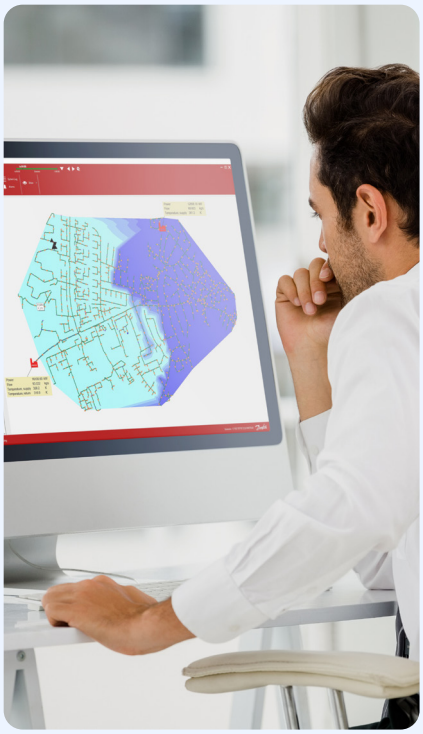
Go online and create your user account now:
https://app.lhm.danfoss.com/

Optimize your entire district energy system with Leanheat® Network

Creating a thermo-hydraulic model of your network enables you to plan, visualize and optimize the district energy system and improve your operation's sustainability. With Leanheat® Network, you can evaluate what-if scenarios, such as: *What happens if we add a new area? What happens if we add new sources? Where are the bottlenecks? And what will solve the problem?* You can calculate optimal pipe dimensions and simulate network changes, before making investments, thus saving costs and time.

Optimize temperatures and reduce electricity costs for pumps

You can also use Leanheat® Network to create a real-time digital twin of the network, using real time data from your network. Use the digital twin to reduce the annual supply temperature, heat losses and production costs. Minimize your pump costs by automatically calculating the optimal pump setpoints, allowing sufficient differential pressure to all clients. And get full transparency into all hydraulic conditions – temperature, flow and pressure – at any point in the network.



Learn more about Leanheat® Network >

Your overview

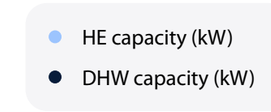
For all networks and for buildings with medium-to-high capacity requirements.

- HE capacity (kW)
- DHW capacity (kW)

					2 kW	100 kW	200 kW	300 kW	1000 kW - 4 MW
Direct heating	DHW systems	**EvoFlat 4.0 W**		Material: PPS Composite DHW controller: TPC-M Nominal pressure: 10 bar Max. Supply temperature (°C): 95 Differential pressure controller, Summer bypass	37-70				
		Akva Lux II		Controller DHW: thermostatic + pressure Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-55				
		Termix Novi		Controller DHW: thermostatic + pressure (NO) Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-58				
		Termix One		Controller DHW: thermostatic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-90				
	Direct flat stations with DHW	**EvoFlat 4.0 M** **EvoFlat 4.0 F**		Material: PPS Composite DHW controller: TPC-M Nominal pressure: 10 bar Max. Supply temperature (°C): 95 Two differential pressure controller, Summer bypass (M-version): Mixing circuit with circulation pump and check valve	37-70 2-15				
		Termix VMTD		Controller DHW: thermostatic / HE: differential pressure Design: wall-mounted or built-in Pressure PN (bar): 10 Max supply temperature (°C): 120	2-85 2-30				
		EvoFlat RENO **EvoFlat RENO 2.0**		Material: Stainless steel pipes DHW controller: TPC-M Nominal pressure: 10 bar Max. Supply temperature (°C): 95 Differential pressure controller, Summer bypass (Reno 2.0) Top and bottom connections	37-55 2-55				
	Direct house and flat stations with DHW storage tank	**Termix BTD**		Controller DHW and HE: thermostatic / electronic Design: stand-alone unit Pressure PN (bar): 10 Max supply temperature (°C): 120	2-22 2-20				
Indirect heating	Indirectly connected substations for heating and DHW	**VX Solo II**		Controller HE: electronic or thermostatic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 110	2-30				
		VXI Solo II		Description: Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-30				
		VXe Solo		Description: Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-30				
		Akva Lux VX		Controller DHW: thermostatic / Controller HE: electronic or thermostatic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 110	2-53 2-34				
		Akva Lux VXI		Description: Controller DHW: thermostatic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-55 2-30				
		Akva Lux VXe		Description: Controller DHW: thermostatic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120	2-55 2-30				

Your overview

For all networks and for buildings with medium-to-high capacity requirements.



Indirect heating	Indirectly connected substations for heating and DHW	**DSA1 MINI**	Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 95/130
		Termix VX	Controller DHW and HE: thermostatic / electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		Termix VVX	Controller DHW: thermostatic / Controller HE: electronic Design: wall-mounted Pressure PN(bar): 10 Max supply temperature (°C): 120
		DSA WALL **DSA HOME**	Controller DHW: electronic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 130
		Unistat 1016	Controller DHW: electronic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16/25 Max supply temperature (°C): 130
Indirect and site-specific	Indirectly connected substations for heating and DHW in larger buildings	**Termix Compact 28 VX**	Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		Termix Compact 28 VVX	Description: Controller DHW: thermostatic or electronic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		DSP1 MAXI	Controller HE: electronic Design: floor-mounted Pressure PN (bar): 16/25 Max supply temperature (°C): 100/140
		DSE FLEX	Description: Controller HE: electronic Design: floor-mounted Pressure PN (bar): 16 Max supply temperature (°C): 100/135
		DSE	Controller DHW: electronic / Controller HE: electronic Design: wall-mounted, floor-mounted Pressure PN (bar): 16/25/40 Max supply temperature (°C): 150
		DSP MOD@	Controller DHW: electronic / Controller HE: electronic Design: wall-mounted, floor-mounted Pressure PN (bar): 16/25/40 Max supply temperature (°C): 150
		DSM (mixing loop)	Controller HE: electronic Design: wall-mounted, floor-mounted Pressure PN (bar): 10/16 Max supply temperature (°C): 120
		DSS (steam)	Controller DHW: electronic Design: floor-mounted Pressure PN (bar): 16 Max supply temperature (°C): 200

Explore our solutions
danfoss.com

We support you every step of the way

01 Project/tender preparation and planning

When preparing a tender, you'll need to specify installation details, system design, and suitable products. The Danfoss website offers valuable resources to streamline this process, including application design recommendations, technical documentation, and tender-ready text. All Danfoss stations come with comprehensive documentation, including technical specifications, dimensioned drawings, and installation/service guides.

02 Consultancy for quotation and product selection

Choosing the right substation involves various factors. Our sales team uses the eQuotation system to efficiently prepare accurate station quotes by dimensioning components and systems, adhering to district heating supplier criteria, providing product-specific tender text and drawings, quoting correct prices, and ensuring timely delivery of all components.

03 Ordering and delivery planning

After placing your order, we assist in optimizing on-site workflow with our online tool for tracking products and documentation. We ensure reliable delivery by maintaining stock of main product groups globally, offering short production times and accurate deliveries to the agreed location, confirmed beforehand.

04 Installation, commissioning and service support

Danfoss provides a comprehensive service support program for proper installation and commissioning, covering commissioning, maintenance, technical support, spares, and warranties.
Contact your local Danfoss sales office for regional service details.

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