

ENGINEERING  
TOMORROW

*Danfoss*

Flat stations and district heating substations

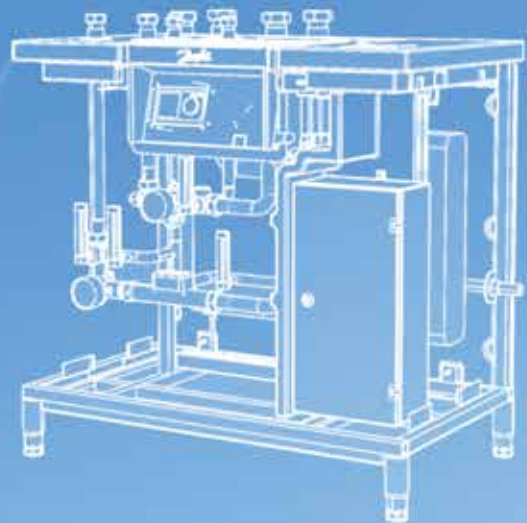
# Specifying the right district heating **substation** **makes** commercial **sense**

For heating, district heating and domestic hot water applications.



**2 kW-4 MW**

District heating  
substations and  
flat stations.  
Whatever capacity  
you need, we can  
supply it.



[www.heating.danfoss.com](http://www.heating.danfoss.com)

# 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**



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**Indirect heating  
systems**

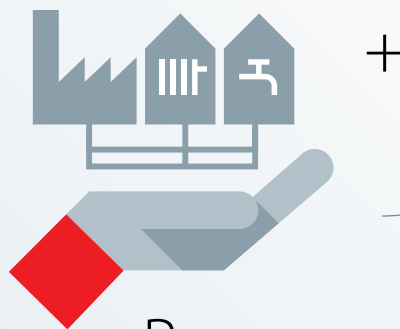


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**Indirect heating  
site-specific systems**



Network expertise

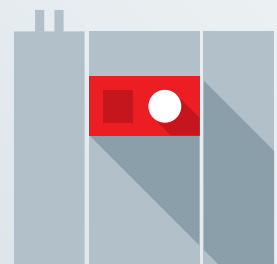


Recommended application design

Your specific needs



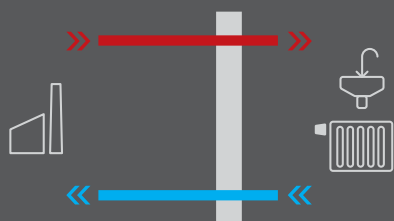
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Your fully optimized station solution

# 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.

**Akva Lux II**

**Akva Les**

**Termix One**

### **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™ FSS**  
**EvoFlat™ MSS**

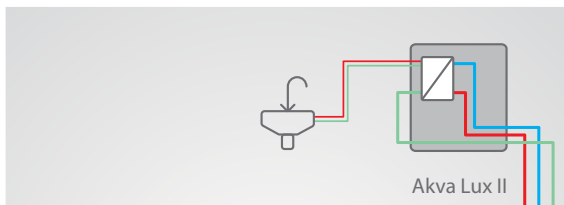
**Termix VMTD**

**Akva Lux II RENO**

### **Direct house and flat stations with DHW storage tank**

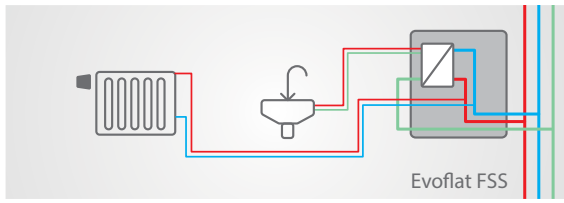
District heating substation for direct heating of apartment buildings or single-family houses. Uses cylinder with thermostatic or electronic control for domestic hot water preparation.

**Termix BTD**



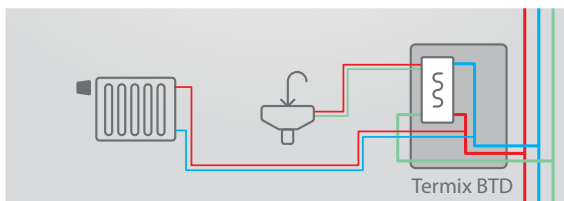
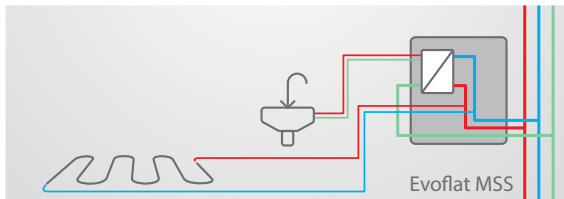
### DHW systems

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.



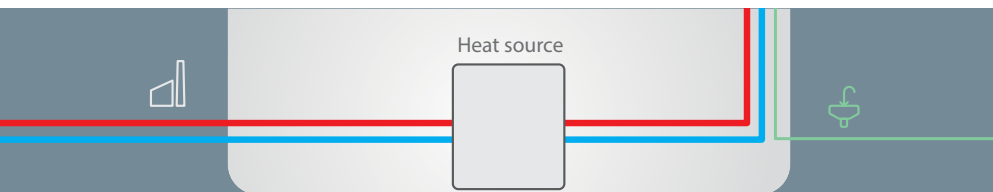
### Direct flat stations with DHW

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.

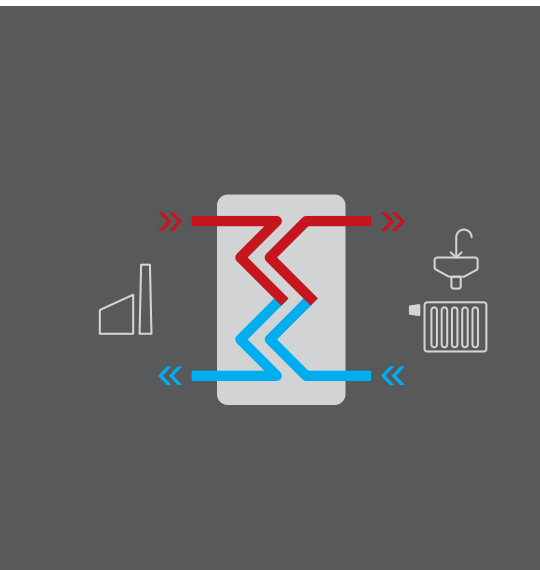


# DIRECT HEATING



# Indirect 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 (hydraulic 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.

**VXi Solo II**

**Akva Lux VXi**

**DSA1 MINI**

**Termix VX**

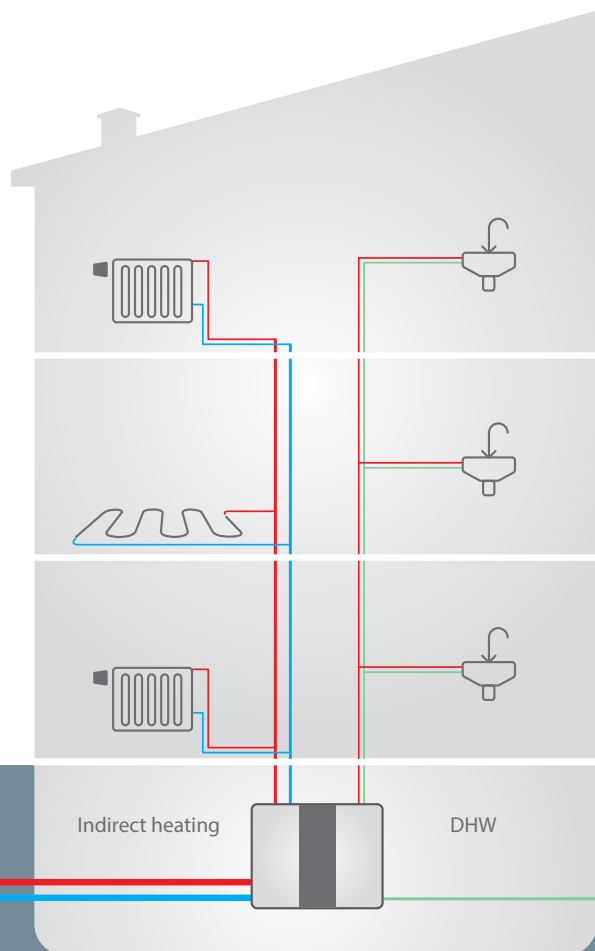
**Termix VVX**

**DSA WALL**

**Unistat 1016**

See product overview on pages 12-13





### **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.

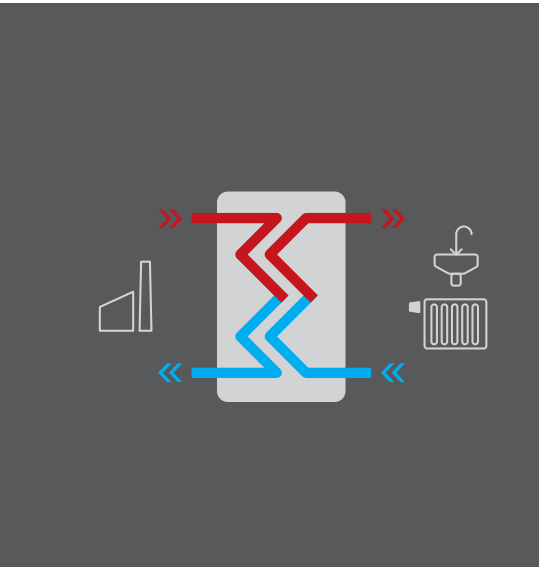
The substation supplies heating and domestic hot water to the building's residents.

# INDIRECT HEATING



# 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 conditions. From the energy supplier’s technical criteria and the requirements 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 exchanger are suitable for:

- Universal use in larger buildings
- Connection of three or more secondary circuits
- Mixing loops
- Primary connection for domestic hot water

These substations are mainly welded and prepared for floor mounting.

DSA 1 MIDI
DSP 1 MAXI
DSE
DSM (mixing loop)
DSS (steam)

See product overview on pages 12-13



# 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 heating

DHW



# INDIRECT AND SITE-SPECIFIC



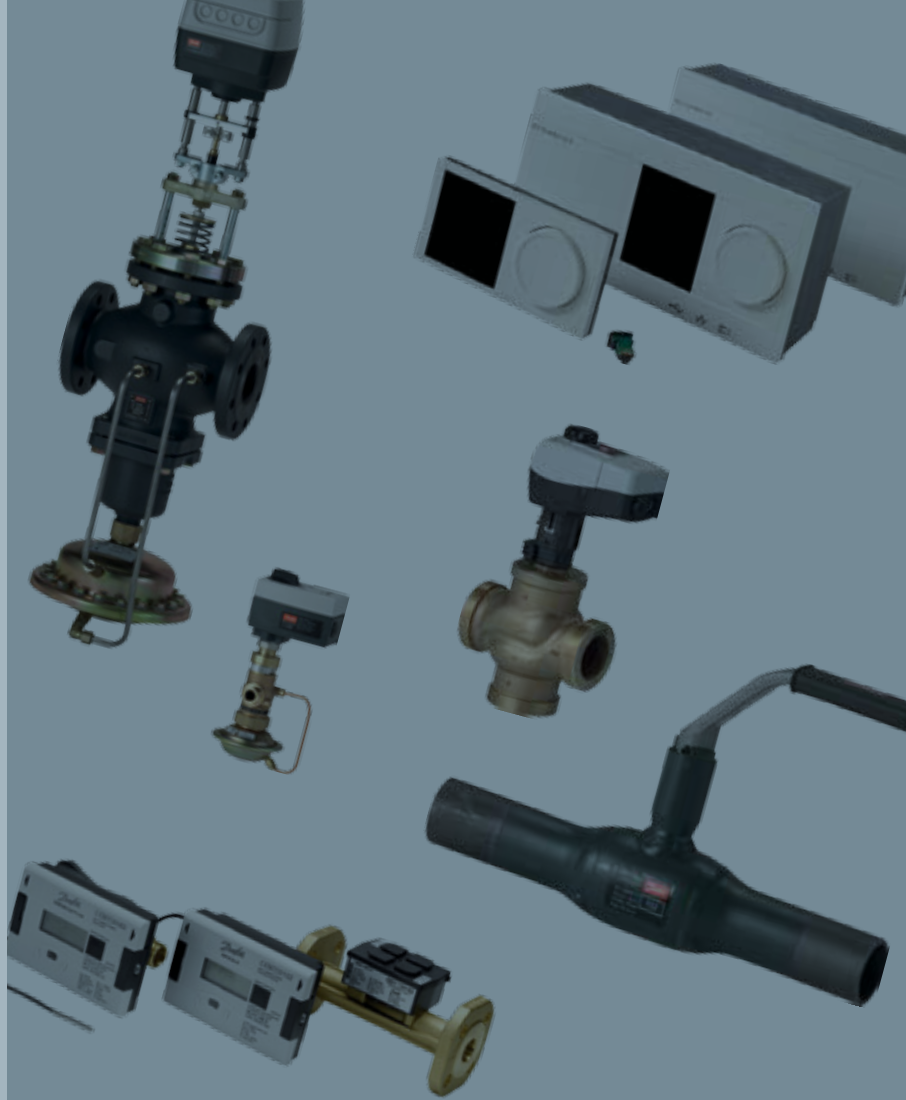
# Quality and reliability are built-in

At Danfoss, we develop and produce all major components for our substations and flat stations in-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 integrated and automatically controlled on nearly all Danfoss substations.

Controllers without auxiliary power, electronic controllers, motorized control valves and energy meters ensure maximum comfort and energy efficiency. They also enable integration into higher-level control and monitoring systems.



# Benefit from maximum return on investment



## **Integrated components create optimized systems that will keep working efficiently, far into the future.**

We build our systems for maximum return on investment, energy efficiency and working life. One example is our plate heat exchangers with patented Danfoss Micro Plate™ technology.

Our range of brazed and gasketed Micro Plate™ heat exchangers ensure up to 10% better heat transfer and up to 30% less pressure loss. Operating inside a district heating substation, they save space while increasing system performance and energy efficiency. They also save costs by reducing the amount of pumping power required.

Designing integrated system components from the ground up ensures safe operation, increases durability and minimizes whole life costs.

# Easy system **monitoring boosts** building **efficiency**

Fitting an electronic controller to your substation or heating installation is now mandatory in many countries.

These devices enable you to monitor and maximize system performance and reduce the energy costs and CO<sub>2</sub> footprint of your heating installation. At the same time, they also streamline all your servicing, commissioning and maintenance requirements.

## **Easy and convenient**

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 the online ECL Portal or by using the ECL controller's highly intuitive interface.




















## **Try it today**

Go online and create your user account now:  
**[ecl.portal.danfoss.com](http://ecl.portal.danfoss.com)**





# Your **overview** Danfoss district heating stations at a glance

Direct heating	DHW systems	Akva Lux II		Controller DHW: thermostatic + pressure Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		Akva Les		Controller DHW: thermostatic + hydronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		Termix One		Controller DHW: thermostatic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
	Direct flat stations with DHW	EvoFlat™ FSS EvoFlat™ MSS		Controller DHW: thermostatic + hydronic Design: wall-mounted or built-in Pressure PN (bar): 10 (FSS) / Pressure PN (bar): 6/10 (MSS) Max supply temperature (°C): 95
		Termix VMTD		Controller DHW: thermostatic / HE: differential pressure Design: wall-mounted or built-in Pressure PN (bar): 10 Max supply temperature (°C): 120
		Akva Lux II RENO gas replacement		Controller DHW: thermostatic + pressure Design: wall-mounted Pressure PN (bar): 10 Max supply temperature (°C): 110
Indirect heating	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
	Indirectly connected substations for heating and DHW	VXi Solo II		Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		Akva Lux VXi		Controller DHW: thermostatic + pressure Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 120
		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		Controller DHW: electronic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16 Max supply temperature (°C): 130
Indirect and site-specific	Indirectly connected substations for heating and DHW in larger buildings	Unistat 1016		Controller DHW: electronic / Controller HE: electronic Design: wall-mounted Pressure PN (bar): 16/25 Max supply temperature (°C): 130
		DSA1 MIDI		Controller DHW: electronic / Controller HE: electronic Design: floor-mounted Pressure PN (bar): 16/25 Max supply temperature (°C): 110/140
		DSP1 MAXI		Controller HE: electronic Design: floor-mounted Pressure PN (bar): 16/25 Max supply temperature (°C): 100/140
		DSE		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

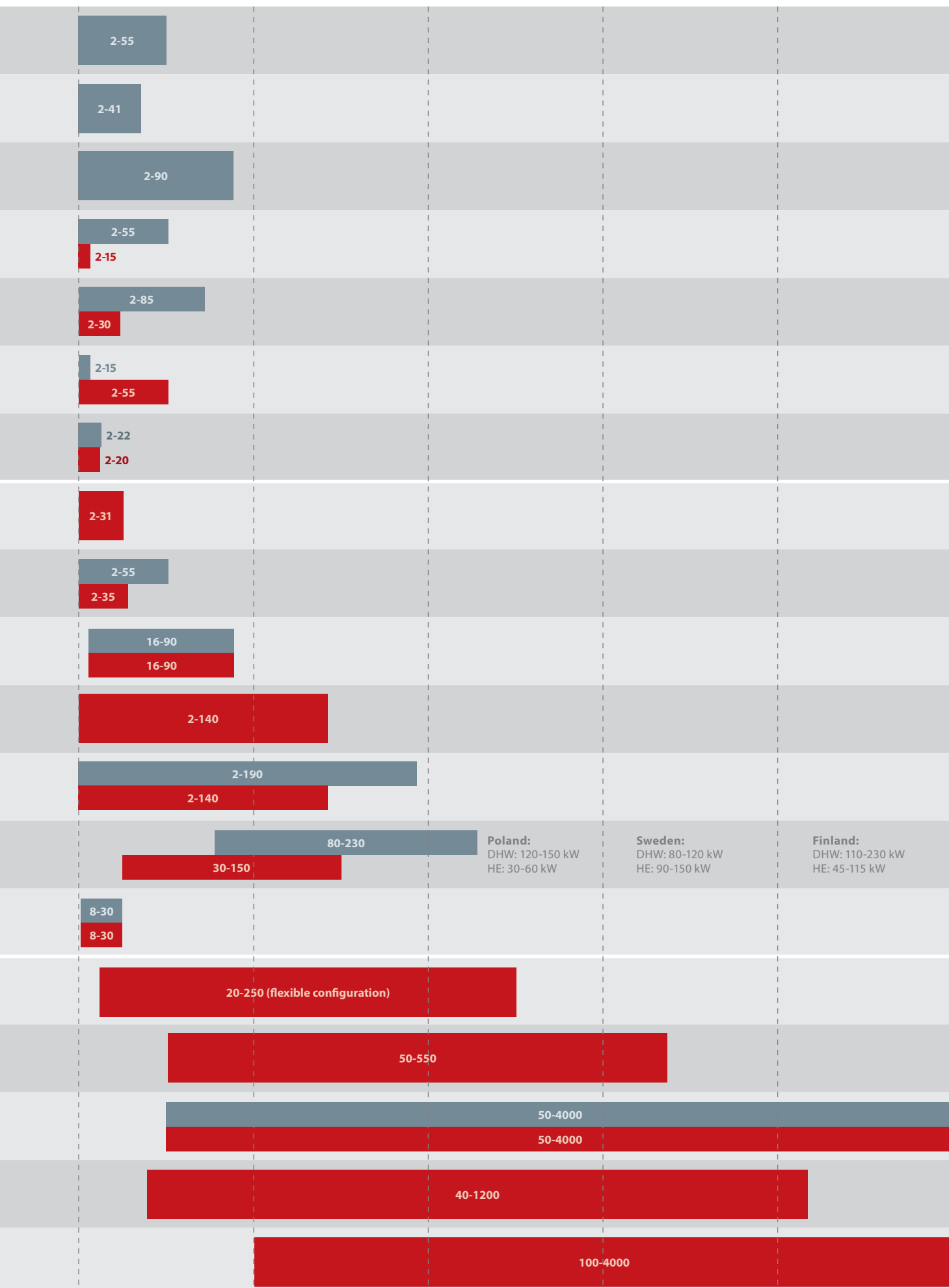
2kW

100kW

200kW

300kW

1000kW – 4MW



DHW capacity (kW)

HE capacity (kW)

# We support you every step of the way



## 1. Project/tender preparation and planning

When preparing a tender, you will usually be asked to detail the installation specifications, system design and suitable products and components.

To help you complete this process as quickly and easily as possible, the Danfoss website provides you with valuable and reliable information:

- Application design and recommendations
- Technical documentation
- Drawings and photos
- Text prepared for use in tender documents

All Danfoss stations come with complete “out-of-the-box” documentation for use before and after purchase, including technical specifications, drawings with dimensions, and installation or service guides.

## 2. Consultancy for quotation and product selection

Selecting the right substation for your project or building depends on a number of different factors.

Our experienced sales office staff use our eQuotation system to help you quickly prepare accurate station quotations:

- Dimensioning both individual components and the entire system for each building or project – this eliminates the risk of over-sizing
- Complying with the specific quotation criteria of different district heating suppliers
- Providing product-specific tender text and drawings
- Quoting a valid and correct sales price
- Detailing project planning and ensuring that all components can be delivered as required

## 3. Ordering and delivery planning

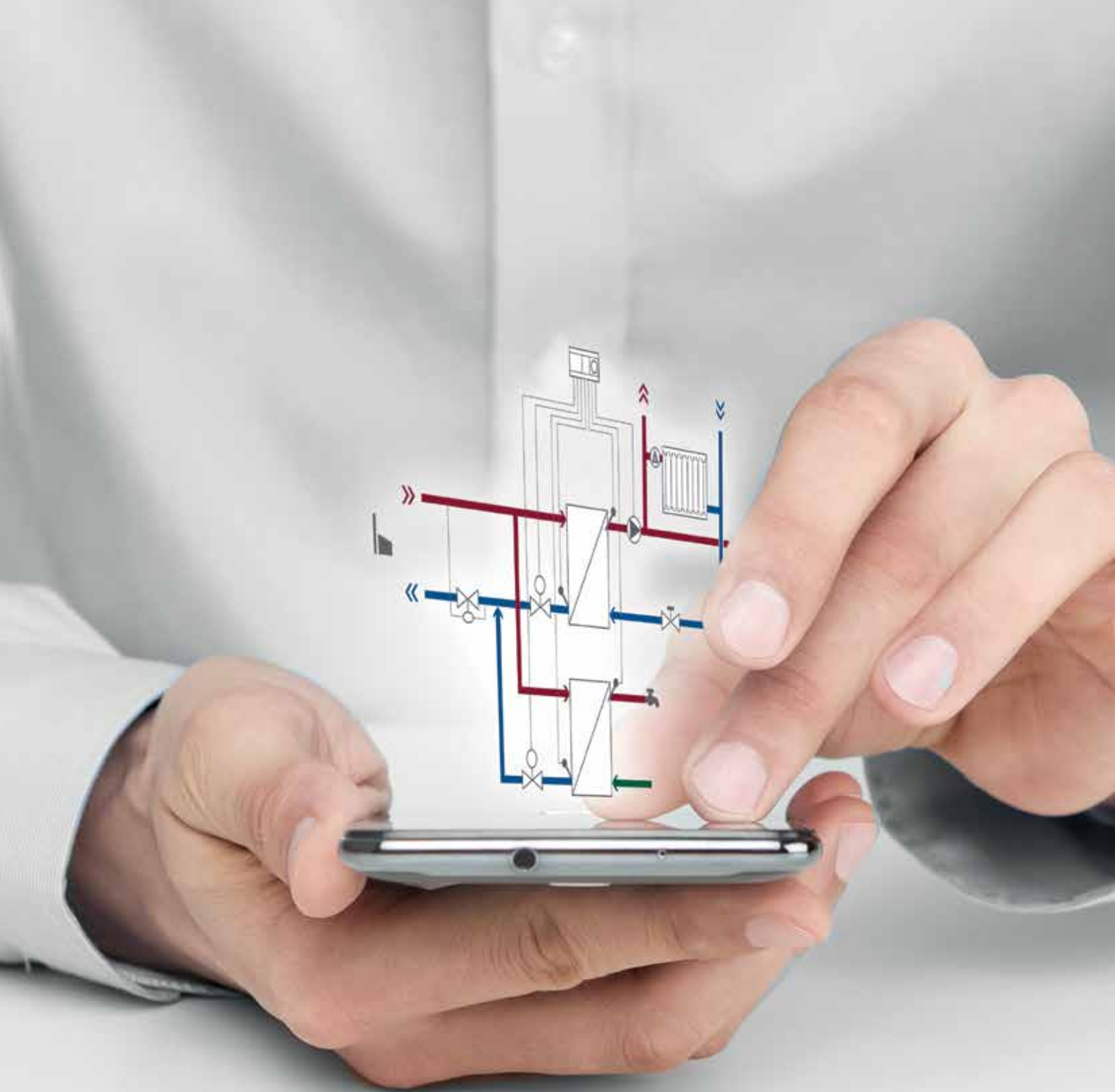
Once you have placed your order, we support you in optimizing workflow on site:

- Track and trace products and documentation via our online web tool
- Reliable delivery: we hold all main product groups in stock worldwide to enable short production times and reliable delivery throughout the year
- Short lead times with accurate deliveries to the agreed location, confirmed prior to delivery

## 4. Installation, commissioning and service support

Danfoss offers a comprehensive service support program to ensure that your new station is properly installed and commissioned. This covers all aspects of commissioning, maintenance, technical support, spares, warranties, etc.

Please contact your local Danfoss sales office ask about the precise range of services we offer in your region.



Speak to **your local Danfoss partner**  
or access project documentation **online.**  
Go to [www.heating.danfoss.com](http://www.heating.danfoss.com)



# Danfoss in future

## Engineering tomorrow

Danfoss currently employs over 22,000 people and serves customers in more than 100 countries. For over 80 years, we have specialized in pushing the boundaries of heating technology. Today, our solutions cover everything from individual components to complete district heating systems.

Our technologies will enable the world of tomorrow to do more with less. Building on decades of experience and knowledge, we lead the market in innovating advanced components and systems for climate and energy applications. Our robust and user-friendly technologies help to keep people comfortable and companies competitive across the globe.

We play an active role in shaping a world that is rapidly changing: improving infrastructure, increasing food production, reducing energy use and protecting the environment. Providing technological solutions for new mega-cities. Creating richer harvests to feed a growing world. Keeping food fresh and our children warm in a world that can make more out of less. This is how we are Engineering Tomorrow.

**[www.heating.danfoss.com](http://www.heating.danfoss.com)**



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