

ENGINEERING
TOMORROW



Take the lead in **modern energy infrastructure** elevate system **efficiency and comfort**

Automatic controls for low energy hydronic systems.

5 mill.

installations worldwide

And more than 75 years of experience within energy efficiency and application optimization, guarantees you a strong partner and state-of-the-art solutions.

www.districtenergy.danfoss.com

Maximize energy efficiency

Control and transfer hydronic energy with a minimum of temperature and pressure



Today's market trends are pointing in new directions. Trends are shifting towards hydronic based heating and cooling systems, combined heat and power and systems fuelled by renewable energy. Consumers demand comfort, stable prices, safety of supply and solutions with a green conscience.

Whether the energy comes from a common network or systems within individual buildings, the common denominator is to maximize energy efficiency.

This puts requirements to the infrastructure, which must be able to control and deliver hydronic energy with a minimum of temperature and pressure.

Controlling energy efficient infrastructures

The transfer of energy from input source to end usage is an art that requires careful control and monitoring in order to secure optimal energy efficiency. The input can take various forms; shared in the form of district energy – district heating and

cooling – individual solutions such as boilers or solar heating or combinations of these sources.

The interface in which the energy is transformed into domestic hot water, room- and floor heating or air conditioning – the hydronic interface – is a central part of the infrastructure in the process of increasing energy efficiency. To do so requires intelligent control components, which are optimized for the settings in which they operate.



Danfoss partnership – from start to end station...

Danfoss District Energy provides you state-of-the-art automatic controls that enable energy efficient systems. In the broad product range you will find a wealth of products that share the ability to maximize efficiency in the distribution of energy.

Add to that 75 years of experience in the business and you will have a partner with premium products and application knowledge that bring truly energy efficient solutions to life.

Take a tour through the infrastructure and enjoy the overview!

Modern energy infrastructure rely on efficient hydronic interfaces for maximum end user comfort

In modern energy infrastructure, the aim is to optimize the system from generation to end user. Flexible use of multiple energy sources – including renewables – and efficient hydronic interface units configured depending of system design

and user demands are the prerequisite for optimum transformation of supplied energy into domestic hot water, heating and cooling. The result is minimum energy consumption, maximum comfort and high end-user satisfaction.



Multiple solutions

- a strong combination for high comfort heating and cooling in modern buildings.

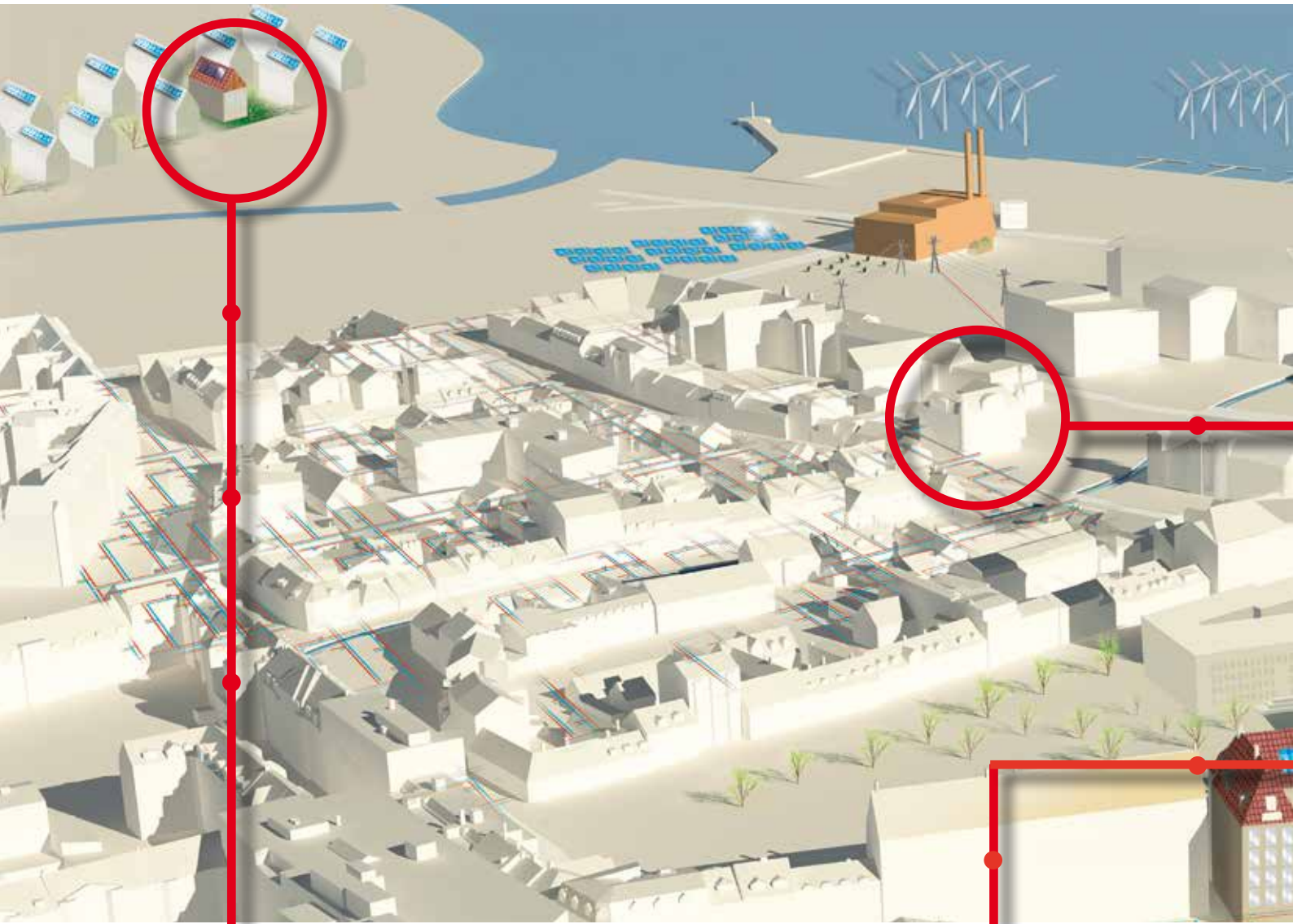


Matching local energy sources with local needs

By taking a look at urban and rural areas with various densities, the solutions with low energy are multiple. Where available, low energy district heating and cooling will most often be a part of the solution. This gives benefits to the individual

house owner or tenant, the city and community as well as the common society. Where district heating or cooling is not available, individual solutions prevail and are preferably combined with renewable energy sources such as heat pumps or

solar heating. The optimum solution depends on matching the infrastructure, available supply of energy sources, building types and customer demands.



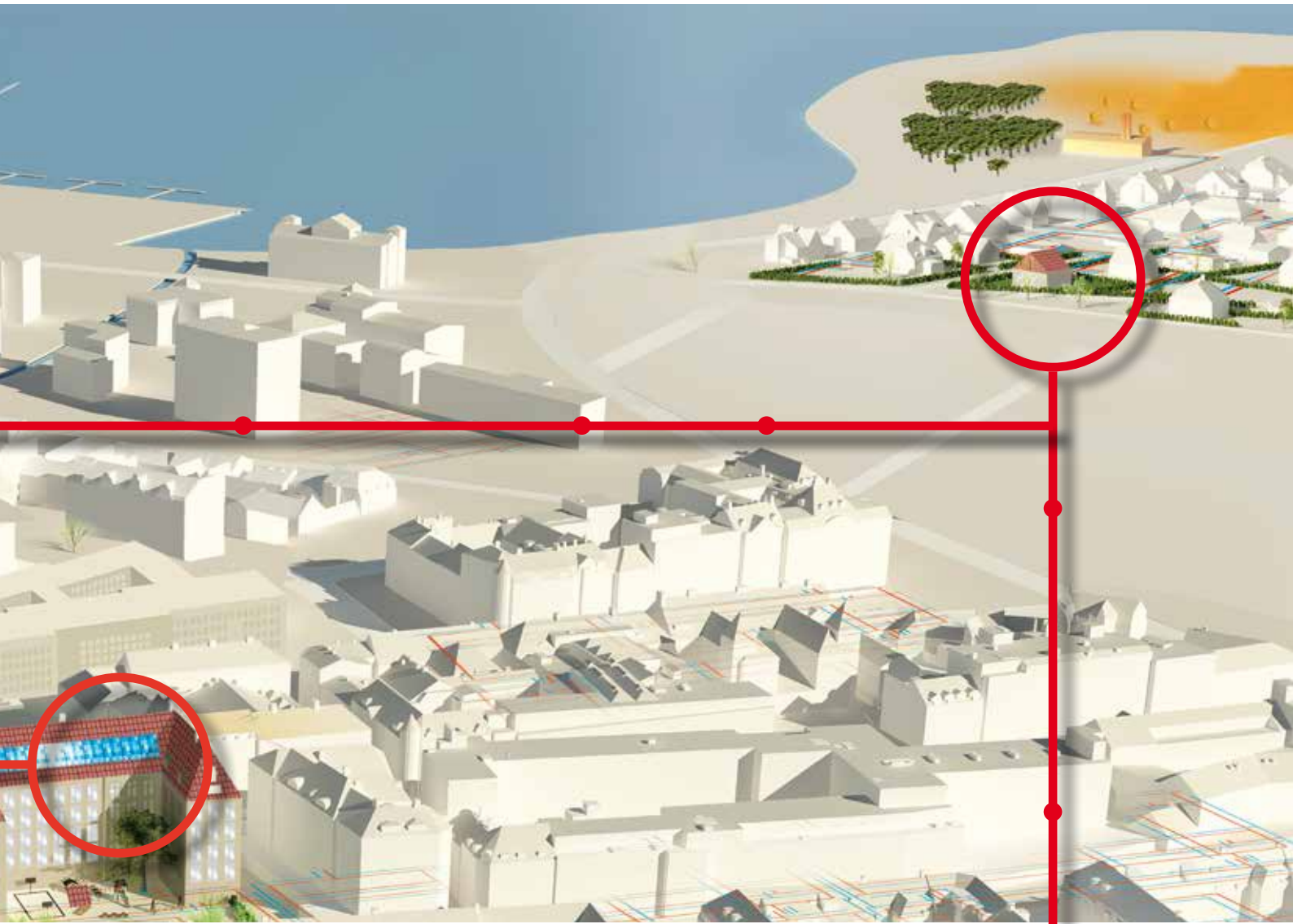
INDIVIDUAL HEATING COMBINED WITH RENEWABLE HEAT SOURCE



In buildings outside urban areas or with no possibility for connection to a district heating network, there will be a need to produce heat and cooling centrally in each individual dwelling or multi-family house. Renewable energy sources can be used either as single source or in combination with a back-up system.

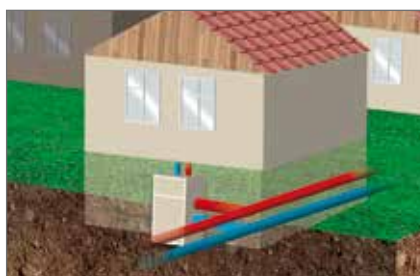
DISTRICT HEATING IN COMBINATION WITH LOCAL RENEWABLE HEAT SOURCE



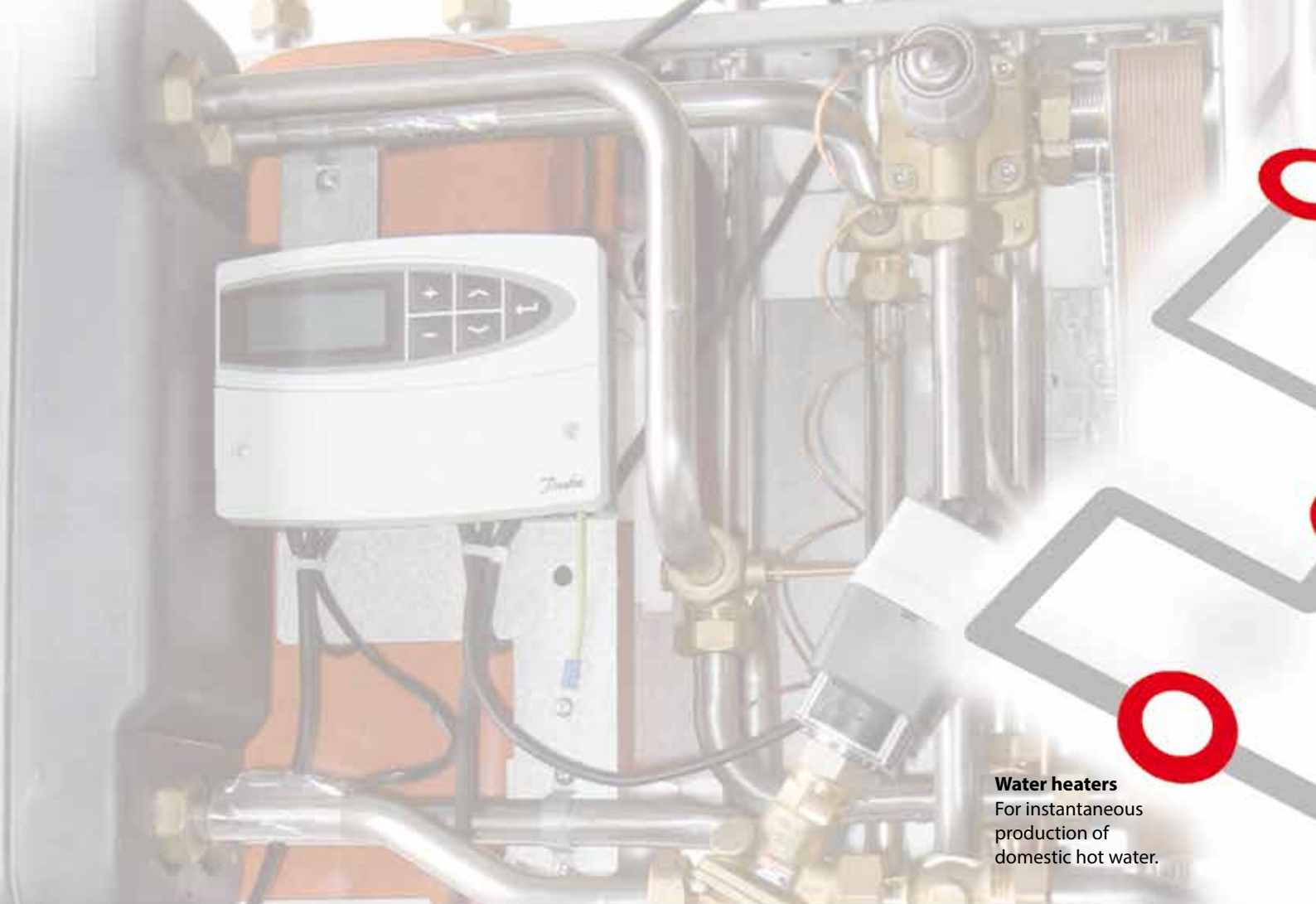


DISTRICT HEATING, DISTRICT COOLING AND MICRO NETWORKS

In buildings with a decentralized primary heat source (e.g. thermal solar heating) which is combined with secondary use of energy from the district heating network, the system needs to be able to switch between energy sources when necessary and keep a constant capacity over the year.



In buildings supplied entirely by district heating or cooling – typically prevalent in cities – or in rural areas where micro networks are used, there is an increasing demand for system efficiency and reduced heat losses. This can be obtained by using low temperature and pressure in the system.



Water heaters
For instantaneous production of domestic hot water.

Be a leader in low energy hydronic systems!

Hydronic interface units are key points in achieving energy savings – regardless of the nature of the energy supply. As a result, the increasing focus on energy savings will require top performance from these modules.

Whether you are providing hydronic interface units or involved in the design of low energy systems, Danfoss will offer components and inherent knowledge that enables you to optimize the total solution and cope with current and future demands.

Keep your focus on performance

Using top performing Danfoss controls and components allows you to focus on enhancing the total system performance, and thereby create superior solutions for your customers.

Consulting when you need it

State-of-the-art hydronic interface units are more than the sum of the built-in components. If you need assistance or



inspiration to optimize your solutions, Danfoss has substantial application knowhow ready for you to employ.

Simplify your processes with one supplier

Keeping the number of suppliers to a

minimum is often the sure path to simpler processes and cost reductions. No others offer a product range as comprehensive as Danfoss. We allow you to have a single supplier for the benefit of your total costs.

**Boiler charge systems/Tank/
boiler systems**

For heating and/or domestic hot
water storage and charging.

Mixing loops

For room heating and
floor heating systems.

**Metering/commissioning
modules**

For metering and
commissioning.

**Distict heating & micro
network substations**

For domestic hot water
and heating.

District cooling substations

For air conditioning solutions
with district cooling.

Combi solutions

For combined
solutions of
multiple energy
sources.

Flat stations

For individual heating
and domestic hot water
solutions in multi-family
houses.

Solar water heaters

For instantaneous production
of domestic hot water based
on solar energy.

Solar charging modules

For heating and/or domestic
hot water storage and charging
based on solar energy.

What is your
range of
hydronic
interface
units?

Energy savings. Engineered.

Danfoss controls and components are fit for low energy solutions. 75 years of striving towards energy efficiency is the key to today's controls and components which are market leaders within energy savings in hydronic interface systems. The product portfolio is built on essential

market demands originating from high-end district heating applications, and is gradually optimized for lower specifications.

Our broad product range covers a multitude of technologies and applications.

Control valves, actuators, electrical and self acting controls, and heat exchangers are all part of what we can offer you as a customer, and are engineered to fulfill one common target: Enabling you to provide efficiency to your customers' system.

Feature examples of controls which could be integrated into your solutions

AHQM – Multi-functional control valve



The Danfoss AHQM valve enables you to make fast installation and trouble-free commissioning in low duty applications.

In operation it optimizes the system to give maximum comfort and minimum energy consumption.

Featured benefits:

- Easy valve selection
- Small built-in dimensions in the application due to compact design
- Increased comfort and lifetime
- Low installation and commissioning costs
- High valve authority (Va) ~ 100%

XB06 – Brazed plate heat exchanger



Due to the extremely low pressure loss, the high performing heat exchangers with Micro Plate™ design bring higher efficiency to the system and thereby enable you to save energy and operation costs.

Compared to size and weight the performance is "best in class"!

Featured benefits:

- 10 to 15% higher heat transfer
- 10 to 30% lower pressure loss
- Less fouling and scaling due to uniform velocity throughout plate
- Long life time due to optimized brazing

IHPT – Domestic hot water control valve



The IHPT valve for domestic hot water can be used in applications with high variations in supply temperature and available differential pressure.

Stable control performance is achieved with the IHPT, as the thermostatic valve operates with constant and low differential pressure.

Featured benefits:

- Small heat loss due to low idle temperature
- High valve authority due to built-in differential pressure controller
- Minimizing risk of limestone in the heat exchanger
- DHW circulation pipe can be installed directly on the valve
- Easy installation

ECL Comfort – Electronic controllers



ECL Comfort is an electronic controller for optimum control of the hydronic system through dedicated features and application keys. ECL Comfort offers a clear and intuitive display, and application keys are available in multiple languages.

ECL controllers ensure energy savings and increased end user comfort.

Featured benefits:

- High flexibility due to the application key system
- Advanced control in a user-friendly interface
- Internet connection possibilities for remote setting
- Auto tuning gives an easy setting of the controller for domestic hot water
- Motor protection increases life time of motor and valve by removing risk of hunting

Motorized control valves



The new range of motorized control valves is optimized for low energy systems and meets the high standards for precise control.

Complete range of 2 and 3-way valves with advanced motors including all needed accessories ensure dedicated solutions for a wide range of hydronic applications.

Featured benefits:

- Automatic stem connection enables easy connection
- Easy installation to the valve neck since no mounting tools is needed
- The external reset and standby functions make the actuator to stay in the current position by ignoring change of the control signal
- Increased controls stability by means of smart control algorithms

Danfoss automatic controls – product range highlights

Motorized control valves

Product	Valve type	Actuator type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	VRG / VRB VF / VL	AMV(E) 435 AMV(E) 55 AMV(E) 85	DN 15-150	6/16	130	2 and 3 port valves. Thread and flanged connection. Actuators for 230 and 24 V a.c.
	Rotary valves HRB / HFE	AMB 162/182	DN 15-150	6/10	110	2 and 3 port valves. Thread and flanged connection. Actuators for 230 and 24 V a.c.

Multi-functional control valves (Pressure independent)

Product	Valve type	Actuator type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	AHQM AHPBM-F	AMV(E) 10/13 AMV(E) 130/140 (-H) AMV(E) 150	DN 15-32	16	120	Integrated flow – limitation / adjustment. Thread connection. Actuators for 230 and 24 V a.c.
	AHQM	AMV(E) 15 AMV(E) 55/56 AMV(E) 85/86	DN 40-250	16	120	Integrated flow – limitation / adjustment. Flanged connection. Actuators for 230 and 24 V a.c.

Differential pressure controllers

Product	Controller type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	AHP	DN 15-40	16	120	Adjustable setting range. Thread connection
	AHP	DN 50-100	16	120	Adjustable setting range. Flange connection

Self-acting temperature controllers

Product	Valve type	Controller type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	RAV VMT VMA	RAVK RAVI RAVV	DN 15-25	10/16	120	Temperature controller. Applicable for domestic hot water/heating control and mixing loops. Thread connection
	VG	AVT	DN 15-50	25	150	Temperature controller. Applicable for domestic hot water/heating control and mixing loops. Thread/Flange connection

Product	Controller type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	AVTB	DN 15-25	16	130	Temperature controller. Applicable for domestic hot water/heating control and mixing loops. Thread connection
	IHPT	DN 15	16	130	Multi-functional controller for flow compensated, instantaneous do- mestic hot water control with plate heat exchanger

Brazed plate heat exchanger

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	XB	DN 20-100	25	180	Stainless steel. Applicable for heating, cooling and HVAC applications

Electronic controllers

Product	Type	Description		
	ECL Comfort 110	Universal electronic PI controller. Applicable for weather compensator for flow temperature control (heating) and constant temperature control, e.g. of domestic hot water in smaller heating systems.		
	ECL Comfort 210	Universal electronic PI controller. Applicable for flow temperature control in all types of heating systems with one or two circuits. By the use of an application key the controller covers a multitude of applications.		
	ECL Comfort 310	Universal electronic PI controller. Applicable for flow temperature control in all types of heating systems with one, two or three circuits. An extension module ECA32 enables analog outputs and additional inputs. Built-in M-bus communication. By the use of an application key the controller covers a multitude of applications.		

Ball valves

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	LD-WW LD-FF	DN 15-200	16/25	150	Shut-off ON/OFF valves. Thread and flange connection

Heat meter

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	SONOMETER™ 1100 SONOMETER™ 2000	DN 15-100 DN 15-100	16/25 16/25	130 (150) 130 (150)	Ultrasonic heat meter. Compact design. Communication available. Applicable for heating and cooling applications.

Butterfly valves

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	VFY	DN 15-300	16	120	Shut-off ON/OFF valves. Manual and motorized version available.

ON / OFF valves

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	AMZ 112 / 113	DN 15-32	16	130	Motorized ON/OFF control valves. Available as 2 and 3 port valves.

Strainers

Product	Type	Size (mm)	PN (bar)	Max temp. (°C)	Description
	FVF	DN 15-300	16/25	300	Flanged connection. Available with magnetic insert.

International destinations

Danfoss controls and components in action Featured low energy reference projects

District Heating

- Asagaarden, Holstebro, Denmark
- Lalandia Resort, Billund, Denmark
- Carlsro, Rødovre, Copenhagen
- Sønderborg District Heating Company, Denmark
- Community of Kněžice, Czech Republic



**Lalandia Resort, Billund, Denmark
– District Heating**

Micro network systems and block heating

- Community of Wiesmath, Niederösterreich, Austria
- Community of Kötschach-Mauthen, Niederösterreich, Austria
- Laas/Eyrs, Southern Tyrol, Italy



**Indecon Court, London, United
Kingdom – Decentralized System**

Flat stations, thermal solar and decentralized systems

- Indecon Court, London, United Kingdom
- Highbury Stadium, London, United Kingdom
- Gandaliskes district, Klaipeda, Lithuania
- Hódmezvásárhely, Hungary
- Zagreb, Croatia
- Selenium Twins, Istanbul, Turkey
- Burgas, Bulgaria
- Solarcity WAG, Austria
- Bolarring, Salzburg, Austria



**Community of Wiesmath, Niederösterreich,
Austria – Micro Network**

Domestic hot water systems

- HafenCity Hamburg, Germany
- Kempinski Grand Hotel, Heiligendamm, Germany

District cooling

- Stockmann department store, Helsinki, Finland
- Copenhagen Energy - Kongens Nytorv, Copenhagen, Denmark
- Discovery Garden, Dubai, United Arab Emirates

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