ENGINEERING
TOMORROW

Modern heating technology for housing associations

Increase the attractiveness of your multi-family building

Energy-efficient and reliable heating solutions.

Up to 23%

energy savings thanks to intelligent thermostats, temperature control and hydronic balancing.

www.heating.danfoss.com

As a resident, I expect **affordable** living with plenty of comfort

“Affordable rent and utilities with no surprises”

“Hygienic domestic hot water whenever I need it”

“Individual temperature zones – anytime, everywhere”

“Modern building services – that I don’t have to worry about”

“No noises from the heating system – and all the radiators give off heat!”

“Modern heating technology that gives the environment a break”

As the owner I expect profitability and **satisfied** tenants

“Stable costs during the planning and implementation of renovation and new-build projects”

“Lowest possible investment with rapid payback”

“Long-term value retention: easy to rent, easy to sell”

“No need for legionella testing”

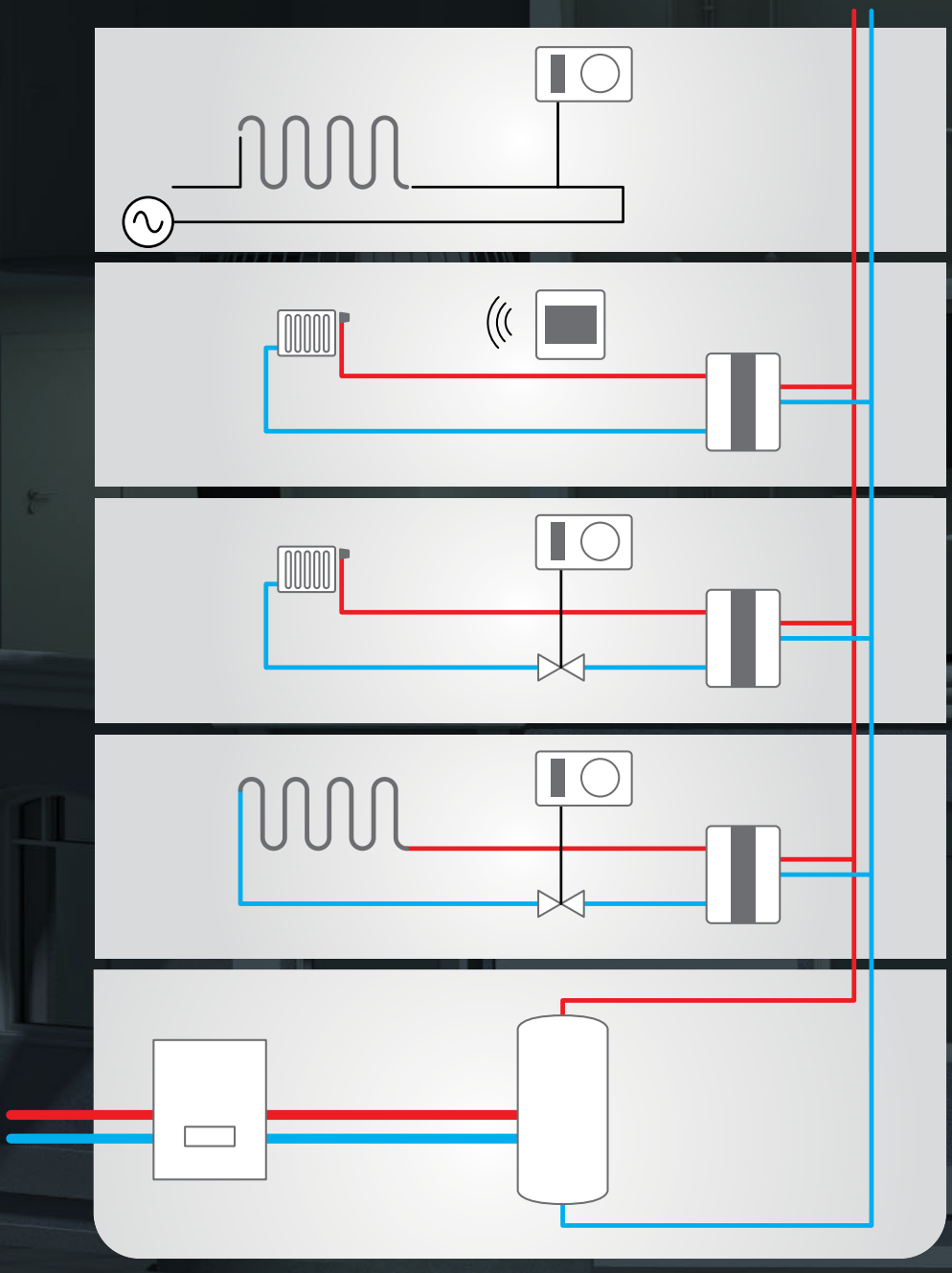
“Satisfied tenants: no complaints due to noise or undersupply to individual radiators”

“Reliable heating technology – easy to operate and easy to bill”

Radiator thermostats

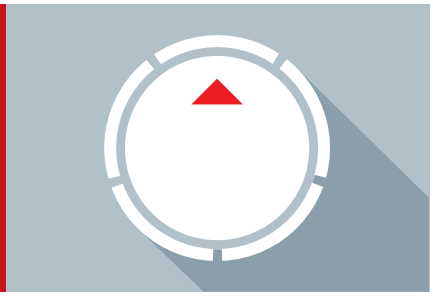
Programmable room thermostats

Intelligent heating system control with *Danfoss Link*™ including App control for floor heating and radiator heating*



* If using multiple *Danfoss Link*™ systems in a single building, please contact your local Danfoss expert.

More comfort**, less** effort with **intelligent** temperature control



Room temperature control and intelligent heating

Depending on the outside temperature and the heating habits of residents, the heating requirements of rooms, apartments and entire buildings are constantly changing. Radiator thermostats and room temperature controller systems compensate for these fluctuations, keeping the temperature in every room at the level individually set by the resident.

Upgrade your building
Modern temperature control enhances the living comfort of your property, improving your chances of renting or selling it at an attractive price.

Renovate with ease
Defective or missing thermostats can lead to tenants withholding rent. Replacing or installing thermostats is easily done, even when residents are at home.

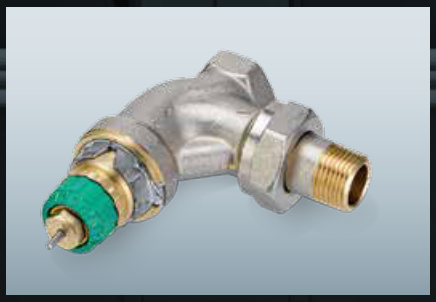
Use floor heating
Hydronic floor heating is becoming more popular in new buildings. You can capitalize on this trend by using electric heating mats for renovation projects.

I want to set the temperature in every room individually - and I want the temperature to stay constant even when the weather outside changes.

I want an attractive, easily rented property with satisfied residents who feel good in their homes.

Ensure constant differential pressure in all risers with ASV [1].

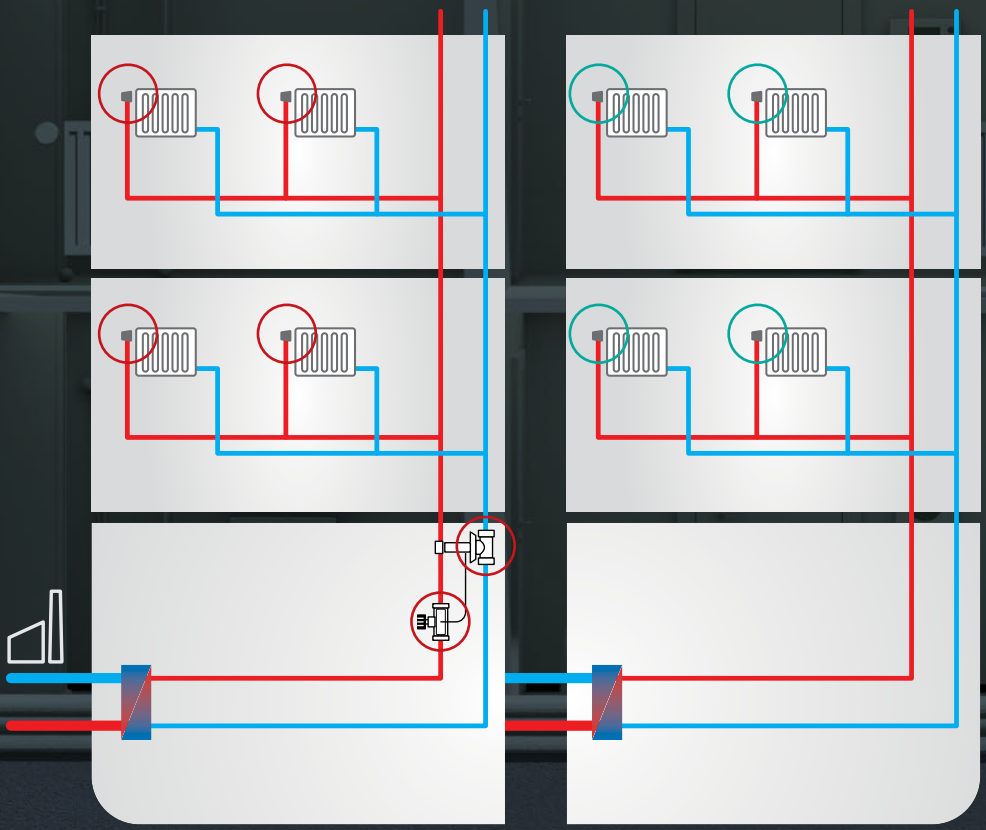
Ensure design flow per radiator with RA-N pre-setting valves.



Ensure constant differential pressure and design flow per radiator with *Dynamic Valve*™.

Automatic balancing solution with riser-mounted ASV and radiator-mounted RA-N valves.

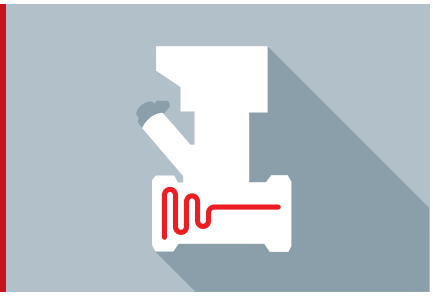
Automatic balancing solution with radiator-mounted *Dynamic Valve*™.



Pressure	Max differential pressure = **250 kPa**	Max. differential pressure = **60 kPa**
Radiator	No flow (l/h) limitations	**Max. flow = 135 l/h** P = 3140 W at ΔT = 20 P = 4700 W at ΔT = 30
System	✓ Best choice if the max. differential pressure is unknown ✓ Best choice when well-functioning pre-setting valves are present ✓ Only choice for systems with built-in valves	✓ Best choice for complex riser design ✓ Best choice when risers/pipes are difficult to access ✓ Best choice when main riser/return pipes are distant from each other
Economy	✓ Best choice for risers with many radiators	✓ Best choice for risers with few radiators

1) ASV automatic balancing valves consist of an ASV-PV (variable setting) or ASV-P (fixed setting) differential pressure controller plus an ASV-I or ASV-BD partner valve.

Noise-free heated radiators thanks to **hydronic balancing**



Hydronic balancing of heating systems

The most common complaints from residents concern flow noise and under- or over-heated radiators. Both are typically caused by a poorly balanced heating system. Automatically balanced heating systems eliminate the main cause of these complaints.

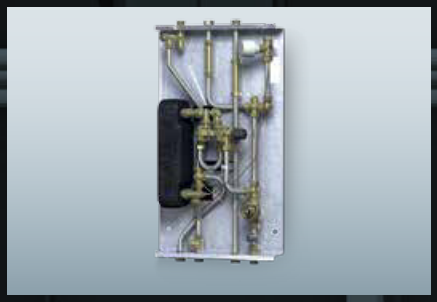
Depending your heating system, you can choose between riser-mounted automatic balancing valves combined with pre-setting radiator valves, or radiator mounted pre-setting valves with a built-in differential pressure controller.

No complaints
Heating systems that have undergone precision hydronic balancing avoid both annoying flow noises and undersupply of individual radiators, letting everyone sleep soundly.

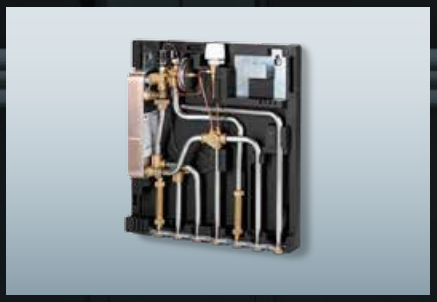
Reduce utility costs
Heating systems with effective hydronic balancing via controlled pumps, differential pressure controllers and presettable thermostatic valves also consume less energy. This reduces heating and utility costs.

I expect every radiator to emit heat and I don't want annoying noises from the system keeping me awake at night.

I don't want any complaints due to flow noise or undersupply of individual radiators.



Flat stations to replace old gas boilers

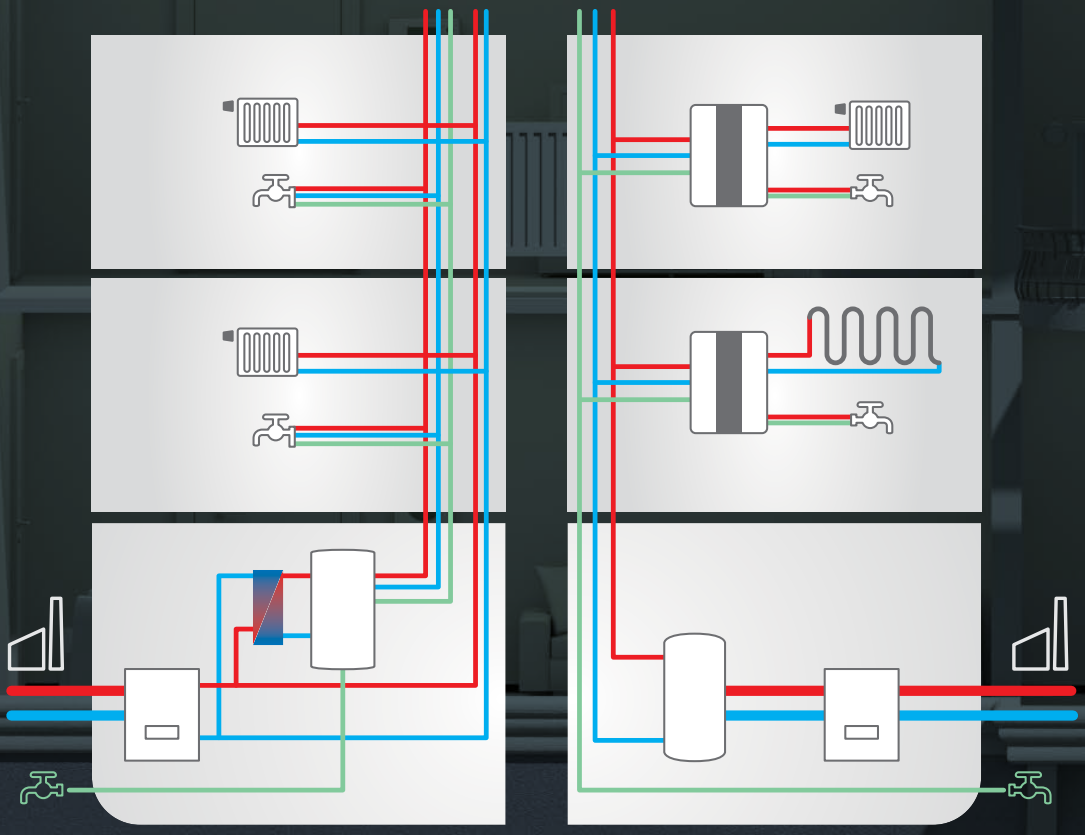


Flat stations for radiator heating

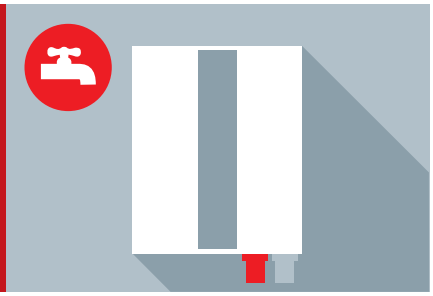
Flat stations for floor heating

Traditional five-pipe system with central DHW heating

Modern three-pipe system with decentralized heat distribution and DHW heating



Plan with confidence and **reduce investment costs** using flat stations and the 3-pipe system



Decentralized heat distribution and easy energy billing

Heating systems with EvoFlat™ flat stations can be operated using all available energy sources. If the system is correctly planned, it will only need three rather than the usual five supply lines and the need for regular Legionella testing will be eliminated. Furthermore, these flat stations have a built-in automatic balancing function, ensuring even heat distribution in the entire building. The system can be safely and conveniently installed without residents needing to temporarily vacate their homes.

Plan with confidence

The EvoFlat™ heating concept enables you to keep an accurate overview of costs, from beginning to end, for both new-build and renovation projects.

Plug-and-play

With the smallest possible footprint, EvoFlat™ flat stations come with all the necessary components for easy installation, hydronically balanced operation and trouble-free energy billing.

Rent and sell with confidence

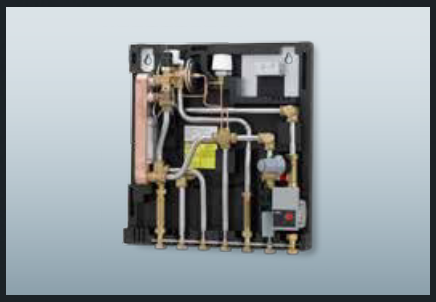
The three-pipe system reduces investment costs, heat losses and heating costs. This makes your property attractive for both purchase and rental.

As a resident, I expect modern heating technology that supplies me with heat and hot water in a convenient, economical and environmentally friendly way.

Planning reliability is a priority in both new-build and renovation projects. That goes for financing and budgeting, as well as for structural measures.

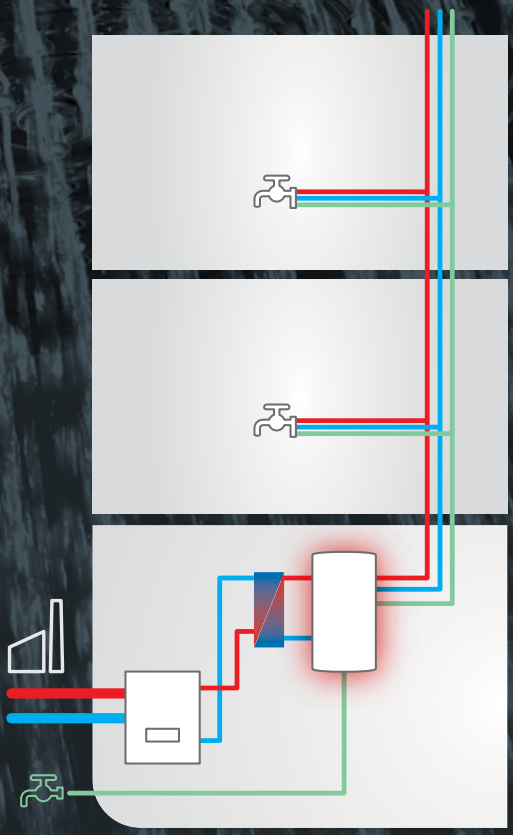
Akva Lux instantaneous water heater

Charging systems for hygienic DHW with storage



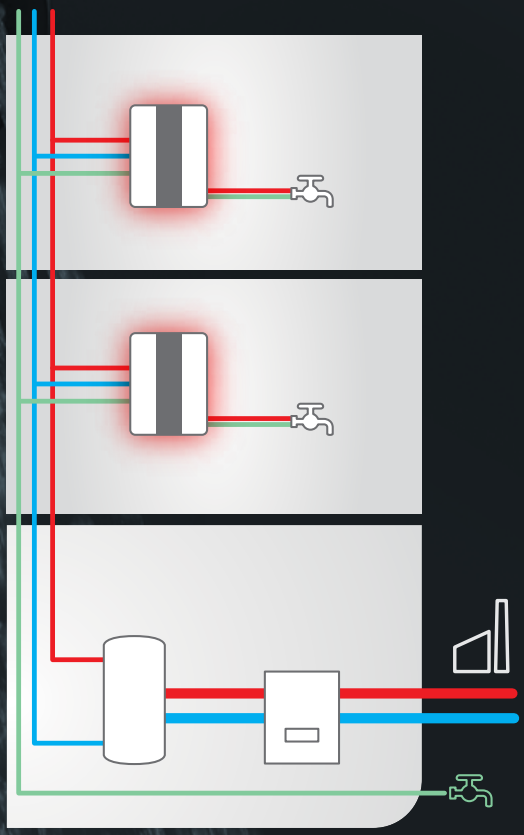
Flat station for floor heating systems with integrated instantaneous domestic hot water

Centralized domestic hot water



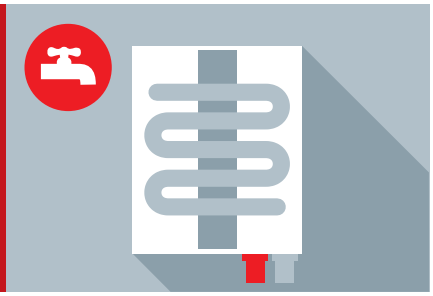
To protect against Legionella, Danfoss supplies storage for charging systems with integrated thermal disinfection. This heats the domestic water to over 65°C and maintains it at this temperature within the circulation network. Legionella die off after five minutes at this temperature.

Decentralized domestic hot water

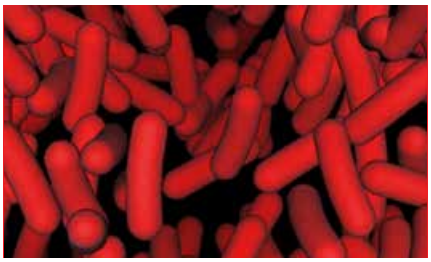


Freshwater systems for decentralized DHW heating are either used alone or integrated into a flat station. They only heat the domestic water when needed. If properly planned, the volume of piping between the freshwater system and the taps in an apartment will be below three liters.

Hygienic domestic hot water



Systems for safe and hygienic DHW heating



Depending on local legislation, DHW system operators can be held responsible for water quality. The particular target of legislators is Legionella.

No need for Legionella testing
If correctly planned and installed, decentralized freshwater systems are not required to undergo regular Legionella testing. This makes property management easier and eliminates shower bans.

Instant domestic hot water
Decentralized systems for instantaneous DHW only heat the domestic water when needed. They do not require a storage tank, do not generate heat losses and enable trouble-free billing of energy consumption.

Pass Legionella tests
If used as intended, charging systems with storage and thermal disinfection reliably kill off Legionella bacteria, preventing proliferation through the entire installation. In other words, you can be confident that you will pass the Legionella tests.

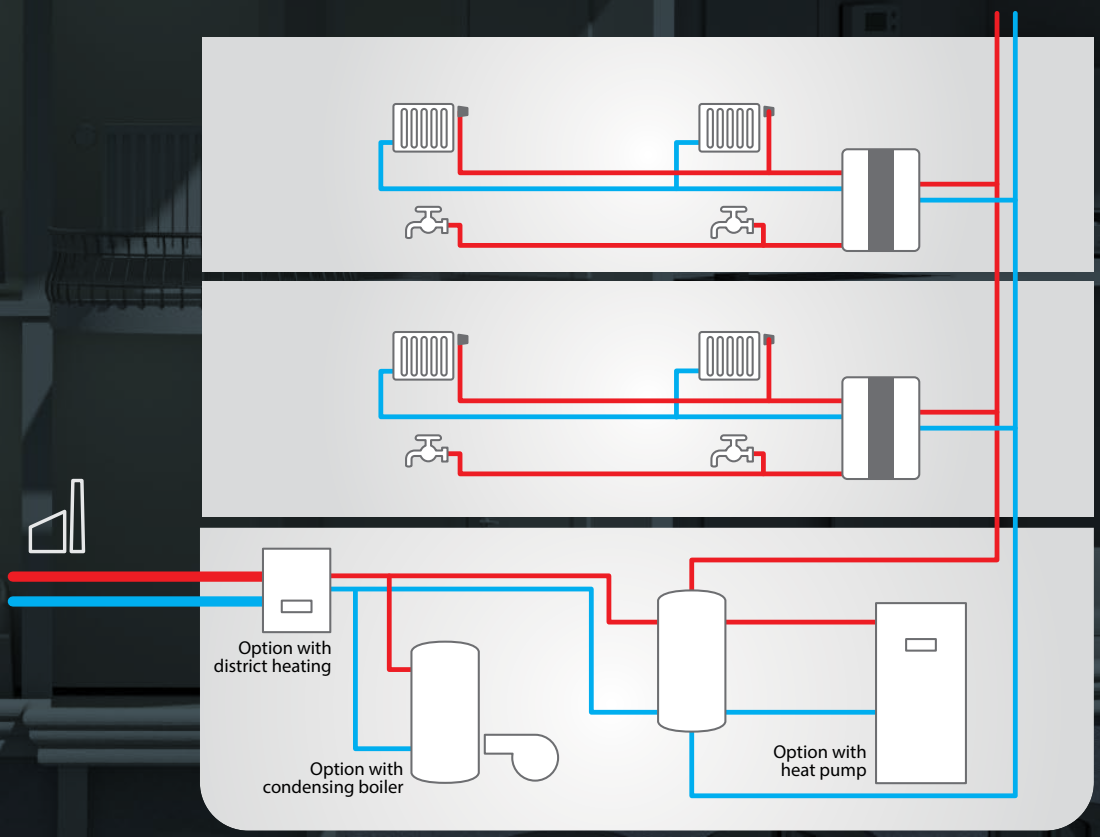
I expect to have as much domestic hot water as I want – and that it is hygienically safe and easily affordable.

I want to avoid Legionella testing if possible, or be able to pass these tests reliably, so that the public health authorities cannot impose a shower ban.

District heating substations with electronic controllers

Oil burner components

Intelligent central controller for heating/ cooling applications



Modern heat supply – **flexible**, **reliable**, and **future-proof**

Central supply with one or more energy sources

Energy costs are constantly rising. Taking advantage of solar energy or other renewables can make buildings independent of a single energy source. These systems collect the hot water delivered by each source in a buffer tank for multiple heating system operations.

Online monitoring

Electronic controllers like the ECL Comfort 310 control and monitor heating systems using central control technologies via the Internet or a smartphone app. This enables you to spot potential problems in advance, before residents complain.

District heating

District heating is an environmentally friendly source of energy. It does not emit exhaust fumes or pollutants at the point of use. It doesn't require a gas tank, oil tank, boiler or heater. All it needs is a substation. This separates the supply network and the building installation and efficiently transmits the district heating.

Combined energy sources

Buildings can be made independent of a single energy source by taking advantage of solar energy or other renewables. These collect the hot water delivered by each available source in a buffer accumulator for multiple heating system operations.

For the sake of my family's future, I want to use affordable and environmentally friendly heating sources at all times.

I want to be flexible in my choice of energy sources so that I can react to price changes and fulfill both legislative requirements and the wishes of my residents.

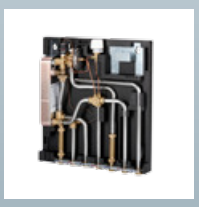
We offer energy-efficient solutions for all common heating systems, including radiator-based and floor heating systems for all new-build and renovation projects. We offer a full range of products to accurately meet the requirements of any specific system, some of which are shown here. Find out more at www.heating.danfoss.com Please contact us to have a Danfoss expert advisor assist you in planning your project.

System 1:

5-pipe system with radiator heating

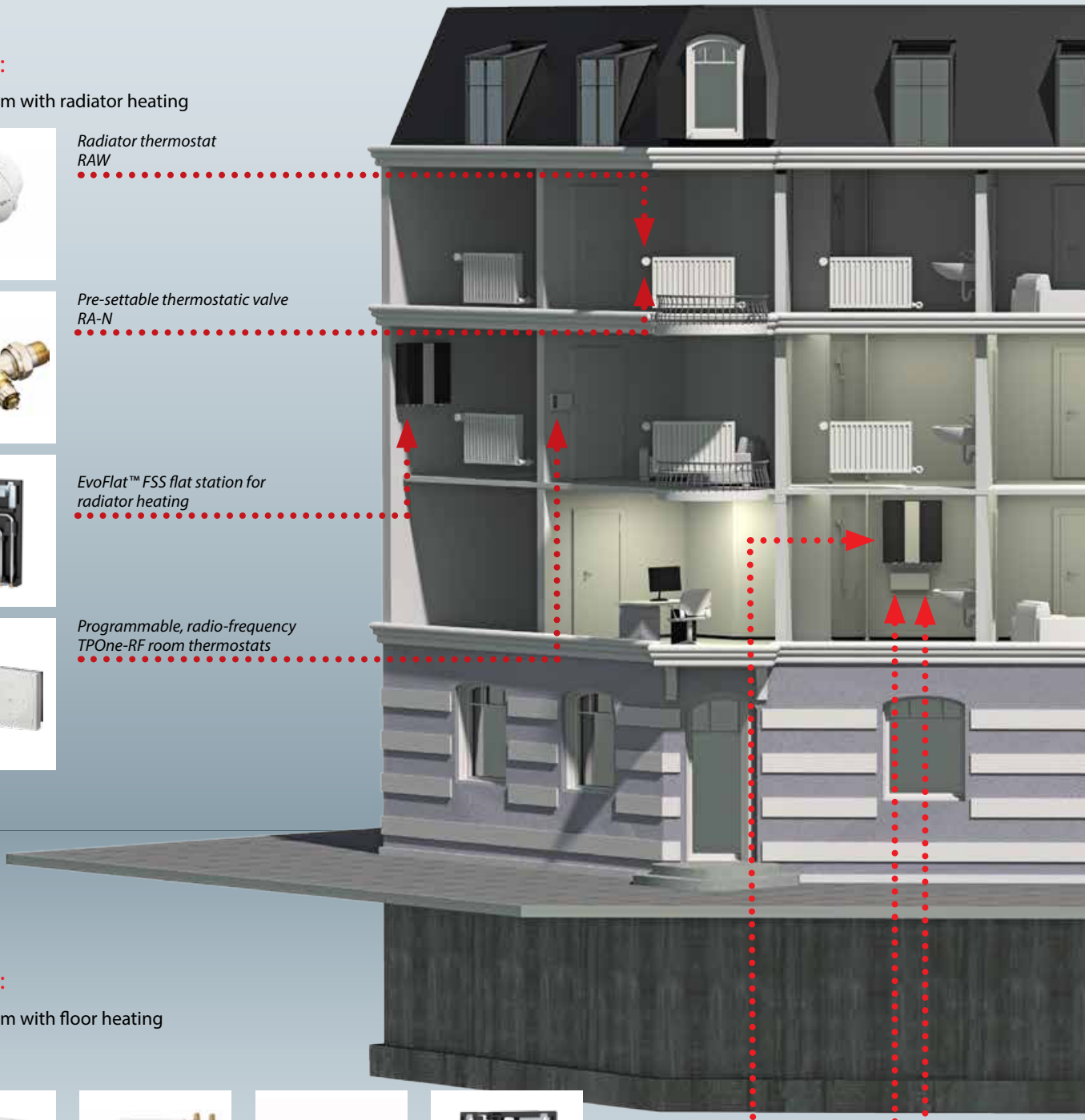
Radiator thermostat RAW

Pre-settable thermostatic valve RA-N



EvoFlat™ FSS flat station for radiator heating

Programmable, radio-frequency TPOne-RF room thermostats



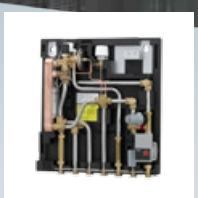
System 2:

3-pipe system with floor heating

Danfoss Icon™ room thermostat

SGC floor heating manifold

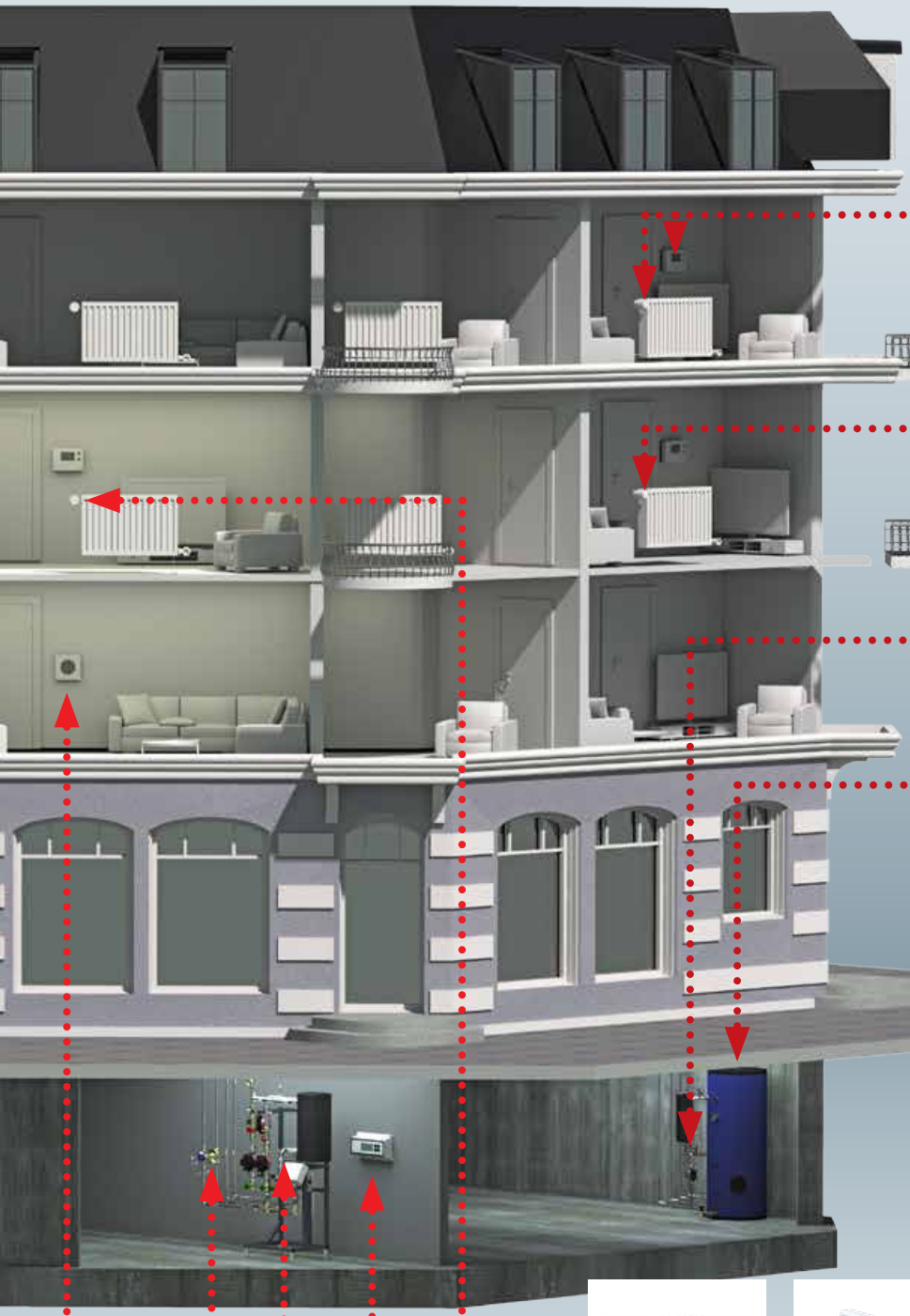
Connecting rail with pre-assembled ball valves



EvoFlat™ MSS flat station for floor heating

Sample applications
for new buildings and renovations

Proven solutions for your system



System 3:

5-pipe system with central DHW heating

Central controller wireless system with Danfoss Link™ app control

Thermostatic radiator valve with built-in differential pressure controller Dynamic Valve™ (RA-DV)

Multifunctional MTCV thermostatic circulation valve

Legiomin storage charging system

System 4:

5-pipe system with central DHW heating (renovation)

RA2000 radiator thermostat

Disinfection process CCR 2 controller system with MTCV

ThermoDual CM DHW charging module

ASV automatic balancing valves

ENGINEERING
TOMORROW

Discover the benefits
at heating.danfoss.com

heating.danfoss.com offers you a comprehensive range of support resources. These tools will help you identify and select the most suitable products for all your projects, check dimensions and specifications, and make your job on site easier. You can also access the latest technical knowledge, explore different case studies, watch training films **and much more.**

1 click
is all it takes.
Expand your toolbox, increase your knowledge, and keep learning at heating.danfoss.com

What you will find:

Literature
Our comprehensive collection of commercial and technical literature will help you explain our products and solutions to your customers and identify the best products for specific projects.

You will find a wide range of useful and informative brochures, case stories, technical datasheets and instruction manuals.

Tools
Videos and educational animations help build your knowledge of our products and the technologies behind them. Calculation tools and software help you prepare the on-site commissioning process.

Social media
You can also follow us on social media. You will find all our videos on our YouTube channel at www.youtube.com/DanfossHeating.

Danfoss quality management system certifications:

✓ ISO9001	✓ ISO14001	✓ PED	✓ TS 16949 compliant

We also comply with all EU directives and product approvals

Danfoss A/S · Heating Segment · Haarupvaenget 11 · 8600 Silkeborg · Denmark
Tel.: +45 7488 8000 · Email: heating@danfoss.com · www.heating.danfoss.com