Danfoss Icon™
Room thermostats made to match your switch frames

Advanced room controls for hydronic floor heating and other applications with actuators.

Fits
into compatible switch frames from manufacturers such as Busch-Jaeger, Gira, Berker and Merten.

icon.danfoss.com
**Matches the switch frames**
Complements the interior

The Danfoss Icon™ room thermostat has been designed to blend in with any interior. This is why we consciously chose to make it look like most common switch frames.

When not in use, the room thermostat display turns off and becomes virtually invisible. When the screen is touched, the display comes to life instantly and displays the current room temperature.

**Build it into a switch frame**

To achieve a perfect match between thermostat, light switches and electrical sockets, Danfoss Icon™ in-wall versions can be easily fitted into many of the most popular switch frames.

You can find an overview of compatible switch frames at:

[icon.danfoss.com](http://icon.danfoss.com)
Danfoss Icon™ room thermostats
Easy to install and functional design

Danfoss Icon™ is designed to make people’s life easier – in every touchpoint from installation to daily use.

For instance, the angle of the frame on the in-wall versions can be slightly adjusted to compensate for inaccurate junction box installation. Additionally, the plastic material is UV-resistant and is easy to clean thanks to its glossiness.

In-wall

Front module 50x50 mm.
- Place inside the wall frame and snap onto the rear part.

Wall frame 80x80 mm.
- Can be exchanged with any compatible switch frame.

Rear module
- Connected with wires and mounted inside junction box.

On-wall

Front module 50x50 mm.
- Place inside the frame, this is snapped onto the rear part.

Frame 86x86 mm.
- Snap the frame onto the rear part.

Rear part
- Mount the rear part on the wall or on top of a junction box and connect the wires to the terminal.

In-wall or on-wall?

If the Danfoss Icon™ room thermostat fits into the junction box, we recommend choosing the in-wall version. With a depth of only 11 mm and 80 x 80 mm square, it effortlessly blends in with the interior design scheme.

The on-wall version is the ideal choice if the junction box is not compatible or not present. At just 25 mm in depth and 86 x 86 mm square, the on-wall version is no more obtrusive than a standard light switch.
**Danfoss Icon™ Master Controllers**

Modular concept to cover every application

The 24V/wireless master controller offers several advanced features which can be expanded even further with the Expansion Module. For instance, you can choose between 10 pre-defined applications that define the actions of inputs and outputs on the master controller.

To get a full overview of all applications please visit: icon.danfoss.com

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**Use scheduling to save energy**

Danfoss Icon™ enables you to automatically change the room temperature throughout the day. The adaptive learning feature turns the heating on at precisely the right moment to achieve the desired temperature at the scheduled time. Every degree the temperature is lowered saves 5% of energy use.

Bear in mind that changing the temperature in a room with standard hydronic floor heating may take several hours.

**Pre-defined scheduling**

The 230V programmable Danfoss Icon™ room thermostat features seven pre-defined schedules that can be selected at the touch of an icon. This eliminates the tedious business of setting up schedules, improves comfort and contributes to reducing energy use. The chosen schedule can be overridden at any time by simply pressing the “Away,” “At home” or “Asleep” icons.

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**Commissioning test**

Based on the application chosen, the 24V/wireless master controller will check if the system is installed correctly. The feature ensures that everything works correctly, allowing you to leave the site with a peace of mind.

See example to the right of a 3 step commissioning test for “Application 0010” (heating/cooling in 4-pipe system).

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**Danfoss Icon™ App**

**Try it out**

The 24V/wireless master controller can be expanded with the App Module, allowing system operation, scheduling of times and temperatures, and much more from any Apple or Android mobile device.

Search for “Danfoss Icon” in the App Store or Google Play to try out the App in demo mode.
Automatic balancing for energy savings and comfort

Why balance?
Water chooses the easiest path with the least resistance. In floor heating systems, the consequence is an uneven heat distribution where the shortest loop will get the most water, resulting in a faster warming of smaller rooms at the expense of the larger rooms. To achieve harmonic room temperatures, the floor heating system should be hydronically balanced as it provides maximum comfort with minimum energy costs.

How automatic balancing works
Based on the ability to meet the setpoint in each room, the Danfoss Icon™ system will know the approximate size of each output (pipe length). With Danfoss Icon™ automatic balancing, the system will reduce the “ON time” for the shorter pipes / small rooms and prioritize the longer pipes / large rooms. Thereby all rooms will get their fair ratio of the available flow when heat demand increases.

ON time  OFF time  Forced OFF time

System without automatic balancing when heat demand suddenly increases

Short pipe  Medium pipe  Long pipe

System with automatic balancing when heat demand suddenly increases

Short pipe  Medium pipe  Long pipe

Large rooms with long pipes experience pressure losses. When heat demand suddenly increases, the long pipes need to be prioritized at the expense of short pipes. Or else it will take too long to heat the room.

Small rooms with short pipes experience limited pressure losses. Therefore, the short pipes will “steal” most of the energy/water at the expense of the long pipes and will be heated quickly.

Demand based supply temperature for increased comfort and easy installation

Why outdoor temperature compensation is not always optimal:
The supply temperature is often controlled via outdoor temperature compensation. However, outdoor temperature compensation requires wiring to an outdoor sensor and heat curve settings. Furthermore, the outdoor temperature does not necessarily reflect the actual heat demand inside of the house.

The sun can heat up a room - even when it is cold outside. By basing the supply temperature on the actual room demand, the Danfoss Icon™ system takes heat from appliances, sunshine, and people in the room into account when setting the supply temperature. The result is a comfortable and welcoming room temperature no matter the circumstances.

How demand based supply temperature works
Danfoss Icon™ 24V and wireless systems detect actual and required temperatures in each room. Based on the information, an actuator on the mixing shunt will constantly adapt the supply temperature to the actual heat demand. In effect, comfort will increase and the return temperature will decrease for improved energy efficiency.
24V and wireless systems
with advanced features and optional modules

- 24V/wireless supports multiple heat emitters in separate rooms
  - Control radiators and/or floor heating in separate rooms. Requires that an actuator is electronically controlled via the room thermostat.

- 230V supports multiple heat emitters in separate rooms
  - Control radiators and/or floor heating in separate rooms. Requires that an actuator is electronically controlled via the room thermostat.

230V room thermostats
with optional master controllers

- Master Controller
  - Basic version:
    - Pump relay (potential free)
    - Boiler relay (potential free)
    - 8 channels, 8 outputs
  - Featured version:
    - Active 230V pump output
    - Boiler relay (potential free)
    - Global away input (230V)
    - Cooling input (230V)
    - 8 channels, 14 outputs

- Danfoss Icon™ Programmable
  - Noiseless switching
  - Can be build into many switch frames (in-wall only)
  - Up to 5x2W NC or NO actuators
  - PWM for accurate control
  - Temperature limitation
  - Choose between radiator, light floor heating and heavy floor heating PWM setting
  - Seven pre-defined schedules
  - Adaptive learning
  - Input for cooling and central ‘away’
  - Optional floor sensor (088U1110)

- Danfoss Icon™ Display
  - Noiseless switching
  - Can be build into many switch frames (in-wall only)
  - Up to 5x2W NC or NO actuators
  - PWM for accurate control
  - Temperature limitation
  - Choose between radiator, light floor heating and heavy floor heating PWM setting

- Danfoss Icon™ Dial
  - Noiseless switching
  - Can be build into many switch frames (in-wall only)
  - Up to 5x2W NC or NO actuators
  - PWM for accurate control
  - Temperature limitation
  - Choose between radiator, light floor heating and heavy floor heating PWM setting

Wired bus communication either as star configuration or daisy chain. Wired and wireless room thermostats can be mixed in the same system.

24V Room Thermostats
(in-wall or on-wall)
- Noiseless switching
- Can be build into compatible switch frames (in-wall only)
- Temperature limitation
- Optional floor sensor (088U1110)

Wireless Room Thermostats
(on-wall only)
- Noiseless switching
- Available with infrared floor sensor

Expand Module
With ten pre-defined applications that can handle global away input, cooling input, dew point sensor, automatic cooling change-over and supply temperature control.

App Module
To establish WiFi connection to the router which enables remote access via the Danfoss Icon™ App.

Radio Module
To establish wireless connection to wireless room thermostats.

Available with infrared floor sensor
# The Danfoss Icon™ family

## In-wall Room Thermostats

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial</td>
<td>230 V</td>
</tr>
<tr>
<td>Display</td>
<td>230 V</td>
</tr>
<tr>
<td>Display</td>
<td>24 V</td>
</tr>
<tr>
<td>Programmable</td>
<td>230 V</td>
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</table>

## On-wall Room Thermostats

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
</tr>
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<tbody>
<tr>
<td>Dial</td>
<td>230 V</td>
</tr>
<tr>
<td>Dial Wireless</td>
<td>230 V</td>
</tr>
<tr>
<td>Display</td>
<td>230 V</td>
</tr>
<tr>
<td>Display 24 V</td>
<td>24 V</td>
</tr>
<tr>
<td>Display Wireless</td>
<td>24 V</td>
</tr>
<tr>
<td>Display Wireless Infrared</td>
<td>230 V</td>
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</tbody>
</table>

## 230 V Master Controllers

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>10 channels Combine with Radio Module for wireless</td>
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<tr>
<td>15 channels Combine with Radio Module for wireless</td>
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</tbody>
</table>

## 24 V Master Controllers

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Basic</td>
</tr>
<tr>
<td>Featured</td>
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## Accessories only for 24 V Master Controllers

<table>
<thead>
<tr>
<th>Feature</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Expansion Module</td>
<td>088U1100</td>
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<tr>
<td>App Module</td>
<td>088U1101</td>
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<tr>
<td>Repeater</td>
<td>088U1102</td>
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<tr>
<td>Radio Module</td>
<td>088U1103</td>
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</table>

## Accessories

<table>
<thead>
<tr>
<th>Feature</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Sensor For 230 V programmable and 24 V display version</td>
<td>088U1110</td>
</tr>
<tr>
<td>Dew Point Sensor To prevent condensation in cooling application Mounted on manifold Powered by Expansion Module</td>
<td>088U0251</td>
</tr>
<tr>
<td>Surface Temperature Sensor, ESM-11 For automatic change over between cooling and heating and for controlling supply temperature</td>
<td>087B1165</td>
</tr>
<tr>
<td>Actuator For demand based supply temperature which requires high IP class Requires adapter 193B2148 for RA connection</td>
<td>193B2148</td>
</tr>
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</table>