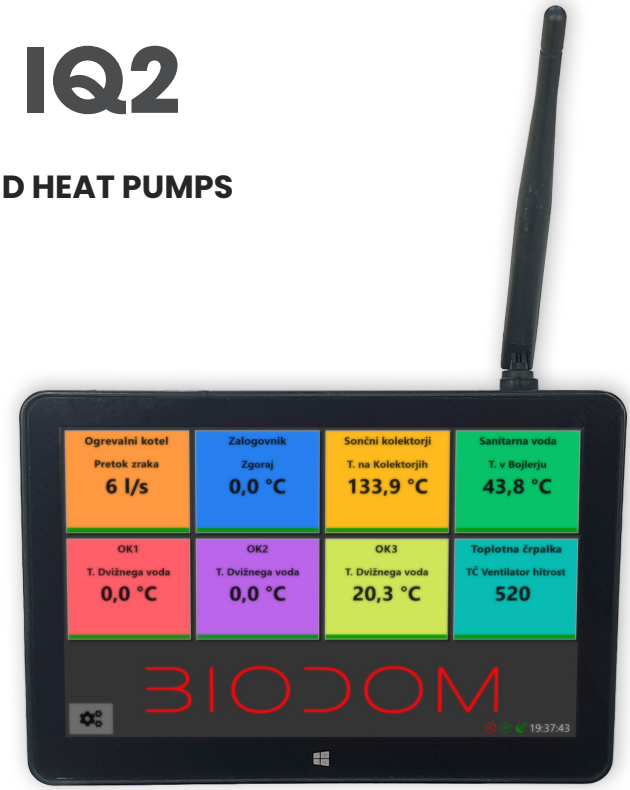
# BIODOM IQ2

## HEATING CONTROL
## FOR BIODOM BOILERS AND HEAT PUMPS

***Instructions for use and installation***

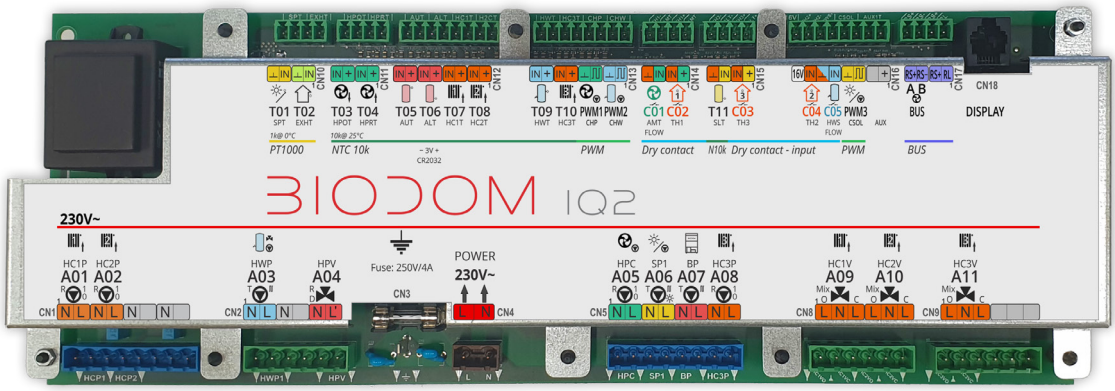



BIODOM IQ2 can control:

- BIODOM pellet boiler
- BIODOM heat pump
- Solar collectors
- Hot water buffer tank
- Domestic hot water tank
- 3 mixing heating circuits, underfloor or radiator heating
- Existing heating appliances can be connected to it

Uses:

- Weather compensation
- WiFi internet connection
- Touchscreen




**October 2021**

**EN**

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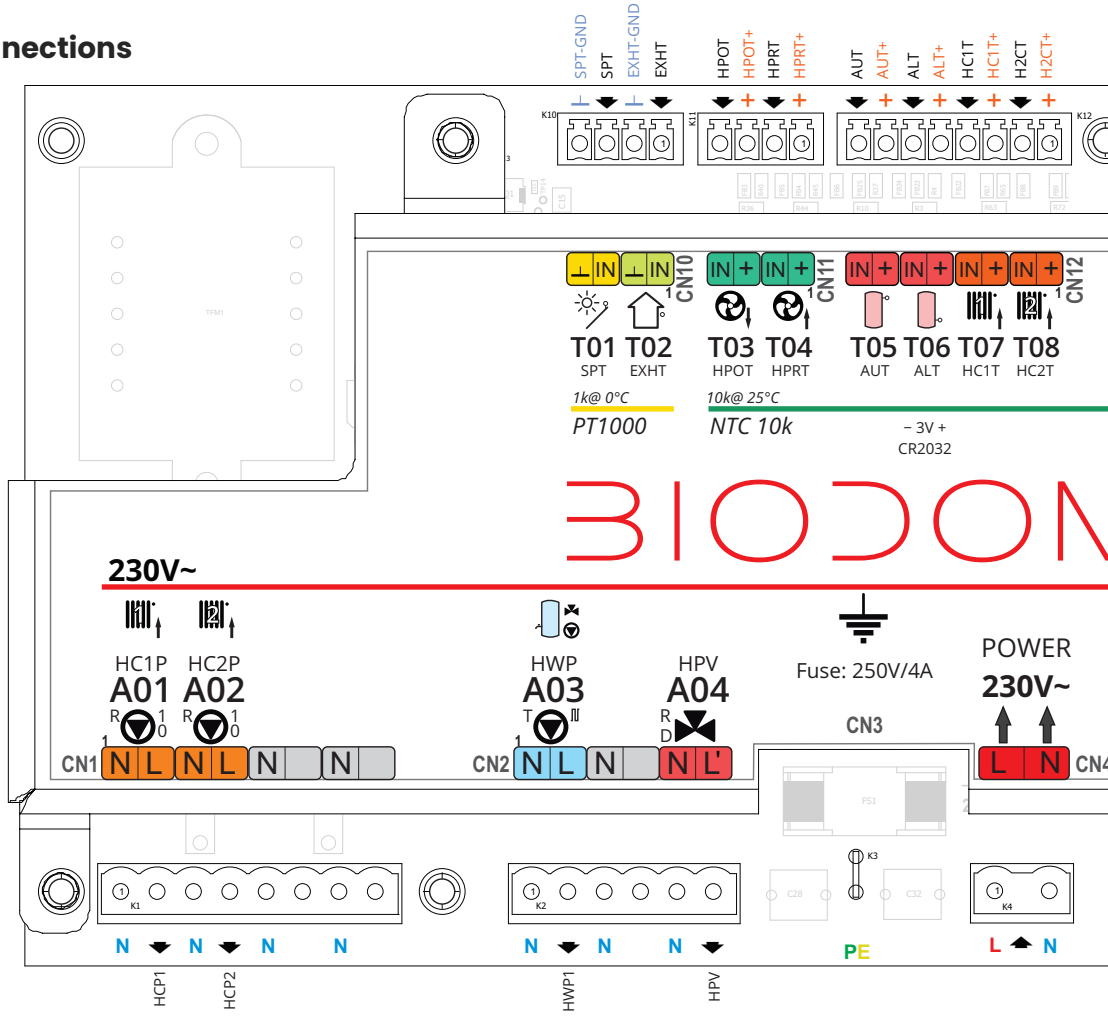
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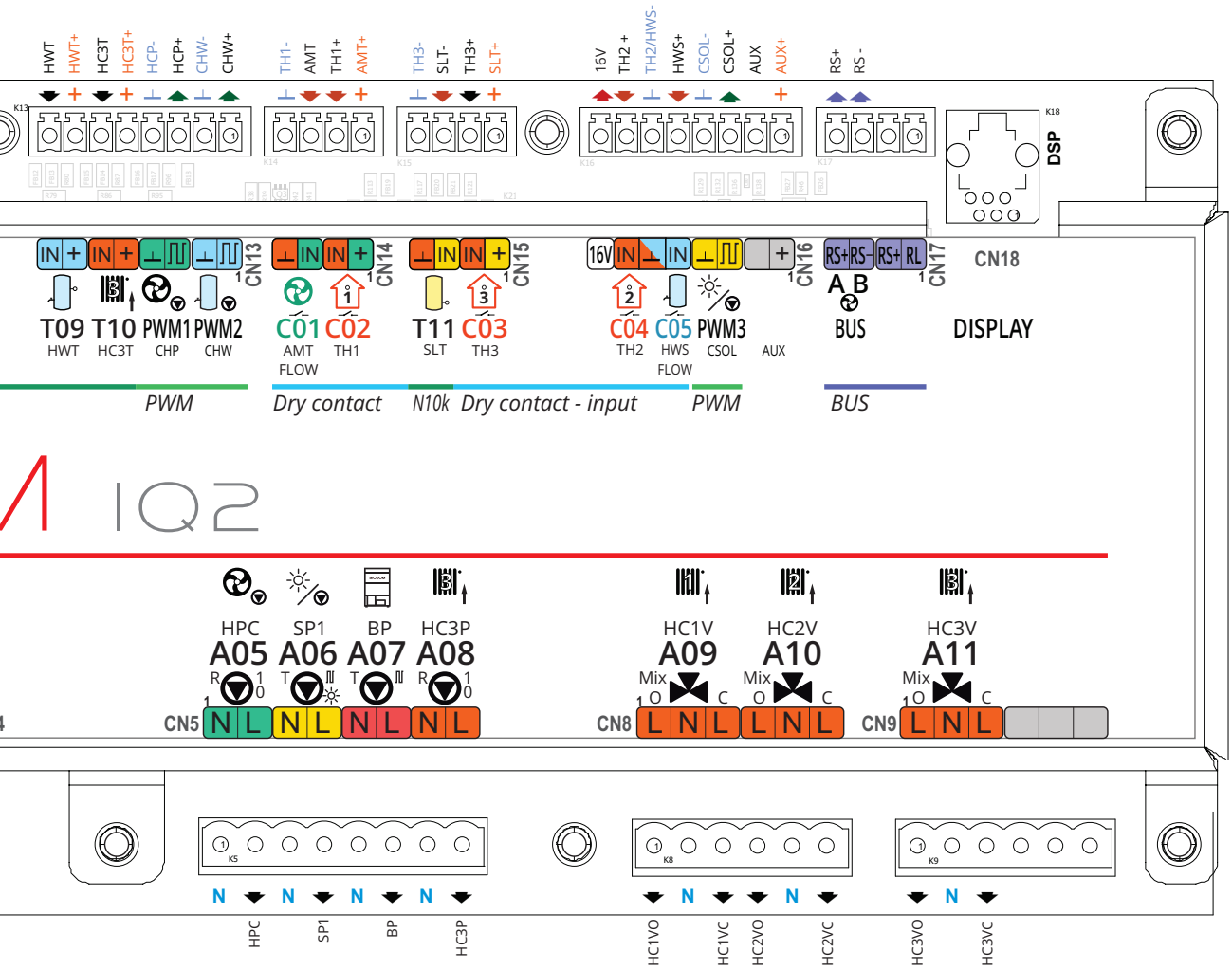
| Sensors, Thermostats, Switches, PWM | | | | |
|---|---|---|---|---|
| **T01** | SPT | GND | Temperature at the solar collectors | PT1000 |
| **T02** | EXHT | GND | Outdoor temperature | PT1000 |
| **T03** | HPOT | + | Heat pump - flow temperature | NTC 10k |
| **T04** | HPRT | + | Heat pump - return temperature | NTC 10k |
| **T05** | AUT | + | Buffer tank top temperature | NTC 10k |
| **T06** | ALT | + | Buffer tank bottom temperature | NTC 10k |
| **T07** | HC1T | + | Heating circuit 1 - flow temperature | NTC 10k |
| **T08** | HC2T | + | Heating circuit 2 - flow temperature | NTC 10k |
| **T09** | HWT | + | DHW tank temperature | NTC 10k |
| **T10** | HC3T | + | Heating circuit 3 - flow temperature | NTC 10k |

## IQ2 connections




| Power 220V - Actuators | | | |
|---|---|---|---|
| **A01** | HC1P | Heating circuit 1 - HC1 pump | Relay 1/0 |
| **A02** | HC2P | Heating circuit 2 - HC2 pump | Relay 1/0 |
| **A03** | HWP | DHW / DHW tank pump - also PWM2 control | Triac mod. |
| **A04** | HPV | Additional heat source - (el. heater) | Relay 1/0 |
| **A05** | HPC | Heat pump - circulation pump - also PWM1 control | Relay 1/0 |

| | | | | |
|---|---|---|---|---|
| **PWM1** | CHP | GND | Heat pump - circulation pump PWM control | PWM |
| **PWM2** | CHW | GND | DHW - circulation pump PWM control | PWM |
| **C01** | AMT | + | Heat pump - flow switch | Potential-free contacts |
| **C02** | TH1 | GND | HC1 room thermostat 1 | |
| **T11** | SLT | + | Buffer/DHW tank - solar temperature sensor | NTC 10k |
| **C03** | TH3 | GND | HC3 room thermostat 3 | Potential-free contacts |
| **C04** | TH2 | GND | HC2 room thermostat 2 | |
| **C05** | HWS | GND | DHW - flow switch for Alfa Laval | |
| **PWM3** | CSOL | GND | Solar module - circulation pump PWM control | PWM |
| **BUS** | A RS+ | B RS- | Heat pump BUS connection | RS+- |
| **DISPLAY** | DSP | | Display/tablet connection | |



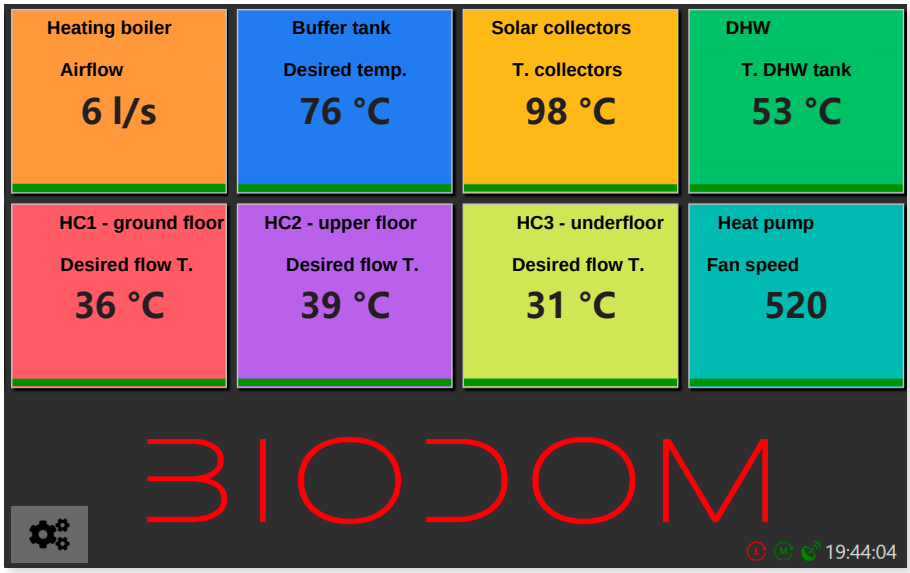

| | | | |
|---|---|---|---|
| **A06** | SP1 | Solar pump - RPM or PWM3 control | Triac mod. |
| **A07** | BP | Boiler pump | Triac mod. |
| **A08** | HC3P | Heating circuit 3 - HC3 pump | Relay 1/0 |
| **A09** | HC1V [O,N,C] | Heating circuit 1 mixing valve - HC1 Mix | Triac |
| **A10** | HC2V [O,N,C] | Heating circuit 2 mixing valve - HC2 Mix | Triac |
| **A11** | HC3V [O,N,C] | Heating circuit 3 mixing valve - HC3 Mix | Triac |

Please read these instructions in full before using the device. These instructions are intended for end users, installers and authorised service technicians of Biodom devices. If you have any doubts about the instructions for use or need any further clarification, please contact the manufacturer or an authorised person of Biodom 27 d.o.o. directly.

# 1. DESCRIPTION AND OPERATION OF THE IQ2 CONTROLLER

## 1.1. MAIN MENU:

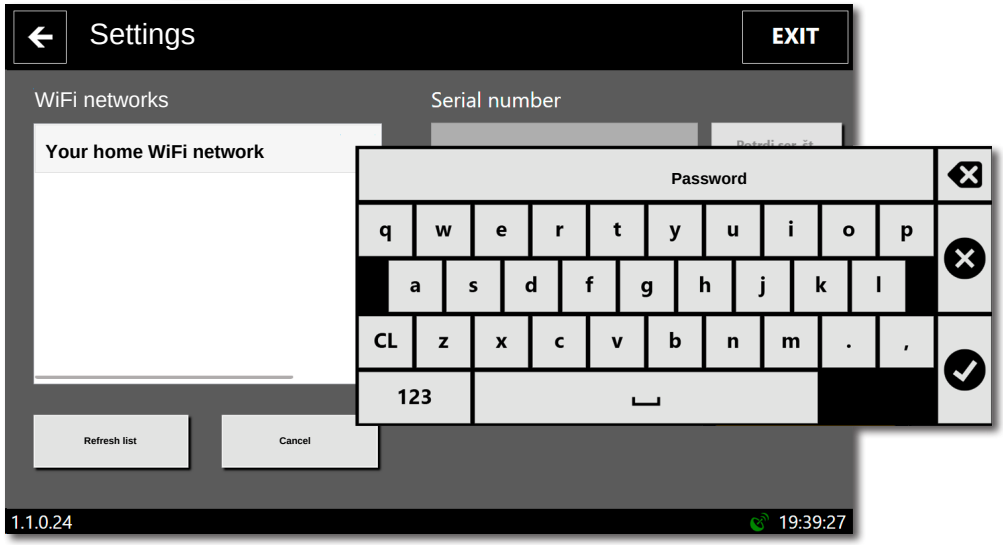
Displayed when the device is switched on. The screen shows basic information about the entire system.




## 1.2. INITIAL SETTINGS

Before using the device for the first time, you need to select a WiFi network:

1. Tap the  "Settings" icon in the bottom left corner.

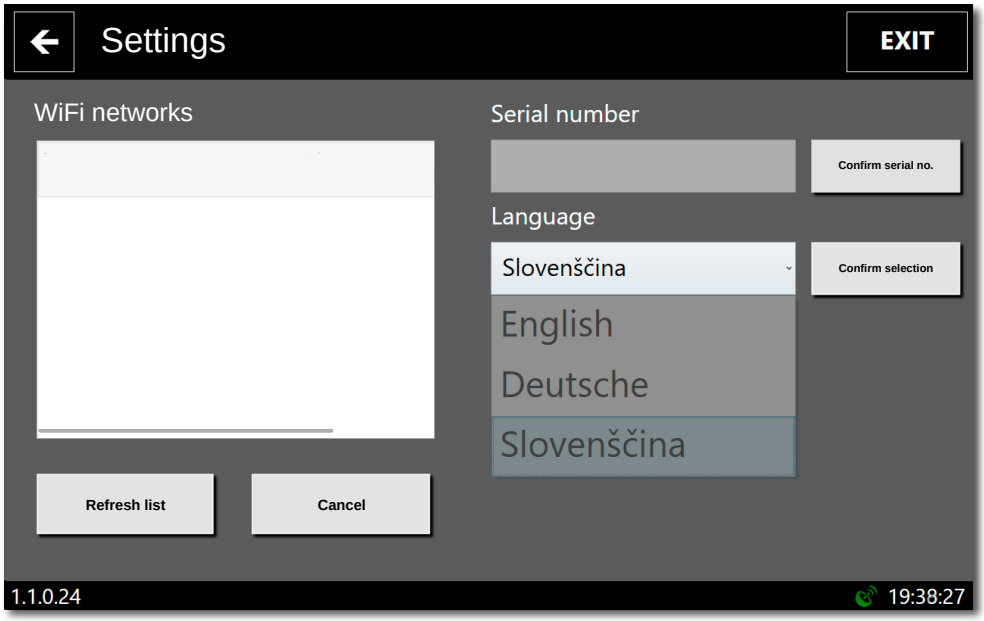



2. Tap **Refresh list**, select your WiFi network and press **Connect**.
3. Enter your network password and confirm with the  tick.

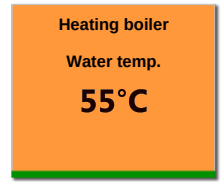
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In the general settings you can select the language - tap the field showing the currently selected language and a list of available languages opens. Select the language you want and press **Confirm selection** .

Once you confirm the language selection, the application restarts in the selected language.

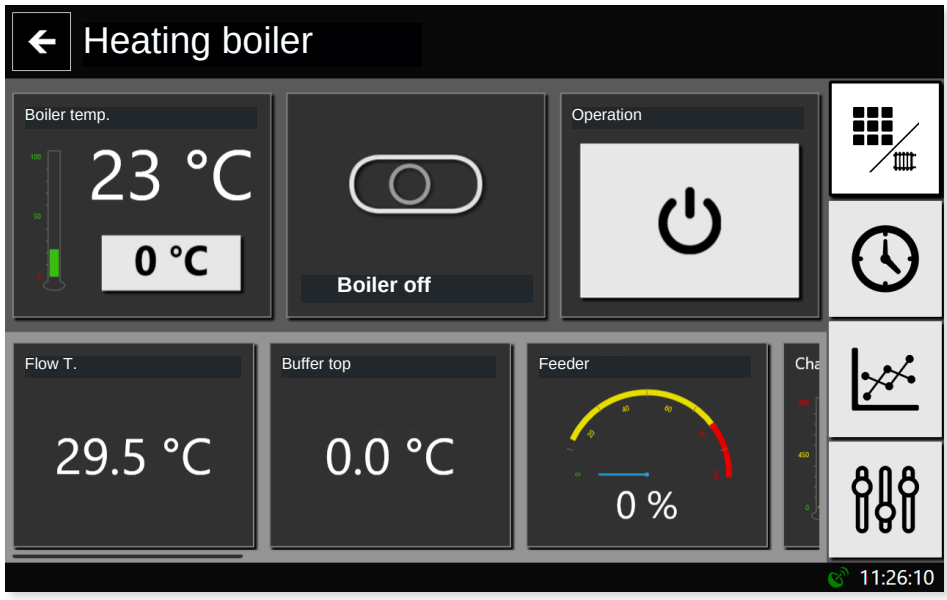



## 1.3. HEATING BOILER

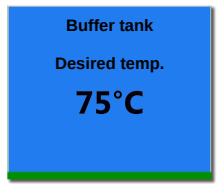



If you have a BIODOM pellet boiler connected to the IQ2, this tile is coloured orange.

For the boiler settings, see the instructions supplied with your BIODOM boiler.



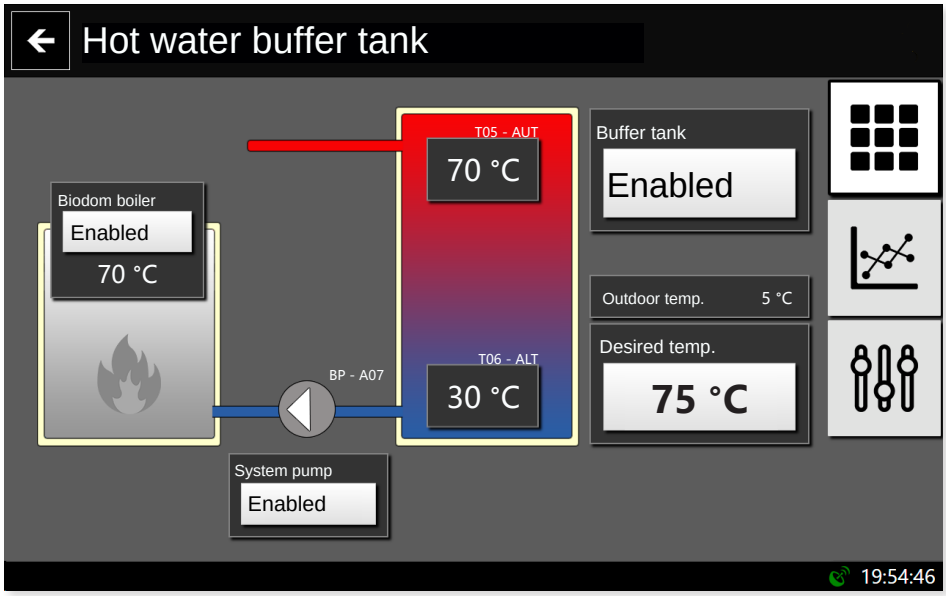
## 1.4. BUFFER TANK (HOT WATER STORAGE TANK)




If you have a buffer tank, you can set the temperatures here and the parameters that govern the buffer tank temperatures.

### Buffer tank screen

Shows the current temperatures in the boiler and at the top and bottom of the buffer tank, the outdoor temperature and the desired buffer tank temperature.




### Settings:

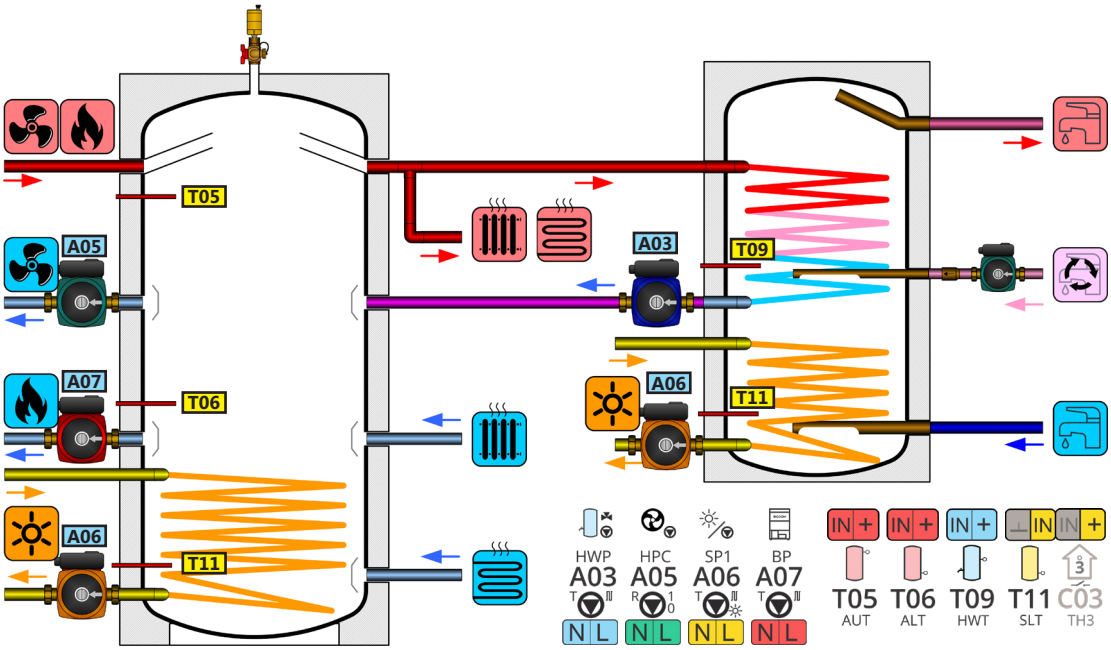
| | |
|---|---|
| Buffer tank | **Buffer tank control on/off** (enable / disable) **Enabled** - The control operates according to the top and bottom buffer tank temperatures and the set desired temperature. **Disabled** - Buffer tank heating is switched off. You can also switch the buffer tank off in summer when there is no need to heat water. |
| Biodom boiler | **BIODOM pellet boiler controlled by the buffer tank** (enable / disable) **Enable** - When there is demand, the controller switches on the pellet boiler. The system pump (next setting) must also be enabled. **Disable** - When you want to disable control of the Biodom pellet boiler, or if you have no Biodom boiler or buffer tank. |
| System pump | **System pump BP - A07** (enable / disable) In addition to the system pump, this output can be used to control external/existing heating appliances via a relay (gas boiler, oil boiler, electric heater, ...) |
| Desired temp. | **Desired buffer tank temperature** (65 - 80°C) Set the temperature the buffer tank is to maintain. |

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## PARAMETERS – Buffer tank

| | |
|---|---|
| BoilerStopDiff | **Boiler switch-off differential** (2-15°C)<br>When the temperature at sensor **ALT** (buffer tank bottom) rises to [set desired temperature] - [this parameter], the system switches off the boiler/additional source.<br>*example: for 6°C, desired T = 75°C:*<br>*75°C - 6°C - the boiler switches off when ALT reaches 69°C* |
| BoilerStartDiff | **Boiler switch-on differential** (2-15°C)<br>When the temperature at sensor **AUT** (buffer tank top) drops below [set desired temperature] - [this parameter], the system switches on the boiler/additional source.<br>*example: for 10°C, desired T = 75°C:*<br>*75°C - 10°C - the boiler switches on when AUT drops below 65°C* |
| SupportBoilerIsOn | **Shows whether the boiler is on** (0-1)<br>0 - off, 1 - on. |

Example of connection and sensor placement when the solar module is used on the buffer tank or DHW tank.



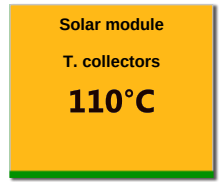

Icon legend

| | | | | | |
|---|---|---|---|---|---|
| boiler | radiator | underfloor | heat pump | DHW | |
| flow/return | | | | hot/cold circulation **T05** AUT | |

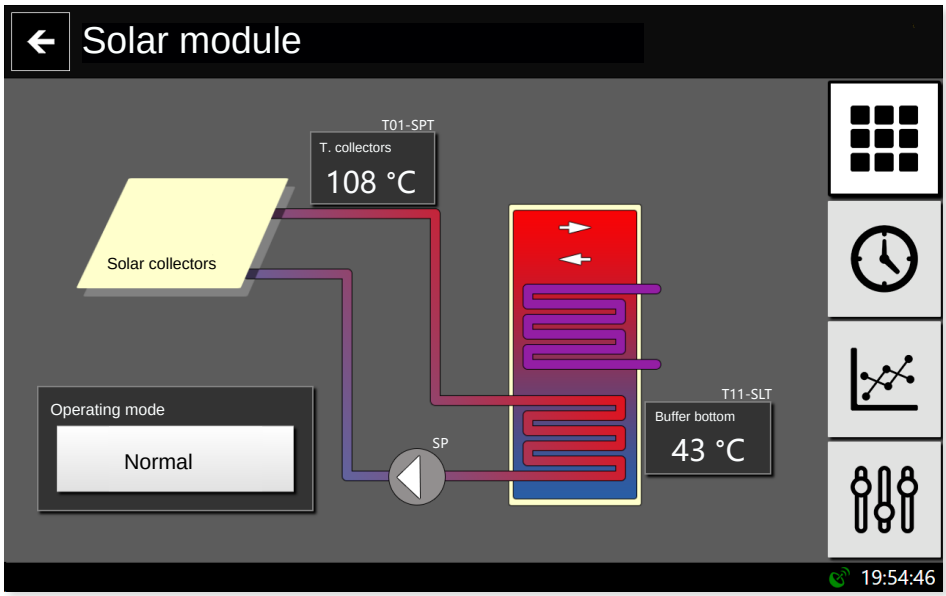
solar module - solar collector connection
optional connection to the buffer tank or DHW tank

**A03** HWP - DHW heating pump **A05** HPC - heat pump circulation pump **A06** SP1 - solar pump
**A07** BP - boiler pump
**T05** AUT - buffer tank top temp.
**T06** ALT - buffer tank bottom temp.
**T09** HWT - DHW temp.
**T11** SLT - temp. at solar coil level
connection to SLT- and SLT+

## 1.5. SOLAR MODULE




The screen shows the current temperatures at the collectors and in the lower part
of the buffer/DHW tank heated by the sun via the coil,
as well as solar pump operation and the current operating mode.




Operating mode:

**Off** - The solar module is switched off

**On** - The solar module operates according to the set parameters

**Night cooling** - Same as **On** ; if the temperature in the buffer/DHW tank exceeds the set desired temperature, the tank is cooled at night through the collectors *(suitable for very hot summer days when not enough domestic hot water is used).*

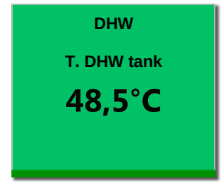
### PARAMETERS – Solar module



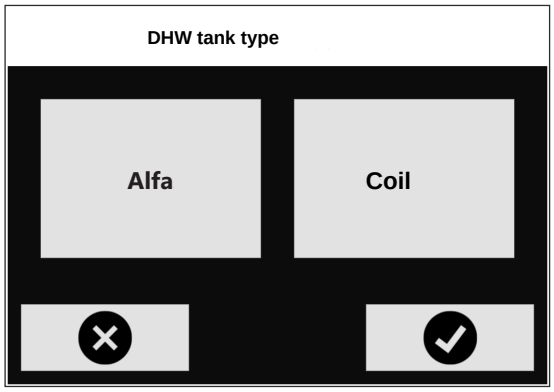
| | |
|---|---|
| SolarPumpOffTresh | **Solar switch-off differential** (2-20°C)<br>While the system is running, the solar pump switches off when the collector temperature drops below the buffer/DHW tank bottom temperature + this parameter. |
| SolarBufferMaxTemp | **Maximum buffer/DHW tank temperature** (80-90°C)<br>If it is exceeded, the solar pump switches off<br>*(to prevent the water in the buffer/DHW tank from boiling).* |
| DesiredSolarDifference | **Solar switch-on differential** (5-25°C)<br>The solar pump switches on when the collector temperature exceeds the buffer/DHW tank bottom temperature + this parameter. |
| MaxSolarPanelsTemp | **Maximum solar collector temperature** (100-130°C)<br>Temperature at which the solar pump stops.<br>*(if the pump ran while the antifreeze temperature in the collectors is above 130°C, it could destroy the solar pump - plastic parts melt).*<br>The temperature in the solar collectors can rise above 150°C, but if the solar expansion vessel is correctly sized, this causes no problems for the system. |

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## 1.6. DOMESTIC HOT WATER – DHW TANK

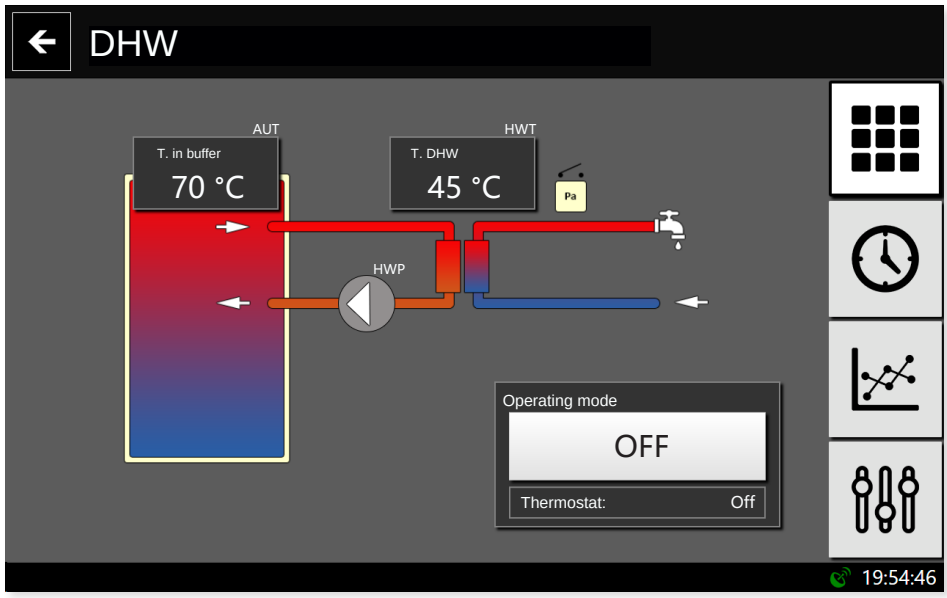



When you select the DHW button for the first time, the system asks which type of DHW tank you have. There are two options:



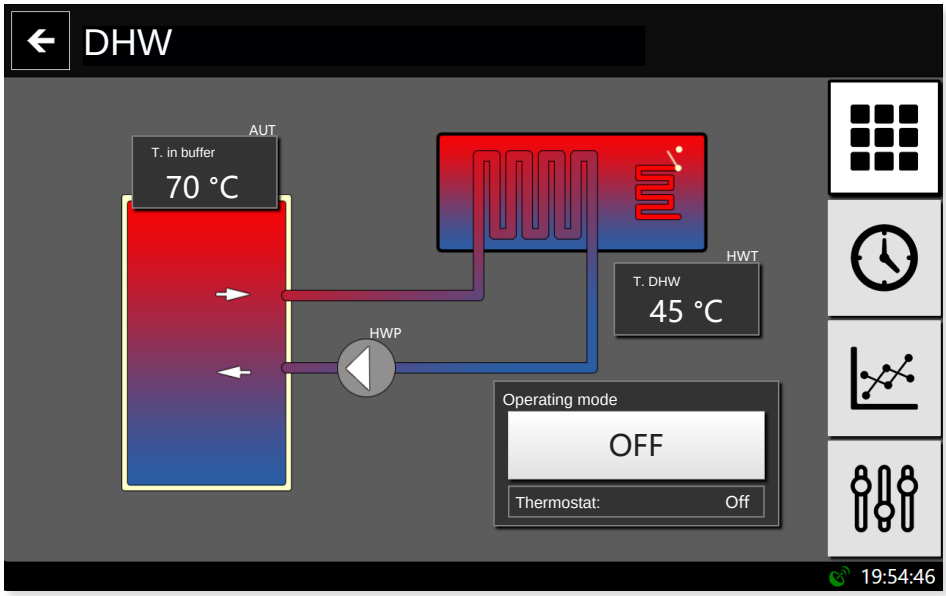

**Alfa** - Intended for a special module. A more detailed description is given in the instructions for that module.

The Alfa module screen shows the temperature at the top of the buffer tank, the DHW outlet temperature, the position of the DHW flow switch, pump operation and the current operating mode.



**Coil** - For DHW tanks with a coil; also used for tanks connected to the buffer tank, such as a tank-in-tank, a DHW heating coil or an instantaneous water heater with a plate heat exchanger (see diagrams).

The screen shows the temperature at the top of the buffer tank, the DHW temperature in the tank, pump operation and the current operating mode.




## Operating mode:

**Off** - DHW heating is switched off

**Normal** - Heats the DHW (HPW pump runs) if the buffer tank temperature AUT or the heat pump water temperature HPOT is at least 2°C higher than in the DHW tank and the desired DHW tank temperature has not yet been reached.

**Time program** - while the time program is on, it works as in “Normal”; otherwise DHW heating is switched off.

**Summer mode** - if you have a BIOBLOCK heat pump, the system switches on the heat pump when required, which then heats the DHW up to the set desired temperature

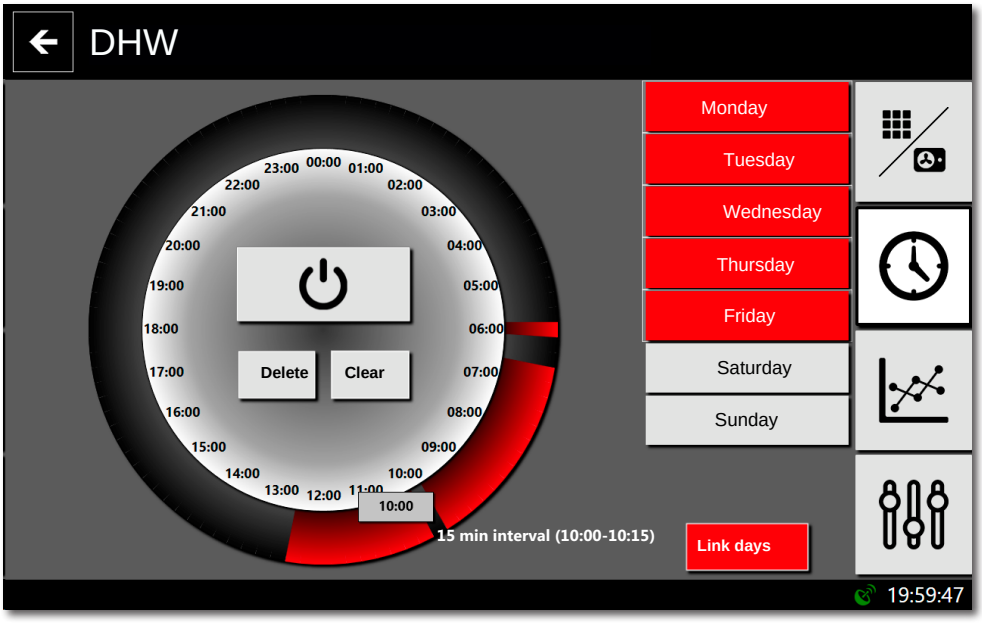
## PARAMETERS – DHW

| | |
|---|---|
| DesiredDHWtemp | **Desired DHW temperature** (40-60°C)<br>DHW temperature maintained by the system. |
| DHWhysteresis | **DHW heating switch-on differential** (2-15°C)<br>When the DHW temperature drops below the desired temperature - this parameter, the system starts reheating the DHW. |

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## TIME PROGRAM – DHW

Set (red) the times when the system is to heat the DHW to the desired temperature.




Time program screen.

Tap/drag your finger around the circle to set/delete the 15-minute intervals in which the DHW is to be heated

**Monday** - select the day for which you want to set the program.

**Set** - when this button is selected, you set time intervals - they turn red

**Delete** - when this button is selected, you delete time intervals - they turn black

**Clear** - Clears / deletes the entire circle.

**Link days**

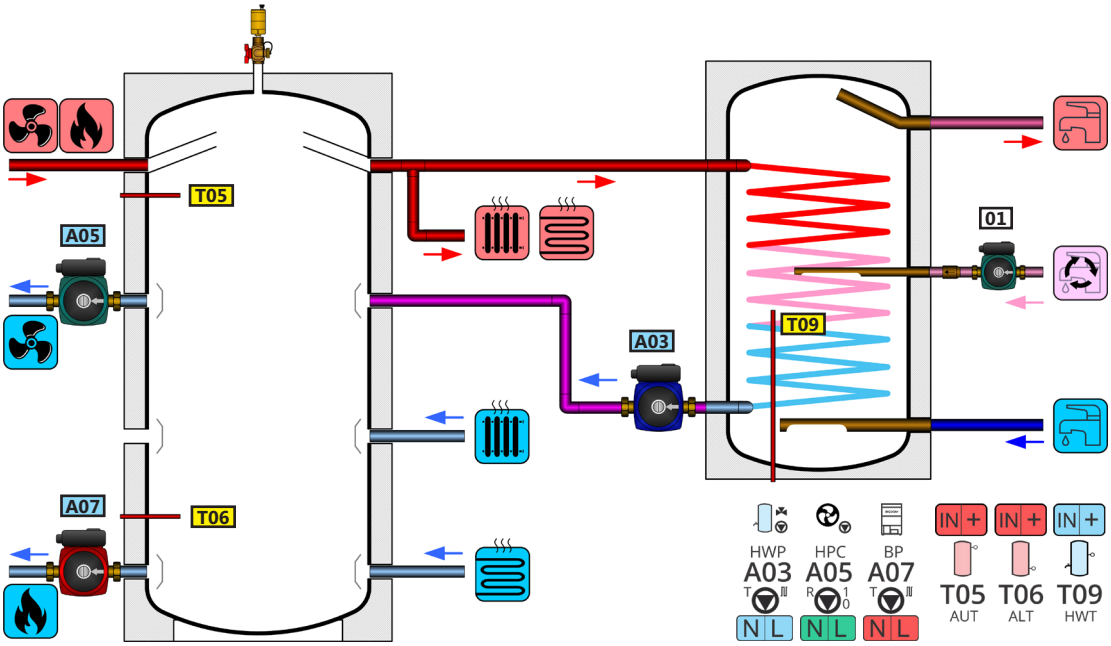
- If active, **Link days** you set the program for all marked (red) days.

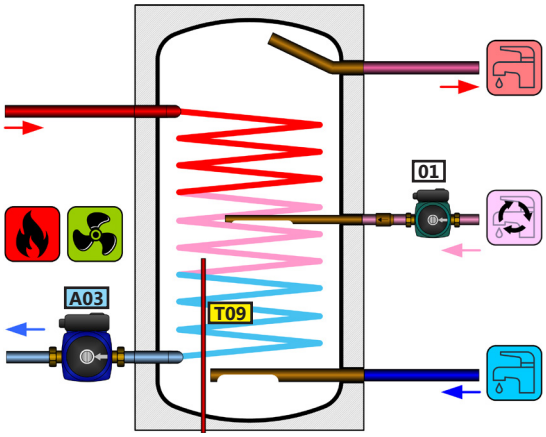
Enable / disable operation according to the time program

If the time program is active, the following appears at the top right of the screen

## Wiring diagrams for different DHW tanks

DHW tank with coil connected to the buffer tank or directly to a heating appliance (pellet boiler or heat pump).




01 recirculation pump (slow)
non-return valve

Icon legend

| | | | | | |
|---|---|---|---|---|---|
| boiler | radiator | underfloor | heat pump | DHW | |
| flow/return | | | | hot/cold circulation | |

**A03** HWP - DHW heating pump **A05** HPC - heat pump circulation pump **A07** BP - boiler pump

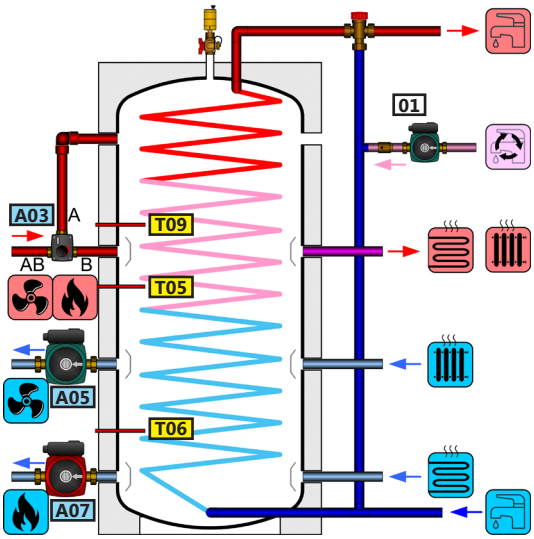
**T05** AUT - buffer tank top temp.

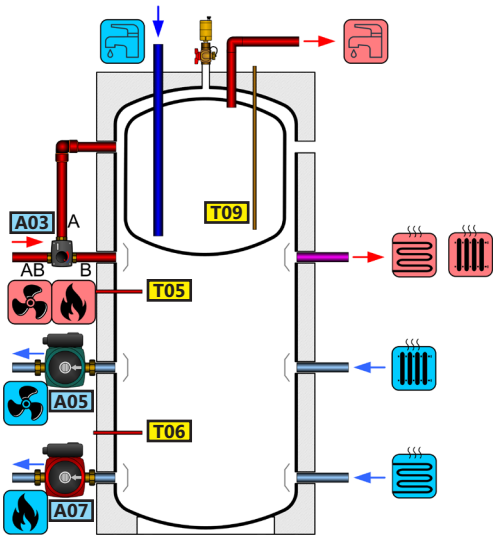
**T06** ALT - buffer tank bottom temp.

**T09** HWT - DHW temp.

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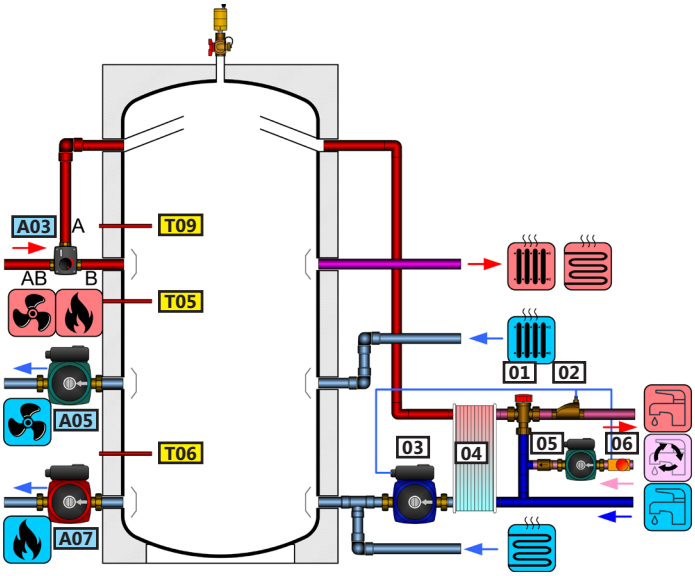
Examples of other types of DHW tanks / water heaters that can be connected.
The upper third of the buffer tank is reserved for DHW heating.
Coil for instantaneous DHW heating, and tank-in-tank in the buffer tank.

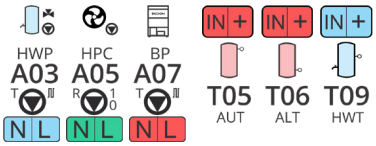



01 recirculation pump (slow)
non-return valve

Instantaneous DHW heater with plate heat exchanger.




01 DHW thermostatic valve DHW flow
02 switch Pump (boiler water)
03
04 Plate heat exchanger
05 Recirculation pump **(fast)** + non-return valve
06 Pipe thermostat - (switches off the recirculation pump at the set water temperature in the recirculation return)

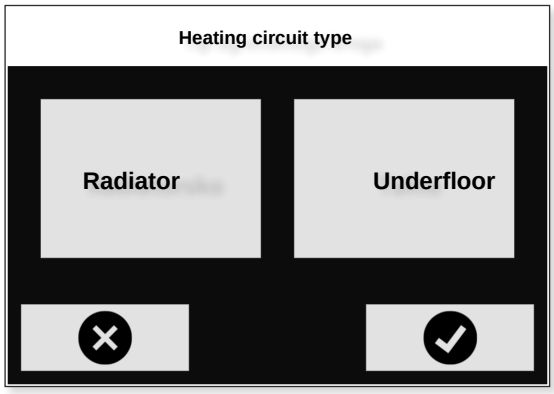
Icon legend

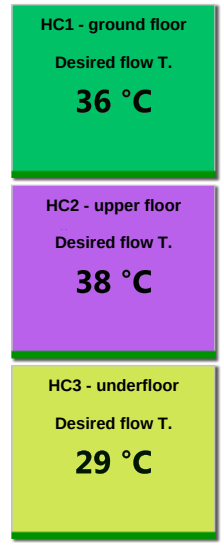
| | | | | | |
|---|---|---|---|---|---|
| boiler | radiator | underfloor | heat pump | DHW | |
| flow/return | | | | hot/cold circulation | |

A03 HWP - DHW heating pump **A05** HPC - heat pump circulation pump **A07** BP - boiler pump
T05 AUT - buffer tank top temp.
T06 ALT - buffer tank bottom temp.
T09 HWT - DHW temp.

## 1.7. HEATING CIRCUITS – HC1, HC2, HC3

When you select Heating circuit 1, 2 or 3 for the first time, a window appears in which you select
the heating circuit type.




You can choose between two heating circuit types:

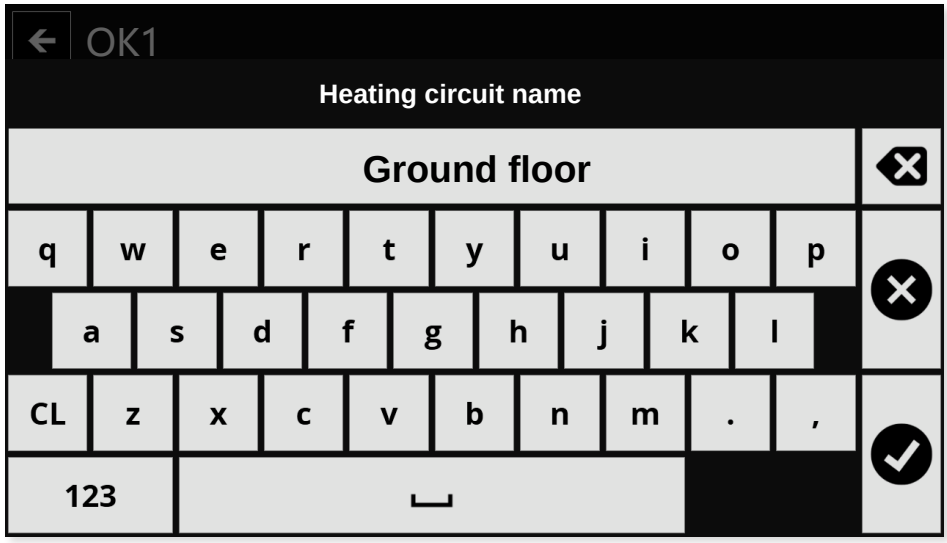
**Radiator** - Radiators and convectors.

Convectors are also suitable for cooling in summer if a **condensate drain** is installed.

**Underfloor** - Underfloor heating, also wall and ceiling heating.

Select the desired heating type and confirm with .

A new screen with a keyboard opens, where you enter the desired heating circuit name (example: Ground floor UFH, Upper floor radiators, ...).

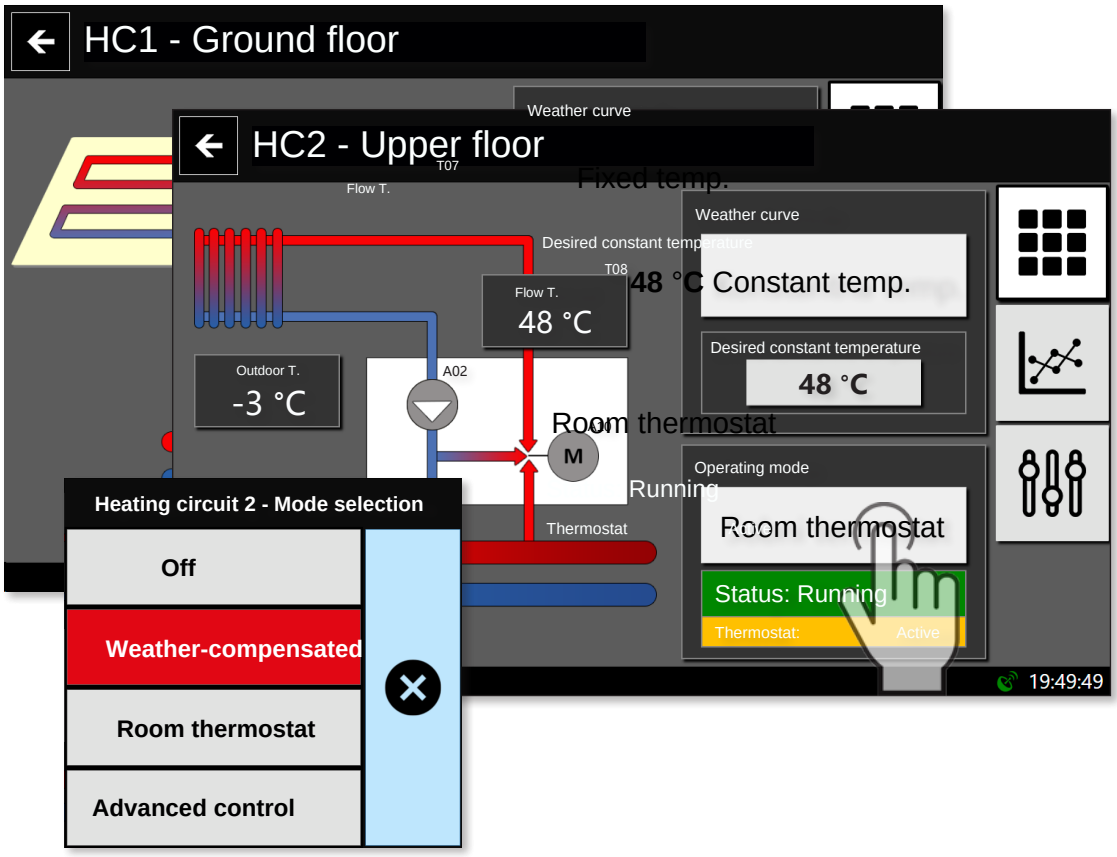



You can change the name at any time by tapping the current name at the top left of the heating circuit screen.

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## Heating circuit settings

By tapping the operating mode, you can choose between three operating modes of the heating circuit.

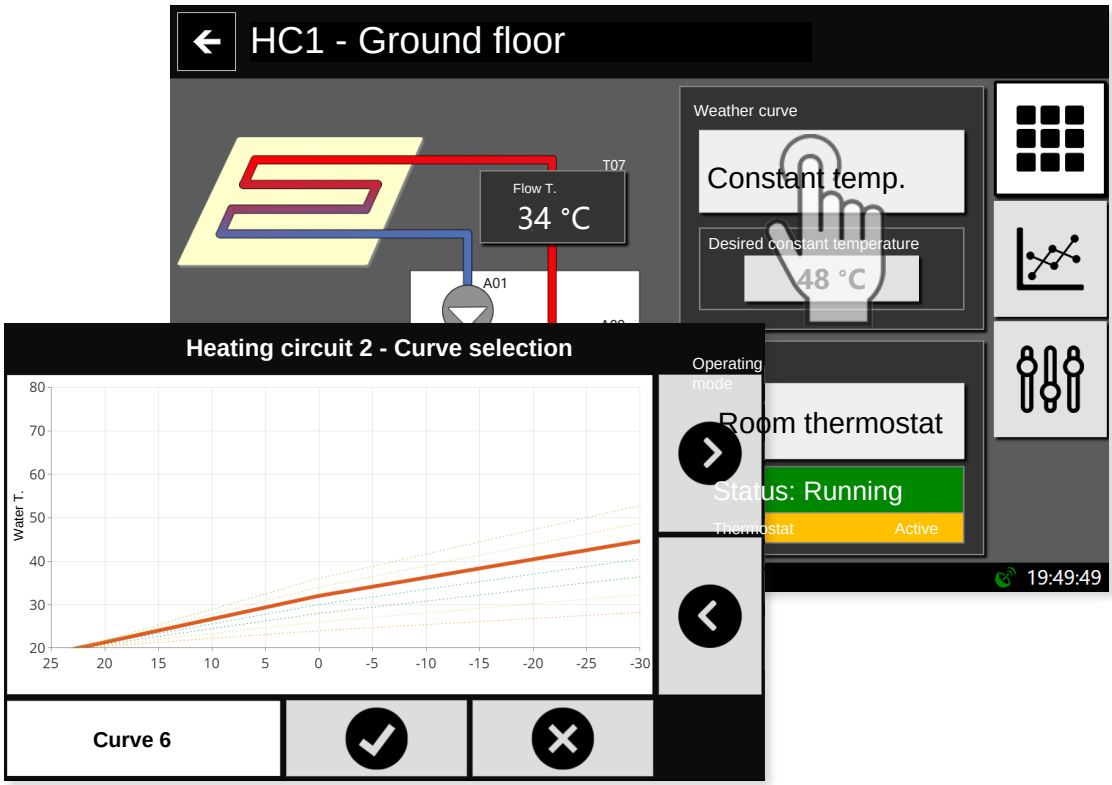



## Operating modes - Heating circuits

| | |
|---|---|
| **Off** | **Heating is switched off** *(summer)* |
| **Weather-compensated** | **Heating control depending on the outdoor temperature** |
| Mixing heating circuits | The system determines the temperature of the water supplied to the heating circuit based on the current outdoor temperature and the selected heating curve, which is chosen according to the heating type and the thermal insulation of the building. |
| **Room thermostat** | **Heating is controlled by a room thermostat or an external device** |
| Mixing and direct heating circuits | The room thermostat switches the heating on or off according to the set temperature and the time program on the thermostat. The water temperature is determined as in Weather-compensated mode. BIODOM offers two room thermostats: PATRO - remote thermostat and ROKO - WiFi thermostat, which can be controlled via an app |
| **Advanced control** | Advanced thermostat linked to the controller - under development. |
| Mixing heating circuits | Upgrade option. |

## Weather-compensated heating - Heating curve selection

Tapping **Curve X** or **Constant temp.** opens the heating curve selection window




Set the curve slope with the arrows you go below curve 1 or above curve 29  constant temperature appears if

The slope of the heating curve determines the temperature of the water supplied to the heating circuit depending on the outdoor air temperature.

The choice depends on the building being heated and the type of heating (underfloor, radiator).

- For underfloor heating, a slope of 2-8 is generally selected.
- For radiator heating, 9-29.

The slope also depends on the insulation, size, location/climate and heat losses of the building - poorer insulation = higher heat losses = steeper curve.

The slope is correct if the room temperature remains constant even with large fluctuations in outdoor temperature. Adjust/correct the slope at temperatures below 5 °C.

If the room is too cold at low outdoor temperatures, increase the slope.

If the room is too warm at low outdoor temperatures, reduce the slope.

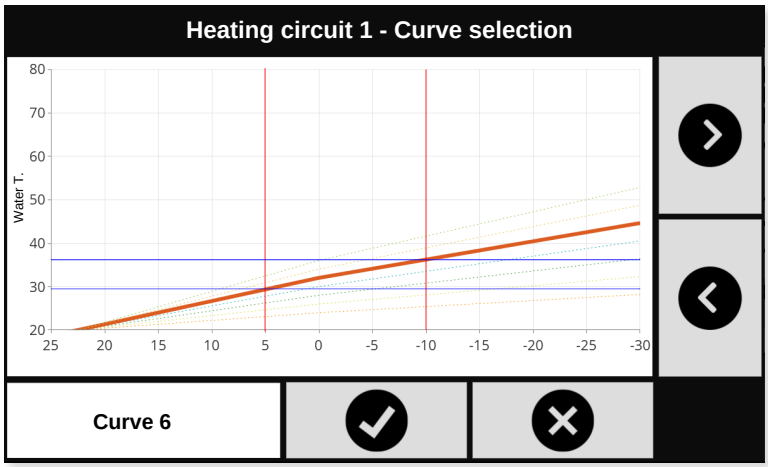
Adjust the curve slope by no more than 1 to 2 steps at a time. Observe the effect for at least 24 hours, preferably longer, before the next correction.

**Constant temperature:** select this when you want a constant water temperature in the system, independent of external influences.

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# Examples of heating curves

## Underfloor heating (2-8)

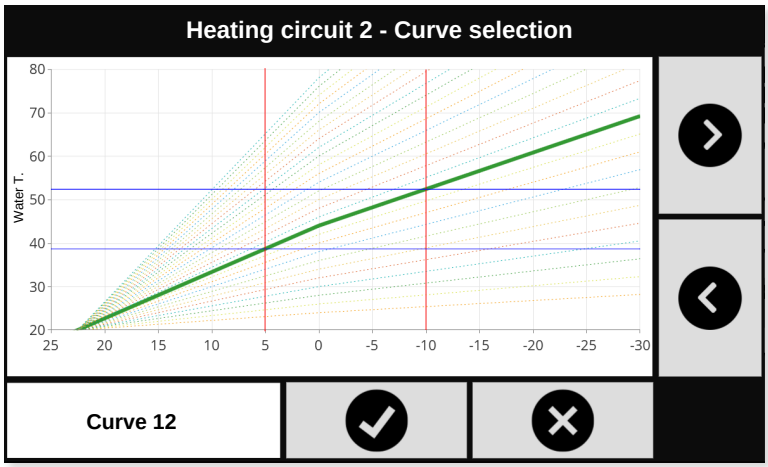



Example for underfloor heating:
**Curve 6**

At 5°C outside
the temperature of the water supplied to the underfloor heating is 29°C

At -10°C outside
the temperature of the water supplied to the underfloor heating is 36°C

## Radiator heating (7-29)

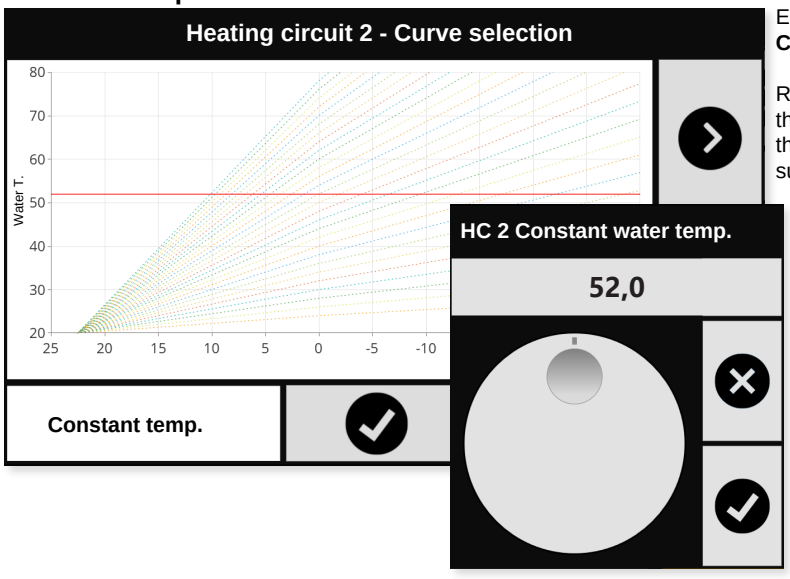



Example for radiator heating:
**Curve 12**

At 5°C outside
the temperature of the water supplied to the radiators is 39°C

At -10°C outside
the temperature of the water supplied to the radiators is 53°C

## Constant temperature




Example of a fixed temperature:
**Constant temp. 52**°C

Regardless of
the outdoor temperature,
the temperature of the water supplied to the system is 52°C

When “Constant temp.” is selected,

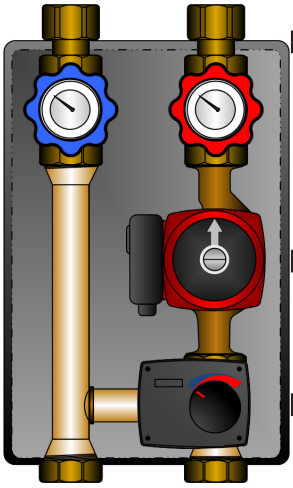
tapping the temperature opens an additional window where you can set it by turning the wheel.

## PARAMETERS - Heating circuits

| | |
|---|---|
| Heating curve | **Heating curve slope** (0-29)<br>0 - constant temperature, 1-29 - heating curve slopes. |
| Desired room temp. | **Desired room temperature** (17-25°C) |
| Constant temp | **Constant water temperature setting** (20-80°C) |

## Heating circuit connection

### Mixing heating circuit



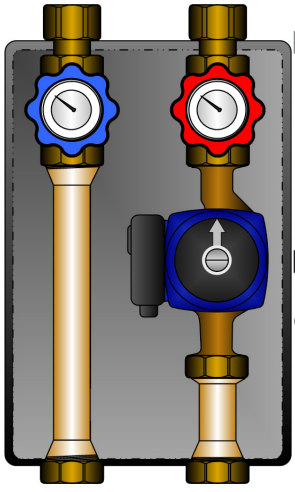
OK1 OK2 OK3

T07 T08 T10
Flow temp. sensor

A01 A02 A08
Heating circuit circulation pump

A09 A10 A11
Heating circuit mixing valve

### Direct heating circuit



OK1 OK2 OK3

T07 T08 T10
sensor option:
only for displaying the temperature on the screen

A01 A02 A08
Heating circuit circulation pump

| | OK1 | OK2 | Ok3 |
|---|---|---|---|
| Pump | HC1P A01 R 1 0 N L | HC2P A02 R 1 0 N L | HC3P A08 R 1 0 N L |
| Mixing valve | HC1V A09 Mix O C L N L | HC2V A10 Mix O C L N L | HC3V A11 Mix O C L N L |
| Flow temp. sensor | IN + T07 HC1T | IN + T08 HC2T | IN + T10 HC3T |
| Room thermostat | ⊥ IN IN + C01 C02 AMT FLOW TH1 | IN ⊥ IN C04 C05 TH2 HWS FLOW | ⊥ IN IN + T11 C03 SLT TH3 |

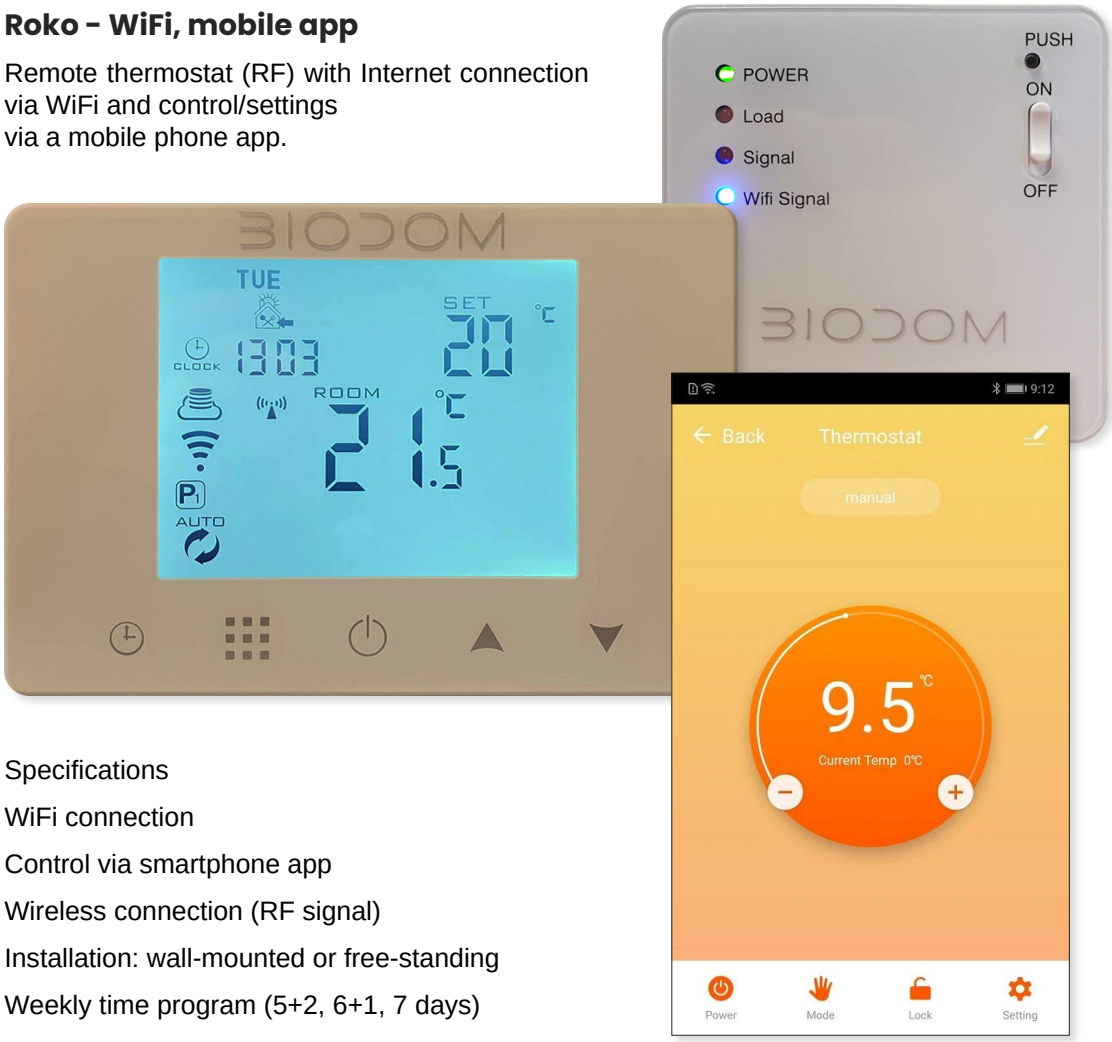
| Operating mode | Mixing circuit | Direct circuit |
|---|---|---|
| Weather compensation | ☑ | ☒ |
| Constant temperature | ☑ | ☒ |
| Room thermostat | ☑ | ☑ |
| Advanced control | ☑ | ☒ |

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## 1.8. ROOM THERMOSTATS

### Roko - WiFi, mobile app

Remote thermostat (RF) with Internet connection via WiFi and control/settings via a mobile phone app.




Specifications

WiFi connection

Control via smartphone app

Wireless connection (RF signal)

Installation: wall-mounted or free-standing

Weekly time program (5+2, 6+1, 7 days)

LCD display

Background colour: blue, white

Frequency: 433MHz/470MHz

Power supply: 2 AA* 1.5V alkaline batteries or USB power

Temperature setting: 5~35°C

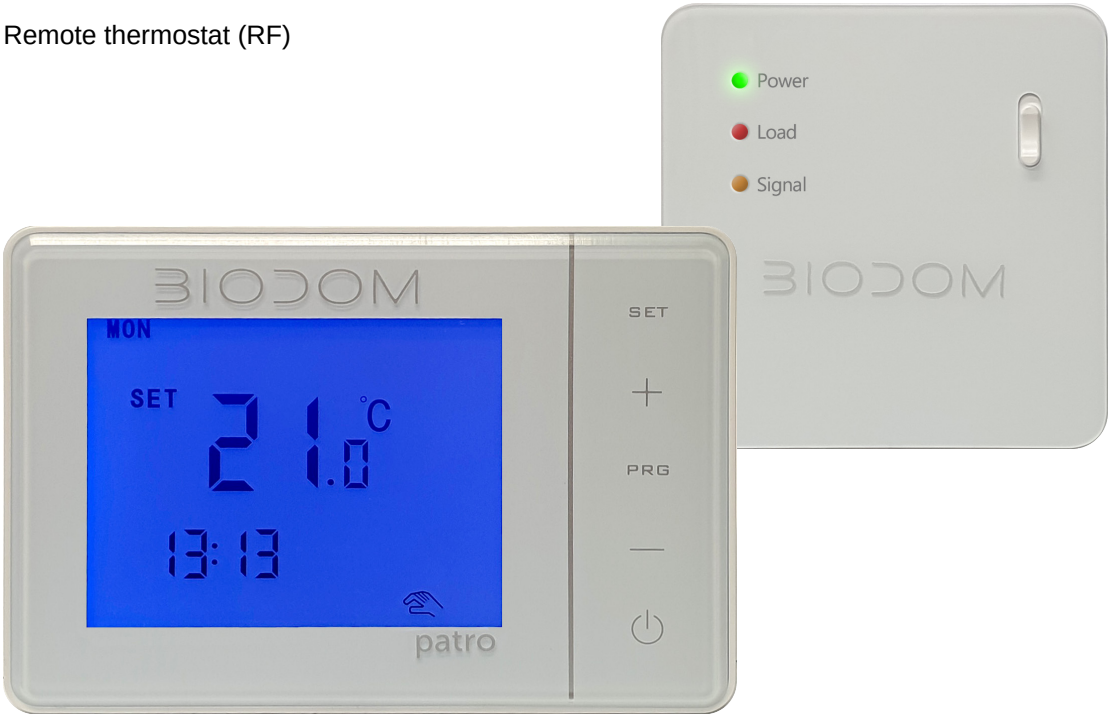
Size (mm): 130 x 90 x 27

Accuracy: ±0.5°C

Output: relay, potential-free contact (switching 5A/220V)

## Patro - remote thermostat

Remote thermostat (RF)




Specifications

Wireless connection (RF signal)

Installation: wall-mounted or free-standing

Weekly time program (5+2, 6+1, 7 days)

LCD display

Background colour: blue, white

Frequency: 433MHz/470MHz

Power supply: 2 AA* 1.5V alkaline batteries

Temperature setting: 5~35°C

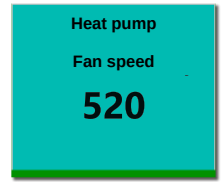
Size (mm): 130 x 90 x 27

Accuracy: ±0.5°C

Output: relay, potential-free contact (switching 5A/220V)

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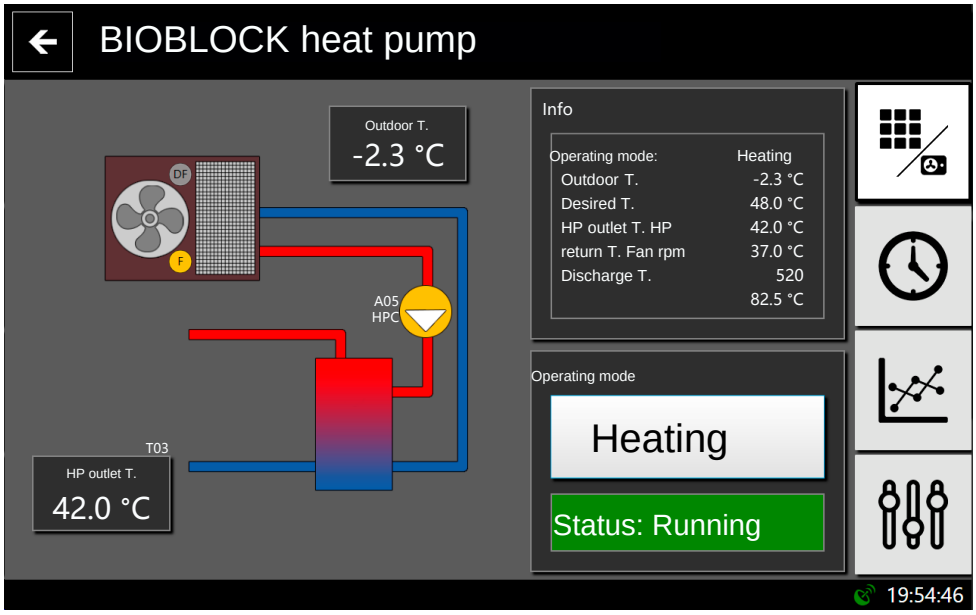
## 1.9. HEAT PUMP

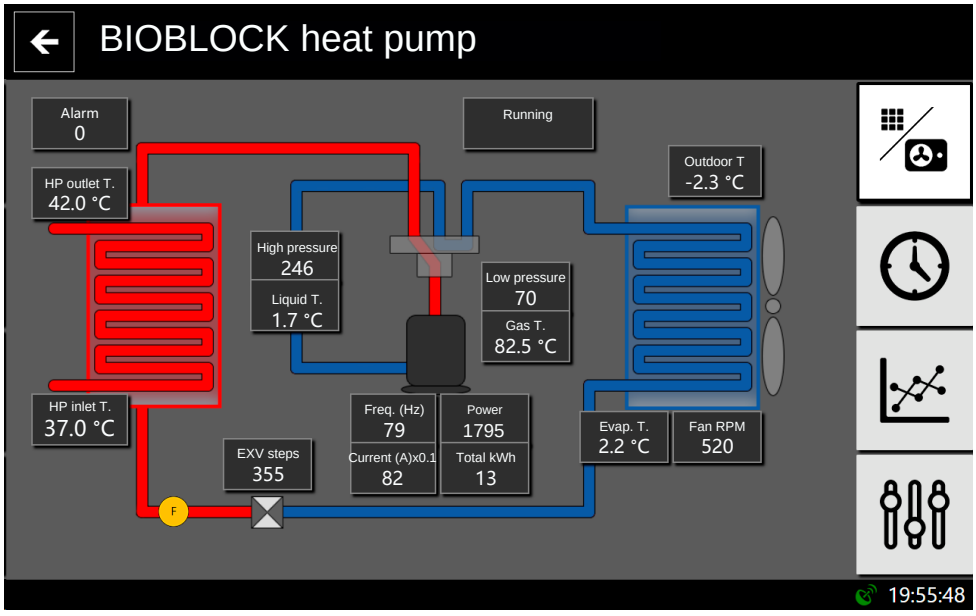



If you have a BIOBLOCK heat pump connected to the IQ2, you can control it here.
In this case you do not need an outdoor sensor either, because the BIOBLOCK heat
pump already sends the outdoor temperature to the IQ2.

The BIOBLOCK module screen shows the outdoor temperature, the inlet and outlet water temperatures, various temperatures, pressures, consumption, ... in the heat pump, and lets you control the operating mode (Off, Cooling, Heating)

For the heat pump settings, see the instructions supplied with the BIOBLOCK heat pump.



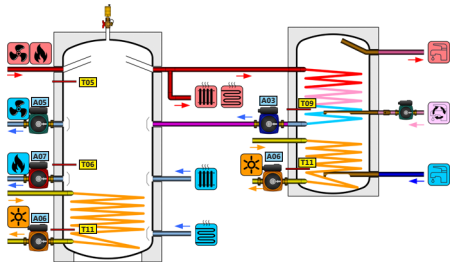



## 1.10. BASIC WIRING DIAGRAMS

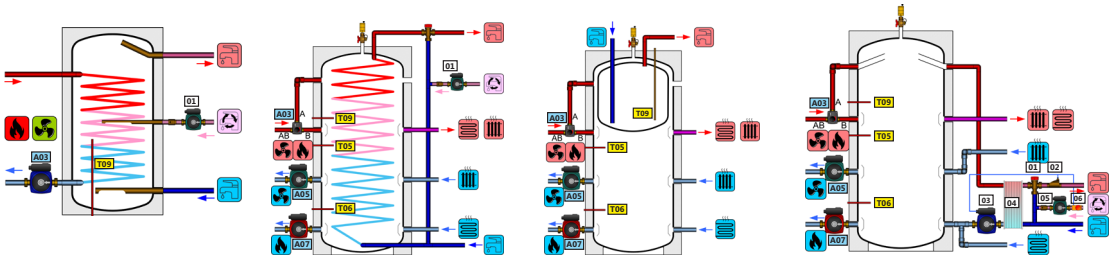
Electrical wiring diagram and description of terminals (page 4)

More detailed connection options and parameter settings are described for the individual modules:

- **Buffer tank** (page 9), different types of buffer tanks, connections to heating, DHW and solar collectors.
- **Solar module** (page 11), connection to the buffer tank or DHW tank.




- **DHW tank** (page 12), with coil, instantaneous coil heating, tank-in-tank, instantaneous with plate heat exchanger, and connection of DHW recirculation.




- **Heating circuits** (page 17), mixing and direct, room thermostats.



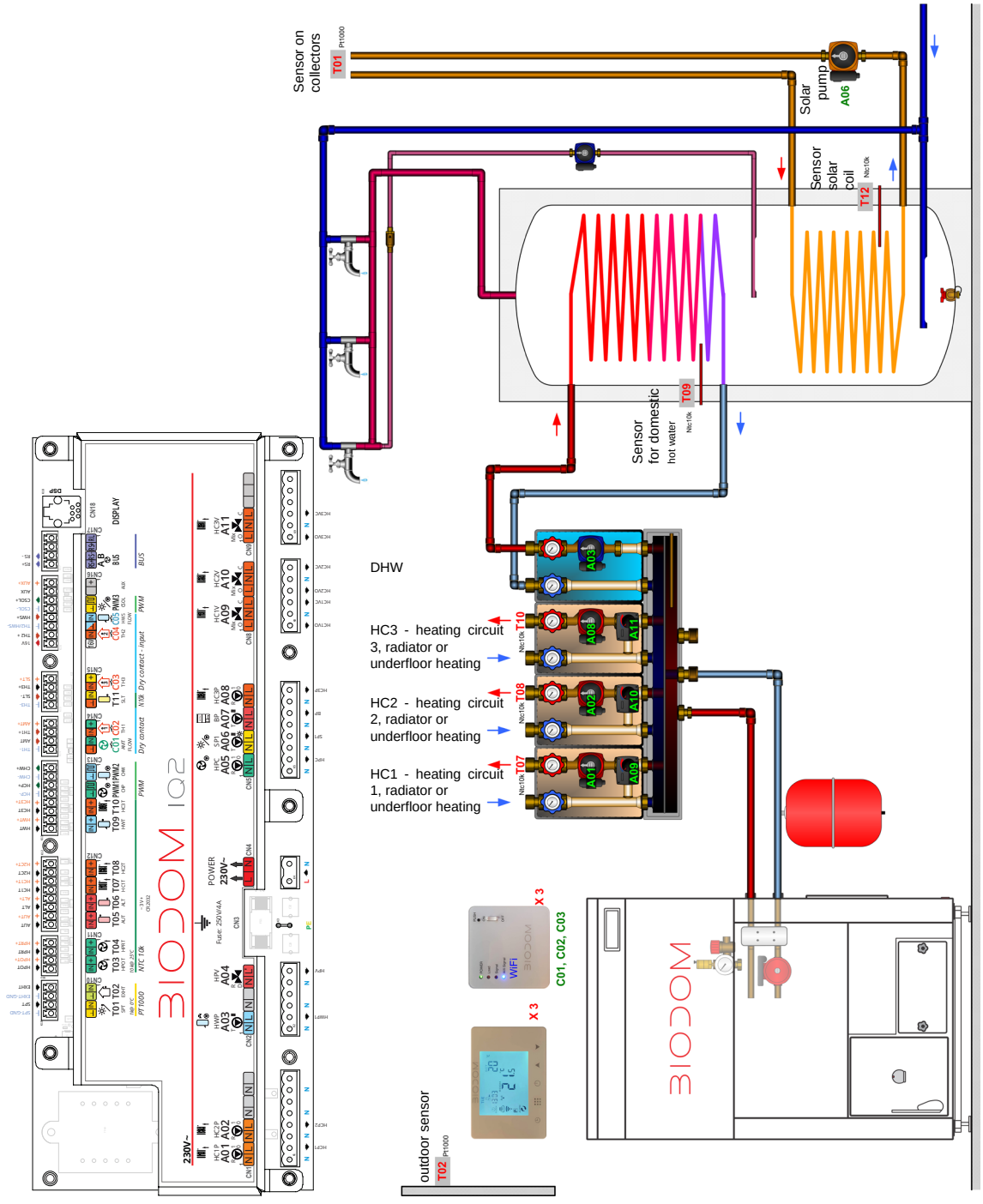

- **Heat pumps - hydraulic separators**: a more detailed description and connection diagrams of the BIOBLOCK heat pump and the hydraulic separators BIOBLOK S, BIOBLOK M, BIOBLOK S3, All in one, Turbo Rudi can be found in the instructions supplied with the BIOBLOCK heat pump

# Diagram 1: Boiler, 1-3 heating circuits, DHW tank, optional solar heating, recirculation

Boiler: BIODOM pellet boiler or existing boiler (pellets, gas, heating oil)

3x heating circuit: each can be mixing or direct (with a direct circuit the mixing valve is not connected and the sensor is optional)

DHW tank: option of an external recirculation pump and of controlling solar collectors for DHW heating.



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