


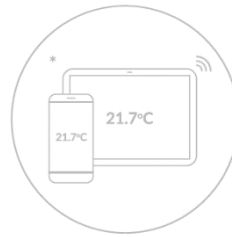


The ecoMULTI controller for heating and cooling system

Additional equipment (optional)

Wireless room thermostat	
Wired room thermostat	
Internet module	



OPERATING AND INSTALLATION MANUAL

ISSUE: 1.0_EN





ELECTRIC DEVICE UNDER VOLTAGE!

Before any action related to the power supply (cables connection, device installation etc.) check if the controller is not connected to the power mains!

Installation should be done by a person with appropriate electrical qualifications. Improper cables connection could result in the controller damage.

The controller can't be used in steam condensation conditions and can't be exposed to water.

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1 Recommendations regarding safety

Requirements concerning safety are listed in particular sections of this instruction. Apart from them it is necessary to fulfill the following requirements.



- The controller can be assembled only by qualified installer and in accordance with currently valid standards and regulations.
- Before to starting the assembly, repairs or maintenance and during the execution of any connection works, it is necessary to switch off the mains supply and make sure that no terminals no electrical wires are energized.
- After turning off the controller terminals of the controller can be under a dangerous level of voltage.
- The controller can be utilized only in accordance -with its intended use.
- Additional automatics should be used in order to protect central heating and DHW system against the results of controller failure or software errors. Particularly control automatics which reduce DHW temperature in order to protect users against burns.
- Values of programmed parameters must be set in accordance with a particular building and hydraulic system.
- The controller is not an intrinsically safe device. It means that in case of failure it can be a source of sparks or high temperature which surrounded by ashes or flammable gases can cause fire or explosion.
- Modification of the programmed parameters should be made only by a person who read this manual.
- Use only in heat circulation system made in accordance with currently valid regulations.
- Electrical system including the controller should be 3-wired and protected with fuse selected in accordance with used loads.
- The controller cannot be used with damaged housing.
- Never make any modifications in controller structure.
- The controller consists of two components: control panel and main module. Replaced component must be compatible.
- Keep children away from the controller.

2 General information

The ecoMULTI controller is intended for controlling a central heating system with heat pump.

The controller may be used in households and other similar premises and in light industry facilities.

3 Information about documentation

The controller manual is divided into two parts: for user and fitter. Yet, both parts contain important information, significant for safety issues, hence the user should read both parts of the manual.

We are not responsible for any damages caused by failure to observe these instructions.

4 Storage of documentation

This assembly and operation manual, as well as any other applicable documentation, should be stored diligently, so that it was available at any time. In the case of removal or sale of the device, the attached documentation should be handed over to the new user.

5 Applied symbols

In this manual the following symbols are used:



- useful information and tips,



- important information, failure to observe these can cause damage of property, threat for human and household animal health and life.

Caution: the symbols indicate important information, in order to make the manual more lucid. Yet, this does not exempt the user from the obligation to comply with requirements which are not marked with symbol.

6 Directive WEEE 2012/19/UE

Purchased product is designed and made of materials of highest quality.

The product meets the requirements of the **Directive 2012/19/EU of 4 July 2012 on waste electrical and electronic equipment (WEEE)**, according to which it is marked by the symbol of crossed-out wheeled

bin (like below), meaning that product is subjected to separate collection.



Responsibilities after finishing a period of using product:

- dispose of the packaging and product at the end of their period of use in an appropriate recycling facility,
- do not dispose of the product with other unsorted waste,
- do not burn the product.

By adhering obligations of waste electrical and electronic equipment controlled disposal mentioned above, you avoid harmful.

USER SETTINGS

ecoMULTI

7 The controller support

When configuring the controller for the first time, it is recommended to use the *System configuration assistant* from the service menu, point 13



7.1 The controller control

The controller is operated using a touch screen. Parameters are edited by touching the selected symbol on the panel screen. An example of the circuit settings screen is shown below.



Main symbols meaning:



- heat circuits settings,



- DHW tank settings (the symbol is not visible when there is no DHW support),



- time schedules for heat circuits, DHW tank, ON/OFF schedule for heat pump,



- *User settings* menu and *Service settings* menu,



- selection of consecutive screens for circuits and active screen (e.g. red) and own name of the circuit, e.g. Salon/H1.



- heat pump settings,



- heating system scheme,



- heating circuits,



- cooling circuits,



- list of active alarms,



- active connection to the www.econet24.com website,



- user set value of the preset temperature of the heating circuit and the DHW tank,



- external (outside) temperature value (displayed value only if external temperature

sensor support is enabled in the service menu).

7.2 The controller operation

Main heat source.

The controller controls the operation of the heat pump by activating or deactivating it according to demand for heating or cooling of the heat circuits.

Domestic hot water.

The controller controls the operation of DHW pump loading a DHW tank up to a user-defined temperature. Preparation of DHW can be programmed in time intervals. The controller also controls a DHW circulating pump which enables quick transportation of DHW to a bathroom or kitchen located far away.

Heat circuits.

The controller controls the operation of one non-adjustable heat circuit and two adjustable heat circuits. Water temperature in circuits is set by weather, i.e. water temperature in the circuit is calculated in accordance with a temperature from the external temperature sensor. Due to this, despite of varying outside temperature, a room temperature in heated rooms is kept on a set level.

- Dependent circuits – the controller touch panel can be a common room thermostat for many circuits. For example, room temperature readings on a panel installed in the living room affect operation of both radiator and floor circuit.

- Independent circuit – there is a possibility of connecting control panels measuring room temperature independently and affecting assigned circuits. It is the way to obtain independency of the circuits, e.g. in case when one part of the building is used for the whole year and the second part is used periodically, e.g. for rent.

7.3 Preset temperature settings

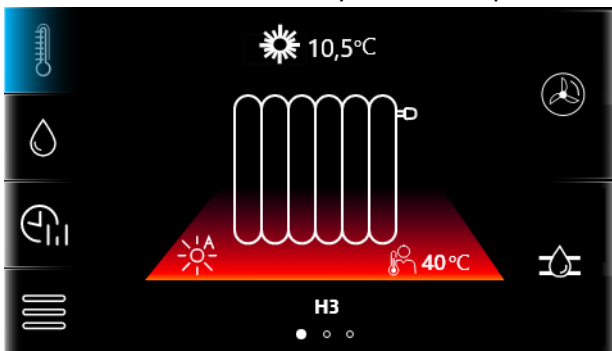
The preset temperature of the circuit and the DHW tank is set by pressing the screen on the value of the temperature of the circuit and the DHW tank.




Tip: changing the background color under the temperature of the circulation and DHW tank indicates whether the temperature is below (blue), above (red) or the same (green) as the preset temperature.



Tip: if the radiator icon is displayed at the circuit temperature display place, then the circuit is not controlled by the room panel.




7.4 Circuit settings

Pressing the  symbol displays the parameters:

- *Circuit name* - own name of the circuit, e.g. "Salon"/"H1".

- *Hysteresis* - the circuit will be charged to the preset temperature. After the water temperature in the circuit drops by the value of Hysteresis, the circuit will be switched on again.
- *Preset day temperature* - optimal temperature in the room that provides the best thermal comfort for the user, e.g. during the day circuit temperature - for Day mode. The parameter is available for editing only when a thermostat is assigned to the circuit.
- *Preset night temperature* - the temperature to which the room temperature will be reduced, e.g. at night or when the user leaves the room - for Night mode. The parameter is available for editing only when a thermostat is assigned to the circuit.
- *Fixed preset water temperature* - the heat source is switched off when the value in this parameter is reached. The parameter is not available when the circuit is controlled by the outdoor temperature.
- *Fixed preset water temperature - cooling* - the heat source is switched off when the value in this parameter is reached.
- *Heating curve* - description in pt. 11.12

Pressing the  symbol allows to *Select circuit thermostat*. The options are: *Empty*, *Control panel*, *Wire thermostat*, *Wireless thermostat*.

7.5 DHW settings

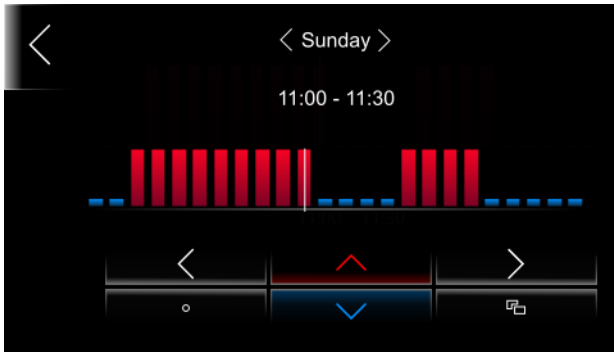
Pressing the  symbol displays the parameters:

- *DHW hysteresis* - DHW tank will be loaded up to the preset temperature. When temperature of water inside the DHW tank drops by *DHW hysteresis* value, pump loading will be enabled and the DHW tank will be loaded again.

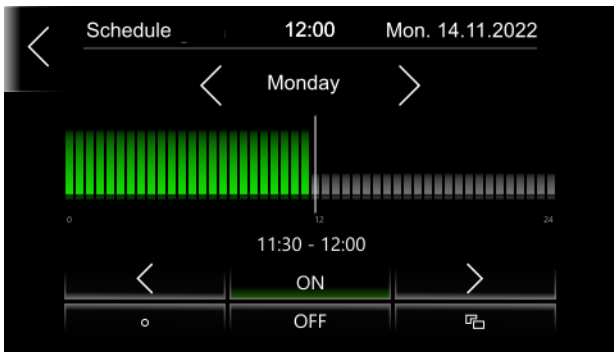
7.6 Time schedules

The controller includes a function of programming time schedules. In the situation when user is out of the home or at night, the controller can decrease the amount of supplied heat/electric energy what affects electric consumption.

Time schedules for decrease preset temperature are defined separately for circuits and circulation pump. Time schedules can be set separately for each day of the week.



The ON/OFF time schedule is defined separately for heat pump and DHW tank. Time schedule can be set separately for each day of the week.



The symbols meaning:

- weekday selection and time period selection. The 24-hour interval is set every 30 minutes.

- copying the currently set time period to any day of the week.

- the preset temperature in the room is set to the value *Preset night temperature* for the circuit, if a thermostat is assigned to the circuit, if not, the reduction will be by the value of the service parameter *Water decrease temp*. The DHW tank and circulation pump are switched off.

- the preset room temperature is set to the value *Preset day temperature* for circuits, if a thermostat is assigned to the circuit. The DHW tank is loaded to the *Preset DHW temperature*. The DHW circulation pump is turned on for *Circulation operation time* and turned off for *Circulation pause time*.



ON – heat source (heat pump) is ON.




OFF – heat source (heat pump) is OFF.




7.7 Operation modes settings

Operation mode of the circuit and the DHW tank, which will suit the user's preferences, is selected by the symbol and the symbol on the screen in the place where the preset temperature of the circuit and the DHW tank is changed. Additional operation mode can be selected separately for each circuit and DHW tank. In case when many circuits are assigned to a mutual control panel, operation mode change is global and applies to all circuits simultaneously.

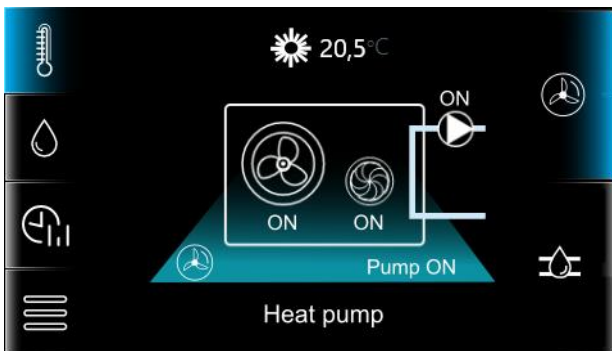
Operation mode	
Day	Preset room temperature is constant and corresponds to the entered <i>Preset day temperature</i> value. DHW tank maintains constant preset temperature.
Day schedule	Preset room temperature is maintained at the same set time periods as the <i>Preset day temperature</i> . This mode can't be selected for the DHW tank.
Night	Preset room temperature is constant and corresponds to the entered <i>Preset night temperature</i> value. This mode cannot be selected for the DHW tank.
Night schedule	Preset room temperature is maintained at the set time periods as the <i>Preset night temperature</i> . This mode can't be selected for the DHW tank.
Off	Controller switches the circuit or DHW tank off.
Schedule	Preset room temperature is switched between <i>Preset day temperature</i> and <i>Preset night temperature</i> depending on clock indications and defined time programs for particular days of the week.
On	DHW mode is On.


 Off	DHW mode is Off.
 1 x loading	Enables a single DHW load in situation when DHW tank heat energy saving mode is active.




User can select main mode for DHW tank as  and, if necessary, activate an additional  mode in order to save heat energy resulting from stoppage losses of DHW tank. The additional operation mode of the circuit is selected by pressing the currently displayed symbol on the main screen in the place where the value of the outside temperature is displayed, usually it is the  symbol.


Additional operation mode	
 Auto	Automatically switches on or off the heating-cooling mode, depending on the external (weather) temperature. Automatic switch to Auto mode is possible only with connected external temperature sensor and when its operation is enabled (can also unlock the cooling function of the heat source and circuits).
 Summer	Adjustable circuit performs the cooling function.
 Winter	Adjustable circuit performs the heating function. No cooling mode in case of non-adjustable circuit.

7.8 Heat pump operation modes

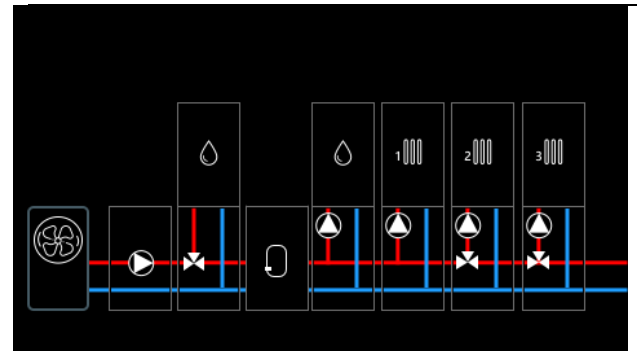


The heat pump operating modes are selected by pressing the  symbol in the heat pump screen.

Operation mode	
 ON	The heat pump is still on.
 OFF	The heat pump is turned off regardless of the conditions in the system.
 Schedule	The heat pump is switched on and off according to the set time schedule.

Additionally, pressing the symbol  displays the scheme of the operated installation system.

The view of the scheme depends on the enabled support for individual circuits, DHW tank, buffer and whether an additional extension module is connected to the controller.




7.9 User settings

The controller settings, according to user preference.


Pressing the  symbol displays the parameters:

- *Screen brightness* – screen brightness intensity.
- *Screen saver* - screen saver selection: *None, Time, Time and temps.*
- *Time to screen save* – time to start the screen saver after the time of inactivity.
- *Brightness of the screen save* – screen brightness when the screen saver is active.
- *Alarm sound* – turn on or off the alarm sound.


- *Key sound* - turning on or off sound of keys when pressed on the screen.
- *Panel temperature correction* - correction of the room temperature value measured by the room panel. The temperature in the room should be measured with an additional temperature sensor and the difference between this measurement and the temperature value displayed by the room panel should be entered into the value of this parameter.
- *Hour* – setting time. Time synchronization function with other connected room panels was applied.

 Time synchronization will occur at the time difference between the room panel and the controller min. 10 sec.

- *Date* – setting date. Day of the week will be set automatically after setting date.
- *Panel address* – enables setting individual ModBus address of room panel in case of connecting more room panels to the controller.


 For the controller to work properly, individual room panels must have different and subsequent addresses from the 100...132 pool set.

- *Language* – menu language selection.
- *Parental lock* - settings of parental control. The lock activates automatically after 5 minutes of inactivity. Unlocking the screen is possible after pressing the screen (about 4 sec., open padlock animation).

Pressing the  symbol displays the parameters:

- *ecoNET300 configuration wizard* - go further to start configuring the Web module.
- *ecoNET status - LAN* – information on the Wi-Fi and the Webserver www.econet24.com connection status.
- *Wi-Fi settings* - configuration of controller Wi-Fi connection, with Web module connected. Connection of Web module and its configuration is described in manual for this module. Parameters should be set:

SSID, Security type, network access Password.

Pressing the  symbol displays: *Diagnostic info* about the operation of the controller, *Alarms list, Firmware version* (e.g. serial number, UID, ISM). Selecting *Firmware update* allows to update the controller's software, point 16.





7.10 Cooperation with the Web module

Web module enables remote maintenance of the heat pump via Wi-Fi through www.econet24.com website. By using computer or mobile device with installed internet browser, user can remotely monitor and modify operation parameters of the controller. In case of mobile system a free and convenient application can be used *ecoNET.apk* and *ecoNET.app*, to be downloaded via QR code.

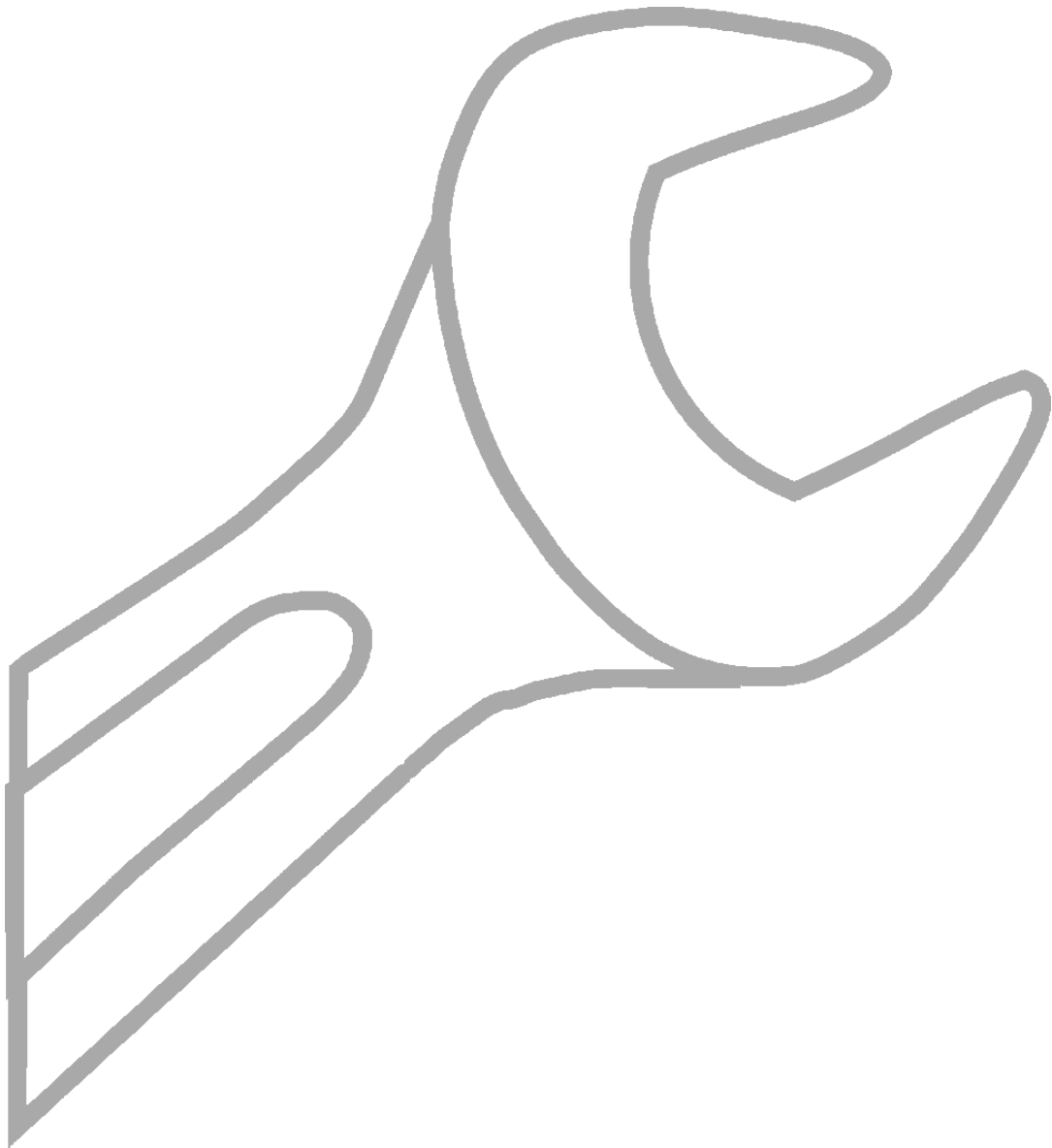


7.11 Cooperation with additional devices

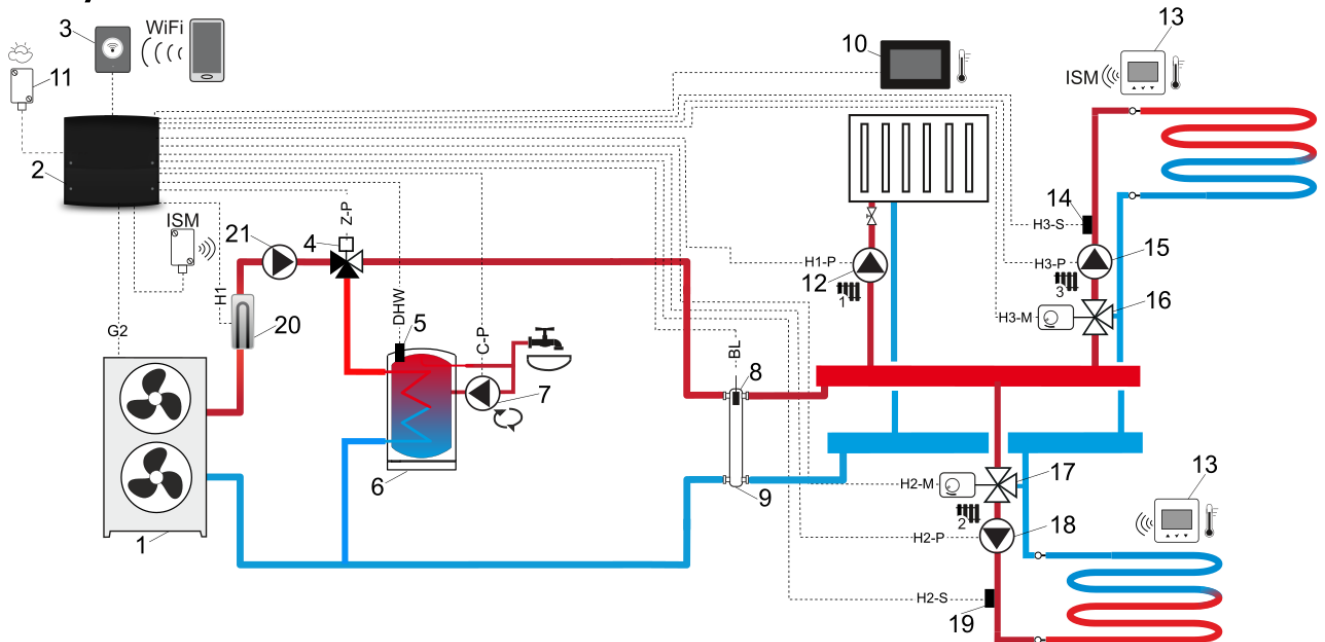
The controller cooperates with additional system devices, which are optionally offered by the controller manufacturer.

	Wireless room thermostat.
	Wireless room temperature sensor.
	Room panel with a room thermostat function. It can act as the main control panel.
	Web module.

ecoMULTI



8 Hydraulic schemes

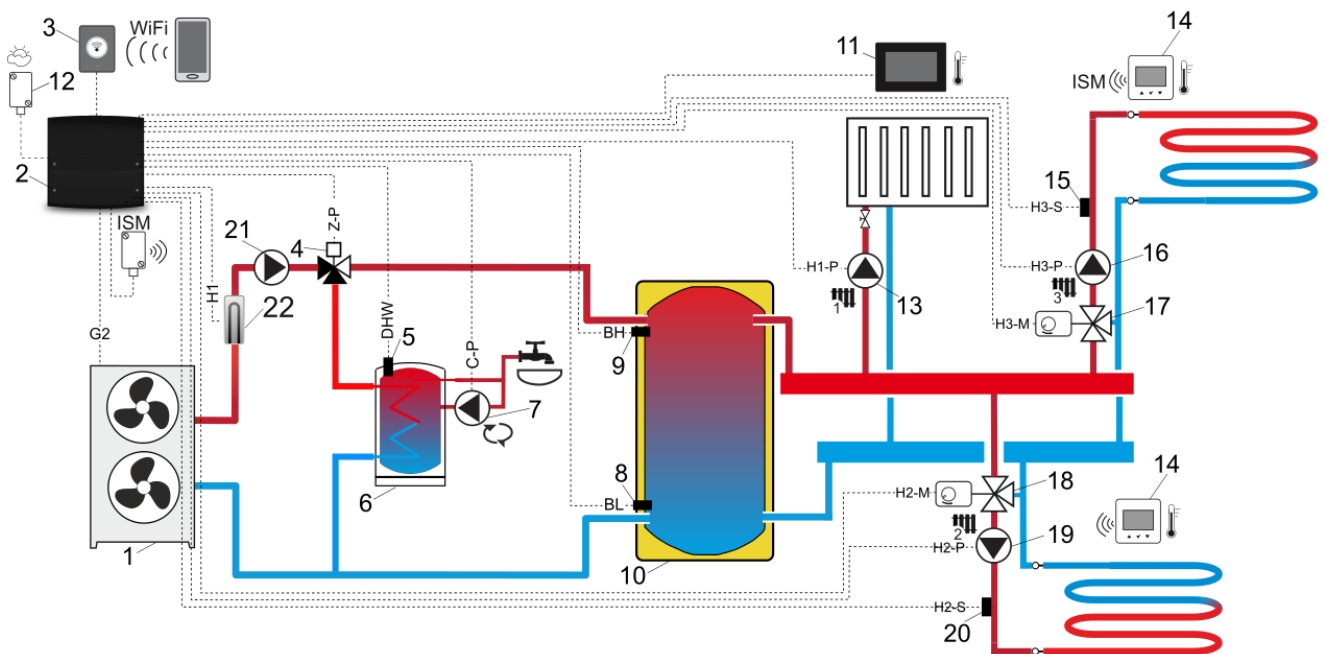


Scheme with hydraulic crossover and DHW tank¹: 1 – heat pump, 2 – controller, 3 – Web module, 4 – 3-way valve, 5 – DHW temp. sensor, 6 – DHW tank, 7 – circulation pump, 8 – hydraulic crossover temp. sensor, 9 – hydraulic crossover, 10 – control panel with room thermostat function, 11 – outside temp. sensor (weather), 12 – circuit 1 pump, 13 - wireless room thermostat, 14 – mixer 3 temp. sensor, 15 – mixer 3 pump, 16 – mixer 3 actuator, 17 – mixer 2 actuator, 18 – mixer 2 pump, 19 – mixer 2 temp. sensor, 20 – flow heater, 21 – DHW pump.

PROPOSED SETTINGS:

Circuit	Parameters	Settings	Service settings
	Hydraulic scheme	Hydraulic crossover	Installation control → Hydraulic scheme
1	Circuit support	YES	Installation controller → Circuit 1
	Circuit type	Heater	Installation controller → Circuit 1
	Control method	Weather	Installation controller → Circuit 1
	Maximum temperature	55°C	Installation controller → Circuit 1
2	Circuit support	YES	Installation controller → Circuit 2
	Circuit type	Floor heating	Installation controller → Circuit 2
	Control method	Weather	Installation controller → Circuit 2
	Thermostat selection	Wireless thermostat	Installation controller → Circuit 2
3	Circuit support	YES	Installation controller → Circuit 3
	Circuit type	Floor heating	Installation controller → Circuit 3
	Control method	Weather	Installation controller → Circuit 3
	Thermostat selection	Wireless thermostat	Installation controller → Circuit 3
	DHW support	YES	Installation controller → DHW settings
	Circulation support	YES	Installation controller → Circulation settings
	Heater type	Flow heater	Installation controller → Heaters

¹ Presented hydraulic diagram does not replace the central heating system project and is only for demonstrative purposes!

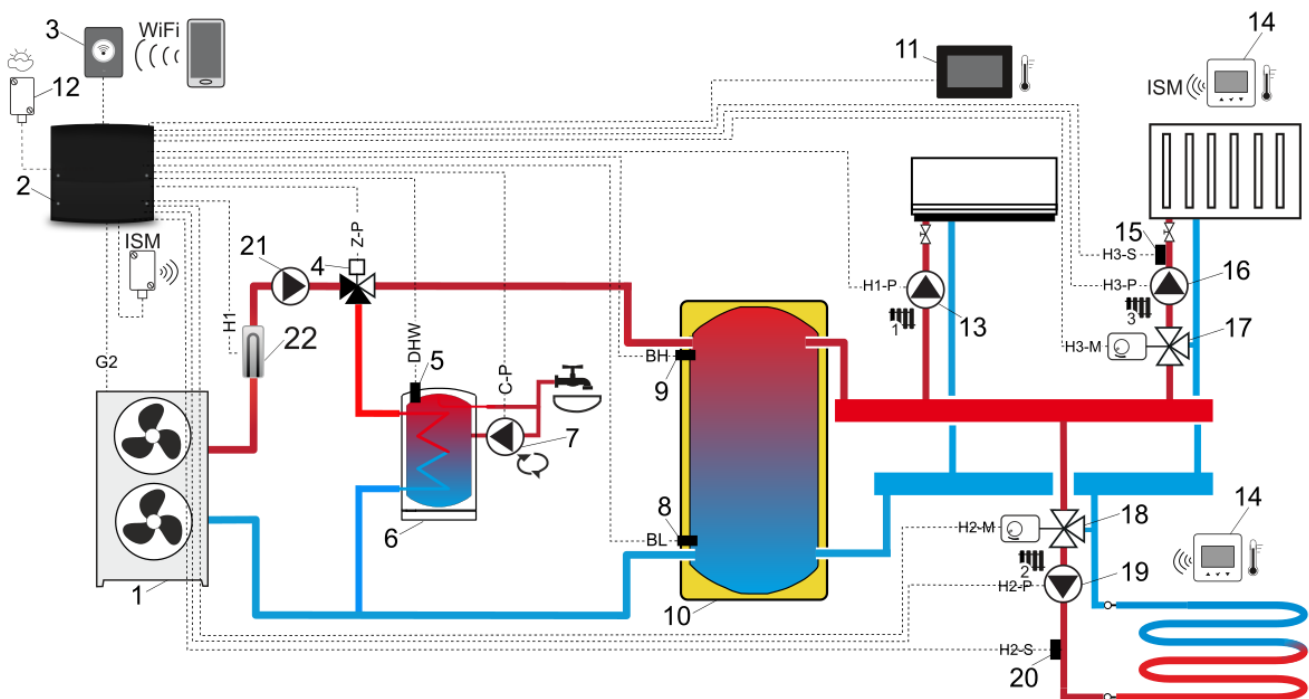


Scheme with buffer and DHW tank²: 1 – heat pump, 2 – controller, 3 – Web module, 4 - 3-way valve, 5 – DHW tank temp. sensor, 6 – DHW tank with heater, 7 – circulation pump, 8 – lower buffer temp. sensor, 9 – upper buffer temp. sensor, 10 – heat buffer, 11 – panel control with room thermostat function, 12 - weather temp. sensor, 13 – circuit 1 pump, 14 – wireless room thermostat, 15 – circuit 3 temp. sensor, 16 – circuit 3 pump, 17 – circuit 3 mixer, 18 – circuit 2 mixer, 19 – circuit 2 pump, 20 – circuit 2 temp. sensor, 21 – DHW pump, 22 – flow heater.

PROPOSED SETTINGS:

Circuit	Parameter	Settings	Service settings
	Hydraulic scheme	Buffer	Installation control → Hydraulic scheme
	Buffer work mode	Two sensors	Installation control → Buffer settings
	Circuit support	YES	Installation control → Circuit 1
	Circuit type	Heater	Installation control → Circuit 1
	Regulation method	Weather	Installation control → Circuit 1
	Circuit support	YES	Installation control → Circuit 2
	Circuit type	Floor heating	Installation control → Circuit 2
	Regulation method	Weather	Installation control → Circuit 2
	Thermostat	Wireless thermostat	Installation control → Circuit 2
	Maximum temperature	55°C	Installation control → Circuit 2
	Circuit support	YES	Installation control → Circuit 3
	Circuit type	Floor heating	Installation control → Circuit 3
	Regulation method	Weather	Installation control → Circuit 3
	Thermostat	Wireless thermostat	Installation control → Circuit 3
	Maximum temperature	55°C	Installation control → Circuit 3
	DHW support	YES	Installation control → DHW settings
	Circulation support	YES	Installation control → Circulation settings
	Heater type	Flow heater	Installation controller → Heaters

² Shown hydraulic scheme does not replace the central heating system and can only be used for demonstrative purposes!



Scheme with buffer and DHW tank³ (cooling function): 1 – heat pump, 2 – controller, 3 – Web module, 4 - 3-way valve, 5 – DHW tank temp. sensor, 6 – DHW tank with heater, 7 – circulation pump, 8 – lower buffer temp. sensor, 9 – upper buffer temp. sensor, 10 - buffer, 11 – panel control with room thermostat function, 12 - weather temp. sensor, 13 - circuit 1 pump, 14 – wireless room thermostat, 15 – circuit 3 temp. sensor, 16 – circuit 3 pump, 17 – circuit 3 mixer, 18 – circuit 2 mixer, 19 – circuit 2 pump, 20 – circuit 2 temp. sensor, 21 – DHW pump, 21 – flow heater.

PROPOSED SETTINGS:

Circuit	Parameter	Settings	Service settings
	Hydraulic scheme	Buffer	Installation control → Hydraulic scheme
	Buffer work mode	Two sensors	Installation control → Buffer settings
	Buffer cooling	YES	Installation control → Buffer settings
	Circuit support	YES	Installation control → Circuit 1
	Circuit type	Fan coil	Installation control → Circuit 1
	Regulation method	Weather	Installation control → Circuit 1
	Circuit support	YES	Installation control → Circuit 2
	Circuit type	Floor heating	Installation control → Circuit 2
	Regulation method	Weather	Installation control → Circuit 2
	Thermostat	Wireless thermostat	Installation control → Circuit 2
	Maximum temperature	55°C	Installation control → Circuit 2
	Circuit support	YES	Installation control → Circuit 3
	Circuit type	Heater	Installation control → Circuit 3
	Regulation method	Weather	Installation control → Circuit 3
	Thermostat	Wireless thermostat	Installation control → Circuit 3
	Maximum temperature	80°C	Installation control → Circuit 3
	DHW support	YES	Installation control → DHW settings
	Circulation support	YES	Installation control → Circulation settings
	Heater type	Flow heater	Installation controller → Heaters

In cooling function the circuit mixers are closed to prevent cold water from entering the heater and floor heating.

³ Shown hydraulic scheme does not replace the central heating system and can only be used for demonstrative purposes!

9 Technical data

Controller	
Power supply.	230 VAC, 50 Hz
Controller current consumption.	0.4 A ⁴
Maximum rated current.	6 (6) A
Protection class.	IP 20 ⁵
Ambient temperature.	0...50°C
Storage temperature.	0...65°C
Relative humidity.	5...85%, without water vapor condensation.
CT10 sensor temperature measurement range.	-40...+110°C
CT4 sensor temperature measurement range (only additional B module).	0...100°C
CT10-P sensor temperature measurement range.	-40...+40°C
Temp. measurement accuracy: CT4, CT10, CT10-P	±2°C
Connectors.	Screw terminals at supply voltage side – 1.0-2.5 mm ² . Screw terminals at control voltage side – 0.14-1.0 mm ² .
Main module dimensions.	234x225x64 mm
Standards.	PN-EN 60730-2-9 PN-EN 60730-1
Software class.	A, acc. to PN-EN 60730-1
Protection class.	I class
Pollution degree.	2-nd pollution degree acc to PN-EN 60730-2-9
Installation method.	On the wall.
Control panel	
Power supply.	12 VDC – directly from the controller socket
Controller current consumption (12 VDC)	0.15 A
Display.	Touch screen, graphical 480x272 pix.
Protection class.	IP 20
Ambient temperature.	0..50°C
Storage temperature.	0..65°C
Relative humidity.	5...85%, without water vapor condensation.
Terminals	Screw terminals: 0,15...1,5 mm ²
Control panel dimensions.	144x97x20 mm
Standards.	PN-EN 60730-2-9 PN-EN 60730-1
Software class.	A, acc. to PN-EN 60730-1
Installation method.	On the wall or stand

10 Conditions of storage and transport

The controller cannot be exposed to direct effects of weather, i.e. rain and sunlight. During transport, the device cannot be

⁴ It is a current consumed only by the controller. Overall current consumption depends on number of devices connected to the controller.

⁵ After installing all cable clamps.

exposed to vibrations greater than typical for normal road transport.

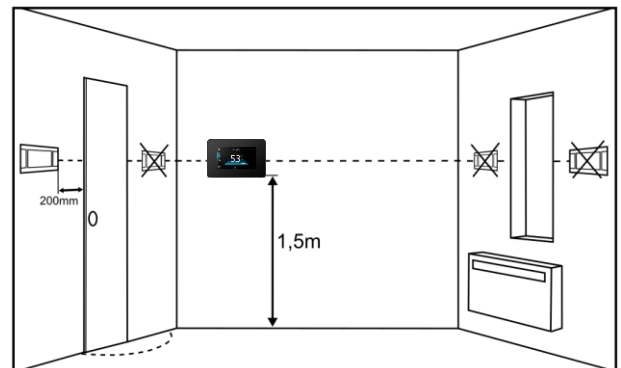
11 The controller installation

11.1 Installation requirements

The controller should be installed by a qualified and authorized installer, in accordance with the applicable norms and regulations. The manufacturer bears no responsibility for damages caused by failure to follow this manual. The controller cannot be used as a stand-alone device. The temperature of the ambient and the fitting surface cannot exceed the range of 0...50°C.

11.2 Installation of control panel

The control panel is designed for mounting on the wall, inside the room. It cannot be used under steam condensation conditions, must be protected against water. The control panel should be mounted at a height allowing comfortable operation, typically 1.5 m above the floor.



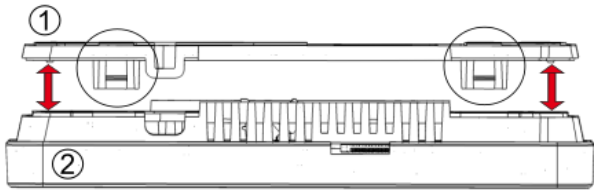
To reduce measurement disturbances avoid locations exposed to strong sunlight, with poor air circulation, near heating equipment, and directly at the door and windows, typically 0.2 m from the edge of the door.



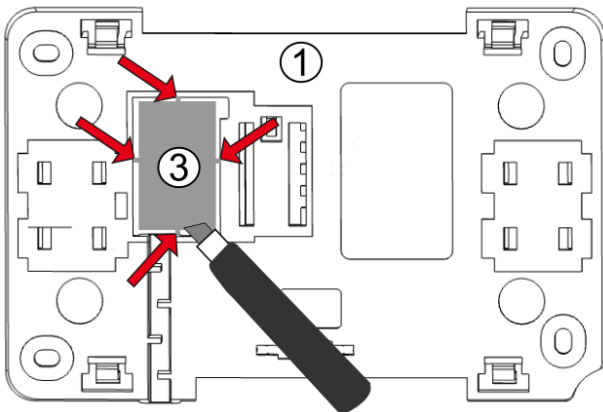
When selecting the cable connecting panel with the controller the following rule must be applied: use a cable where single wire has a resistance lower than 8 Ω and the total length of the cable does not exceed 100 m.

The control panel installation should be done according to the following guidelines:

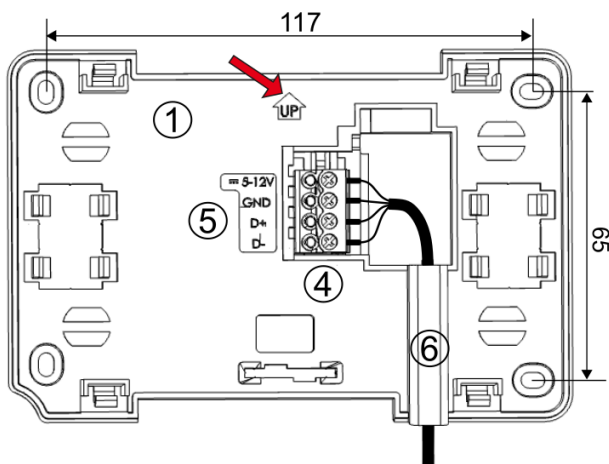
Disconnect the mounting frame (1) from the back of control panel housing (2). The frame is attached to the panel housing with latches. Use a flat screwdriver to detach the frame.



Using sharp tool cut out holes in four places of the cover (3) for the screw terminals.



Connect transmission cable, connecting panel with the controller, to the screw terminal (4), as described on the plate (5). The cable connecting panel with the controller can be recessed in the wall or it can run over its surface - in this case the cable should be additionally placed in the cable channel (6). The connection cable cannot be conducted along with the cables of the building mains. The cable should not be routed near devices emitting strong electromagnetic field.



Drill holes in the wall and use screws to fix the mounting frame in the chosen place of the wall, maintaining its proper position (UP).

Then attach the panel to the mounting frame using latches.

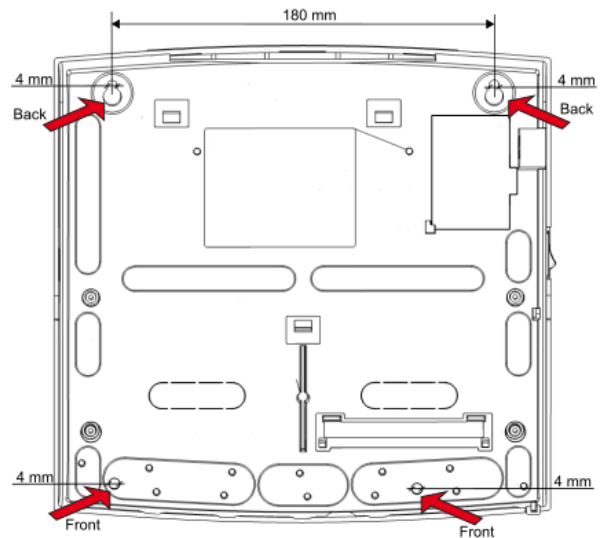
11.3 Installation of module

The controller should be located closest to the electrical devices included in the central heating system.



The controller must not be used as a free-standing device.

The controller should be screwed on to the flat surface, e.g. wall. To screw on the controller use mounting holes and proper screws. Location and spacing of mounting holes is shown in the figure below.



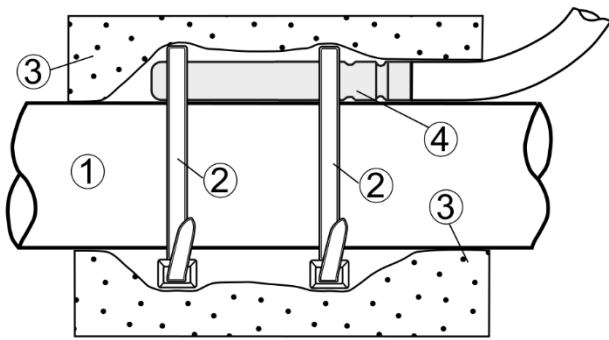
After installation make sure that the device is properly mounted and it is impossible to detach it from the mounting surface.

11.4 Temperature sensors installation

The controller works only with CT4, CT10, CT10-P temperature sensors. Using other sensor types is prohibited. Connecting the wrong sensor type will cause the controller malfunction. At least one circuit temperature sensor is necessary to activate the controller.

Circuit temperature sensors.

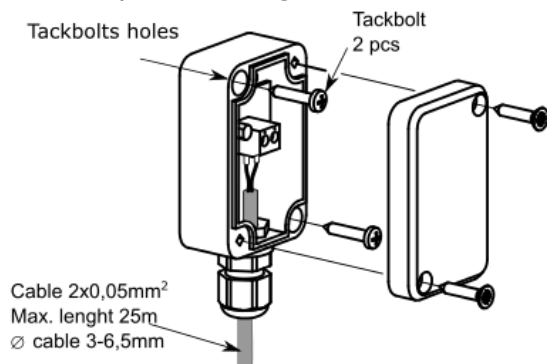
Direct circuit temperature sensor type CT4, CT10 should be installed to a supplying pipe coming out from the heat source. Temperature sensor of the adjustable circuit type CT4, CT10 should be installed on a pipe behind the circuit pump. Insulate the sensors affixed to the external surface of the pipe with using thermal insulation covering the sensor together with the pipe.



Mounting temperature sensor: 1 - pipe, 2 - clamps, 3 - thermal insulation, 4 - temperature sensor.

External temperature sensor.

The controller cooperates only with external (weather) temperature sensor type CT10-P. Temperature sensor should be fixed to a coldest wall in the building. Usually it is a north wall under the roof. Sensor should not be exposed to direct solar radiation or rain. Sensor should be fixed on a minimum height of 2 m above the ground and in a distance of at least 1.5 m from windows, chimneys and other heat sources which could interrupt the temperature measurement. Use a connecting cable with a cross section of at least 0.5 mm² and length of 25 m. Polarity of wires is not important. Fix the sensor to the wall with the screws. Holes containing fixing screws can be accessed by unscrewing a sensor cover.



11.5 Temperature sensors check

Temperature sensors can be checked by measuring their resistance in a given temperature. In case of significant differences between measured resistance value and values in table below, the sensor should be replaced with a new one.

CT10, CT10-P (weather)	
Temp. [°C]	Nom. [Ω]
-30	175200
-20	96358
-10	55046

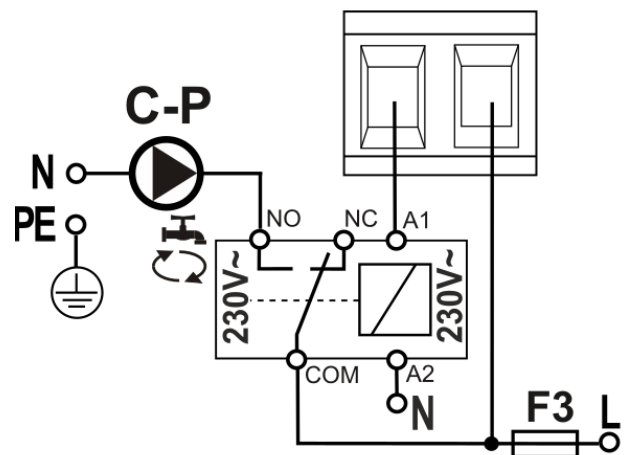
0	32554
10	19872
20	12488
30	8059
40	5330
50	3605
60	2490
70	1753
80	1256
90	915,4
100	677,3
110	508,30
120	386,60

CT4 (only B module)			
Temp. [°C]	Min. [Ω]	Nom. [Ω]	Max. [Ω]
0	802	815	828
10	874	886	898
20	950	961	972
25	990	1000	1010
30	1029	1040	1051
40	1108	1122	1136
50	1192	1209	1225
60	1278	1299	1319
70	1369	1392	1416
80	1462	1490	1518
90	1559	1591	1623

11.6 Connecting pumps

Make electrical connections of the circuit pumps to the controller according to the electric scheme.

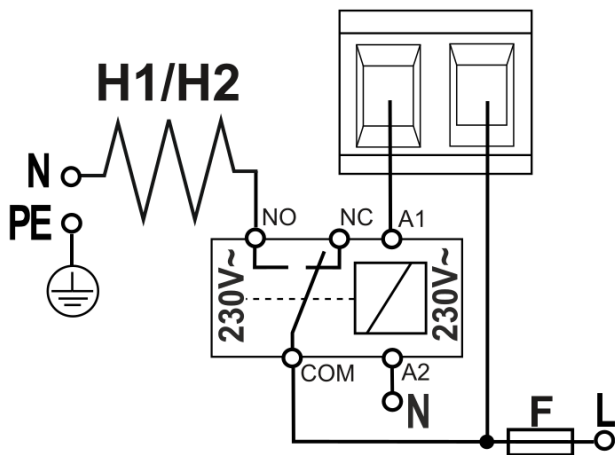
Note: the DHW circulation pump can be controlled by an external relay that is connected to terminals 11-12 of the controller.



11.7 Connecting heaters

Electrically connect the DHW/CH/buffer three-phase heater via an external relay to

terminals 19-20 and 21-22 of the controller. Select the relay according to the power of the heater used. An example of connecting the relay is shown in the drawing below.



11.8 Connecting mixer servo

Electrical servo is installed only when there is an adjustable circuit. The controller cooperates only with servos of valves equipped with limit switches. Using other switches is forbidden.

11.9 Output test

Go to the *Manual control* menu and perform a functional test of all electrical consumers connected to the controller, such as pumps and mixer actuators.

11.10 Connection of room panel

In order to stabilize room temperature, settings concerning room thermostat or room panel should be made. Room thermostat or room panel complements weather control and corrects water temperature in the circuit in case room temperature is still improper. It is recommended to use the control panel as a room thermostat. Room thermostat or room panel should be assigned to each circuit.



The control panel can operate as a room panel.

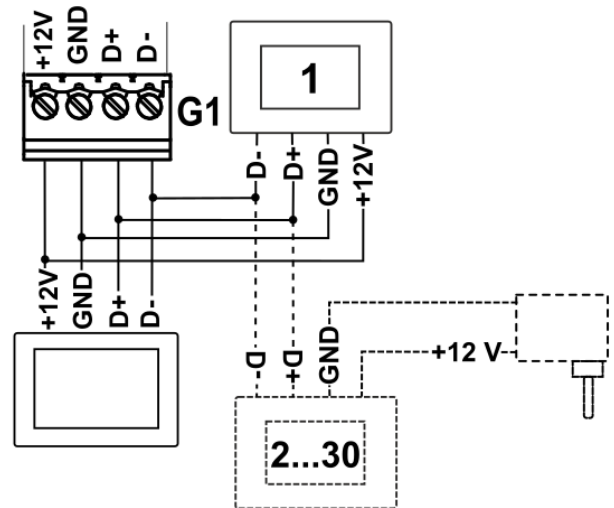
Wireless connection.

Connecting the room thermostat requires connecting the ISM radio module controller to the G1 socket, in accordance with the electric scheme, and pairing between this ISM module and the wireless thermostat. The description of the operation of the wireless room

thermostat can be found in the manual of that device.

Wired connection.

Attention: Directly to the G1 controller socket only one room panel can be connected. Connecting the additional room panels (max. 32 panels) to the controller requires the use of an external power supply 12 VDC with a min. current = number of panels x 0.15 A. The controller can support maximum up to 30 room panels.

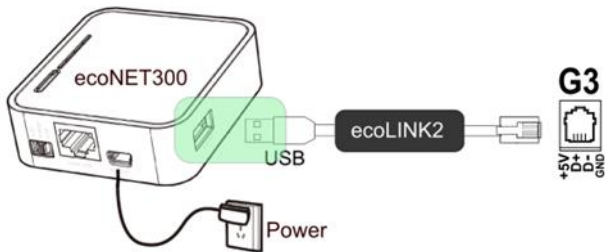


Cross-section area of wires used to connect room panel should be 0,5 mm².

Max. length of wires should not exceed 30 m. This length may be longer if the wires used have cross-section exceeding 0.5 mm².

11.11 Connecting the Web module

The ecoNET300 Web module should be connected using the ecoLINK2 interface to G3 socket of the controller. Then enter the menu: *User settings* → *ecoNET300 configuration wizar* or *ecoNET settings* and configure the module connection to the Wi-Fi network by entering the network SSID, password and choosing the type of security. The connection status of the module to the Wi-Fi network and econet24 server can be checked in the information: *ecoNET status - LAN*, *ecoNET WiFi status - Wi-Fi*.



Description of ecoNET300 operation and Web service www.econet24.com is included in device manual.

11.12 Circuit control settings

Settings for the circuit without weather sensor.

Should disable the external temperature sensor and then it is necessary to manually set the required water temperature in the circuit using parameter *Fixed preset water temperature*, e.g. at a value of 50°C. The value should allow to obtain the required room temperature.

After connecting room panel, it is necessary to set a value of decrease in the *Decreasing fixed water temperature* parameter, e.g. at 5°C. This value should be selected by trial and error. Upon activation of the room panel, the preset circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

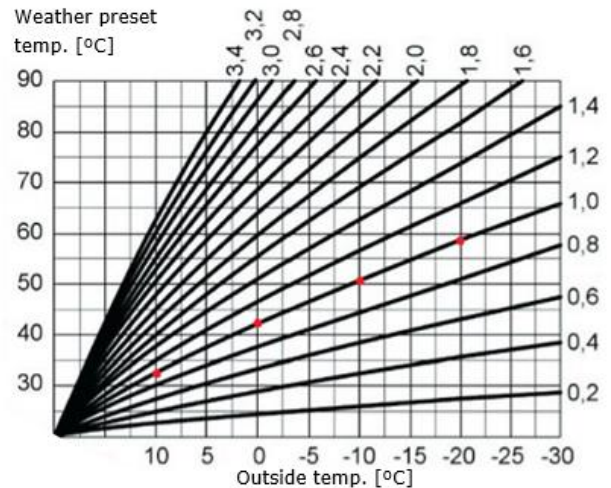
Settings for circuit with weather sensor.

Shouldn't disable the external temperature sensor. Using parameter *Heating curve shift*, set preset room temperature following the formula: $\text{Preset room temperature} = 20^{\circ}\text{C} + \text{heating curve shift}$.

In this setup, it is possible to connect a room panel which will equalize the inaccuracy of selecting heating curve, if the selected heating curve value is too high. In such case, it is necessary to set the value of parameter *Decreasing fixed water temperature*, e.g. at 2°C. Upon activation of the room panel, the preset circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

Weather control.

For the circuit can be turned on weather control, which requires the connection of external temperature sensor. It should enable the external temperature sensor and select *Regulation method = Weather*. The circuit water preset temperature is calculated basing on the temperature prevailing outside the building. The colder it is outside, the higher water temperature in the circuit is. This relation is shown in the controller in the form of heating curve.



Heating curves of the circuit.

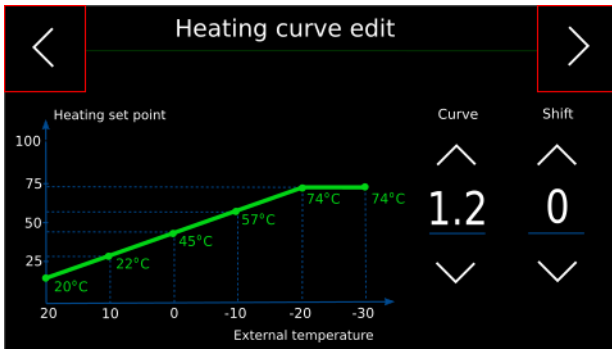
The heating curve can be changed in the service menu of controller, within the range for the weather preset temperature and it is a reflection of the thermal characteristics of the building. If the building is less insulated then the heating curve should be greater. Heating curve should be selected experimentally by changing it in a few day intervals. During trial and error selection of appropriate heating curve, it is necessary to exclude influence of the room thermostat on regulator operation (regardless of whether the room thermostat is connected or not), by selecting *Circuit → Thermostat = Empty*.

After choosing the proper heating curve, the circuit preset temperature is calculated according to the outside temperature. As a result if the heating curve is appropriate for the building, the room temperature remains constant regardless of the temperature outside.

Guidelines for selecting a proper heating curve:

- if the outdoor temperature drops, and the room temperature increases, the selected heating curve value is too high,

- if the outdoor temperature drops, and the room temperature drops as well, the selected heating curve value is too low,
- if during frosty weather the room temperature is proper, but when it gets warmer - it is too low, it is recommended to increase the *Heating curve shift* and to select a lower heating curve,
- if during frosty weather the room temperature is too low, and when it gets warmer - it is too high, it is recommended to decrease the *Heating curve shift* and to select a higher heating curve.



Poorly warmed buildings require setting higher heating curves. Whereas for well heating buildings, heating curve will have a smaller value.

The controller can increase or decrease the preset temperature, calculated in accordance with the heating curve, if it exceeds the temperature range for the given circuit set in controller service menu.

12 Connecting electrical system

The controller is designed to be fed with 230 VAC, 50 Hz voltage. The electrical system should be:

- three core, with protective wire PE,
- in accordance with applicable regulations, equipped with a residual current protection device (RCD) with inrush

current $I_{\Delta n} \leq 30 \text{ mA}$, protecting against the effects of electric shock and limiting damage to the controller, including protection against fire,

- protected with an inverter, which ensures the correct time course of the controller supply power, if there are or may occur undesirable disturbances of this voltage in the installation, e.g. by power supply from a generator, which may damage the controller.



After the controller is turned off, dangerous voltage on terminals might occur. Before starting any assembly works, disconnect the mains supply and make sure that there is no dangerous voltage on terminals and the leads.



All peripherals may be connected only by qualified persons in accordance with applicable regulations. Keep safety precautions to prevent electrocution. The controller should be equipped with a set of pins connected to the 230 VAC mains.



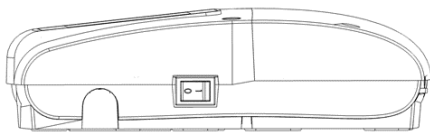
For safety reasons, the controller must be absolutely connected to the 230 VAC power grid, with the sequence of connecting the phase (L) and neutral (N) wires. Make sure that the L and N conductors are not replaced within the building's electrical system, e.g. in an electrical socket or in an electrical socket junction box.

12.1 Connecting the wires

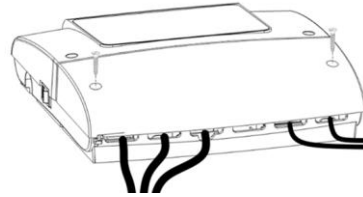
Before connecting the wires, remove the terminal cover from the controller's housing.



Disconnect power supply before unscrewing the terminal cover of the controller.

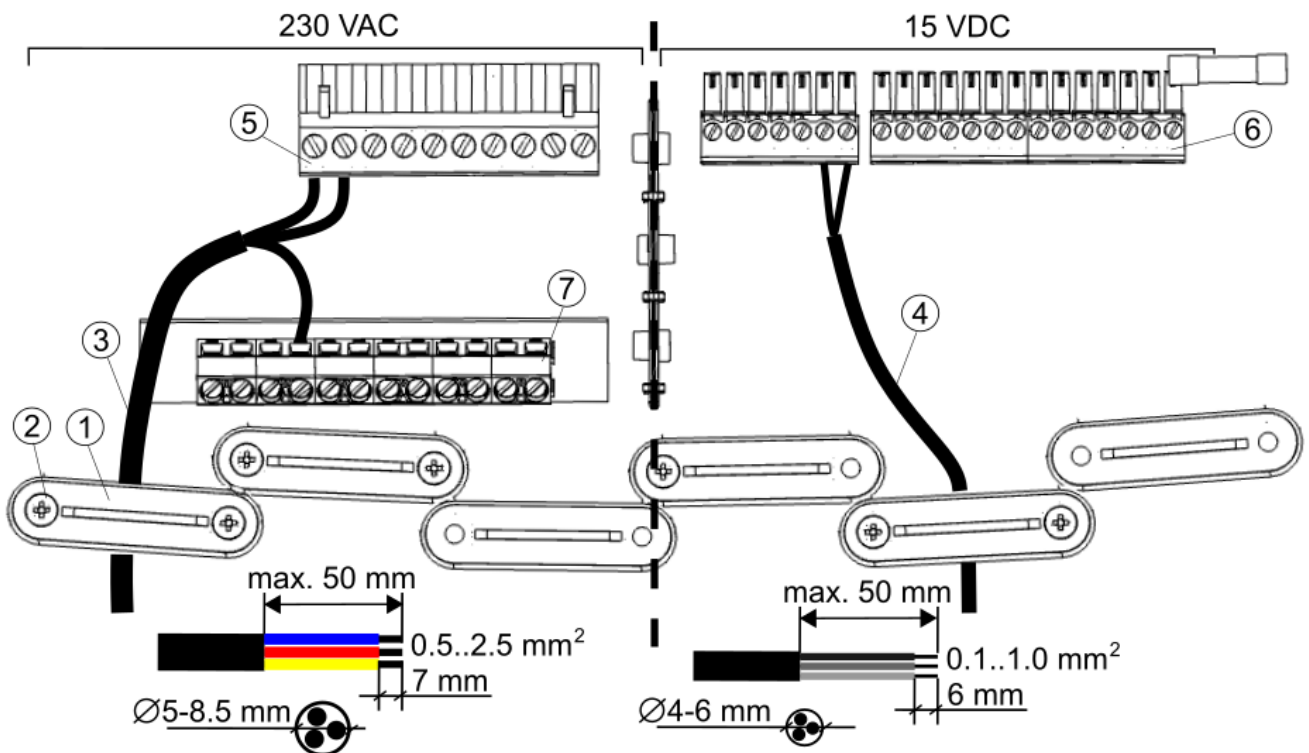


Power switch.



The controller terminals cover.

Cables should be connected to screw terminals of the (5 and 6) connector. The wires should be secured against pulling out using cable clamps (1). Tighten the cable clamp screws (2) with a force to prevent tearing or loosening wires from terminals due to mechanical stress. Protection lead of the power supply cable and protection leads of connected devices should be connected to the (7) protective strip placed inside the controller's housing.



Connecting wires to the controller: 1 - cable clamps, 2 - cable clamp screws, 3 - voltage cables (mains 230 VAC), 4 - safe voltage cables (signal, below 15 VDC), 5 - mains cable connector 230 VAC, 6 - signal wires connector, 7 - protective wires connector.



Due to protection class IP20, all cable clamps (1) must be fitted, even if not all clamps are needed.

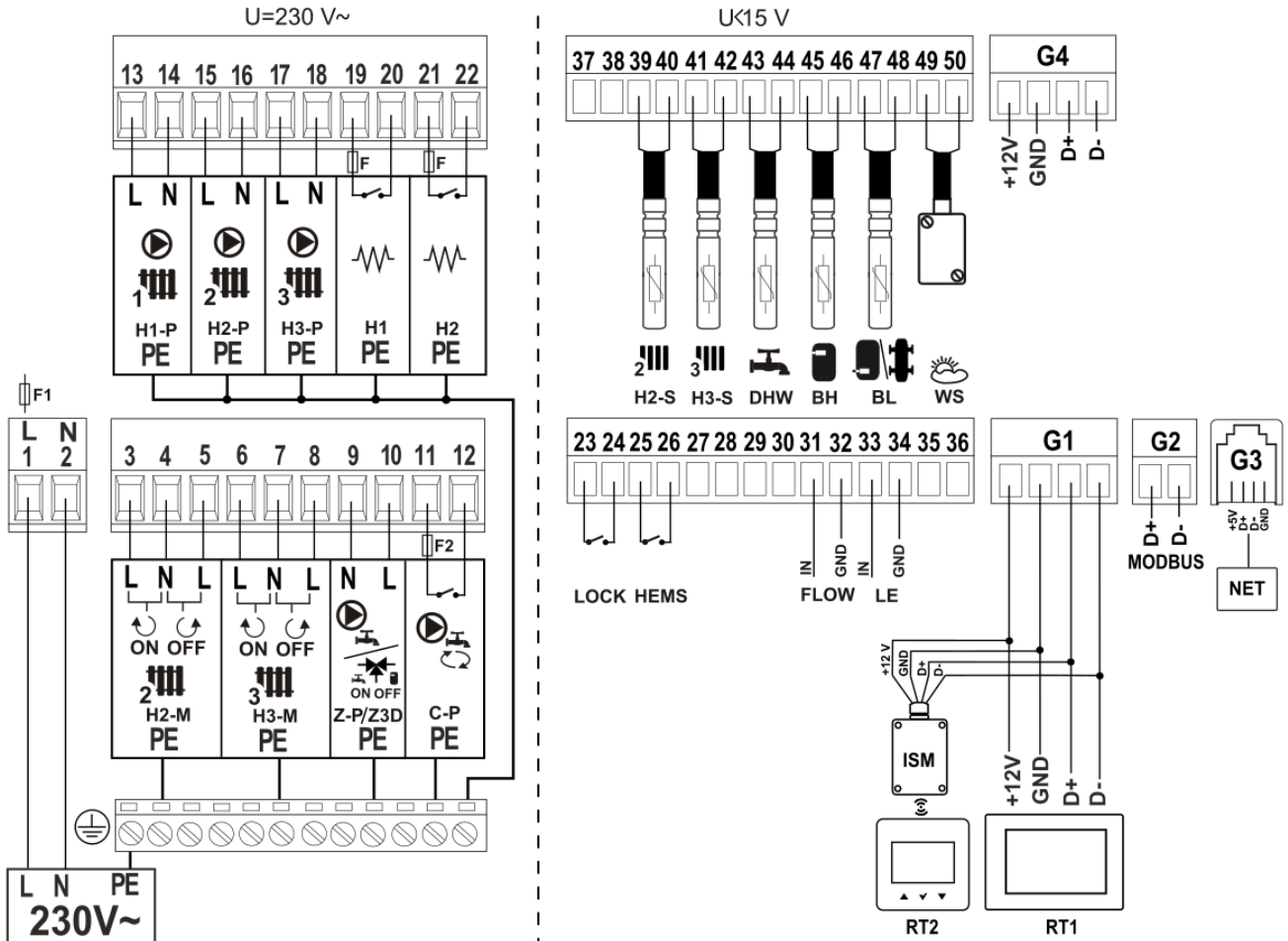


When the cables connection is done place the connectors back in place. Before screwing the controller terminal cover, arrange the wires to prevent damaging the insulation by cutting it with cover edges or screws securing the cover. The maximum length of the external tire insulation cannot exceed 50 mm. Connection cables should not have contact with surfaces temperature of which exceeds cables nominal operating temperature.



The connectors cover should always be screwed on to the controller's housing.

12.2 Electrical scheme



Scheme of electrical connections to the main controller.

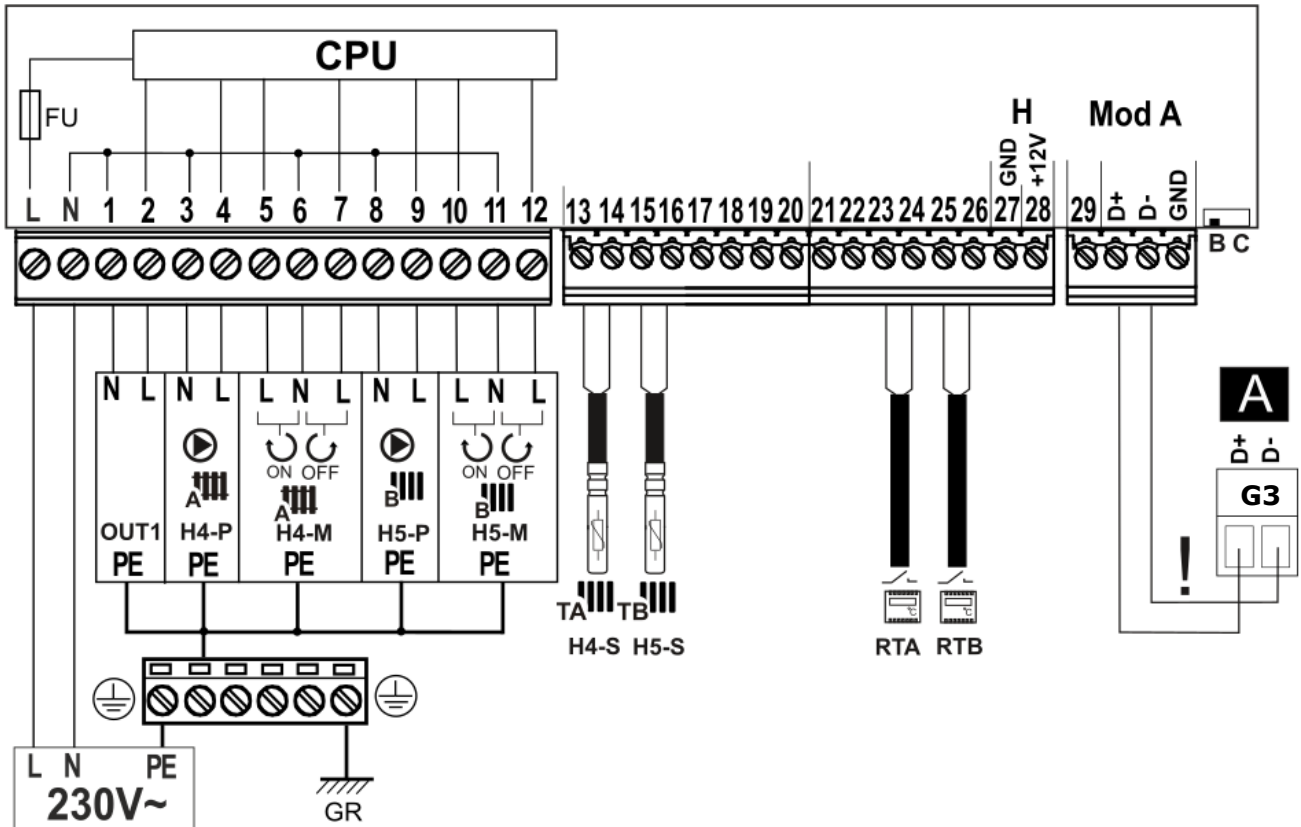


Terminals 1-22 are designed to connect devices supplied by the mains 230 VAC voltage. Terminals 23-50 are designed to work with low-voltage devices (< 15 VDC). Connection of the 230 VAC mains voltage to terminals 23-50 or to transmission terminals G1...G4 results in the regulator damage and poses a threat of electrocution.

L N PE - power supply 230 VAC, 50 Hz,
F1 - main fuse installed inside the controller, point 15.1,
H2-M - adjustable 2 circuit servo,
H3-M - adjustable 3 circuit servo,
Z3D - 3-way valve buffer/DHW tank,
Z-P - DHW pump,
C-P - DHW circulation pump - no-voltage contact and must be protected by external fuse **F2** - max. value 3.15 A, point 11.6,
H1-P - direct (non-adjustable) circuit water pump,
H2-P - adjustable 2 circuit water pump,
H3-P - adjustable 3 circuit water pump,
H1 - CH/buffer three-phase heater - no-voltage contact for controlling the external relay that turns on the heater L power supply, point 11.7. The contact must be protected by external fuse **F** - max. 3.15 A,
H2 - DHW tank three-phase heater - no-voltage contact for controlling the external relay that turns on the heater L power supply, point 11.7. The contact must be protected by external fuse **F** - max. 3.15 A,
H2-S - water temperature sensor of adjustable 2 circuit type CT10,

H3-S - water temperature sensor of adjustable 3 circuit type CT10,
DHW - DHW temperature sensor type CT10,
BH - upper buffer temperature sensor type CT10,
BL - bottom buffer temperature sensor/hydraulic crossover type CT10,
WS - weather temperature sensor type CT10-P,
LOCK - contact input - lock from the mobile application of the HEMS energy management system,
HEMS - contact input - control from the HEMS energy management system,
FLOW - flow meter,
LE - electric energy meter,
RT1 - control panel with room thermostat function,
RT2 - wireless room thermostat or wireless room temp. sensor (**ISM** radio module),
G3 - RS485 (**MODBUS**) communication with the heat pump and additional B/C module (extension with additional regulated circuits),
NET - web module (optional).

12.3 Electric scheme additional module



Scheme of electrical connections to the additional module (B/C module).

L N PE - power supply 230 VAC,

FU - fuse,

GR - grounding strip,

OUT1 - not connected,

H4-P - adjustable 4 circuit water pump,

H5-P - adjustable 5 circuit water pump,

H4-M - adjustable 4 circuit electrical servo,

H5-M - adjustable 5 circuit electrical servo,

H4-S - water temperature sensor of adjustable 4 circuit type CT4,

H5-S - water temperature sensor of adjustable 5 circuit type CT4,

RTA - standard room thermostat of adjustable 4 circuit type ON-OFF,

RTB - standard room thermostat of adjustable 5 circuit type ON-OFF,

A - main controller,

! - connect exclusively with two wires (do not connect with four wires, as it may lead to damage of the module and main controller).

Switch in position **B** - expansion module is used as module B (support for adjustable circuits 4 and 5), in position **C** - expansion module is used as module (support for adjustable circuits 6 and 7).

13 Service menu – structure



Entering the menu requires entering the service password. Default password [0000].



When configuring the driver for the first time, it is recommended to use the *System configuration assistant*.

Service settings
Installation control
System configuration assistant
Alarm list

Installation control
Manual control
Weather sensor
Hydraulic scheme
Main heat source
DHW settings
Circulation settings*
Buffer settings
Hydraulic crossover settings*
Circuit 1
Circuit 2-3
Circuit 4-7*
Heaters
Additional heat source
Flow meter
HEMS
Power consumption meter
Additional modules

Weather sensor
External temp. sensor support
Sensor source
SUMMER mode activation temperature
WINTER mode activation temperature

Main heat source
Cooling support
Heat pump lock
DHW temp. correction
Buffer temp. correction
Circuit temp. correction
Setpoint temp. correction – heating
Setpoint temp. correction – cooling*

Buffer settings
Buffer operation type
Buffer cooling **
Preset temperature
Preset temperature hysteresis
Heating installation start temp.
Cooling installation start temp.**
Ice water temperature**
Ice water temp. hysteresis**

Hydraulic crossover settings
Additional sensor
Preset temperature
Preset temperature hysteresis
Ice water temperature
Ice water temp. hysteresis

DHW settings
DHW support

Circulation settings
Circulation support
Circulation operation time
Circulation pause time
Start temperature
Pump start temperature

Circuit 1
Circuit support
Circuit name
Circuit type
Regulation method
Work mode
Heating circuit
Cooling circuit *
Fixed preset water temperature*
Fixed preset water temperature – cooling*
Decreasing fixed water temperature
Heating curve*
Thermostat
Coefficient room temperature*
Thermostat pump lock*

Circuit 2-7
Circuit support
Circuit name
Circuit type
Pump only
Circuit stop from preset temp.*
Regulation method
Work mode
Heating circuit
Cooling circuit *
Fixed preset water temperature*
Fixed preset water temperature – cooling*
Decreasing fixed water temperature
Heating curve*
Minimal temperature
Minimal temperature – cooling*
Maximum temperature
Maximum temperature – cooling*
Thermostat
Coefficient room temperature*
Thermostat pump lock*
Valve opening time

Proportional range
Integration time constant
Mixer dead zone

* item unavailable if no appropriate sensor is connected or another parameter setting has hidden this item.

Heaters
Heater type
Flow heater – step 1 delay*
Flow heater – step 2 delay*
Flow heater – step 3 delay*
Ch heater*
Ch heater delay*
Outside temp. to activate the heater*
Outside temp. force heater*

13.1 Manufacturer – structure

Manufacturer menu
Alarm erase
Restore default settings
HEMS availability
Delete the power meter

Additional heat source
AHS enable
Work in alarms
AHS enable outdoor temp.
AHS disable hysteresis
Ch set temp.
Ch hysteresis
AHS min. stop time

Flow meter
None/Pulse
Time detect*
Time alarm erase*
No flow detection threshold*
No flow detection hyst.*
Pulse rate
Pulse counting time*
Too often alarm*

HEMS
HEMS service
Input filtering time
DHW increase
Buffer increase - heating
buffer increase – cooling*
Buffer reduction – cooling*
Increase for 1, 2, 3 circuit - heating
Increase for 1, 2, 3 circuit thermostat - heating
Reduction for 1, 2, 3 circuit – cooling*
Reduction for 1, 2, 3 circuit thermostat - cooling*

Power consumption meter
Meter type
Falling edge
Rising edge
Number of pulses for 1 kWh
Resetting counters
Delete periodic counter
Delete average COP counters
Delete average SEER counters

14 Description of service parameters



During the first configuration of the controller has disabled support for all heating circuits, DHW tank, buffer, and circulation pump. Depending on the hydraulic system used, these circuits must be turned on.

Parameters	Description
Installation control	
System configuration assistant	<p>The assistant allows to configure the parameters of the controller when it is started for the first time, after connecting the CH system. The parameters to be set during configuration are displayed in the form of questions. Depending on the choice of the answer to the currently asked question, the subsequent questions about the parameters may be different.</p> <p>Note: If parameter configuration is interrupted, the next time enter the assistant, confirm the selection for the previous parameters from the beginning.</p> <p>Note: All parameters in the assistant are available in the service menu.</p>
<ul style="list-style-type: none"> Manual control 	<p>Menu enables turning on particular heating system elements separately and conducting operation correctness tests of selected device. Turning on or off particular selected device is done by pressing the symbol on the screen.</p> <p>Note: the controller does not check automation elements protection logics, so this menu should be used prudently and with awareness of starting outputs in order to avoid damaging the controller and devices connected to its terminals. Long and uncontrolled operation of devices e.g. pumps, may result in damage.</p>
<ul style="list-style-type: none"> Weather sensor 	<p>The menu contains settings for an weather external sensor.</p> <ul style="list-style-type: none"> <i>External temp. sensor support</i> - enabling or disabling support for the external (weather) temperature sensor. <i>Sensor source</i> - selection of external temperature sensor operation depending on its connection: <i>ecoMULTI</i>, <i>Heat pump</i>. <i>SUMMER mode activation temperature</i> - weather temperature at which summer mode is activated. <i>WINTER mode activation temperature</i> - weather temperature at which summer mode is deactivated.
<ul style="list-style-type: none"> Hydraulic scheme 	<p>Selection of a supported hydraulic system scheme for the heat pump. Options: <i>Directly</i>, <i>Buffer</i>, <i>Hydraulic crossover</i>.</p>
<ul style="list-style-type: none"> Main heat source 	<p>The menu contains settings related to the heat pump.</p> <ul style="list-style-type: none"> <i>Cooling support</i> - activating the circuit cooling function. <i>Heat pump lock</i> - after exceeding the preset temperature in the room, the heat pump is blocked. <i>DHW temp. correction</i> - correction (increase) of the preset DHW temperature in heating mode. <i>Buffer temp. correction</i> – correction (increase) of the preset buffer temperature in heating mode. <i>Circuit temp. correction</i> – correction (increase) of the preset circuit temperature in heating mode. <i>Setpoint temp. correction – heating</i> - correction (increase) of the preset heat pump temperature in heating mode. <i>Setpoint temp. correction – cooling</i> - correction (increase) of the preset heat pump temperature in cooling mode.
<ul style="list-style-type: none"> Buffer settings 	<p>The menu contains settings for the heat buffer.</p> <ul style="list-style-type: none"> <i>Buffer operation type</i> - selection of the number of sensors with which the buffer will work. To choose from: <i>One sensor</i>, <i>Two sensors</i>. <i>Buffer cooling</i> - enabling the cooling function of the circuit by generating ice water in the buffer. <i>Preset temperature</i> - preset buffer temperature value. <i>Preset temperature hysteresis</i> - if the current temperature of the buffer drops to the preset temperature minus the hysteresis in this parameter, the buffer will be heated. <i>Heating installation start temp.</i> - the circuit pumps will be switched on when the buffer temperature rises above this parameter. <i>Cooling installation start temp.</i> – the circuit pumps will be switched on when the buffer temperature drops below this parameter. <i>Heating installation stop hysteresis</i> – the circulation pumps will be turned off if the buffer temperature drops below <i>Heating installation start temp</i> by the hysteresis value in this parameter. <i>Ice water temperature</i> – preset ice water temperature. Parameter available only with circuit cooling function on. <i>Ice water temp. hysteresis</i> - if the ice water temperature exceeds the <i>Ice water temperature</i> by the <i>Ice water temp. hysteresis</i> value, the heat pump will stop generating ice water. Parameter available only with circuit cooling function on.
<ul style="list-style-type: none"> Hydraulic crossover settings 	<p>Settings related to the hydraulic crossover. Settings visible for the setting <i>Hydraulic scheme</i> to <i>Hydraulic crossover</i>.</p>

	<ul style="list-style-type: none"> • <i>Additional temp. sensor</i> – support for an additional hydraulic crossover temperature sensor connected to the controller (lower buffer temperature sensor). If the operation is switched off, the temperature value is measured on the return. • <i>Preset temperature</i> – preset temperature of water in the circuit in heating mode. • <i>Preset temperature hysteresis</i> – if the actual clutch temperature drops to the value of the preset water temperature minus the hysteresis in this parameter, the circuit will be heated. • <i>Ice water temperature</i> – preset temperature of ice water in the circuit in cooling mode. • <i>Ice water temp. hysteresis</i> – if the actual clutch temperature drops to the preset ice water temperature minus the hysteresis in this parameter, the circulation will be cooled.
• DHW settings	<p>The menu contains settings related to the support of the DHW tank.</p> <ul style="list-style-type: none"> • <i>DHW support</i> – enable/disable DHW tank support.
• Circulation settings	<p>The menu contains parameters related to the operation of the circulation pump.</p> <ul style="list-style-type: none"> • <i>Circulation support</i> - turn on/off circulation support. • <i>Circulation operation time</i> - the DHW circulation pump operation time. It determines the working time after a break in the circulation pump operation. The DHW circulation pump operates periodically. • <i>Circulation pause time</i> - the DHW circulation pump pause time. Defines the time interval between activations of the circulation pump. The DHW circulation pump operates periodically. • <i>Start from temperature</i> - activation or deactivation of the circulation pump operation depending on the DHW tank temperature. • <i>Pump start temperature</i> - in order to save energy, the circulation pump will be turned off when the temperature of the DHW tank is lower than the <i>Pump start temp.</i>
• Circuit 1	<p>Menu related to operating a non-adjustable circuit. The non-adjustable circuit 1 preset temperature will be automatically increased in order to guarantee heat for 2 and 3 adjustable circuits.</p> <ul style="list-style-type: none"> • <i>Circuit support</i> - turn on or off circuit support. • <i>Circuit name</i> - name of the circuit set by user. • <i>Heating circuit</i> - switching on the heating function of the circuit. • <i>Cooling circuit</i> - switching on the cooling function of the circuit • <i>Fixed preset water temperature</i> - when <i>Regulation method</i> = <i>Fixed</i> heat pump is disabled when <i>Fixed preset water temperature</i> is reached. Parameter is not available if <i>Regulation method</i> = <i>Weather</i>. • <i>Fixed preset water temperature - cooling</i> - when <i>Regulation method</i> = <i>Fixed</i> and the cooling function is switching on, heat pump is disabled when <i>Fixed preset water temperature</i> is reached. Parameter is not available if <i>Regulation method</i> = <i>Weather</i>. • <i>Decreasing fixed water temperature</i> - when <i>Regulation method</i> = <i>Fixed</i>, then a constant set temperature of water in the circuit is decreased for work modes: <i>Day</i>, <i>Night</i>, <i>Auto</i>. • <i>Heating curve</i> - shows heat characteristic of building, the higher curve the higher water temperature in heat circuit. The parameter applies when <i>Regulation method</i> = <i>Weather</i>. • <i>Thermostat</i> - activation or deactivation of the room thermostat influence on the circuit operation and selecting the room thermostat for circuit: <i>Room panel</i>, <i>Wireless thermostat</i>, <i>Wired thermostat</i>. • <i>Coefficient room temperature</i> – with thermostat support enabled automatic correction of room temperature is carried out in accordance with the following formula: Preset temperature with correction = Preset temperature of the circuit + (Preset temperature of the thermostat assigned to the circuit minus Current temperature of the thermostat assigned to the circuit) x <i>Room temperature correction</i>. By default, the Room temperature correction value is 4.0, and the value range is 0...10. It is necessary to find appropriate value of the <i>Room temperature correction</i>. The higher the coefficient, the greater the correction of preset circuit temperature. If the setting is "0", the preset circuit temperature is not corrected. Note: setting a value of the room temperature coefficient too high may cause cyclical fluctuations of the room temperature.
➤ Circuit type	<p>Selecting the type of a non-adjustable circuit. To choose are:</p> <ul style="list-style-type: none"> • <i>Heater</i> – the circuit is on and loading radiator heating. • <i>Fan coil</i> - the circuit can operate in cooling or heating mode for the circuit. <p>When selecting <i>Fan coil</i> and setting the additional operating mode to:</p> <ul style="list-style-type: none"> - <i>Summer</i> - the circuit performs the cooling function. - <i>Winter</i> - the circuit performs the heating function. - <i>Auto</i> - the circuit performs the heating or cooling function depending on the outside temperature. <p>Note: selecting any circuit as <i>Fan coil</i>, with the active additional Summer mode, will always result in the other circuit not being heated. Cooling has a higher priority.</p>
➤ Regulation method	<p>Selecting the control method for non-adjustable circuit.</p> <ul style="list-style-type: none"> • <i>Fixed</i> – constant set temperature of water in the non-adjustable circuit is maintained. • <i>Weather</i> – water temperature is relate to outside temperature sensor. The parameter is invisible when no outside temperature sensor is connected.
➤ Work mode	<p>Selecting the circuit work mode.</p> <ul style="list-style-type: none"> • <i>OFF</i> – the circuit is off. • <i>Day</i> – setting higher preset circuit temperature. • <i>Night</i> – setting lower preset circuit temperature. • <i>Schedule</i> – <i>Day</i> or <i>Night</i> mode is set depending on the time schedule.

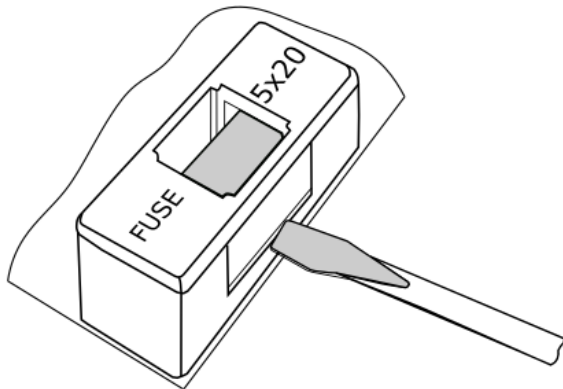
<ul style="list-style-type: none"> ➤ Thermostat blockade pump 	<p>The circuit pump is blocked when the room thermostat is active for the circuit. Available selection:</p> <ul style="list-style-type: none"> • <i>OFF</i> – when the preset temperature in the room is exceeded, the circuit pump is not blocked. • <i>ON</i> – when the preset room temperature is exceeded, the circuit pump is blocked.
<ul style="list-style-type: none"> • Circuit 2 	<p>Menu related to operating an adjustable circuit. Note: description is the same as for circuit 1 – additionally:</p> <ul style="list-style-type: none"> • <i>Cooling circuit</i> - switching on the cooling function of the circuit. • <i>Minimal temperature</i> - minimum preset water temperature in the adjustable circuit. • <i>Minimal temperature – cooling</i> - minimum preset water temperature in the adjustable circuit during circuit cooling. • <i>Maximum temperature</i> - maximum preset water temperature in the adjustable circuit. If set the e.g. <i>Maximum temperature</i> > 55°C and <i>Circuit type</i> = <i>Floor heating</i>, the controller will take 55°C as a maximum value in order to avoid the risk of scalding. • <i>Maximum temperature - cooling</i> - maximum preset water temperature in the adjustable circuit during circuit cooling. • <i>Valve opening time</i> – the time during which the mixing valve will open (or close) from one end position to the other. • <i>Proportional range</i> – it is a percentage of the full range of changes in the input value needed to cause a full change in the output value of the controller. • <i>Integral time constant</i> - time taken for the output of the PI controller (control signal) to reach a value equal to twice the value of the input signal resulting from the proportional action, assuming a step input signal. • <i>Mixer dead zone</i> - this is the so-called "dead zone", in which after the current temperature of the circuit drops in relation to the set temperature by the value of this parameter, the circuit will not be switched on again.
<ul style="list-style-type: none"> • Circuit type 	<p>Selecting the type of a non-adjustable circuit. To choose are:</p> <ul style="list-style-type: none"> • <i>Heater</i> – the circuit is on and loading radiator heating. • <i>Floor heating</i> – the circuit is on and loading floor heating. For this setting, the controller ensures that the limit temperature in the floor circuit is not exceeded. High temperatures in the floor circuit can damage the floor structure and burn users. • <i>Fan coil</i> - the circuit can operate in cooling or heating mode for the circuit. <p>When selecting <i>Fan coil</i> and setting the additional operating mode to:</p> <ul style="list-style-type: none"> - <i>Summer</i> - the circuit performs the cooling function. - <i>Winter</i> - the circuit performs the heating function. - <i>Auto</i> - the circuit performs the heating or cooling function depending on the outside temperature. <p>Note: selecting any circuit as <i>Fan coil</i>, with the active additional Summer mode, will always result in the other circuit not being heated. Cooling has a higher priority.</p>
<ul style="list-style-type: none"> ➤ Pump only 	<ul style="list-style-type: none"> • <i>No</i> – the circuit pump is not blocked when the preset room temperature is exceeded. • <i>Yes</i> – <i>Yes</i> – after exceeding the preset room temperature set in the <i>Circuit stop from preset temp.</i> parameter, the circuit pump is blocked and the mixer servo stops.
<ul style="list-style-type: none"> • Circuit 3-7 	<p>Menu related to the operation of an adjustable circuit. Settings for the regulated Circuit 3-7 are analogous to those for Circuit 2.</p>
<ul style="list-style-type: none"> • Heaters 	<p>Menu related to the operation of the Built-in heater and flow heater which support the heating of the DHW tank, buffer and circuits.</p> <ul style="list-style-type: none"> • <i>Heater type</i> - selection of heater type: <i>Built-in heaters</i>, <i>Flow heater</i>. • <i>Flow heater – step 1 delay</i> - delay time for switching on the 1st step of the flow heater after turning on the heat pump, if the heat pump is unable to heat the circuits at that time. • <i>Flow heater – step 2 delay</i> - delay time for switching on the 2nd step of the flow heater after turning on the 1st step of the heater in order to continue heating the circuits. • <i>Flow heater – step 3 delay</i> - delay time for switching on the 3rd step of the flow heater after turning on the 1st step of the heater in order to continue heating the circuits. • <i>Ch heater</i> - enabling or disabling the built-in heaters support. Parameter available when choosing a <i>Built-in heaters</i>. • <i>Ch heater delay</i> - delay time for switching on the built-in heaters after switching on the heat pump, if the heat pump is not able to heat the DHW/buffer/circuits during this time. • <i>Outside temp. to activate heater</i> – enabling or disabling of the built-in heaters/flow heater operation based on the outside temperature value. • <i>Outside temp. to activate heater</i> – outside (external) temperature value beyond which the built-in heaters/flow heater will be activated. • <i>Outside temp. force heater</i> – enabling or disabling of the parameter. The outside (external) temperature value at which the built-in heaters/flow heater will be permanently switched on during heat pump operation.
<ul style="list-style-type: none"> • Additional heat source 	<p>Enabling or disabling the operation of an additional heat source (AHS) to support heating of the circuits.</p> <ul style="list-style-type: none"> • <i>AHS enable</i> – enabling or disabling the operation of the additional heat source. • <i>Work in alarms</i> – enabling or disabling the AHS heating during heat pump alarms. • <i>AHS enable outdoor temp.</i> – value of the outdoor AHS heating activation temperature. • <i>AHS disable hysteresis</i> – the hysteresis of disable the AHS heating for the outdoor temperature value. • <i>Ch set temp.</i> – value of the preset Ch heater temperature.

	<ul style="list-style-type: none"> • <i>Ch hysteresis</i> – the hysteresis of re-activating the Ch heater in heating for the <i>Ch set temp.</i> value. • <i>AHS min. stop time</i> - minimum AHS stop time in case there is a new heat demand. In other words: if heating is finished and after some time there is another demand for heating the DHW tank and the AHS blocking time has not ended, then the AHS will not be switched on again - the AHS blocking time must be counted.
<ul style="list-style-type: none"> • Flow meter 	<p>Menu related to the flow meter operation.</p> <ul style="list-style-type: none"> • <i>Time detect</i> – time after which the no-flow alarm will be reported. • <i>Time alarm erase</i> – time after which the no-flow alarm will be reset. The controller will not report an alarm. • <i>No flow detection threshold</i> – flow value below which the alarm "Flow error" will be reported. • <i>No flow detection hyst.</i> - if the actual flow rises above the value of <i>No flow detection threshold</i> plus <i>No flow detection hysteresis</i>, the "Flow error" alarm will be turned off. • <i>Pulse rate</i> – parameter defined by the manufacturer of the flowmeter, used to calculate the actual flow. • <i>Pulse counting time</i> – time of counting pulses by the flow meter depending on the flow meter used. • <i>Too often alarm</i> - too frequent no-flow alarm detection threshold. It allows to limit the frequent reporting of the no-flow alarm.
<ul style="list-style-type: none"> • HEMS 	<p>Menu related to HEMS system operation.</p> <ul style="list-style-type: none"> • <i>HEMS support</i> - enabling or disabling the HEMS system. • <i>Input filtering time</i> – filtering time of the signal coming from the HEMS system. • <i>DHW increase</i>– increasing the preset DHW temperature by the value read from the HEMS system for the <i>Signal filtering time</i> parameter. • <i>Buffer increase – heating</i> – increasing the preset buffer temperature by the value read from the HEMS system for the <i>Signal filtering time</i> parameter in heating mode. • <i>Buffer increase – cooling</i> – increasing the preset buffer temperature by the value read from the HEMS system for the <i>Signal filtering time</i> parameter in cooling mode. • <i>Buffer reduction – cooling</i> – reduction the buffer temperature in cooling mode after information from HEMS. • <i>Increase for 1, 2, 3 circuit – heating</i> – increasing the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system for the <i>Signal filtering time</i> parameter in heating mode. • <i>Increase for 1, 2, 3 circuit thermostat - heating</i> - increasing the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system and the value from the thermostat for the <i>Signal filtering time</i> parameter in heating mode. • <i>Reduction for 1, 2, 3 circuit – cooling</i> – reduction the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system for the <i>Signal filtering time</i> parameter in cooling mode. • <i>Reduction for 1, 2, 3 circuit thermostat - cooling</i> - reduction the preset temperature of circuits 1, 2, 3 by the value read from the HEMS system and the value from the thermostat for the <i>Signal filtering time</i> parameter in cooling mode
<ul style="list-style-type: none"> • Power consumption meter 	<p>Electricity power consumption meter setting.</p> <ul style="list-style-type: none"> • <i>Meter type</i> - selection of the current measurement method depending on the type of connected meter: <i>None, Pulse</i>. • <i>Falling edge</i> – counting pulses on the falling edge of the signal. • <i>Rising edge</i> – counting pulses on the rising edge of the signal. • <i>Number of pulses for 1 kWh</i> - setting the number of pulses as per 1kWh of electricity consumed for a pulse meter. • <i>Resetting counters</i> – reset of counters for SCOP and EER. • <i>Delete periodic counter</i> – resetting the pulse counter that counts the periodic consumed electric energy. • <i>Delete average COP counters</i> – resetting the counters for the electricity consumption efficiency coefficient in heating mode. • <i>Delete average SEER counters</i> – reset the counters for the electricity consumption efficiency ratio in cooling mode.
<ul style="list-style-type: none"> • Additional modules 	Enable or disable support for the additional extension (B/C) module.
Alarm list	List of alarms reported by the controller.
Alarm erase	Deleting the list of controller alarms.
Restore default settings	Erases all changes made to the manufacturer's parameters in the control panel of the controller or controller module and restores the factory settings.
HEMS availability	Enabling or disabling in the service parameters of HEMS support.

15 Replacing components

15.1 Mains fuse replacement

The fuse is located under the controller cover, next to the terminals at high-voltage side. Use 250 VAC fuses, anti-surge, made of porcelain: 5 mm x 20 mm. Output circuit fuses should be selected depending on the load. Standard current for the fuse is 6.3 A. A smaller fuse is allowed if the total load on the circuits is lower. A spare fuse is located under the cover of the controller housing, at the low-voltage terminals.



Fuse replacement.

In order to remove fuse lift fuse holder with flat-blade screwdriver and pull out the fuse.

15.2 Control panel replacement

When replacing the control panel make sure that its software is compatible with software in controller's module. The compatibility is kept if the first number of software in the control panel and module is the same.



Incompatibility between the software in panel and controller may cause unexpected errors. The Manufacturer is not responsible for malfunctions caused as a result of using incompatible software by the end-user.

15.3 Executive module replacement

Requirements are analogous to the control panel.

16 Firmware update

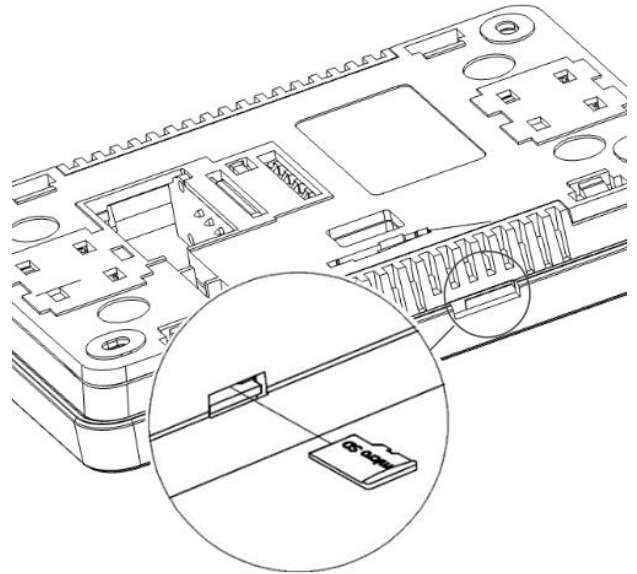
Firmware update can be performed using only microSD HC memory card (max. 32 GB, FAT32 file format). In order to make firmware

update the controller's power supply must be disconnected.



Before starting firmware update all peripheral devices operating with the central must be disconnected from electric power supply.

Insert memory card into the indicated socket.



Control panel memory card socket location.

The memory card should contain new firmware in *.pfc format for the panel and *.pfi format for the controller module. New firmware should be placed directly on memory card with no folders or sub-folders. Next, connect the electric power supply to the controller, then enter into user menu and install new firmware first in the controller module, then in the control panel and other devices connected to the controller module.



After updating the software, it is necessary to restore the controller's service settings and check them. In case of problems, it is recommended to restore the default/factory settings.



The incompatibility of the controller software and the control panel software may cause unforeseen errors. The manufacturer is not responsible for failures resulting from the use of incompatible software's by the end customer.

17 Additional functions of the controller

17.1 Power stoppage

In case of power stoppage the controller returns to operation mode in which it was before stoppage.


17.2 Prevention cooling

The function tries to cool down the main heat source before switching the regulator into the alarm state of overheat of the heat source.

17.3 Pump anti standstill function

The controller performs the function of protecting pump from anti standstill. It involves the periodic switching (which 167 h for a few seconds). This protects the pump against immobilization due to scaling. Therefore, during a break in the use of the controller, the controller power supply should be connected.

18 Alarms

The controller reports alarms on the main screen with the  symbol. Pressing the symbol will display the list of active alarms.

Alarms from controller:

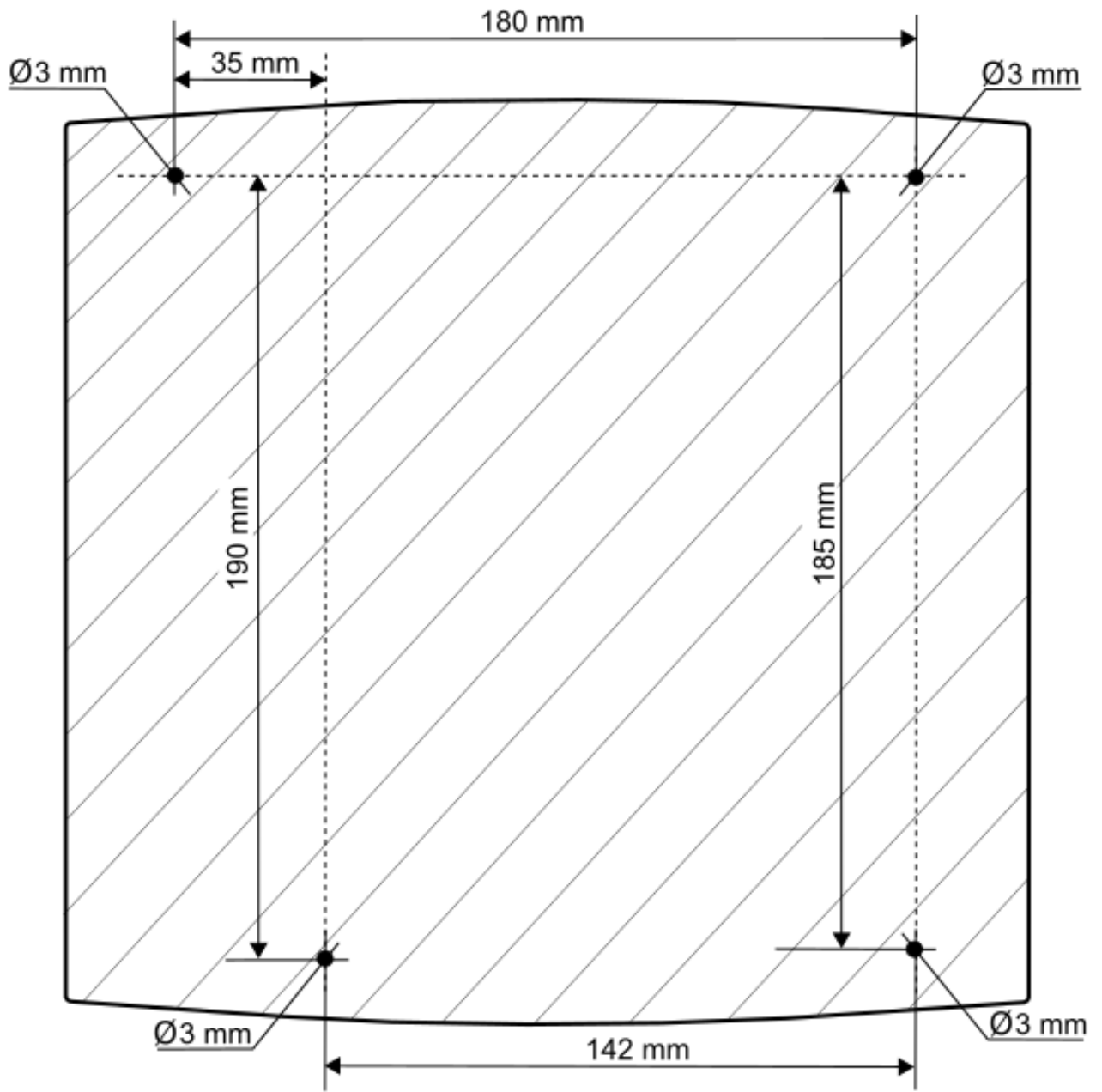
- Outside temperature sensor error
- No communication with the controller
- No compatibility of programs
- Panel temperature sensor error

- DHW sensor error
- Upper buffer temperature sensor error
- Lower buffer temperature sensor error
- Circuit 2 temperature sensor error
- Circuit 3 temperature sensor error
- Anti-freeze active
- Source sensor error
- No communication with eSTER thermostat
- No communication with thermostat circuit 1, 2, 3
- Alarm from digital input
- No flow detected
- Too often no flow detected
- No communication with heat pump module

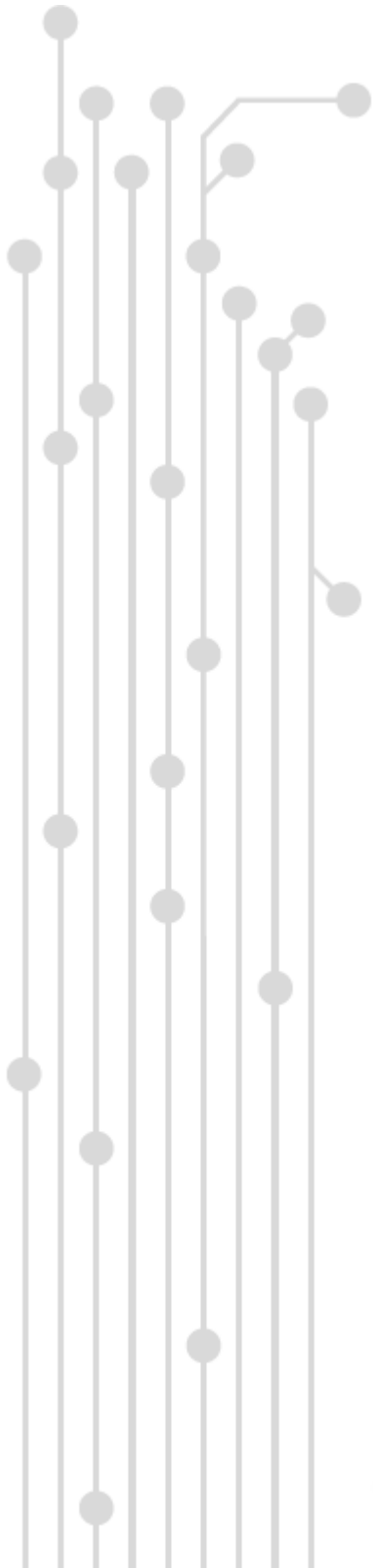
Changes record:



The manufacturer reserves a right to make improvements and modifications of the products.



Installing the module.



GROOTHANDEL VOOR DUURZAME ENERGIETECHNIEK

IJsseldijk 260
2922 BL Krimpen aan den IJssel, Holand
info@aretec.nl
<https://aretec.nl>



Manufacturer:
PLUM Sp. z o. o.
ul. Wspólna 19, Ignatki
16-001 Kleosin, Poland
plum@plum.pl
www.plum.pl
National Waste Database No. 000009381