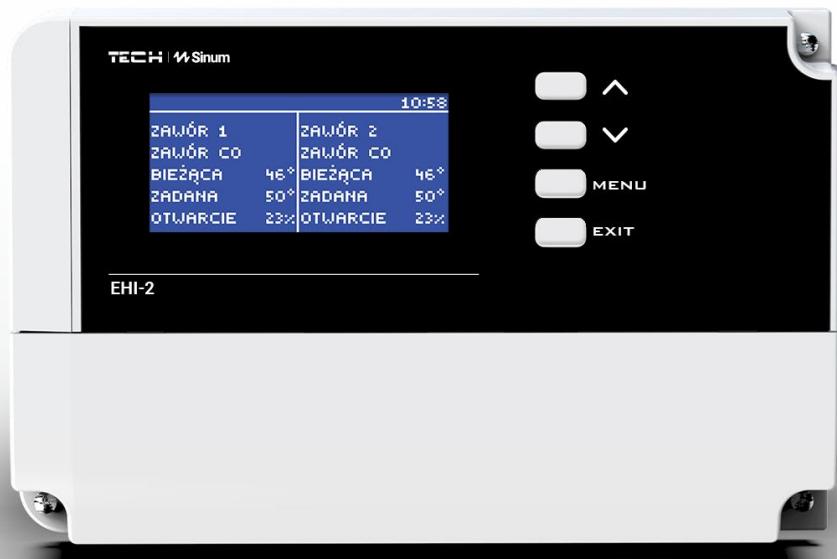


# USER MANUAL

## EHI-2

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*Images and diagrams contained in the document serve illustrative purposes only.*

*The manufacturer reserves the right to introduce changes.*

## 1. SAFETY

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Before operating the device, please read the following instructions carefully. Failure to observe instructions may cause damage to the device or even personal injury. Please store this manual for future reference.

To avoid functional errors or accident, make sure that all persons operating the device are thoroughly familiarized with its operation and safety functions. Please retain the operating manual for future reference and make sure that it stays with the device if it is transferred or sold, so that anyone using it will have sufficient information concerning the operation and safety of the device. For the safety of life and property, take precautions in accordance with the user manual, as the manufacturer is not responsible for damage caused by negligence.



### WARNING

- Live electrical equipment! Before carrying out any operations related to the power supply (connecting cables, installing the device, etc.), make sure that the controller is not connected to the mains!
- Installation should be carried out only by a person holding appropriate electrical qualifications!
- Before starting the controller, the ground resistance of electric motors and the insulation resistance of electric wires should be measured.
- The controller is not intended to be operated by children!



### NOTE

- Atmospheric discharges can damage the controller, in the event of a thunderstorm, the controller should be switched off by unplugging the mains plug.
- The controller may not be used contrary to its intended purpose.
- Before and during the heating season, check the technical condition of the cables. Also check the installation of the controller, clear away dust and other soiling.

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There could be changes introduced in the products listed in the present manual following its last revision. The manufacturer reserves the right to introduce design changes. Illustrations may contain optional equipment. Printing technology may affect differences in the presented colours.

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Care for the natural environment is of paramount importance to us. The awareness that we manufacture electronic devices for the home consumer is linked with our obligation to dispose the used electronic parts and devices in a way that is safe for the environment. Therefore, the company requested and received a registration number issued by the Polish Chief Inspector for Environmental Protection. The symbol of the crossed wheeled bin on the product indicates that the product must not be disposed of as municipal waste. By segregating waste for recycling, we help protect the environment. It remains the user's responsibility to hand over used equipment to a designated collection point for recycling electrical and electronic equipment waste.

## 2. DEVICE DESCRIPTION

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The **EHI-2** controller is a module for controlling the operation of two built-in valves and two additional valves. Through its sophisticated software, the controller can perform a number of functions:

- Smooth 3- or 4-way mixing valve control
- Controlling the operation of an auxiliary pump with the possibility of choosing the type of device (CH pump, DHW pump, circulation pump, floor pump)
- Controlling the operation of voltage-free contact with the possibility of choosing the type of device (CH pump, DHW pump, circulation pump, floor pump)
- Valve weather control
- Weekly schedule control
- Cooperation with a binary room regulator
- Return temperature protection
- Software Update via USB.

In addition, it provides 2 built-in valve control modules, and 2 additional modules.

## 3. HOW TO INSTALL

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The controller should only be installed by a properly qualified person!



### WARNING

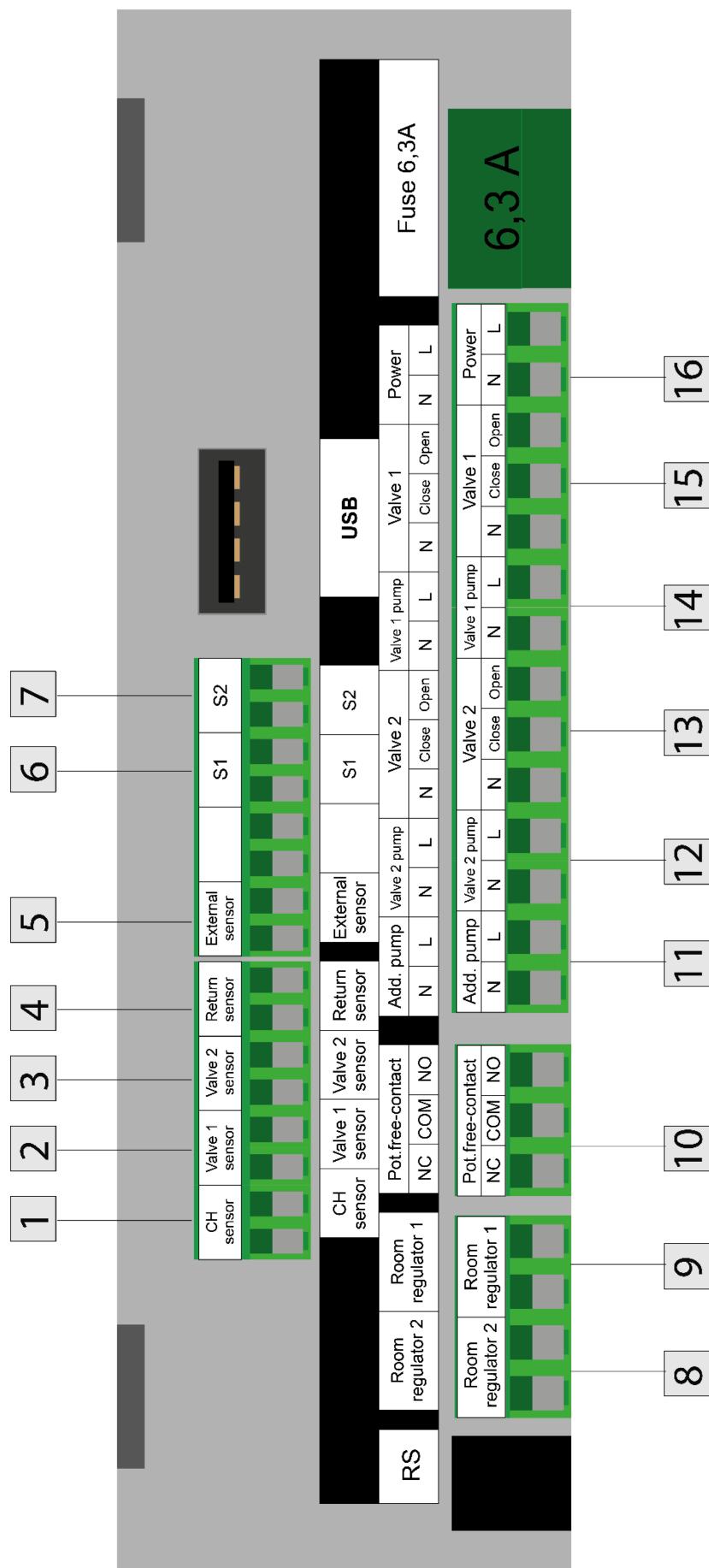
Danger of injury or death due to electric shock on live connections. Before working on the controller, disconnect its power supply and secure it against accidental switching on.

#### NOTE

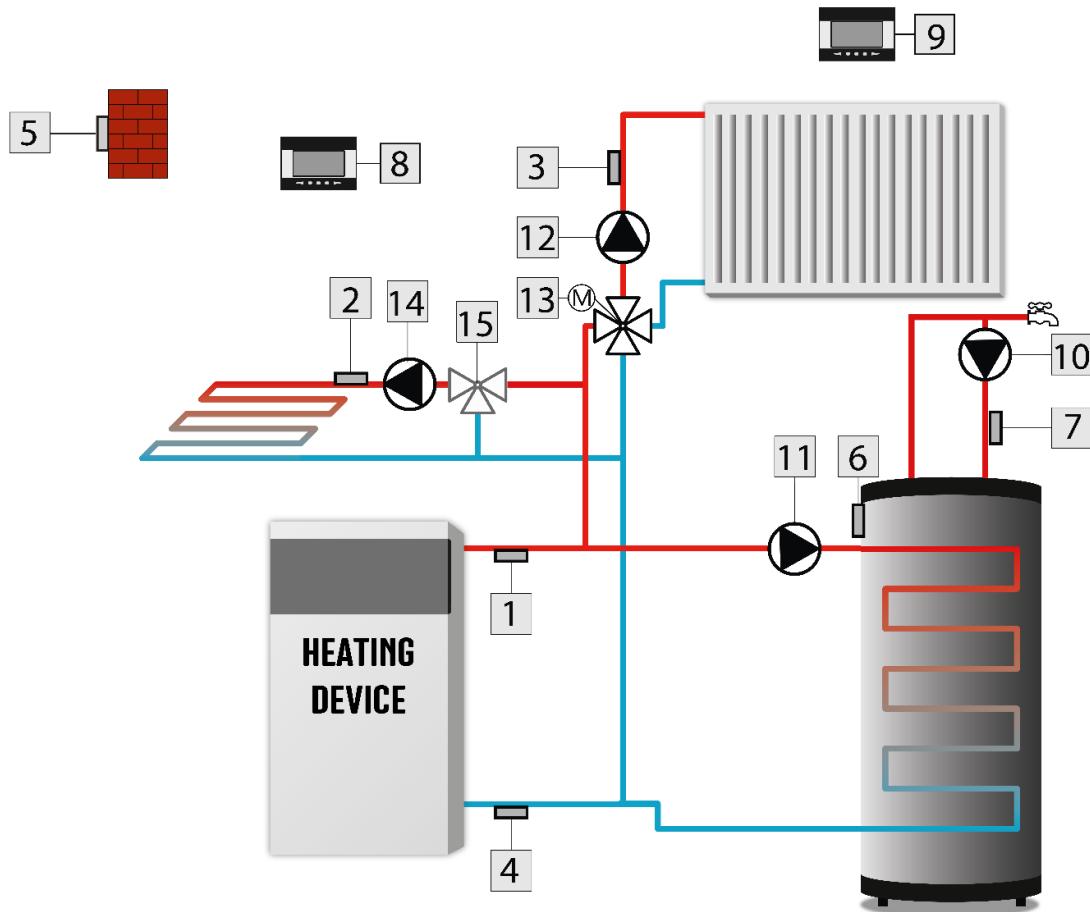
Never connect the pump controlling outputs directly to the systems pumps if the manufacturer requires the use of external main switch, a power supply fuse or additional deformed current resistant residual current circuit breaker!

To prevent damage to the device, use an additional safety system between the controller and the pump. The manufacturer recommends the ZP-01 pump adapter, which must be ordered separately.

Sample installation diagrams:

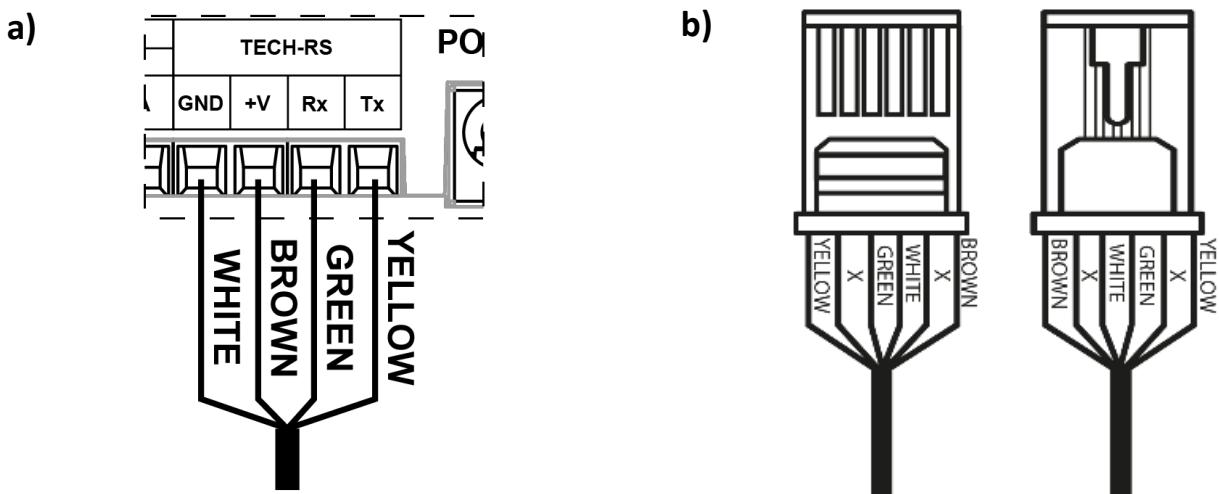


1. CH sensor	7. S2 – auxiliary sensor 2	13. Valve 2
2. Valve 1 sensor	8. Room regulator 2	14. Valve 1 pump
3. Valve 2 sensor	9. Room regulator 1	15. Valve 1
4. Return sensor	10. Voltage-free contact	16. Power supply
5. External sensor	11. Additional pump	
6. S1 – auxiliary sensor 1	12. Valve 2 pump	



## Connection to Sinum Central device

It is possible to connect the EHI-2 controller to the Sinum Central device. To use this option, connect the EHI-2 module and the Sinum Central device directly to each other using an RS cable. The Sinum Central will automatically detect the EHI-2 controller and display it in the **Tech RS devices** tab in the Sinum Central device application.



## 4. CONTROLLER OPERATION

The device is operated via the use of four buttons.

⇒ **EXIT** button - pressing it from the main screen position will bring up the screen view selection window showing:

- panel view
- valve 1, 2
- auxiliary pump
- voltage-free contact
- sensors.

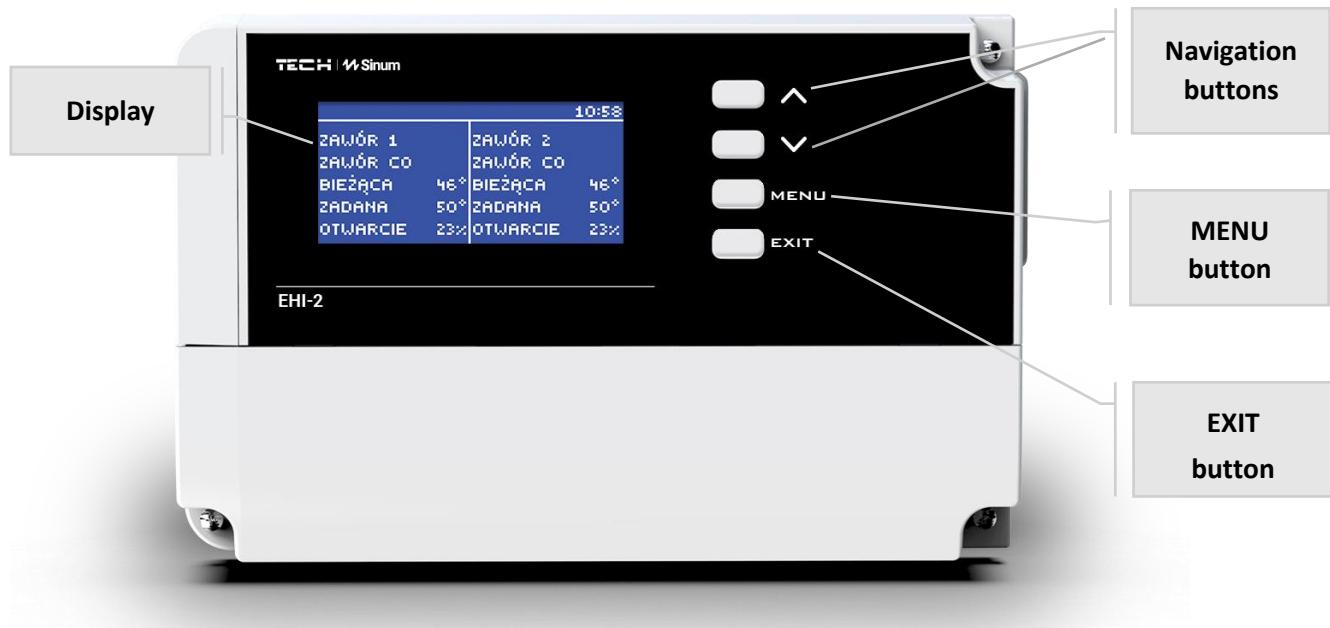
After selecting a specific screen view, all values from connected devices and setpoints are displayed, as well as information about the setting of the auxiliary pump or voltage-free contact, external temperature, return, boiler, percentage of opening (deflection) of the selected valve, etc.

After entering the controller menu, this button is used to exit the menu and cancel the settings.

⇒ **MENU** button - to enter the controller menu, confirm the settings.

⇒ **ARROW DOWN** button - from the main screen position; pressing this button will move the view of the left main screen. After entering the controller menu, it enables users to navigate the menu functions and reduce the set values.

⇒ **ARROW UP** button - from the home screen position; its employment allows users to move the view of the right main screen. After entering the controller menu, it enables users to navigate the menu functions and increase the set values.



### 4.1 OPERATING PRINCIPLE

The controller is designed to operate 2 built-in and 2 additional valves. It also controls the operation of the auxiliary pump and the voltage-free contact.

This controller is equipped with a weather control function and a weekly schedule setter, and is compatible with a room regulator. An additional advantage of the device is that it provides protection of the system's return temperature against excessively low boiler return water temperature.

## 4.2 CONTROLLER FUNCTIONS – MAIN MENU

### 4.2.1 Central heating circuits

The device allows independent control of two heating circuits according to the following operating modes:

#### 4.2.1.1 Operation modes

##### ➤ Mode

- **Boiler priority** – enables operation of the DHW pump. After reaching the preset temperature in the boiler, the DHW pump switches off and the CH pump is switched on. The next switch to the operation of the DHW pump occurs after the preset temperature on the boiler drops by the hysteresis value.
- **Parallel pumps** – allows simultaneous operation of CH and DHW pumps and circulation valves that maintain set temperatures.
- **House heating** – enables operation of the CH pump only, switching on above the pump switch-on threshold (default value 35°C). The pump switches off below the switch-on temperature threshold less the hysteresis.
- **Summer mode** – CH valve is closed, the DHW circuit alone is active.

##### ➤ Auto summer mode (Off / On) – the function automatically switches from active operation mode, to summer mode - depending on the average outdoor temperature.

#### 4.2.1.2 Central heating circuit 1,2

The function allows users to switch on/off the respective circuit and set the set temperature for each circuit.

#### 4.2.1.3 Additional circuit 1/2

The function allows users to switch on/off the respective circuit and set the set temperature for each circuit. The function is available only when an auxiliary valve is incorporated in the system.

#### 4.2.1.4 Pumps anti-stop

Switching on/off – the function protects the pumps against limescale deposits. It starts up the pumps automatically for 5 minutes every 10 days when they have not been used for a long time.

### 4.2.2 Manual mode

This selection enables manual activation of pumps, valves and auxiliary contact.

### 4.2.3 Fitters menu

The **EHI-2** controller has 2 built-in modules controlling mixing valves and has the option to register 2 more. A number of parameters are used to operate the valves, which allows them to be adjusted to individual needs. When the selected valve is switched on, an additional menu with valve parameters will appear on the controller display screen.

#### 4.2.3.1 Built-in valve 1/2

When additional valves are incorporated in the system, the setting of individual parameters is possible only after the valve is registered by way of entering the module number located on the valve body.

 <b>Built-in valve 1,2 / Additional valve 1,2</b>	Pump only
	Valve type
	CH valve
	Floor valve
	Return protection
	Cooling
	Opening time
	Room regulator
	Room regulator
	Control without room regulator
	Standard regulator of valve
	Room regulator function
	Room regulator temperature lower
	Closing
	Room regulator temperature lower
	Pump deactivation after heating
	Valve pump
	Pump operation modes
	Always ON
	Always OFF
	Above the threshold
	Pump switch on temperature
	Pumps anti-stop
	Closing below temperature threshold
	Weather control
	Heating curve
	Mixing valve settings

		Temperature monitoring
		Opening direction
		Minimum opening
		Single stroke
		Proportional coefficient
		Calibration
		Valve weekly control
		Valve hysteresis
		Opening in CH calibration
		Valve closing
		Sensors selection*
		Own sensors*
		Main sensor*
		CH sensor*
		Own sensors*
		Main sensor*
		Security
		Boiler protection
		Return protection
		External sensor calibration*
		External temperature correction*
		Averaging time*
		Factory settings
		Module version*
		Valve removal*

\*Functions only available for auxiliary valve after registering within the EHI-2 controller.

#### 4.2.3.1.1 Pump only (ON / OFF)

When enabled, the controller controls only the pump and the valve is not controlled.

#### 4.2.3.1.2 Valve type

With this setting, users select the type of controlled valve.

- **CH valve** - allows control of the temperature in the CH circuit using a valve sensor. Note: The valve sensor must be placed downstream of the mixing valve on the supply pipe!
- **Floor valve** - enables regulation of the temperature of the floor heating circuit. The floor valve type protects the floor system against excessive temperatures. Note: If a CH valve is employed, and it is connected to the floor system, this may lead to damage to the sensitive floor installation!

- **Return protection** - set so as to adjust the temperature at the return of our installation by way of a return sensor. Only return and boiler sensors are active when this setting is used, and the valve sensor is not connected to the controller. In this configuration, the valve protects the boiler's return from cold temperature as a priority, and if the boiler protection function is selected, it also protects the boiler from overheating. If the valve is closed (0% open), the water flows only in a shortened circuit, If the valve is fully opened (100%), the shortened circuit is closed and the water flows through the entire central heating system.

**NOTE**



When the boiler protection is OFF, the CH temperature will not affect the opening of the valve. In extreme cases, the boiler may overheat. We, therefore, recommend that the boiler protection settings be properly configured!

- **Cooling** – switching the cooling mode on or off

#### 4.2.3.1.3 Maximum floor temperature

---

Option only visible if the valve type is set to Floor valve.

The function determines the maximum temperature that the valve sensor can reach (if Floor valve is selected). Once this value is reached, the valve closes, the pump is switched off, and a floor overheating warning appears on the main screen of the controller.

#### 4.2.3.1.4 Opening time

---

A parameter that specifies the time it takes the valve actuator to open the valve from 0% to 100%. This time should be selected to match that of the valve actuator (as indicated on its nameplate).

#### 4.2.3.1.5 Room regulator

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Selection and configuration of the room regulator operation that is to provide control over valve operation.

**NOTE**



The function is not displayed when the *Cooling* and *Return Protection* modes are enabled.

- **Room regulator**

- **Control without room regulator** - this option should be selected when the room regulator is not to affect the operation of the valve.
- **Standard regulator of valve** - this option is selected if the valve is to be controlled by a binary room regulator.

- **Room regulator function**

- **Room regulator temperature lower** - the value by which the valve will lower its set temperature once the temperature set in the room controller is reached (room overheating).
- **Closing** – following selection, upon reaching the set room temperature, the room regulator will report overheating and the valve will automatically close.

- **Room regulator temperature lower**

The option is used to set the lowering value of room regulator.

- **Pump deactivation after heating (OFF/ON)** – if enabled, the pump will switch off after receiving an “overheating” signal from the controller. If the option is switched off, the pump will operate independently of the regulator, and will use the readings from the settings on the valve, i.e. it will switch on at a given threshold or will always be on or always off.

#### 4.2.3.1.6 Valve pump

- **Pump operation modes**
  - **Always ON** - the pump operates at all times, regardless of the temperature of the heat source and the valve.
  - **Always OFF** - the pump is permanently switched off and the regulator controls only the operation of the valve.
  - **Above the threshold** - the pump switches on if the actual temperature is above the set switch-on temperature. If the pump is to be switched on above the threshold, the threshold pump switching temperature must also be set. The value from the CH sensor is taken into account.
- **Pumps switch on temperature** - This option applies to the pump operating above the threshold. The valve pump will switch on when the boiler sensor reaches the pump switching temperature.
- **Pumps anti-stop** - When this option is activated, the valve pump will switch on for 5 minutes every 10 days. This prevents water contaminants from fouling the installation outside the heating season.
- **Closing below temperature threshold** - After this function is activated (selecting the Enabled option), the valve will remain closed until the boiler sensor reaches the pump switch-on temperature value. This function not available when *Return Protection* mode is enabled.

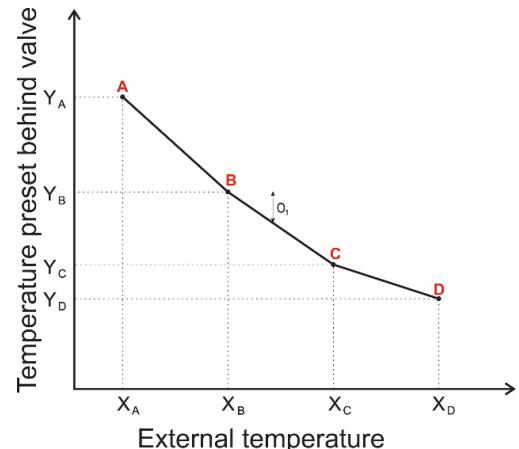
When the *Cooling* mode is switched on, the following parameters are displayed:

- **Deactivation threshold** – an option to set the temperature value of the CO sensor above which the pump will shut down.
- **Pumps anti-stop** – an option to enable “Pumps anti-stop” (described above).

#### 4.2.3.1.7 Weather control

For the weather function to be active, the external sensor must be positioned in a place exposed to outside atmospheric influences. After correct installation and connection of the sensor to the controller, the *Weather control* function in the controller menu is operational.

- **Heating curve** - the compensation curve according to which the set temperature of the controller is determined on the basis of the external temperature. In order for the valve to operate correctly, the set temperature (downstream the valve) is set for four intermediate external temperatures: -20°C, -10°C, 0°C and 10°C.



Note: This function is not available when *Return Protection* mode is enabled.

#### 4.2.3.1.8 Mixing valve settings

- **Temperature monitoring** - determines the frequency of measuring (controlling) the water temperature on the valve sensor for the CH installation. If the sensor indicates a change in the valve temperature (deviation from the setpoint), then the valve actuator will open or close by the set stroke to return to the setpoint temperature.

- **Opening direction** - If, after connecting the valve to the controller, it turns out that it was supposed to be connected the other way round, the power cables need not be disconnected and switched over, instead, the opening direction in this parameter can be changed by selecting: LEFT or RIGHT. Note: This function is only available for built-in valves.
- **Minimum opening** - determines the smallest possible valve opening. This parameter enables leaving the valve slightly open to maintain a minimum flow. The 0° setting switches off the valve pump. Note: This function is not available when the *Return Protection* mode is enabled.
- **Single stroke** - the maximum single stroke (opening or closing) that the valve can perform during single temperature sampling. If it is close to the set temperature, this stroke is calculated on the basis of the < Proportional coefficient > parameter. The smaller the unit stroke, the more precisely the set temperature can be achieved, but the preset temperature will take longer to achieve.
- **Proportional coefficient** - used to determine the valve stroke: the closer to the set temperature, the smaller the stroke. If this coefficient is high, the valve will reach an opening close to the appropriate faster, but with lower precision. The percentage of the unit opening is calculated using the following formula:

$$(SET\_TEMP - SENSOR\_TEMP) * (PROPORTIONAL\_COEF / 10)$$

- **Calibration** - enables the calibration of the selected built-in valve at any time. During calibration, the valve is set to a safe position, i.e. for the CH valve - to its fully open position, and for floor valve - to its closed position.
- **Valve weekly control** - allows programming the deviations of the set temperature of the valve on individual days of the week at specific times. The set temperature deviations are in the range of +/- 10°C. Note: This function is not available when *Return Protection* mode is enabled.

To enable weekly control, select and check *Mode 1* or *Mode 2*. Detailed settings of these modes can be found in the following sections of the submenu: *Set Mode 1* and *Set Mode 2*.



#### NOTE

For the correct operation of this function, it is necessary to set the current date and time!

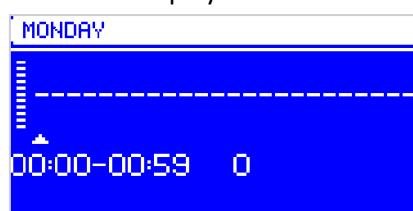
#### ❖ WEEKLY CONTROL SETPOINT – WEEKLY

The weekly control can be programmed in two different modes:

**MODE 1** - in this mode it is possible to program deviations of the set temperature for each day of the week separately.

#### Mode 1 programming:

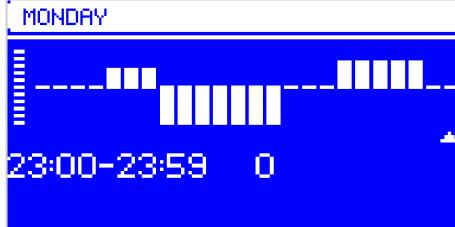
- ⇒ Select the option: Set Mode 1
- ⇒ Then select the day of the week for which the temperature settings are to be changed to.
- ⇒ The edit screen then appears on the display:



- ⇒ Use the arrow buttons to select the desired time of temperature change. Confirm the selection by pressing the MENU button.
- ⇒ Options appear at the bottom, select CHANGE by pressing the MENU button when it is highlighted in white.
- ⇒ Then decrease or increase the temperature by the selected value - and confirm.
- ⇒ The set temperature can be changed in the range from -10°C to 10°C.

- ⇒ If the same change is wanted for neighboring hours, press the MENU button on the selected setting, and after the option appears at the bottom of the screen, select COPY and copy the setting to the subsequent or previous hour using the arrow buttons. Confirm the settings by pressing MENU.

**Example:**



	Time	Temperature - setting of weekly control (+/-)
<b>Monday</b>		
<b>PRESET</b>	4 <sup>00</sup> - 7 <sup>00</sup>	+5°C
	7 <sup>00</sup> - 14 <sup>00</sup>	-10°C
	17 <sup>00</sup> - 22 <sup>00</sup>	+7°C

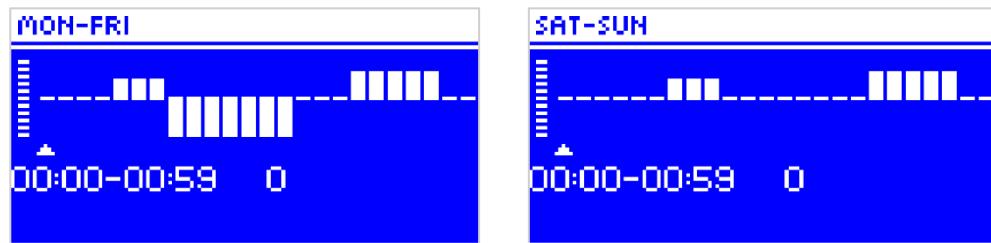
*In this case, if the temperature set on the valve is 50°C, on Mondays, from 4<sup>00</sup> to 7<sup>00</sup> hours, the temperature set on the valve will increase by 5°C, or to 55°C; from 7<sup>00</sup> to 14<sup>00</sup>, it will decrease by 10°C, or to 40°C, between 17<sup>00</sup> and 22<sup>00</sup>, it will increase by 7°C, or to 57°C.*

**MODE 2** - in this mode, it is possible to program the temperature deviations in detail for all working days (Monday – Friday) and for the weekend (Saturday – Sunday).

**Mode 2 programming:**

- ⇒ Select the option: Set Mode 2.
- ⇒ Then select the part of the week for which the temperature settings are to be changed.
- ⇒ The editing procedure is the same as for Mode 1.

**Example:**



	Time	Temperature - setting of weekly control (+/-)
<b>Monday - Friday</b>		
<b>PRESET</b>	4 <sup>00</sup> - 7 <sup>00</sup>	+5°C
	7 <sup>00</sup> - 14 <sup>00</sup>	-10°C
	17 <sup>00</sup> - 22 <sup>00</sup>	+7°C
<b>Saturday - Sunday</b>		
<b>PRESET</b>	6 <sup>00</sup> - 9 <sup>00</sup>	+5°C
	17 <sup>00</sup> - 22 <sup>00</sup>	+7°C

In this case, if the temperature set on the valve is 50°C Monday to Friday, from 04<sup>00</sup> to 07<sup>00</sup> hours, the temperature on the valve will increase by 5°C, or to 55°C; in the hours from 07<sup>00</sup> to 14<sup>00</sup>, it will decrease by 10°C, or to 40°C, while between 17<sup>00</sup> and 22<sup>00</sup> it will increase by 7°C, or to 57°C.

During the weekend, from 06<sup>00</sup> to 09<sup>00</sup> hours, the temperature on the valve will rise by 5°C, or to 55°C, and between 17<sup>00</sup> and 22<sup>00</sup>, it will rise by 7°C, or to 57°C.

- **Valve hysteresis** - This option is used to set the valve set point hysteresis. This is the difference between the preset temperature and the temperature at which the valve will start to close or open.

Example:

Valve preset temperature: 50°C

Hysteresis: 2°C

Valve stop: 50°C

Valve opening: 48°C

Valve closing: 52°C

When the set temperature is 50°C and the hysteresis is 2°C, the valve will stop in one position when the temperature reaches 50°C; when the temperature drops to 48°C, it will start to open; and when it reaches 52°C, the valve will start to close in order to lower the temperature. Note: This function is not available if the *Return Protection* mode is enabled.

- **Opening in CH calibration (ON / OFF)** - Enabling this function will cause the valve to start its calibration from the opening phase. Note: This function is only available when the valve type is set as *CH Valve Function*, and is not available in *Cooling* mode and in the case of *Floor Valve and Return Protection*.
- **Valve closing (ON / OFF)** - A parameter setting the behaviour of the valve in the CH mode after its shutdown. Enabling this option closes the valve, while disabling opens it. Note: This function is not available in *Cooling* mode and in the case of *Floor Valve and Return Protection*.
- **Floor heating – summer (ON / OFF)** - This function is only available with the *Floor Valve* mode on. When this function is enabled, the floor valve will operate in the summer mode.

#### 4.2.3.1.9 Sensor selection\*

This option applies to the return sensor and the external sensor and allows users to determine whether the **own sensors** of the valve module or the **main sensors** are to be taken into account in the operation of the auxiliary valve.

*\*Note: This function is only available if an auxiliary valve is incorporated in the system..*

#### 4.2.3.1.10 CH sensor

This option applies to the CH sensor and allows users to determine whether the function of the auxiliary valve should take into account the **own sensor** of the valve module or the **main controller sensor**.

*\*Note: This function is only available if an auxiliary valve is incorporated in the system.*

#### 4.2.3.1.11 Security

- **Boiler protection** - This function is intended to prevent a dangerous increase in boiler temperature. Here, the maximum allowable temperature that the boiler can reach must be first set. In the event of a dangerous temperature increase, the valve will begin to open so as to cool the boiler down. This function is disabled by default.
- **Return protection** - This function allows setting boiler protection against too cold main circuit return water from causing low temperature corrosion of the boiler. The return protection works in such a

way that when the temperature is too low, the valve closes until the shortened circuit of the boiler reaches the required temperature. The temperature below which the return protection is enabled, is selectable.



#### NOTE

*Boiler Protection and Return Protection are not available in the *Cooling* mode.*

*The *Boiler Protection* function is not available for the *Floor Valve* type.*

*The *Return Protection* function is not available with the *Return protection* mode enabled.*

---

#### 4.2.3.1.12 External sensor calibration\*

This function is used to adjust the external sensor, it is done during installation or after prolonged use of the sensor if the displayed external temperature deviates from the actual. When calibrating the system, the **External temperature correction** (adjustment range: -10 to +10°C with an accuracy of 1°C) is first set and, subsequently, the **Averaging time** is set, i.e. the time for which the temperature is sampled and after which its value will be read again.

*\*Note: The function is only available only if an auxiliary valve is incorporated in the system.*

---

#### 4.2.3.1.13 Factory settings

This parameter allows users to return to the settings of a given valve saved by the manufacturer. The factory reset does not change the set valve type.

---

#### 4.2.3.1.14 Module version\*

The option allows users to view the module number – this information is required when contacting the service technician.

*\*Note: This function is only available if an auxiliary valve is incorporated in the system.*

---

#### 4.2.3.1.15 Valve removal\*

This function is used to completely delete the valve from the controller memory. Valve removal function is used, for example, when servicing/removing the valve or replacing the module (re-registration of the new module is required).

*\*Note: This function is only available if an auxiliary valve is incorporated in the system.*

---

#### 4.2.3.2 Valve 1/2 registration

If auxiliary valves are incorporated in the system, they must be registered by entering the number found on the auxiliary valve body. After registration, the parameters described in the item will be displayed under *Built-in valve, auxiliary valve 1/2*.

---

#### 4.2.3.3 Additional pump

The parameters of this submenu are used to set the operation of the controller connected to the auxiliary pump output. In order for the auxiliary pump to be active, the appropriate type of pump must be incorporated in the system and its parameters inputted into the main controller.

#### 4.2.3.3.1 Pump type

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- **OFF**
- **CH pump**
  - **Minimum temperature** - temperature for switching ON the additional pump acting as a CH pump. Once this temperature is reached on the selected sensor, the pump will switch ON.
  - **Hysteresis** - auxiliary CH pump threshold temperature hysteresis. This is the difference between the threshold temperature and the shutdown temperature.

Example:

The threshold temperature is 40°C and hysteresis is 5°C. Once the threshold temperature is reached, i.e. 40°C, the additional CH pump will be switched on. The CH pump will be switched off again when the temperature drops to 35°C.

- **Sensor selection** - a sensor whose reading is to be taken into account when switching on the auxiliary CH pump.
- **Room regulator** - provides the possibility to select the influence of room regulators on the pump operation. After selecting this option, the device connected to the contact will switch on if the switch-on threshold is reached and when any of the selected regulators reports the demand for heating. The device will switch off when all selected regulators report overheating of the rooms.

#### ➤ **DHW pump**

When this option is checked, the auxiliary pump will act as an auxiliary DHW pump. This pump will switch on when the threshold temperature on the selected sensor 1 is exceeded and will operate until the set temperature on sensor 2 is reached. In addition, after activating this function, users can set the maximum temperature on sensor 1 - the reaching of which will trigger the emergency procedure.

For proper operation of the DHW pump, the following parameters must be configured:

- **Threshold** - DHW pump switch-on temperature (temperature measured on sensor 1 reading the value from the heat source - i.e. the boiler). Below the set temperature, the device remains switched off, and above this temperature, the device operates until the set temperature is reached.
- **Hysteresis** - Hysteresis is the difference between the temperature of switching the pump on and switching it off again (for example: when the set temperature is 60°C and the hysteresis is 3°C, the pump will be switched off when the temperature reaches 60°C, while the pump will be switched on when the temperature drops to 57°C).
- **Set temperature** - the set temperature of the device - once it reaches it, the device is switched off. The temperature is measured on sensor 2.
- **Max temperature** - maximum temperature on sensor 1 (reading the value from the heat source) – once it is reached, the device will switch on regardless of the current temperature on sensor 2. This function protects the boiler from overheating.
- **Sensor 1 selection** - temperature sensor from which the value for the operation of the device connected to the auxiliary contact - heat source (switch-on threshold) is to be read.
- **Sensor 2 selection** - temperature sensor from which the value for the operation of the device connected to the auxiliary contact (set temperature) is to be read.

### ➤ **Buffer pump**

The pump will operate on the basis of information from two temperature sensors. The device connected to the contact will switch on if on both sensor, the temperature drops below the set point (taking the hysteresis 1°C into account). Switching off will occur after reaching the set temperature on the bottom buffer sensor.

- **Top buffer set temperature** - option to set the value of the upper set temperature (top sensor). When this temperature is reached, the pump will shut down (provided that the bottom buffer setpoint temperature is also reached).
- **Bottom buffer set temperature** - option to set the set temperature of the buffer bottom.
- **Sensor 1 selection** – selection of sensor 1 to affect the pump operation.
- **Sensor 2 selection** – selection of sensor 2 to affect the pump operation.

### ➤ **Circulation pump**

After checking this option, the additional device will act as a circulation pump, the use of which is to control the hot water mixing between the buffer and the DHW receivers. The following parameters are used to configure its operation:

- **Operating time** - the operating time of the pump during its activity.
- **Pause time** - the time between consecutive starts of the circulation pump, during which the pump will not operate.
- **Operation schedule** – the daily cycle of activation or stopping of the pump with an accuracy of 30 minutes. During the designated periods of activity, the pump will switch on at the frequency set in the *Break Time* parameter for the time set in the *Operating Time* parameter. A detailed description of the setting of the pump operation plan is described in the item: *Weekly schedule control*.
- **Sensor active (ON/OFF)** – switching on will cause the pump to operate according to the readings from the selected sensor. It is also possible to set the shutdown threshold. Disabling this option will cause the pump to operate according to the set *Operating Plan*.
- **Sensor 1** – the ability to select a sensor that will affect the pump operation (Note: This function is not available in the *Cooling* mode).
- **Shutdown threshold** - Enables the user to set the temperature value above which the contact will switch off, taking into account constant overheating (shutdown threshold + constant overheating equal to the hysteresis parameter). Note: This function is not available in *Cooling* mode.

### ➤ **Floor pump**

After selecting this option, the additional device will act as a floor pump, the use of which is to support the floor installation. The following parameters are used to configure its operation:

- **Min temperature** – the option to set the minimum temperature in order to protect the installation from cooling down. When the floor temperature drops below the set minimum temperature, the pump will switch on.
- **Max temperature** - the maximum temperature can be set to protect the installation from overheating. When the floor temperature exceeds the set maximum temperature, the pump will switch off.
- **Sensor 1 selection** - temperature sensor from which the value for the operation of the device connected to the auxiliary contact - heat source (switch-on threshold) is to be read.
- **Sensor 2 selection** – temperature sensor from which the value for the operation of the device connected to the auxiliary contact (set temperature) is to be read.

### ➤ Weekly control

- **Operation schedule** - a weekly work schedule, as well as breaks in the operation of the pump for an entire week in cycles of 30 minutes duration can be set.

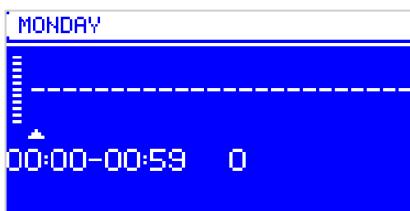
Select **Operation schedule**, and then select the day of the week for which the programming of the operating plan is desired.

#### ❖ OPERATING PLAN SETTING

It is possible to program the breaks in the pump operation in detail for each day of the week separately.

#### Programming the operating plan:

- ⇒ Select the day of the week for which the daily work schedule of the pump is to be set.
- ⇒ The edit screen then appears on the display:



- ⇒ First, using the navigation keys, select the time interval for activating the pump operation. Confirm the selection by pressing the MENU button.
- ⇒ Options appear at the bottom, select CHANGE by pressing the MENU button when it is highlighted in white.
- ⇒ Then, with the help of the navigation arrows, set the operating time of the pump.
- ⇒ If it is desired to apply the same change for adjacent hours, press the MENU button on the selected setting and similarly use the arrows to select the times of pump operation (start/stop).

#### 4.2.3.3.2 Control of room regulator

The device will operate on the basis of the signal from the room regulator. The device connected to the contact will switch on when the regulator does not reach the set point (regulator contact shorted). The shutdown will take place after reaching the preset at the regulator (regulator contact open).

It is possible to make the operation of the auxiliary device dependent on the signal from more than one room regulator – the device will switch off only if all room regulators report overheating. After selecting the DHW option, the switching on and off of the device connected to the auxiliary contact will depend on the DHW preset, once it is reached, the device will shut off.

- **Room regulators (Standard room regulator 1/2 )** – option for selecting a regulator that will affect the operation of the device.

#### 4.2.3.4 Potential-free contact

The parameters of this submenu are used to set the operation of the device connected to the voltage-free contact input. After selecting the type of device, an additional menu will appear on the display screen.

The operation of this function is the same as the operation of the *Auxiliary Pump* function. A detailed description and operation of these parameters can be found in the item: *Auxiliary pump*.

In addition, the following functions appear:

#### 4.2.3.4.1 Need for heating

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The device connected to the contact will work according to the reading from the selected sensor. If several circuits are turned on at the same time, the *Need for heating* algorithm takes into account the highest set temperature of these circuits.

The demand for heating can be realized according to the operation of the chosen type of contact (*CH pump, DHW pump, additional heat source, buffer pump, etc.*).

- **Hysteresis** - option to set the temperature value below which the contact will switch on, taking into account the set temperature of the valve (set temperature – hysteresis).
- **DHW hysteresis** - option to set the temperature value below which the contact will switch on, taking into account the DHW set temperature (DHW set temperature – hysteresis).
- **Overheat temperature** - option to set the value of the set temperature increase for the selected sensor (set temperature + overheating).
- **Central heating circuits – (DHW, Built-in valve 1,2, Additional valve 1,2)** - after selecting the DHW circuit, the device will switch on after the set temperature decreases minus the DHW hysteresis, while the shutdown will take place after reaching the set temperature plus overheating of the DHW or when all selected circuits report the status of overheating.

After selecting the valve circuit, the device will switch on if the temperature on the selected sensor falls below the highest setpoint minus the hysteresis from the marked valve circuits. The shutdown will take place after reaching the highest set temperature from the marked valve circuits plus overheating.

- **Sensor selection 1** - temperature sensor from which the value for the operation of the device connected to the auxiliary contact - heat source (switch-on threshold) is to be read.
- **Sensor selection 2** - temperature sensor from which the value for the operation of the device connected to the auxiliary contact (set temperature) is to be read.

The controller operates an installation heated by a CH boiler connected to a buffer, with an additional heating device with three valves. The chosen boiler type is connected to the installation, which is connected to the voltage-free contact in the heating demand algorithm. At the moment when any of the selected heating circuits reports underheating and there is not enough temperature on the sensor to heat up these circuits, the additional device will be switched on and will operate until it reaches the highest required temperature increased by the set overheating. The contact will switch off when the set temperature increased by overheating is reached or when all selected devices report an overheating status. It will switch on again when the temperature on the sensor is lower than the set point minus hysteresis or when the selected circuits report underheating.



#### NOTE

- 1) For the **Need for heating** work properly, the **Weather control** and the **Room Regulator** control must be disabled.
- 2) The **Need for heating** for DHW circuits switches on the contact only in the following modes: **Boiler priority, Parallel pumps** and **Summer mode**.
- 3) The **Need for heating** for CH circuits switches on the contact only in the following modes: **Boiler priority, Parallel pumps** and **House heating**.

#### 4.2.3.4.2 Additional heating source

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The source connected to the contact will be incorporated in the event of a temperature drop as reported by the selected sensor. The shutdown will occur when the temperature rises by the set overheating value.

- **Set temperature** - an option that is used to set the set the room temperature, and will cause the source to be switched out.
- **Hysteresis** - the ability to set the temperature value below which the source will be switched in, taking into account the set temperature.
- **Sensor selection** - the ability to select a source sensor that will be responsible for switching the source in/out.
- **Room regulators** - the possibility to select the influence of room regulators on the contact operation. After selecting this option, the source connected to the contact will be switched in if the switch-on threshold is reached and when any of the selected options will report the demand for heating. The source will be switched out when all selected options report reheating to the set temperature or when the condition (switch-on threshold + hysteresis) is met.

Example:

Part of the CH system is operated by a fireplace and a boiler. The boiler is connected to a voltage-free contact and the temperature in the fireplace is read by the CH sensor. The additional heat source will incorporate if the value on the sensor falls below the switch-on threshold and will operate until the threshold temperature increased by overheating value is reached. The device will switch out when the room controller sends information about overheating or when the temperature on the CH sensor exceeds the value of the switch-on threshold increased by the value of overheating.

#### 4.2.3.5 Test screen

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This parameter is intended only for service technicians with appropriate qualifications. The entry to this menu is secured by a code. This code is owned by the Tech Sterowniki II company.

### 4.2.4 Settings

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#### 4.2.4.1 Language version

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Option used to select the user's preferred software language.

#### 4.2.4.2 Screen settings

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The function allows users to customize the screen to their individual needs.

- **Display contrast** - changing the display contrast settings.
- **Blanking time** - the time of inactivity after which the controller is to switch to the blanked mode (the brightness of the screen will be reduced to the level set by the user in the parameter Brightness in blanking).
- **Screen brightness** - brightness of the controller screen during its operation - viewing menu functions, changing settings, etc.
- **Brightness in blanking** - brightness of the controller screen during blanking automatically triggered after a specified period of inactivity.
- **Energy saving** - switching it on will automatically reduce the brightness of the screen by 20%.

#### 4.2.4.3 Lock

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This function allows users to set the settings menu access lock. To do this:

1. Enter the Access Code option
2. Set an individual PIN for unlocking the menu

3. Confirm by clicking OK.

**NOTE**

Entering code 0000 deactivates the lock again.

If the user forgets the PIN code he has set, enter the code: 7851 or 3950.

#### 4.2.4.4 Time settings

For inputting current time settings. The arrows are used to set the time and minutes separately.

#### 4.2.4.5 Data settings

For inputting current date settings. The arrows are used to set the year, month and day separately.

#### 4.2.4.6 Software version

This function enables users to obtain basic information about the driver software version.

**NOTE**

When contacting the Service Department of TECH STEROWNIKI, please provide the version number of the controller software.

## 5. PROTECTIONS

In order to ensure maximally safe and seamless operation, the controller has a number of safeguards. In the event of an alarm, an acoustic signal is activated and a message will appear on the display.

To return the controller to operation, press the **MENU** button.

### AUTOMATIC SENSOR CONTROL

If the temperature sensor is damaged, an audible alarm is activated, and the relevant fault is indicated on the display, e.g. "**Valve sensor defective**", in the case of an active type of **CH or Return protection** valve, the pump is switched on regardless of the current temperature and the valve is opened. In the case of a floor valve, the valve pump is switched off and the valve is closed.

### FUSE

The controller has a WT 6.3A fuse insert as grid protection.



**NOTE:**

Using a higher rating fuse may cause damage to the controller.

## 6. ALARMS

ALARM/MESSAGE	Description
<b>TEMPERATURE ALARM</b>	stops the temperature control of the valve and sets the valve in the safest position: closed for the floor valve, and opened for the CH valve.
<b>VALVE SENSOR</b>	Indicates an improperly connected or missing or damaged valve sensor. If it is a sensor of strategic importance for valve operation, it must be replaced immediately.
<b>RETURN SENSOR</b>	this alarm occurs when the return protection function is activated or this sensor is damaged; the return sensor must be corrected or replaced. It is possible to disable this alarm by disabling the return protection function.
<b>WEATHER SENSOR</b>	occurs when the external temperature sensor is damaged; this alarm can be cancelled when the sensor is replaced; this alarm will not be triggered when the operation mode of the valve is different from "weather control" or "room with weather".
<b>CH SENSOR</b>	may occur in the event of improper configuration of the device with an assigned sensor, when the sensor is not properly connected or it is mechanically damaged; in order to clear this alarm, check the connections on the connection blocks, make sure that the connection of the sensor wire is not broken or that there is no short circuit, check the operation of the sensor by temporarily connecting another sensor in its place and check the correctness of its indications.
<b>SENSOR S1, S2</b>	May occur if the sensor is incorrectly connected or the cable is damaged. In order to check the correct operation of the sensors, they can be swapped.

## 7. TECHNICAL DATA

No.	Specification	Unit	
1	Power supply voltage	V	230 +/-10% /50Hz
2	Power consumption of the controller	W	2
3	Ambient temperature	°C	5÷50
4	Max. load on pump and valve outputs	A	0.5
5	Nominal voltage-free contact load	A	230V AC / 0.5A (AC1)* 24V DC / 0.5A (DC1)**
6	Sensor temp. resistance	°C	-30÷99
7	Fuse insert	A	6.3

\* AC1 load category: single-phase, resistive or slightly inductive AC load.

\*\* DC1 load category: direct current, resistive or slightly inductive load.



## EU Declaration of Conformity

The TECH STEROWNIKI II Sp. z o.o. company, with registered office in Wieprz, 34-122, at ulica Biała Droga 31, declares under sole responsibility that the **EHI-2** manufactured by us meets the requirements of Directive **2014/35/EU** of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the **making available on the market of electrical equipment designed for use within certain voltage limits** (Official Journal of EU L 96 of 29.03.2014, page 357) and Directive **2014/30/EU** of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to **electromagnetic compatibility** (O. J. EU L 96 of 29.03.2014, page 79), Directive **2009/125/EC** on ecodesign requirements for energy-related products and REGULATIONS OF THE MINISTER OF ENTREPRENEURSHIP AND TECHNOLOGY of 24 June 2019 amending the regulation on the essential requirements for the restriction of use certain hazardous substances in electrical and electronic equipment implementing Directive (EU) 2017/2102 of the European Parliament and of the Council of 15 November 2017 amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (O. J. EU L 305 of 21.11.2017, p. 8)

The harmonized standards applied for conformity assessment were:

**PN-EN IEC 60730-2-9:2019-06,**

**PN-EN 60730-1:2016-10,**

**PN EN IEC 63000:2019-01 RoHS.**

Wieprz, 27.09.2023

Paweł Jura

Janusz Master

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Prezesi firmy





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