TECH CONTROLLERS

USER MANUAL

EU-ML-12

EN

www.tech-controllers.com

TABLE OF CONTENTS

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

The manufacturer reserves the right to introduce changes.

I. SAFETY

Before operating the device, please read the following instructions carefully. Failure to observe the instructions may cause personal injuries and damage the device. To avoid unnecessary errors and accidents, make sure that all persons operating the device have thoroughly familiarized themselves with the device operation and its safety functions. Please do not discard the manual and please make sure that it remains with the device when it is transferred. As far as safety of human life, health, and property is concerned, please observe the precautions listed in the operating manual, as the manufacturer will not be liable for any damages caused by negligence.

WARNING

- **Live electric equipment.** Before carrying out any operations related to the power supply (connecting cables, installing the device, etc.), make sure that the device is not connected to the mains.
- Installation should be carried out 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 device is not intended for use by children.

CAUTION

- Atmospheric discharges can damage the controller, so during a thunderstorm, switch it 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, and check the installation of the controller, also clean it of dust and other soiling.

There could be changes introduced in the products listed in the present manual, following its last revision of 21.03.2023. The manufacturer reserves the right to introduce changes in design or deviations from the established colours. Illustrations may contain optional equipment. Printing technology may affect differences in the presented colours.

Care for the natural environment is of paramount importance to us. The awareness that we manufacture electronic devices 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 with 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.

II. SYSTEM DESCRIPTION

The EU-ML-12 additional controller is a part of heating control system that enables expansion of the existing installation with additional zones. It has RS 485 and wireless communication. Its primary function is to maintain the preset temperature in each zone. The EU-ML-12 is a device that, together with all peripheral devices (room sensors, room controllers, floor sensors, external sensor, window sensors, thermostatic actuators, signal enhancers), forms the entire integrated system.

Through its extensive software, the EU-ML-12 control board can perform a number of functions:

- controlling for dedicated wired regulators: EU-R-12b, EU-R-12s, EU-F-12b and EU-R-X
- controlling wireless regulators: EU-R-8X, EU-R-8b, EU-R-8b Plus, EU-R-8s Plus, EU-F-8z or sensors: EU-C-8r, EU-C-mini, EU-CL-mini
- controlling for external sensors and weather control (after registering the sensor in EU-L-12)
- controlling for wireless window sensors (up to 6 pcs per zone)
- possibility to control STT-868, STT-869 or EU-G-X wireless actuators (6 pcs per zone)
- possibility of operating thermostatic actuators
- possibility of operating mixing valves – after connecting the EU-i-1, EU-i-1m valve module
- control of the installed heating or cooling device by means of potential-free contact
- enabling one 230V output to pump
- possibility to set individual operating schedules for every zone
- possibility of updating the software via its USB port

III. INSTALLING THE CONTROLLER

The EU-ML-12 control board should only be installed by a properly qualified person.

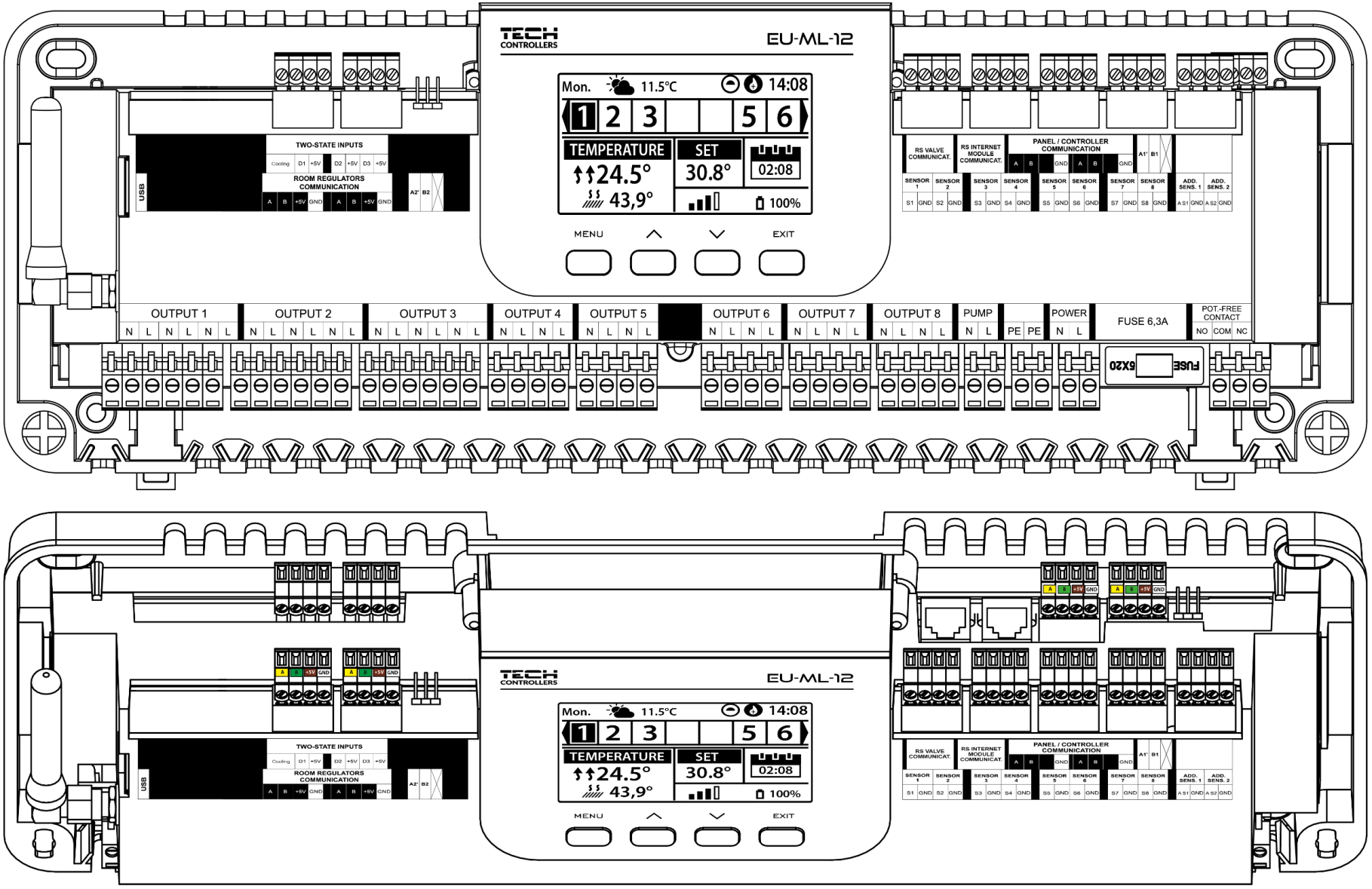
CAUTION

- You can only connect 4 EU-ML-12 boards in series to the EU-L-12 main board.
- 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.
- Incorrect wiring may damage the controller.

WARNING

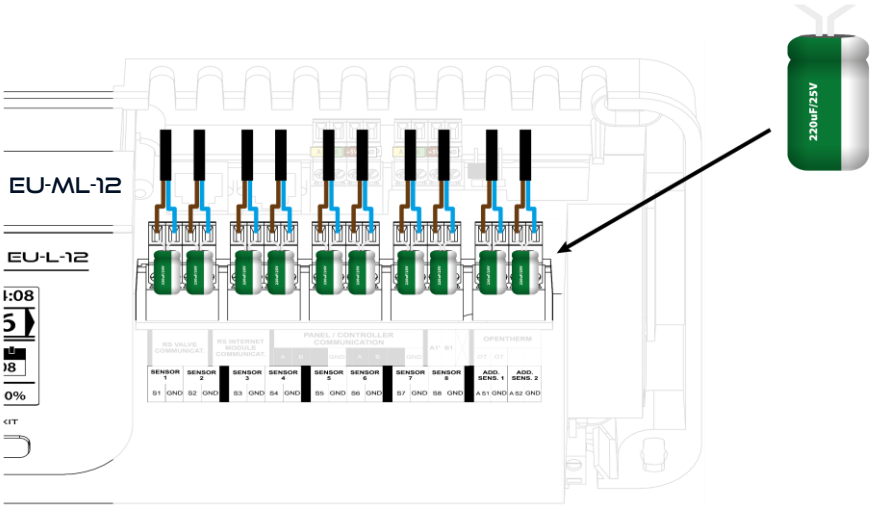
If pump manufacturer requires an external main switch, power supply fuse or additional residual current device selective for distorted currents it is recomemnded not to connect pumps directly to pump control outputs.

To avoid damaging to the device, an additional safety circuit must be used between the regulator and the pump. The manufacturer recommends the ZP-01 pump adapter, which must be purchased separately.


TECH CONTROLLERS
EU-ML-12
Mon. 11.5°C 14:08
1 2 3 5 6
TEMPERATURE
24.5°
43,9°
SET
30.8°
02:08
100%
MENU
EXIT
TWO-STATE INPUTS
ROOM REGULATORS COMMUNICATION
USB
RS VALVE COMMUNICAT.
RS INTERNET MODULE COMMUNICAT.
PANEL / CONTROLLER COMMUNICATION
SENSOR 1
SENSOR 2
SENSOR 3
SENSOR 4
SENSOR 5
SENSOR 6
SENSOR 7
SENSOR 8
ADD. SENS. 1
ADD. SENS. 2
OUTPUT 1
OUTPUT 2
OUTPUT 3
OUTPUT 4
OUTPUT 5
OUTPUT 6
OUTPUT 7
OUTPUT 8
PUMP
POWER
FUSE 6,3A
POT.-FREE CONTACT
NO COM NC
FUSE 5X20

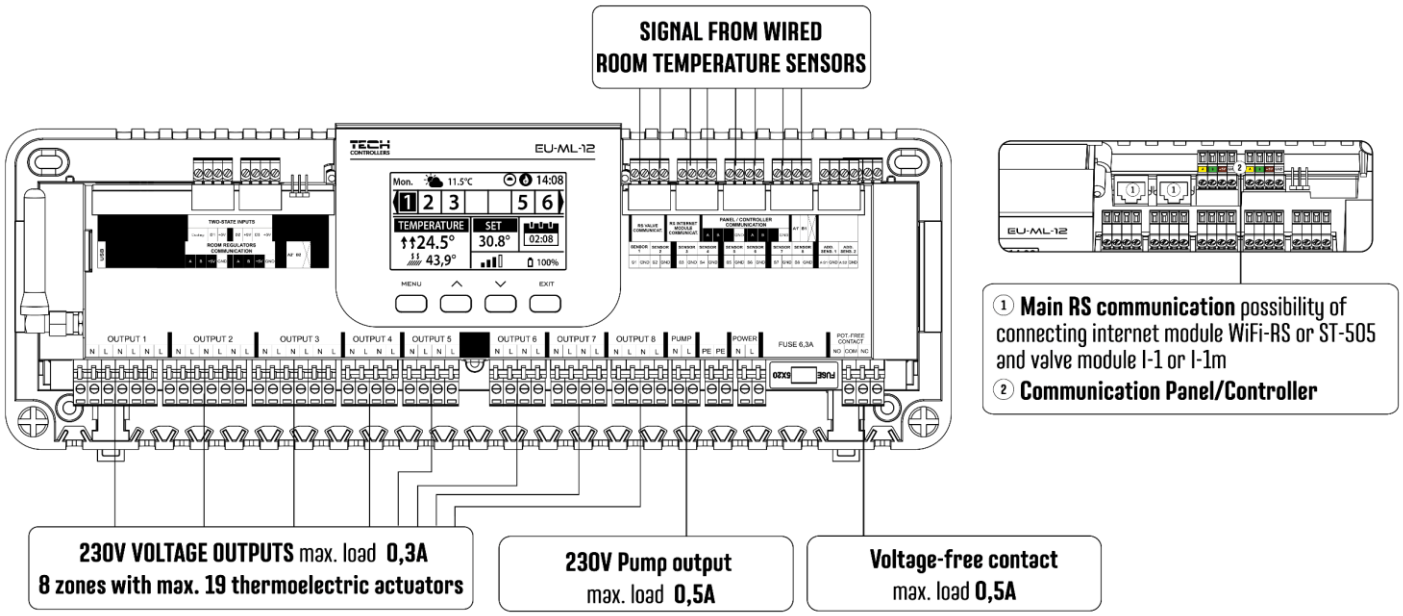
Installation of electrolytic capacitors

In order to reduce the phenomenon of temperature spikes being read from the zone sensor, a 220uF/25V low impedance electrolytic capacitor, connected in parallel with the sensor cable, should be installed. When installing the capacitor, always pay particular attention to its polarity. The ground of the element marked with a white strip is screwed into the right terminal of the sensor connector - as seen from the front of the controller, and depicted in attached illustrations. The second terminal of the capacitor is screwed into the terminal of the left connector. We found that this solution has completely eliminated the existing distortions. However, it is worth noting that the basic principle is to correctly install the wires in order to avoid interference. The wire should not be routed near sources of electromagnetic field. If such a situation has already occurred, a filter in the form of a capacitor is necessary.



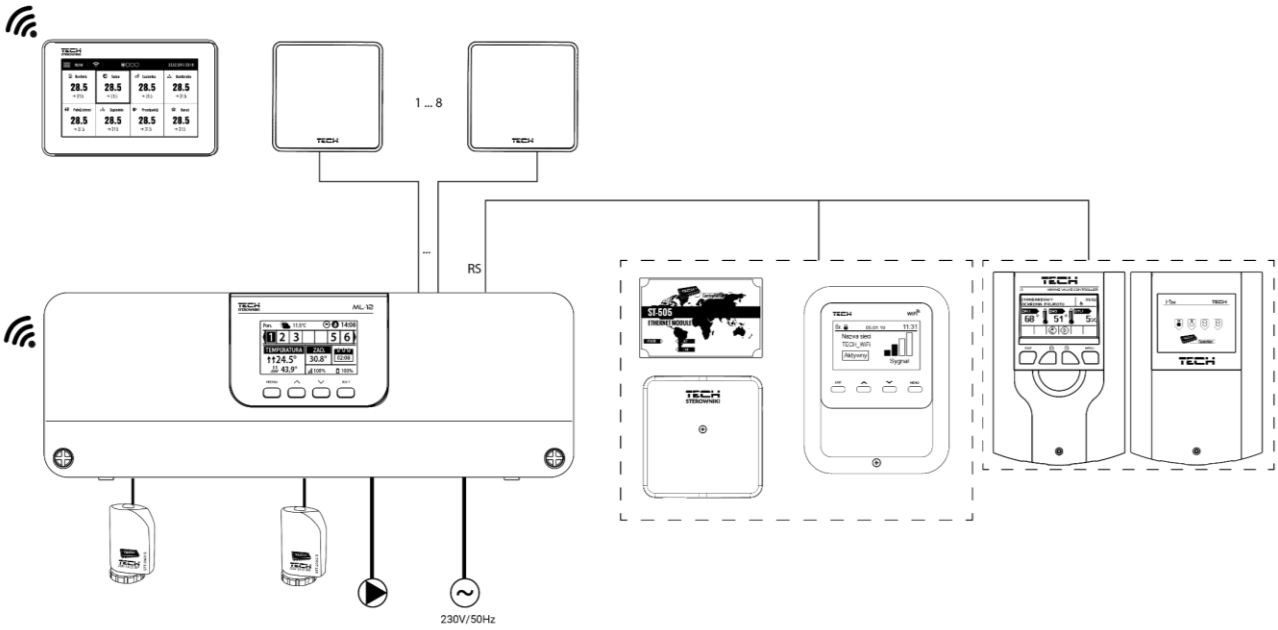
Low impedance 220uF/25V electrolytic capacitor

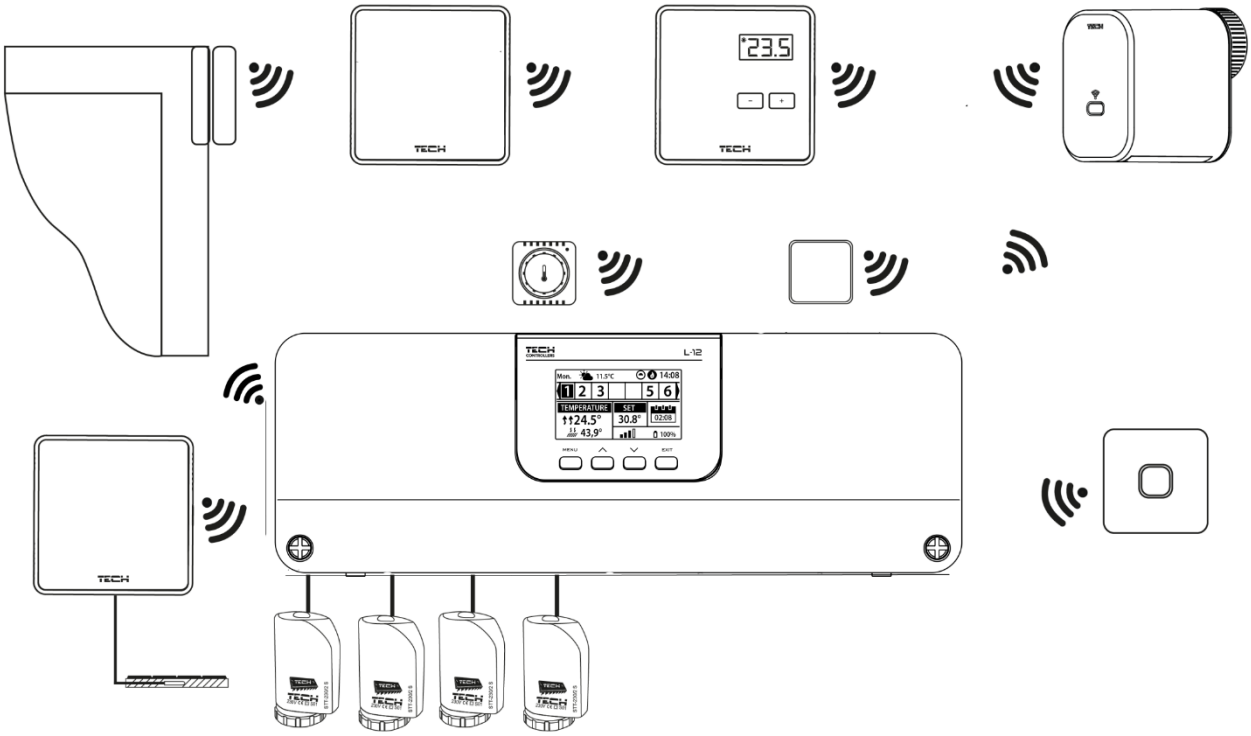
An illustrative diagram explaining how to connect and communicate with the remaining equipment:



CAUTION

- Connections: "two-state inputs" (D1, D2, D3) and "additional sensor 2" are not supported!
- If the EU-WiFi RS, EU-505 or EU-WiFi L Internet module is connected to the EU-ML-12, then the emodul.eu application will display only the zones of the respective EU-ML-12 controller. If such a module is connected to the main EU-L-12 controller, the application will display all zones of the entire system.

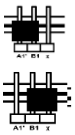

1 ... 8
RS
230V/50Hz


L-12

Connection between controllers

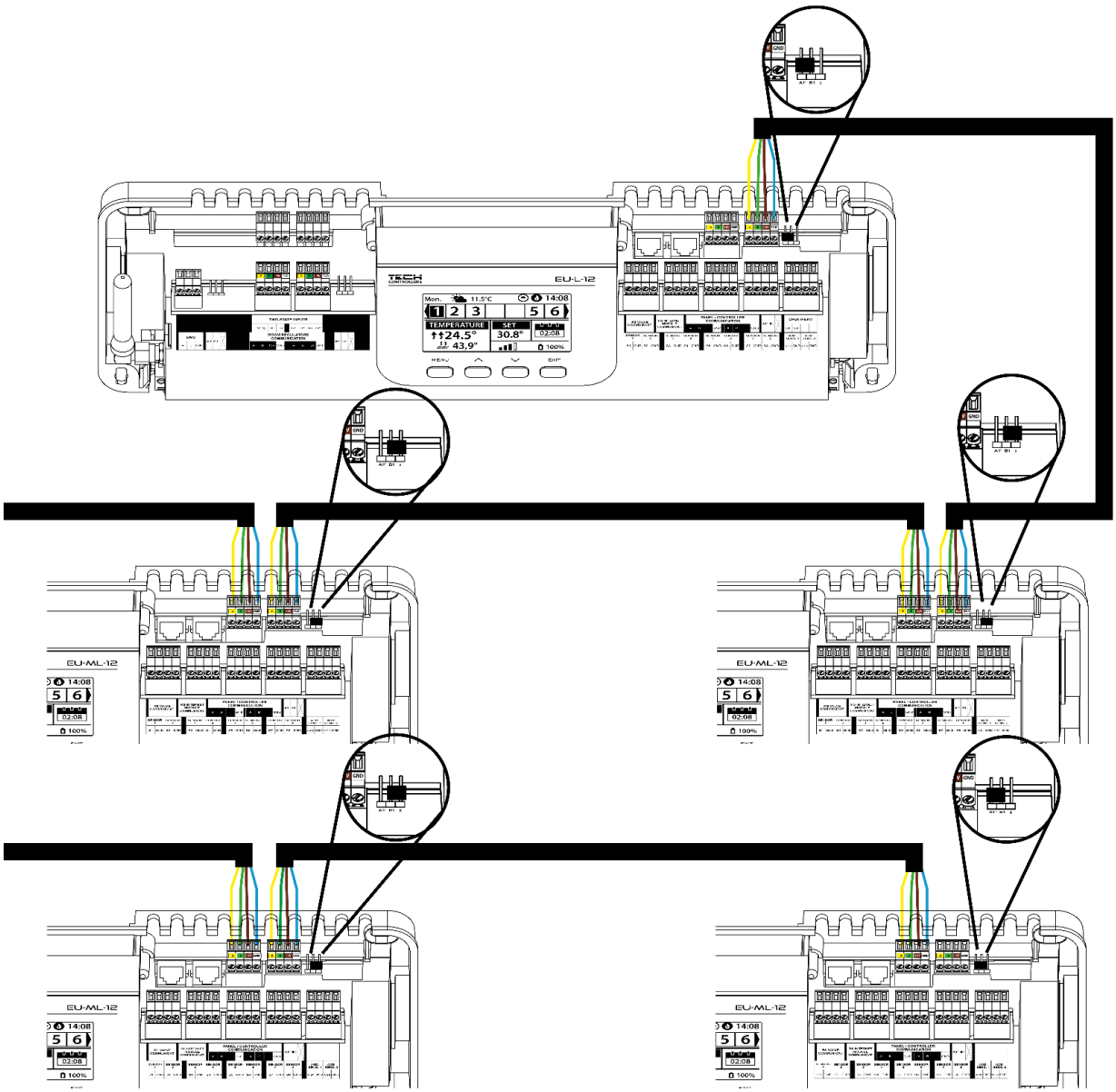
In the case of wired connection between devices: controllers (EU-L-12 and EU-ML-12), room controllers and panel, terminating resistors (jumpers) should be used at the **beginning and end** of each transmission line. The controller has a built-in terminating resistor, which should be set in the appropriate position:

- A, B – terminating resistor on (first and last controller)
- B, X – neutral (factory settings) position.



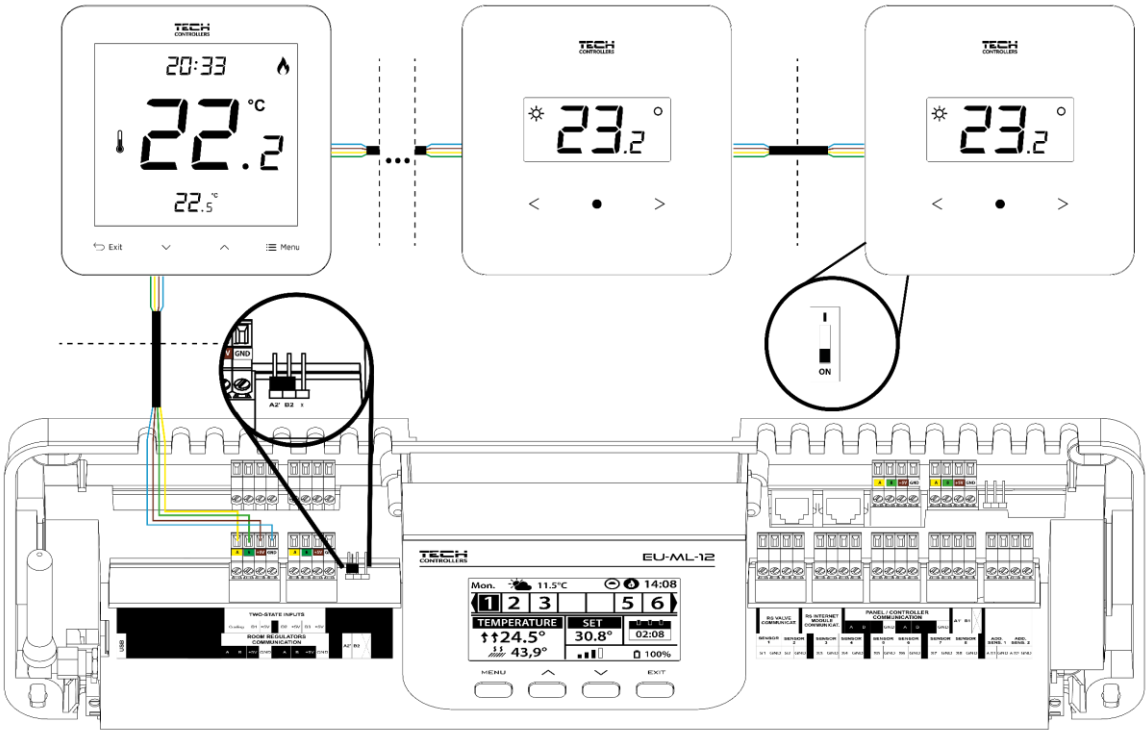
CAUTION

The order of the controllers in the case of terminating connection does not matter.

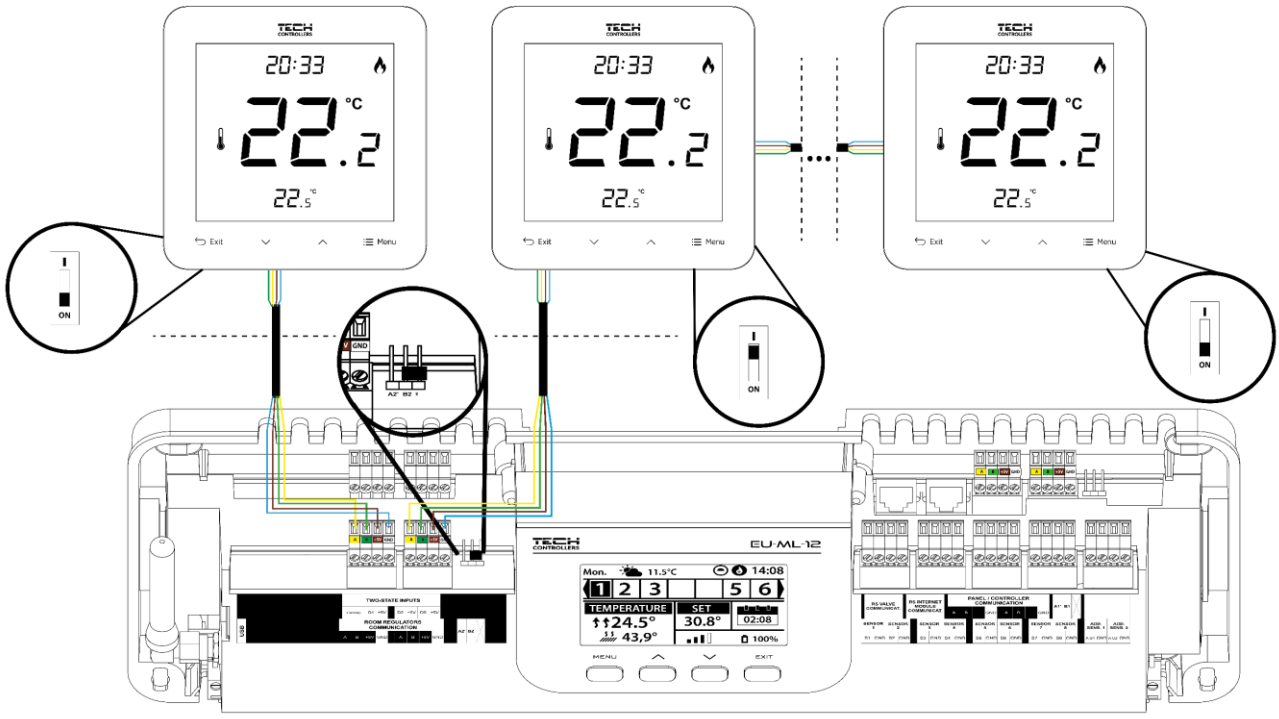


Connection between the controller and the room controllers

When connecting room controllers to the **first controller**, the jumpers on the **controller and on the last** of **the room controllers are switched to the ON position**.



If the room controllers are connected to a controller located **in the middle of** the transmission line, the jumpers to the **first and last controllers are switched to the ON position**.



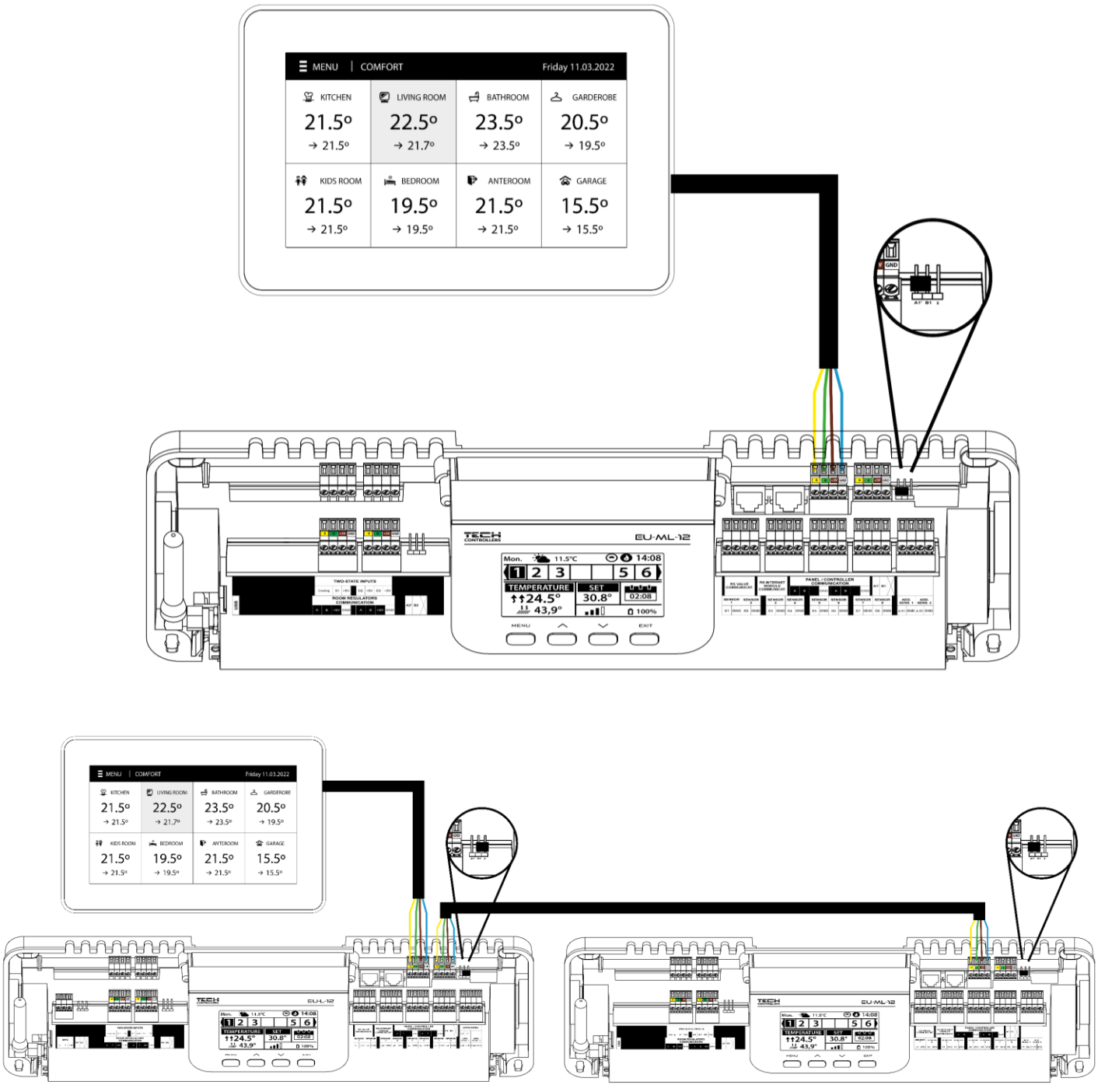
Connection between the controller and the panel

CAUTION

The panel should be connected to the **first or last** controller due to the fact that the panel cannot be equipped with a terminating resistor.

CAUTION

If the panel is connected to the EU-ML-12, then this controller must be connected to the main EU-L-12 controller, and this panel must be registered in the following way: ***Menu → Fitter's menu → Control panel → Device type.*** The panel can be registered as a wired or wireless device, depending on the type of assembly. Click ***Register*** option on the EU-M-12 panel screen.



IV. FIRST STARTUP

In order for the controller to operate correctly, the following steps must be followed for the first start-up:

Step 1: Connect the EU-ML-12 mounting controller with all devices to be controlled

To connect the wires, remove the controller cover and then connect the wiring – this should be done as described on the connectors and the diagrams in the manual.

Step 2. Switch on the power supply, checking the operation of the connected devices

After connecting all devices, switch on the power supply of the controller.

Using the Manual mode function (***Menu → Fitter's menu → Manual mode***), check the operation of the individual devices. Using the ∨ and ∧ buttons, select the device and press the MENU button – the device to be checked should switch on. Check all the connected devices in this manner.

Step 3. Set the current time and date

To set the current date and time, select: ***Menu → Controller settings → Time settings***.

CAUTION

If you are using the EU-505, EU-WiFi RS or EU-WiFi L module, the current time can be downloaded from the network automatically.

Step 4. Configure temperature sensors, room controllers

In order for the EU-ML-12 controller to support a given zone, it must receive information about the current temperature. The simplest way is to use a wired or wireless temperature sensor (e.g. EU-C-7p, EU-C-mini, EU-CL-mini, EU-C-8r). However, if you wish to be able to change the set temperature value directly from the zone, you can use either room controllers: e.g. EU-R-8b, EU-R-8z, EU-R-8b Plus or dedicated controllers: EU-R-12b, EU-R-12s, EU-F-12b, EU-R-X. To pair a sensor with the controller, select: ***Menu → Fitter's menu → Zones →Zone… → Room sensor → Select sensor.***

Step 5. Configure the EU-M-12 control panel and the EU-ML-12 add-on modules

The EU-ML-12 controller can utilize the EU-M-12 control panel, which performs a master function - through it, you can change the set temperatures in the zones, and designate local and global weekly schedules, etc.

Only one control panel of this type may be installed in the installation, which must be registered in the main EU-L-12 controller: ***Menu → Fitter's menu → Control panel*** in order for the panel to display data on the zones operated by the slave ML-12 controller, this controller must be connected to the master L-12 controller, where the control panel is registered.

In order to expand the number of supported zones in the installation (max, 4 additional modules), each EU-ML-12 controller should be separately registered in the main EU-L-12 controller by selecting: ***Menu → Fitter's menu → Additional modules → Module 1..4.***

Step 6. Configure the remaining cooperating devices

The EU-ML-12 controller can also work with the following devices:

- EU-505, EU-WiFi RS or EU-WiFi L Internet modules (the emodul.eu application will display only zones supported by the EU-ML-12 controller).

After connecting the Internet module, the user has the possibility to control the installation via the Internet and the emodul.eu app. For configuration details, refer to the manual of the respective module.

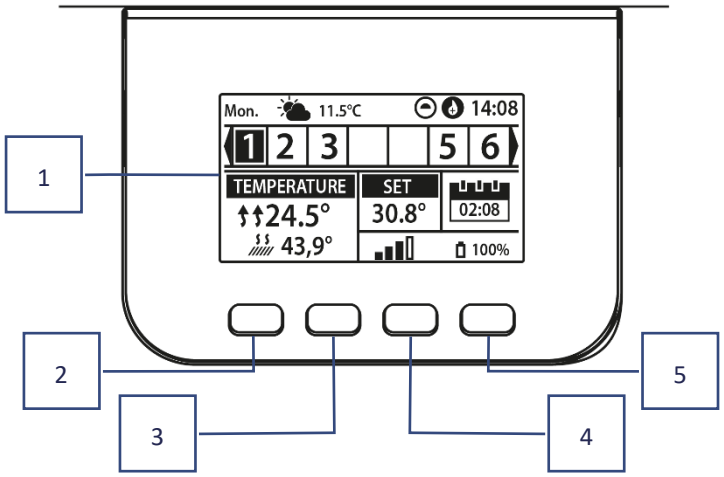
- EU-i-1, EU-i-1m mixing valve modules
- additional contacts, e.g. EU-MW-1 (6 pcs per controller)

CAUTION

If the user wants to use these devices during operation, they must be connected and/or registered.

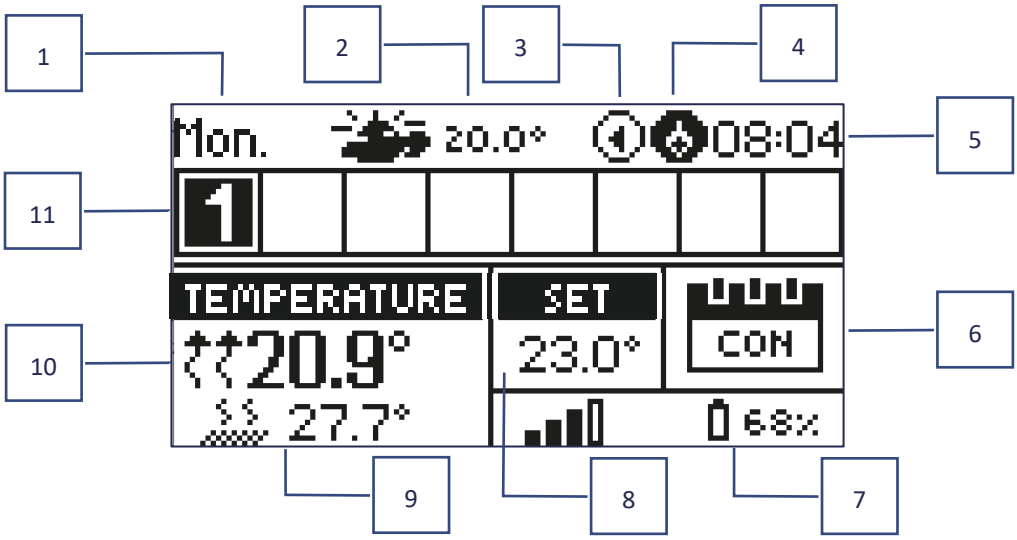
V. MAIN SCREEN DESCRIPTION

The control is carried out by means of buttons located under the display.



1. Controller display.
2. **MENU button** - enters the controller menu, confirming the settings.
3. ⋁ **button** - used to browse the menu functions, decrease the value of the edited parameters. This button also switches the operation parameters between the zones.
4. ⋀ **button** - used to browse the menu functions, increase the value of the edited parameters. This button also switches the operation parameters between the zones.
5. **EXIT button** - EXIT from the controller menu, cancel the settings, toggle the screen view (zones, zone).

Sample screens - ZONES



1. Current day of the week
2. Outside temperature
3. Pump running

4. Activated potential-free contact

	the zone is overheated		the zone is cooled

5. Current time
6. Information about the operating mode/schedule in the respective zone

L	local schedule	**CON**	constant temperature
G-1….G-5	global schedule 1-5	**02:08**	time-limited

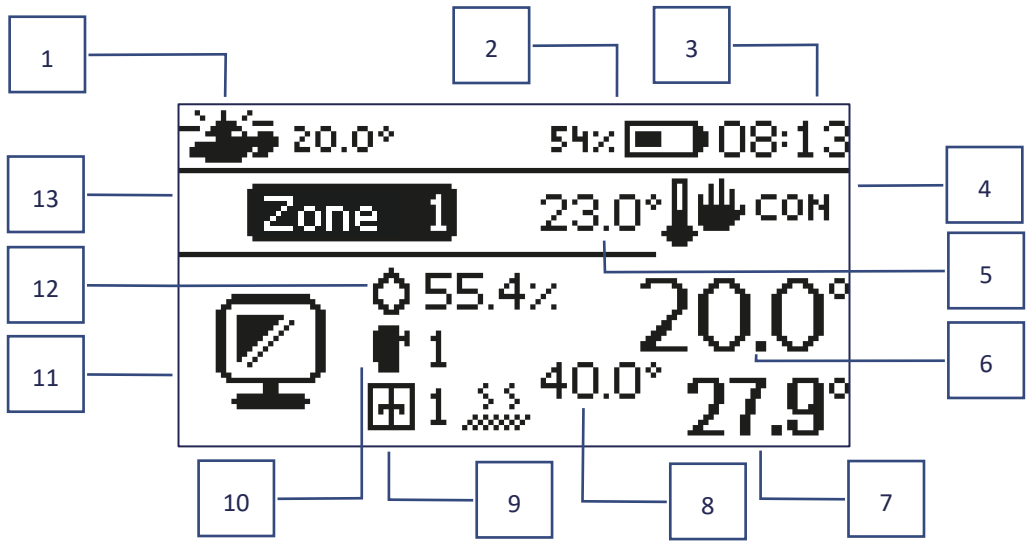
7. Signal strength and battery status of the room sensor information
8. Pre-set temperature in a given zone
9. Current floor temperature
10. Current temperature in a given zone

	the zone is overheated		the zone is cooled

11. Zone information. A visible digit means a registered room sensor that provides information about the current temperature in the respective zone. If the zone is currently heating or cooling, depending on the mode, the digit flashes. If an alarm occurs in a given zone, an exclamation mark will be displayed instead of a digit.

    To view the current operating parameters of a specific zone, highlight its number using the buttons.

Sample Screen - ZONE



1. Outside temperature
2. Battery status
3. Current time
4. Current mode of operation of the displayed zone
5. The preset temperature of the given zone
6. Current temperature of the given zone
7. Current floor temperature
8. Maximum floor temperature
9. Information on the number of registered window sensors in the zone
10. Information about the number of registered actuators in the zone
11. Icon of the currently displayed zone
12. Current humidity level in the given zone
13. Zone name

VI. CONTROLLER FUNCTIONS

Menu	Operation mode
	Zones
	Controller settings
	Fitter's Menu
	Service menu
	Factory settings
	Software version

1. OPERATION MODE

This function enables activation of the selected operating mode.

- **Normal mode** – the preset temperature depends on the set schedule
- **Holiday mode** – the set temperature depends on the settings of this mode

Menu → Fitter's menu → Zones → Zone… → Settings → Temperature settings > Holiday mode

- **Economy mode** – the set temperature depends on the settings of this mode

Menu → Fitter's menu → Zones → Zone… → Settings → Temperature settings > Economy mode

- **Comfort mode** – the set temperature depends on the settings of this mode

Menu → Fitter's menu → Zones → Zone… → Settings → Temperature settings > Comfort mode

CAUTION

- Changing the mode to holiday, economy and comfort will apply to all zones. It is only possible to edit the setpoint temperature of the selected mode for a particular zone.
- In operation mode other than normal, it is not possible to change the set temperature from the room controller level.

2. ZONES

2.1. ON

To display the zone as active on the screen, register a sensor in it (see: Fitter's Menu). The function allows you to disable the zone and hide the parameters from the main screen.

2.2. SET TEMPERATURE

The set temperature in the zone results from the settings of a specific mode of operation in the zone, i.e. the weekly schedule. However, it is possible to switch off the schedule and set a separate temperature and duration of this temperature. After this time, the set temperature in the zone will depend on the previously set mode. On an ongoing basis, the set temperature value, along with the time until the end of its validity, is displayed on the main screen.

CAUTION

In the event that the duration of a specific setpoint temperature is set to CON, this temperature will be valid for an indefinite period (constant temperature).

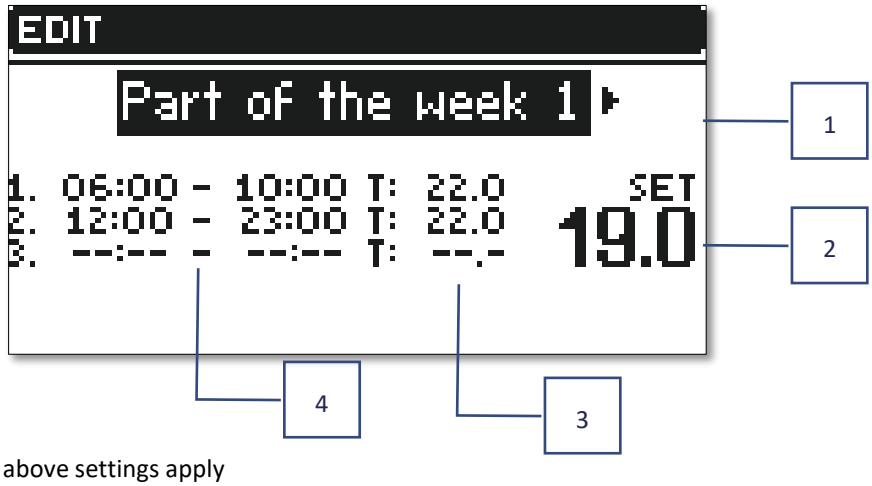
2.3. OPERATION MODE

The user has the ability to view and edit the operating mode settings for the zone.

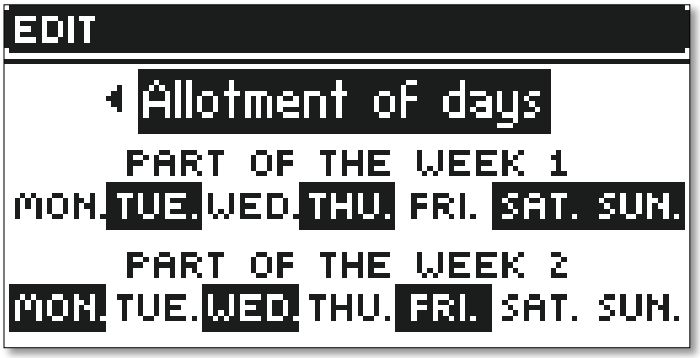
- **Local Schedule** – Schedule settings that only apply to this zone
- **Global Schedule 1-5** – These schedule settings apply to all zones, where they are active
- **Constant temperature (CON)** - the function allows you to set a separate set temperature value, which will be valid in a given zone permanently, regardless of the time of day
- **Time limit –** the function allows you to set a separate temperature, which will be valid only for a specific period of time. After this time, the temperature will result from the previously applicable mode (schedule or constant without time limit).

Schedule editing

Menu → Zones → Zone… → Operation mode → Schedule… → Edit



1. Days on which the above settings apply
2. Temperature set outside the time intervals
3. Set temperatures for time intervals
4. Time intervals



To configure a schedule:

- Use the arrows ∧ ∨ to select the part of the week for which the set schedule will apply (1st part of the week or 2nd part of week)
- Use the MENU button to go to the set temperature settings, which will apply outside the time intervals - set it using the arrows, confirm using the MENU button
- Use the MENU button to go to the settings of the time intervals and the set temperature that will apply to the specified time interval, set it using the arrows, confirm with the MENU button
- Then proceed to the editing of the days that are to be assigned to 1st or 2nd part of the week, active days are displayed in white. The settings are confirmed with the MENU button, the arrows navigate between each day.

After setting the schedule for all the days of the week, press the EXIT button and select the ***Confirm*** option with the MENU button.

CAUTION

The users can set three different time intervals in a given schedule (with an accuracy of 15 minutes).

3. CONTROLLER SETTINGS

3.1. TIME SETTINGS

The current time and date can be automatically downloaded from the network if the Internet module is connected and the automatic mode is enabled. It is also possible for the user to manually set the time and date if the automatic mode does not operate correctly.

3.2. SCREEN SETTINGS

This function allows users to customize the display.

3.3. BUTTON SOUNDS

This option is used to enable the sound that will accompany button pressing.

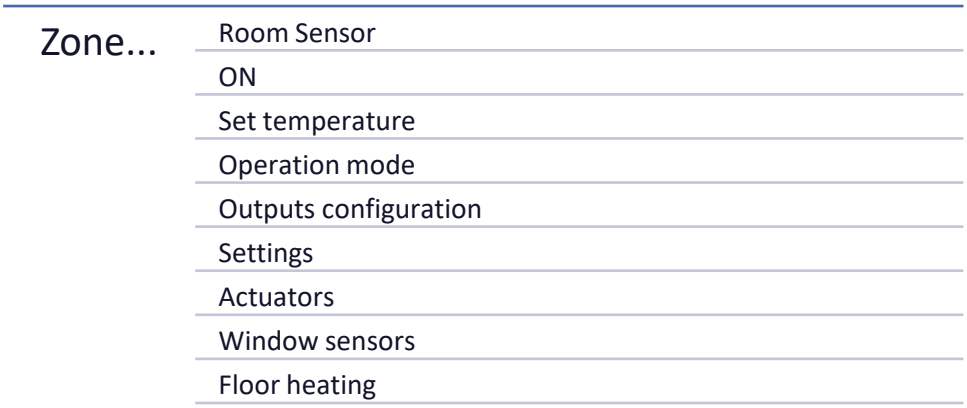
4. FITTER'S MENU

The Fitter's menu is the most complex controller menu, here, users have a wide selection of functions that allow for maximum use of the controller's capabilities.

Fitter's Menu
Zones
Additional contacts
Mixing valve
Master module
Repeater Function
Internet module
Manual mode
External sensor
Heating stopping
Potential-free contact
Pump
Heating - cooling
Anti-stop settings
Max. humidity
Language
Heat pump
Factory settings

4.1. ZONES

In order for a given zone to be active on the controller display, a sensor must be registered in it.



4.1.1. ROOM SENSOR

Users can register/enable any type of sensor: NTC wired, RS or wireless.

- **Hysteresis** - adds a tolerance for the room temperature in the range of 0.1 ÷ 5°C, at which there is additional heating/cooling enabled.

  Example:
  The preset room temperature is 23°C
  Hysteresis is 1°C

  The room sensor will start to indicate room underheating after the temperature drops to 22°C.

- **Calibration** - Room sensor calibration is carried out during assembly or after a longer period of use of the sensor, if the displayed room temperature deviates from the actual one. Adjustment range: from -10°C to +10°C with a step of 0.1°C.

4.1.2. SET TEMPERATURE

The function is described in the ***Menu → Zones*** section.

4.1.3. OPERATION MODE

The function is described in the ***Menu → Zones*** section.

4.1.4. OUTPUTS CONFIGURATION

This option controls the outputs: floor heating pump, potential-free contact and outputs of sensors 1-8 (NTC to control the temperature in the zone or floor sensor to control the floor temperature). Sensor outputs 1-8 are assigned to zones 9-, respectively.

The type of sensor selected here will appear by default in the option: ***Menu → Fitter's menu → Zones → Zones... → Room sensor → Select sensor*** (for temperature sensor) and ***Menu → Fitter's Menu → Zones → Zones… → Floor heating → Floor sensor → Select sensor*** (for floor sensor).

The outputs of both sensors are used to register the zone by wire.

The function also allows to switch off the pump and the contact in a given zone. Such a zone, despite the need for heating, will not participate in the control.

4.1.5. SETTINGS

- **Weather control** - the option to turn the weather control on/off.

CAUTION

- Weather control works only if in the ***Menu → Fitter's menu → External sensor,*** the ***Weather control*** option was checked.
- The external sensor menu is available after registering the sensor with L-12.

- **Heating** – the function enables/disables the heating function. There is also a selection of a schedule that will be valid for the zone during heating and for editing of a separate constant temperature.

- **Cooling** - this function enables/disables the cooling function. There is also a selection of a schedule that will be valid in the zone during cooling and editing of a separate constant temperature.

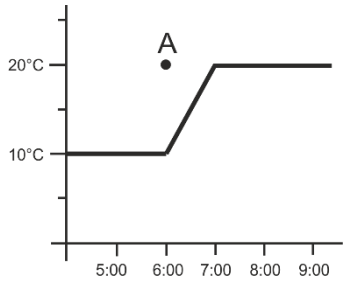
- **Temperature settings** – the function is used to set the temperature for the three operating modes (Holiday mode, Economy mode, Comfort mode).

- **Optimum start**

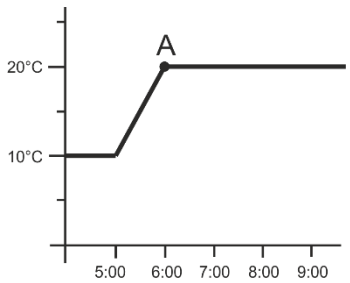
Optimum start is an intelligent heating control system. It consists of continuous monitoring of the heating system and the use of this information to automatically activate the heating in advance of the time required to reach the set temperatures.

This system does not require any involvement on the part of the user and precisely responds to any changes that affect the efficiency of the heating system. If, for example, there are changes made to the installation and the house warms up faster, the optimum start system will identify the change at the next programmed temperature change resulting from the schedule, and in the subsequent cycle it will delay the activation of the heating until the last moment, reducing the time required to reach the preset temperature.

Room temperature – OPTIMUM START OFF



Room temperature – OPTIMUM START ON



A – programmed moment of changing the economic temperature to the comfortable one

Activating this function will ensure that when the programmed change of the set temperature resulting from the schedule occurs, the current temperature in the room will be close to the desired value.

CAUTION

The optimum start function only works in the heating mode.

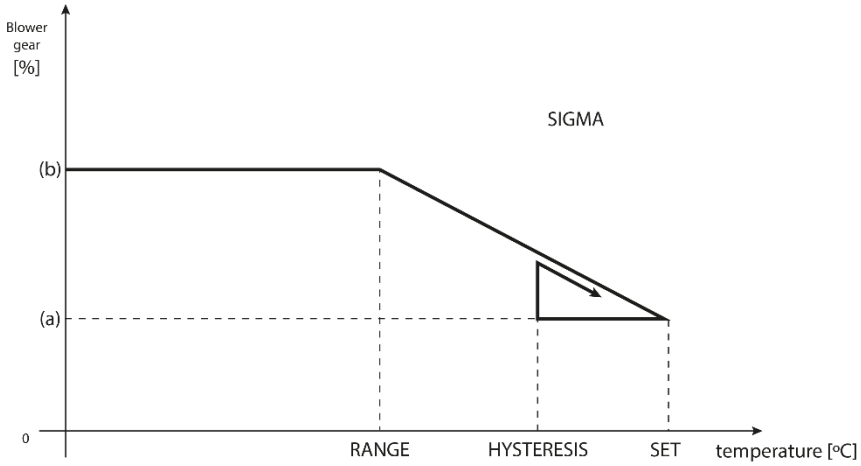
4.1.6. ACTUATORS

➢ **Settings**

- **SIGMA** - the function enables seamless control of the electric actuator. The user can set the **minimum and maximum openings of the valve** – this means that the degree of opening and closing of the valve will never exceed these values. In addition, the user adjusts the **Range** parameter, which determines at which room temperature the valve will start to close and open.

CAUTION

The Sigma function is only available for radiator actuators.



(a) - min. opening
(b) - Actuator opening
ZAD - set temperature

Example:

Zone preset temperature: 23˚C
Minimum opening: 30%
Maximum opening: 90%
Range: 5˚C
Hysteresis: 2˚C

With the above settings, the actuator will start to close once the temperature in the zone reaches 18°C (preset temperature minus the range value). The minimum opening will occur when the zone temperature reaches the set point.

Once the set point is reached, the temperature in the zone will start to drop. When it reaches 21°C (set temperature minus hysteresis value), the actuator will start to open - reaching maximum opening when the temperature in the zone reaches 18°C.

- **Protection** - When this function is selected, the controller checks the temperature. If the set temperature is exceeded by the number of degrees in the ***Range*** parameter, then all actuators in a given zone will be closed (0% opening). This function only works with the SIGMA function enabled.
- **Emergency mode** – This allows for manual actuator opening alteration in case an alarm is triggered in the respective zone (e.g. by sensor failure or room regulator communication error). If the regulator does not operate correctly, setting the actuator opening will be possible via the master controller or the mobile (Internet) app.
  If the regulator operates correctly, this mode does not affect the operation of actuators, as it is the controller that sets their opening on the basis of setpoint temperature. In case of loss of power in the master controller, the actuators will be switched to their default position, as set in the main parameters.

- **Actuator 1-6** - option enables the user to register a wireless actuator. To do this, select ***Register*** and briefly press the communication button on the actuator. After successful registration, an additional ***information*** function appears, where the users can view the actuator parameters, e.g. battery status, range, etc. It is also possible to delete one or all actuators at the same time.

4.1.7. WINDOW SENSORS

- **Settings**

  - **ON** - The function enables the activation of window sensors in a given zone (window sensor registration required).

  - **Delay Time** - This function allows setting the delay time. After the preset delay time, the main controller responds to the opening of the window and blocks heating or cooling in the respective zone.

Example: The delay time is set to 10 minutes. Once the window is opened, the sensor sends information to the main controller about opening the window. The sensor confirms the current state of the window from time to time. If after the delay time (10 minutes) the window remains open, the main controller will close the valve actuators and turn off the overheating of the zone.

CAUTION

If the delay time is set to 0, then the signal to the actuators to close will be transmitted immediately.

- **Wireless** – option to register window sensors (1-6 pcs per zone). To do this, select ***Register*** and briefly press the communication button on the sensor. After successful registration, an additional ***Information*** function appears, where users can view the sensor parameters, e.g. battery status, range, etc. It is also possible to delete a given sensor or all at the same time.

4.1.8. FLOOR HEATING

- **Floor Sensor**

  - **Sensor Selection** - This function is used to enable (wired) or register (wireless) floor sensors. In the case of a wireless sensor, register it by additionally pressing the communication button on the sensor.

  - **Hysteresis** - adds a tolerance for the room temperature in the range of 0.1 ÷ 5°C, at which the additional heating/cooling is enabled.

    Example:
    The maximum floor temperature is 45°C
    Hysteresis is 2°C

    The controller will deactivate the contact after exceeding 45°C at the floor sensor. If the temperature starts to drop, the contact will be switched back on again after the temperature at the floor sensor drops to 43°C (unless the set room temperature has been reached).

  - **Calibration** - Floor sensor calibration is carried out during assembly or after a longer period of use of the sensor, if the displayed floor temperature deviates from the actual. Adjustment range: from -10°C to +10°C with a step of 0.1°C.

CAUTION
The floor sensor is not used during the cooling mode.

- **Operation mode**

  - **OFF** – Selecting this option disables the floor heating mode, i.e. neither ***Floor Protection*** nor ***Comfort Mode*** are active.

  - **Floor Protection** – This function is used to keep the floor temperature below the set maximum temperature to protect the system from overheating. When the temperature rises to the set maximum temperature, the reheating of the zone will be switched off.

  - **Comfort mode** – This function is used to maintain a comfortable floor temperature, i.e. the controller will monitor the current temperature. When the temperature rises to the set maximum temperature, the zone heating will be switched off to protect the system from overheating. When the floor temperature drops below the set minimum temperature, the zone reheat will be switched back on.

- **Min. temperature**

  The function is used to set the minimum temperature to protect the floor from cooling down. When the floor temperature drops below the set minimum temperature, the zone reheat will be switched back on. This function is only available when ***Comfort Mode*** *is selected.*

- **Max. temperature**

  The maximum floor temperature is the floor temperature threshold above which the controller will switch off the heating regardless of the current room temperature. This function protects the installation from overheating.

4.2. ADDITIONAL CONTACTS

Menu → Fitter's Menu → **Additional contacts**

The function allows you to utilize additional contact devices. It is first necessary to register such a contact (1-6 pcs.). To do this, select the ***Registration*** option and briefly press the communication button on the device, e.g. MW-1.

After registering and switching on the device, the following functions will appear:

- **Information** - information about the status, operating mode and contact range is displayed on the controller screen
- **ON** - option to enable/disable contact operation
- **Operation mode** – user available option to activate the selected contact operation mode
- **Time mode** – the function allows setting the contact operation time for a specific time
  The user can change the contact status by selecting/deselecting the ***Active*** option, and to set the ***Duration*** of this mode
- **Constant mode** – the function allows setting the contact to operate permanently. It is possible to change the contact status by selecting/deselecting the ***Active*** option
- **Relays** – the contact works according to the zones to which it has been assigned
- **Drying** – if the ***Maximum Humidity*** is exceeded in a zone, this option allows start-up of the air dehumidifier
- **Schedule settings** – the function allows setting a separate contact operation schedule (regardless of the status of the controller zones).

CAUTION

The ***Drying*** function works only in the ***Cooling*** operation mode.

- **Remove** – this option is used to delete the selected contact.

4.3. MIXING VALVE

Menu → Fitter's Menu → **Mixing valve**

The EU-ML-12 controller can operate an additional valve using a valve module (e.g. EU-i-1m). This valve has RS communication, but it is necessary to carry out the registration process, which will require you to quote the module number located in the rear of its housing, or in the software information screen). After correct registration, it is possible to set individual parameters of the additional valve.

- **Information** - This function allows users to view the valve parameters status.
- **Register** - After entering the code on the back of the valve or in the ***Menu → Software version***, users can register the valve with the main controller.

- **Manual mode** – This function enables users to manually stop valve operation, open/close the valve and switch pump on and off in order to control the correct operation of the devices.

- **Version** - This function displays the valve software version number. This information is necessary when contacting the service.

- **Valve removal** - This function is used to completely delete the valve. The function is initiated, for example, when removing the valve or replacing the module (it is then necessary to re-register the new module).

- **ON** – option to temporarily enable or disable the valve.

- **Valve set temperature** – This parameter allows setting the valve set temperature.

- **Summer mode** – turning on the summer mode closes the valve to avoid unnecessary heating of the house. If the boiler temperature is too high (enabled boiler protection is required), the valve will be opened in emergency mode. This mode is not active in ***Return protection*** mode.

- **Calibration** - This function can be used to calibrate the built-in valve, e.g. after prolonged use. During calibration, the valve is set to a safe position, i.e. for the CH valve and the ***Return protection*** type - to their fully open positions, and for floor valves and the ***Cooling*** type - to their fully closed positions.

- **Single stroke** - This is the maximum single stroke (opening or closing) that the valve can perform during single temperature sampling. If the temperature is close to the set point, this stroke is calculated on the basis of the ***Proportionality coefficient*** parameter. Here, the smaller the unit stroke, the more precisely the set temperature can be reached, but the set temperature is reached over a longer period of time.

- **Minimum opening** - A parameter that specifies the smallest valve opening in percent. This parameter enables leaving the valve slightly open to maintain minimum flow.

CAUTION

If the minimum opening of the valve is set to 0% (complete closing), the pump will not operate when the valve is closed.

- **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).

- **Measurement pause** - This parameter determines the frequency of measuring (control) of water temperature downstream of the CH installation valve. If the sensor indicates a temperature change (deviation from the set point), then the solenoid valve will open or close by the preset value to return to the preset temperature.

- **Valve Hysteresis** - This option is used to set the valve setpoint temperature 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.

- **Valve type** – This option enables users to select the following valve types:

  - **CH** - set when the intent is to control the temperature in the CH circuit using the valve sensor. The valve sensor shall be placed downstream of the mixing valve on the supply pipe.

  - **Floor** - set when adjusting the temperature of the underfloor heating circuit. The floor type protects the floor system against excessive temperatures. If the type of valve is set as CH and it is connected to the floor system, it may lead to damage to the floor system.

  - **Return protection** - set when adjusting the temperature at the return of the installation using the return sensor. Only return and boiler sensors are active in this type of valve, 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 short circuit, while the full opening of the valve (100%) means that the short circuit is closed and the water flows through the entire central heating system.

    CAUTION

    If the ***Boiler Protection*** is off, the CH temperature will not affect the opening of the valve. In extreme cases, the boiler may overheat, so it is recommended to configure the boiler protection settings.
    For this type of valve, refer to the ***Return Protection Screen.***

  - **Cooling** - set when adjusting the temperature of the cooling system (the valve opens when the set temperature is lower than the temperature of the valve sensor). ***Boiler protection and Return protection*** do not work in this type of valve. This type of valve operates despite the active ***Summer mode***, while the pump operates using the shutdown threshold. In addition, this type of valve has a separate heating curve as a function of the ***Weather sensor***.

- **Opening in calibration** – When this function is enabled, the valve starts its calibration from the opening phase. This function is only available when the valve type is set as a ***CH Valve***.

- **Floor heating - summer** – This function is only visible after selecting the valve type as ***Floor Valve***. When this function is enabled, the floor valve will operate in the ***Summer Mode***.

- **Weather sensor** – For the weather function to be active, the external sensor must be placed **in a location exposed to atmospheric influences**. After installing and connecting the sensor, switch on the ***Weather sensor*** function in the controller menu.

CAUTION

This setting is not available in the ***Cooling*** and ***Return Protection*** Modes.

Heating curve - this is the 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 properly, the set temperature (downstream the valve) is set for four intermediate external temperatures: -20°C, -10°C, 0°C and 10°C. There is a separate heating curve for the ***Cooling*** mode. It is set for intermediate outdoor temperatures of: 10°C, 20°C, 30°C, 40°C.

- **Room controller**
  - **Controller type**

    → **Control without room controller** - This option should be checked when users do not want the room controller to affect the operation of the valve.

    → **RS controller lowering** - check this option if the valve is to be controlled by a room controller equipped with RS communication. When this function is checked, the controller will operate according to the ***Lower room temp.*** parameter.

    → **RS proportional controller** - When this controller is switched on, the current boiler and valve temperatures can be viewed. With this function checked, the controller will operate according to the ***Room Temperature Difference*** and ***Setpoint Temperature Change*** parameters.

    → **Standard controller** - this option is checked if the valve is to be controlled by a two-state controller (not equipped with RS communication). When this function is checked, the controller will operate according to the ***Lower room temp.*** parameter.

  - **Lower room temp.** - In this setting, set the value by which the valve will lower its set temperature once the temperature set in the room controller is reached (room heating).

CAUTION

This parameter applies to the ***Standard controller*** and ***RS Controller lowering*** functions.

- **Room temperature difference** - This setting determines the unit change in the current room temperature (to the nearest 0.1°C) at which a specific change in the set temperature of the valve will occur.

- **Preset temperature change** - This setting determines how many degrees the valve temperature will increase or decrease with a unit change in room temperature (see: ***Room temperature difference***). This function is only active with the RS room controller and is closely related to the ***Room temperature difference*** parameter.

  Example: Room temperature difference: 0.5°C
  Valve set temperature change: 1°C

  Valve set temperature: 40°C
  Room controller set temperature: 23°C

  If the room temperature rises to 23.5°C (by 0.5°C above the set room temperature), the valve closes to the 39°C preset (by 1°C).

CAUTION

This parameter applies to the ***RS proportional controller*** function.

- **Room controller function** - In this function, it is necessary to set whether the valve will close (***Closing***) or the temperature will lower (***Lowering the room temperature***) once it is heated.

- **Proportionality coefficient** – The proportionality coefficient is 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 a similar opening faster, but it will be less precise.
  The percentage of the unit opening is calculated using the following formula:

  (set temperature – sensor temp.) x (proportionality coefficient/10)

- **Maximum floor temperature–** This function specifies the maximum temperature that the valve sensor can reach (if Floor valve is selected). When this value is reached, the valve closes, switches off the pump and the information about overheating of the floor appears on the main screen of the controller.

CAUTION

This parameter is only visible if the valve type is set to ***Floor valve***.

- **Opening direction** – If, after connecting the valve to the controller, it turns out that it was supposed to be connected in the opposite direction, it is not necessary to switch the supply lines - as it is possible to change the opening direction of the valve by selecting the selected direction: Right or Left.

- **Sensor Selection** – This option applies to the return sensor and the external sensor and allows determining whether the additional valve operation should take into account the ***Own sensors*** of the valve module or the ***Sensors of the main controller*** (Only in Slave Mode).

- **CH sensor selection** – This option applies to the CH sensor and allows determining whether the function of the additional valve should take into account the ***Own sensor*** of the valve module or the ***Main controller sensor*** (Only in slave mode).

- **Boiler protection** – Protection against excessive CH temperature is intended to prevent dangerous increase of boiler temperature. The user sets the maximum permissible boiler temperature. In the event of a dangerous temperature rise, the valve begins to open to cool the boiler down. The user also sets the maximum permissible CH temperature, after which the valve will open.

CAUTION

The function is not active for the ***Cooling*** and ***Floor*** valve types.

- **Return protection** – This function allows setting the boiler protection against too cold water returning from the main circuit (which could cause 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.

CAUTION

The function does not appear for the valve type ***Cooling***.

- **Valve pump**

  - **Pump operating modes** – the function allows selection of the pump operating mode:
    → **Always ON** - pump runs at all times regardless of temperature
    → **Always OFF** - the pump is switched off permanently and the controller only controls the operation of the valve

→ **Turned ON above the threshold** - the pump turns on above the set switching 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.

- **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.
- **Pump anti-stop** - When enabled, the valve pump will turn on every 10 days for 2 minutes. This prevents water from fouling the installation outside the heating season.
- **Closing below temperature threshold** - When this function is activated (check the ON option), the valve will remain closed until the boiler sensor reaches the pump switching temperature.

CAUTION
If the additional valve module is an i-1 model, the anti-stop functions of the pumps and the closure below the threshold can be set directly from the sub-menu of that module.

- **Room controller pump valve** - Option whereby the room controller switches the pump off once heated.
- **Pump Only** - When enabled, the controller controls only the pump and the valve is not controlled.

➢ **External sensor calibration** – This function is used to adjust the external sensor. This is done during installation or after prolonged use of the sensor if the displayed external temperature deviates from the actual. The user specifies the correction value applied (adjustment range: -10 to +10°C).

➢ **Closing** – Parameter in which the behaviour of the valve in the CH mode is set after it is switched off. Enabling this option closes the valve, while disabling opens it.

➢ **Valve Weekly** – The weekly function allows users to program deviations of the valve set temperature on particular days of the week at specific times. The temperature deviations set are in the range of +/-10°C.

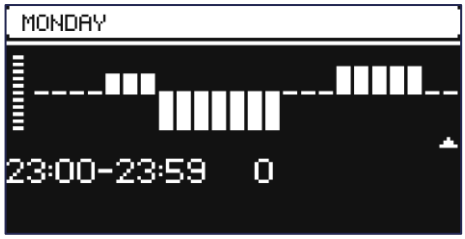
To enable weekly control, select and check ***Mode 1*** or ***Mode 2***. Detailed settings of these modes can be found in the following sections of the submenu: ***Set Mode 1*** and ***Set Mode 2***.

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

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

→ Select the option: ***Set Mode 1***
→ Select the day of the week for which you wish to change the temperature settings
→ Use the ∨ ∧ buttons to select the time for which you want to change the temperature, then 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.
→ If you want to apply the same change also to the neighboring hours, press the MENU button on the selected setting, and after the option appears at the bottom of the screen, select COPY, then copy the setting to the subsequent or previous hour using the ∨ ∧ buttons. Confirm the settings by pressing MENU.

Example:



	Time	Temperature - Set Weekly Control
Monday		
PRESET	4^{00} - 7^{00}	+5°C
	7^{00} - 14^{00}	-10°C
	17^{00} - 22^{00}	+7°C

In this case, if the temperature set on the valve is 50°C, on Mondays, from 4^{00} to 7^{00} hours - the temperature set on the valve will increase by 5°C, or to 55°C; in the hours from 7^{00} to 14^{00} - it will decrease by 10°C, so it will be 40°C; between 17^{00} and 22^{00} - it will increase to 57°C.

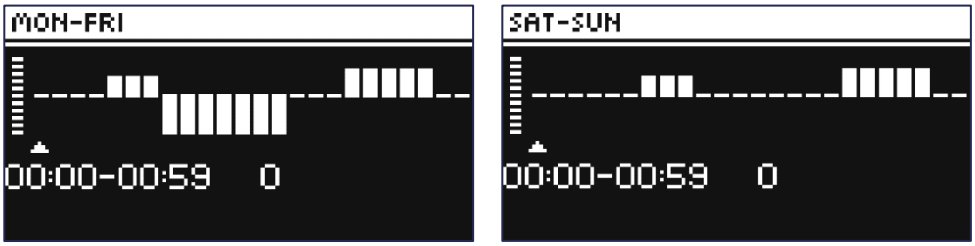
MODE 2 - in this mode, it is possible to program the temperature deviations in detail for all **working days** (Monday – Friday) and for the **weekend** (Saturday – Sunday). To do this:

→ Select the option: ***Set Mode 2***

→ Select the part of the week for which you wish to change the temperature settings

→ The further procedure is the same as in ***Mode 1***

Example:



	Time	Temperature - Set Weekly Control
Monday - Friday		
PRESET	4^{00} - 7^{00}	+5°C
	7^{00} - 14^{00}	-10°C
	17^{00} - 22^{00}	+7°C
Saturday - Sunday		
PRESET	6^{00} - 9^{00}	+5°C
	17^{00} - 22^{00}	+7°C

In this case, if the temperature set on the valve is 50°C Monday to Friday, from 04^{00} to 07^{00} hours - the temperature on the valve will increase by 5°C, or to 55°C; in the hours from 07^{00} to 14^{00} - it will decrease by 10°C, so it will amount to 40°C; between 17^{00} and 22^{00} - it will increase to 57°C.
During the weekend, from 06^{00} to 09^{00} hours - the temperature on the valve will rise by 5°C, that is to 55°C; between 17^{00} and 22^{00} - it will rise to 57°C.

- **Factory settings** – This parameter allows you to return to the settings of a given valve saved by the manufacturer. Restoring the factory settings will change the valve type to a CH valve.

4.4. MASTER MODULE

Menu → Fitter's Menu → **Master module**

The function is used to register the EU-ML-12 slave controller in the EU-L-12 main controller. To do this:

- For wired registration, connect the EU-ML-12 controller to the EU-L-12 controller following to the diagrams in the manual
- In the EU-L-12 controller, select: ***Menu → Fitter's Menu → Additional Module → Module Type***
- In the EU-ML-12, select: ***Menu → Fitter's Menu→ Main Module → Module Type.***

After registering the EU-ML-12 add-on module, users can control the operation of additional zones that the EU-ML-12 module supports from the level of the main EU-L-12 controller and the Internet. Each EU-ML-12 controller allows the operation of a further 8 zones. A maximum of 40 zones can be controlled by the system.

CAUTION

This function allows registration of up to 4 EU-ML-12 devices. Options of wired and wireless registration are possible.

CAUTION

Registration will only be successful if the system versions* of the registered devices are compatible with each other.

*system version – version of the device communication protocol

4.5. REPEATER FUNCTION

Menu → Fitter's Menu → **Repeater Function**

In order to use the repeater function:
1. Select registration ***Menu → Fitter's Menu →Repeater function → Registration***
2. Start the registration on the transmitting device (e.g. EU-ML-12, EU-M-12).
3. After the correct execution of steps 1 and 2, the wait prompt on the EU-ML-12 controller should change from "Registration step 1" to "Registration step 2", and on the registration of the transmitting device - “success”. Every step of the registration process is approx. 2 min.
4. Run the registration on the target device or on another device that supports repeater functions.
The user will be notified by an appropriate prompt about the positive or negative result of the registration process.

CAUTION

Registration should always be successful on both registered devices.

4.6. INTERNET MODULE

Menu → Fitter's Menu → **Internet module**

The Internet module is a device that allows remote control of the installation. The user can control the operation of various devices and change some parameters using the ***emodul.eu*** application.
After registering and switching on the Internet module and selecting the DHCP option, the controller will automatically retrieve parameters such as: IP address, IP mask, Gateway address and DNS address from the local network.

The Internet module can be connected to the controller via an RS cable. A detailed description of the registration process is provided in the user manual of the Internet module.

CAUTION

This type of control is possible only after purchasing and connecting an additional module - ST-505, WiFi RS or WiFi L to the controller, which are not included as standard in the controller.

CAUTION

When the Internet module is connected to the EU-ML-12 controller, the emodul.eu application will display only the zones of the given EU-ML-12 controller; when connected to the main EU-L-12 controller, the application will display all zones of the entire system.

4.7. MANUAL MODE

Menu → Fitter's Menu → **Manual mode**

This function allows the individual control of device operation, and the user can manually switch on each of the devices: pump, potential-free contact and individual valve actuators. It is recommended to use manual mode mode to check the correct operation of the connected devices at the first start-up.

4.8. EXTERNAL SENSOR

Menu → Fitter's Menu → **External sensor**

CAUTION

This function is only available when an external sensor has been registered in the EU-L-12 controller.

An external temperature sensor can be connected to the EU-L-12 controller so as to allow switching on weather control. In such as case, only one sensor on the main module (EU-L-12) is registered in the system, and the current outdoor temperature value is displayed on the main screen and transmitted to other devices (EU-ML-12 and EU-M-12).

- **Sensor Selection** – You can select either a NTC and OpenTherm wired sensor or a EU-C-8zr wireless sensor. The wireless sensor requires registration.
- **ON** – to use the weather control, the selected sensor must be enabled
- **Weather control** - When the external sensor is connected, the main screen will display the external temperature, while the controller menu will display the mean external temperature.

  The function based on the outside temperature allows determination of the mean temperature, which will work on the basis of the temperature threshold. If the mean temperature exceeds the specified temperature threshold, the controller will switch off the heating of the zone in which the weather control function is active.

  - **Averaging time** – the user sets the time on the basis of which the mean outside temperature will be calculated. Setting range is from 6 to 24 hours.

  - **Temperature threshold** – this is a function protecting against excessive heating of the given zone. The zone in which the weather control is switched on will be blocked from overheating if the mean daily outdoor temperature exceeds the set threshold temperature. For example, when temperatures rise in the Spring, the controller will block unnecessary room heating.

- **Calibration** - The calibration is performed at installation or after prolonged use of the sensor if the temperature measured by the sensor deviates from the actual temperature. Adjustment range is from -10°C to +10°C - with a step of 0.1°C.

In the case of a wireless sensor, the subsequent parameters relate to the range and level of the battery.

4.9. HEATING STOPPING

Function to prevent actuators from turning on at specified time intervals.

- **Date settings**

- **Heating Off** – sets the date from which the heating will be switched off
- **Heating ON** - sets the date from which the heating will be switched on

- **Weather control** - When the external sensor is connected, the main screen will display the external temperature, and the controller menu will display the mean external temperature.

The function based on the outside temperature allows determining the mean temperature that will work on the basis of the temperature threshold. If the mean temperature exceeds the specified temperature threshold, the controller will switch off the heating of the zone in which the weather control function is active.

- **ON** – to use the weather control, the selected sensor must be enabled
- **Averaging time** – the user sets the time on the basis of which the mean outside temperature will be calculated. Setting range is from 6 to 24 hours.
- **Temperature threshold** – a function protecting against excessive heating of the respective zone. The zone in which the weather control is switched on will be blocked from overheating if the mean daily outdoor temperature exceeds the set threshold temperature. For example, when temperatures rise in the Spring, the controller will block unnecessary room heating.
- **Mean outdoor temperature** – temperature value calculated on the basis of the ***Averaging time.***

4.10. POTENTIAL-FREE CONTACT

Menu → Fitter's Menu → **Potential-free contact**

The EU-ML-12 controller will activate the potential-free contact (after counting down the delay time) when any of the zones has not reached the set temperature (heating – when the zone is underheated, cooling – when the temperature in the zone is too high). The controller deactivates the contact once the set temperature has been reached.

- **Remote operation** - allows starting the contact from another slave controller (EU-ML-12 add-on module) that is registered in the main EU-L-12 control controller
- **Delayed operation** - the function allows setting the delay time of switching on the potential-free contact after the temperature drops below the set temperature in any of the zones.

4.11. PUMP

Menu → Fitter's Menu → **Pump**

The EU-ML-12 controller controls the pump operation – it switches on the pump (after counting down the delay time) when any of the zones is underheated and when the floor pump option is enabled in the respective zone. When all zones are heated (the set temperature is reached), the controller switches off the pump.

- **Remote operation** - allows starting the pump from another slave controller (EU-ML-12 add-on module), registered in the main EU-L-12 control controller
- **Delayed operation** - allows setting the delay time of switching on the pump after the temperature drops below the set temperature in any of the zones. The delay in switching on the pump is used to allow the valve actuator to open.

4.12. HEATING - COOLING

Menu → Fitter's Menu → **Heating - cooling**

The function allows selection of the operating mode:

- **Remote operation** - allows starting the operating mode from another slave controller (EU-ML-12 add-on module), registered in the main EU-L-12 control controller
- **Heating** – all zones are heated
- **Cooling** – all zones are cooled
- **Automatic** – the controller switches the mode between heating and cooling based on the two-state input.

4.13. ANTI-STOP SETTINGS

Menu → Fitter's Menu → **Anti-stop settings**

This function forces the pumps to operate, which prevents scale from building up during a period of prolonged inactivity of the pumps, e.g. outside the heating season. If this function is enabled, the pump will switch on for the set time and with a specified interval (e.g. every 10 days for 5 min.)

4.14. MAXIMUM HUMIDITY

Menu → Fitter's Menu → **Maximum humidity**

If the current humidity level is higher than the set maximum humidity, the cooling of the zone will be disconnected.

CAUTION

The function is only active in ***Cooling*** mode, provided that a sensor with humidity measurement is registered in the zone.

4.15. HEAT PUMP

This is a dedicated mode for an installation operating with a heat pump, and enables optimal use of its capabilities.

- **Energy saving mode** – ticking this option will start the mode and more options will appear
- **Minimum break time** – a parameter limiting the number of compressor starts, which allows to extend its service life. Regardless of the need to reheat a given zone, the compressor will switch on only after the time counted from the end of the previous operating cycle.

- **Bypass** – an option needed in the absence of a buffer, providing the heat pump with an appropriate heat capacity. It relies on sequential opening of subsequent zones every specified time.
  - **Floor pump** – activation/deactivation of the floor pump
  - **Cycle time** – the time for which the selected zone will be opened**.**

4.16. LANGUAGE

Menu → Fitter's Menu → **Language**

The function allows change of the controller language version.

4.17. FACTORY SETTINGS

Menu → Fitter's Menu → **Factory settings**

The function allows return to the Fitter's menu settings saved by the manufacturer.

5. SERVICE MENU

The controller service menu is only available to authorized persons and is protected by a proprietary code held by Tech Sterowniki.

6. FACTORY SETTINGS

The function allows return to the default settings of the controller, as defined by the manufacturer.

7. SOFTWARE VERSION

When this option is activated, the manufacturer's logo will appear on the display, along with the controller software version number. The software revision is required when contacting the Tech Sterowniki service.

VII.ALARM LIST

Alarm	Possible cause	Troubleshooting
Sensor defective (room sensor, floor sensor)	Sensor short-circuited or defective	- Check the correct connection of the sensor - Replace the sensor with a new one, Contact service if necessary.
Lack of communication with wireless Sensor/Controller Alarm	- No signal - No battery - Battery missing/dead	- Move the sensor/room controller to another location - Insert new battery into the sensor/room controller The alarm will be cleared automatically after successful communication.
Lack of communication with a wireless module/control panel/contact alarm	No signal	- Move the device to another location, or use a repeater to increase the range. The alarm will be cleared automatically after successful communication is established.
Software upgrade	Incompatible versions of system communication in two devices	Please update software to the latest version.
STT-868 Actuator Alarms		
ERROR #0	Actuator battery low	Replace batteries.
ERROR #1	Damage to mechanical or electronic components	Contact service.
ERROR #2	- Valve control piston missing - Valve stroke (offset) too large - The actuator is incorrectly installed on the radiator - Wrong valve on the radiator	- Fit the control piston to the actuator - Check valve stroke - Install the actuator correctly - Replace the valve on the radiator.
ERROR #3	- Valve jam - Wrong valve on the radiator - Valve stroke (offset) too small	- Check the operation of the radiator valve - Replace the valve on the radiator - Check valve stroke.

ERROR #4	- No signal - No battery	- Check the distance of the main controller from the actuator - Insert new batteries into the actuator The alarm is cleared automatically once successful communication is established.
STT-869 actuator alarms		
ERROR #1 – Calibration error 1 – Screw retraction to mounting position took too long	Limit sensor defective	- Re-calibrate by holding down the registration button until the LED flashes 3 times. - Call service.
ERROR #2 – Calibration error 2 – Screw is fully extended – no resistance during extension	- The actuator was not screwed on the valve properly or it is not fully screwed on - The valve stroke is too large or the valve has non-standard dimensions - Damaged actuator current measurement system	- Check the correctness of the actuator installation - Replace the batteries - Re-calibrate by holding down the registration button until the LED flashes 3 times - Call service.
ERROR #3 – Calibration error 3 – Screw extension too short – screw resistance encountered too early	- The valve stroke is too small or the valve has non-standard dimensions - Damaged actuator current measurement system - Battery low	- Replace batteries - Re-calibrate by holding down the registration button until the LED flashes 3 times - Call service.
ERROR #4 – No feedback communication	- Master controller disabled - Poor signal or no signal to master controller - Defective RF module in the actuator	- Check if the master controller is operating - Reduce the distance from the master controller - Call service.
ERROR #5 – Low battery	Battery low	Replace the batteries
ERROR #6 – Encoder blocked	Encoder failure	- Re-calibrate by holding down the registration button until the LED flashes 3 times. - Call service.
ERROR #7 – Current too high	- Unevenness, e.g. on the screw, thread, causing high movement resistance - High transmission or motor resistance - Faulty current measurement system	
ERROR #8 – Limit sensor error	Faulty limit switch system	
EU-GX actuator alarm		
ERROR #1 - Calibration error 1	Bolt retraction to mounting position took too long.	Locked/damaged actuator piston. Check the assembly and recalibrate the actuator.
ERROR #2 - Calibration error 2	Bolt maximally extended as it did not meet any resistance during extension.	• actuator was not screwed properly onto the valve • the actuator was not fully tightened onto the valve • actuator movement was excessive, or non-standard valve encountered • motor load measurement failure occurred Check the assembly and recalibrate the actuator.
ERROR #3 - Calibration error 3	Bolt extension too short. The bolt met resistance too early during the calibration process.	• valve movement was too small, or a non-standard valve encountered

		• motor load measurement failure • motor load measurement inaccurate due to low battery charge Check the assembly and recalibrate the actuator.
ERROR #4 - Actuator feedback communication error.	For the last x minutes, the actuator did not receive a data package via wireless communication. After this error is triggered, the actuator will set itself to 50% opening. The error will reset after a data package is received.	• master controller disabled • poor signal or no signal originating from the master controller • defective RC module in the actuator
ERROR #5 - Battery low	The actuator will detect battery replacement after voltage rises and launch calibration	• battery depleted
ERROR #6	-	-
ERROR #7 - Actuator blocked		• while changing the opening of the valve, excessive load was encountered Recalibrate the actuator.

VIII. SOFTWARE UPDATE

To upload new software, disconnect the controller from the network. Insert the USB flash drive containing the new software into the USB port. Subsequently, connect the controller to the network while holding down the EXIT button. Hold down the EXIT button until you hear a single beep marking the start of uploading new software. Once the task is completed, the controller will restart itself.

CAUTION

- The process of uploading new software to the controller may only be carried out by a qualified installer. After changing the software, it is not possible to restore the previous settings.
- Do not turn off the controller while updating the software.

IX. TECHNICAL DATA

Power supply	230V ± 10% / 50 Hz
Max. power consumption	4W
Ambient temperature	5 ÷ 50°C
Max. load on potential outputs 1-8	0.3A
Max. pump load	0.5A
Potential-free cont. nom. out. load	230V AC / 0.5A (AC1) * 24V DC / 0.5A (DC1) **
Thermal resistance of NTC sensor	-30 ÷ 50°C
Operation frequency	868MHz
Fuse	6.3A

* 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

Hereby, we declare under our sole responsibility that **EU-ML-12** manufactured by TECH STEROWNIKI II Sp. z o. o., headquartered in Wieprz Biała Droga 31, 34-122 Wieprz, is compliant with Directive 2014/53/EU of the European parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment, Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products as well as the regulation by the MINISTRY OF ENTREPRENEURSHIP AND TECHNOLOGY of 24 June 2019 amending the regulation concerning the essential requirements as regards the restriction of the use of certain hazardous substances in electrical and electronic equipment, implementing provisions of 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 (OJ L 305, 21.11.2017, p. 8).

For compliance assessment, harmonized standards were used:

PN-EN IEC 60730-2-9 :2019-06 art. 3.1a Safety of use

PN-EN 62479:2011 art. 3.1 a Safety of use

ETSI EN 301 489-1 V2.2.3 (2019-11) art.3.1b Electromagnetic compatibility

ETSI EN 301 489-3 V2.1.1:2019-03 art.3.1 b Electromagnetic compatibility

ETSI EN 300 220-2 V3.2.1 (2018-06) art.3.2 Effective and coherent use of radio spectrum

ETSI EN 300 220-1 V3.1.1 (2017-02) art.3.2 Effective and coherent use of radio spectrum

EN IEC 63000:2018 RoHS

Wieprz, 21.03.2023

Paweł Jura Janusz Master

Prezesi firmy

TECH
CONTROLLERS

Central headquarters:
ul. Biała Droga 31, 34-122 Wieprz

Service:
ul. Skotnica 120, 32-652 Bulowice

phone: **+48 33 875 93 80**
e-mail: **serwis@techsterowniki.pl**