TECH CONTROLLERS

USER MANUAL

EU-L-8e

EN

www.tech-controllers.com

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KN.18.09.18

The pictures and diagrams are for illustration purposes only.

The manufacturer reserves the right to introduce some hanges.

I. SAFETY

Before using the device for the first time the user should read the following regulations carefully. Not obeying the rules included in this manual may lead to personal injuries or controller damage. The user's manual should be stored in a safe place for further reference. In order to avoid accidents and errors it should be ensured that every person using the device has familiarized themselves with the principle of operation as well as security functions of the controller. If the device is to be sold or put in a different place, make sure that the user's manual is there with the device so that any potential user has access to essential information about the device.

The manufacturer does not accept responsibility for any injuries or damage resulting from negligence; therefore, users are obliged to take the necessary safety measures listed in this manual to protect their lives and property.

WARNING

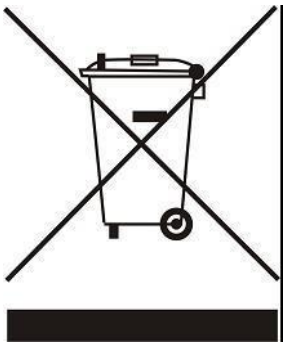
- High voltage! Make sure the regulator is disconnected from the mains before performing any activities involving the power supply (plugging cables, installing the device etc.).
- The device should be installed by a qualified electrician.
- Before starting the controller, the user shoud measure earthing resistance of the electric motors as well as the insulation resistance of the cables.
- The regulator should not be operated by children.

NOTE

- The device may be damaged if struck by a lightning. Make sure the plug is disconnected from the power supply during storm.
- Any use other than specified by the manufacturer is forbidden.
- Before and during the heating season, the controller should be checked for condition of its cables. The user should also check if the controller is properly mounted and clean it if dusty or dirty.

Changes in the merchandise described in the manual may have been introduced subsequent to its completion on September 18th 2018. The manufacturer retains the right to introduce changes to the structure. The illustrations may include additional equipment. Print technology may result in differences in colours shown.

We are committed to protecting the environment. Manufacturing electronic devices imposes an obligation of providing for environmentally safe disposal of used electronic components and devices. Hence, we have been entered into a register kept by the Inspection For Environmental Protection. The crossed-out bin symbol on a product means that the product may not be disposed of to household waste containers. Recycling of wastes helps to protect the environment. The user is obliged to transfer their used equipment to a collection point where all electric and electronic components will be recycled.



II. DEVICE DESCRIPTION

EU L-8 external controller is intended for both wired and wireless control of the valves (see: Wireless communication). The controller enables significant energy saving due to precise temperature management in particular rooms.

Due to advanced software, the controller fulfils a wide range of functions:

- possibility of controlling actuators via 8 room sensors C-8r, C-mini or room regulators R-8b and R-8z
- one 230V output for a pump
- voltage-free contact (e.g. for controlling the heating device)
- possibility of connecting ST-505 Internet or WiFi RS to control the system via the Internet
- possibility of connecting M-8 wireless control panel
- possibility of controlling the mixing valve (via ST-431N valve module or i-1m)
- possibility of updating the software via USB
- possibility of controlling wireless actuators STT-868 or STT-869 (6 per section)

III. HOW TO INSTALL THE CONTROLLER

L-8 controller should be installed by a qualified person.

WARNING

Risk of fatal electric shock from touching live connections. Before working on the controller switch off the power supply and prevent it from being accidentally switched on.

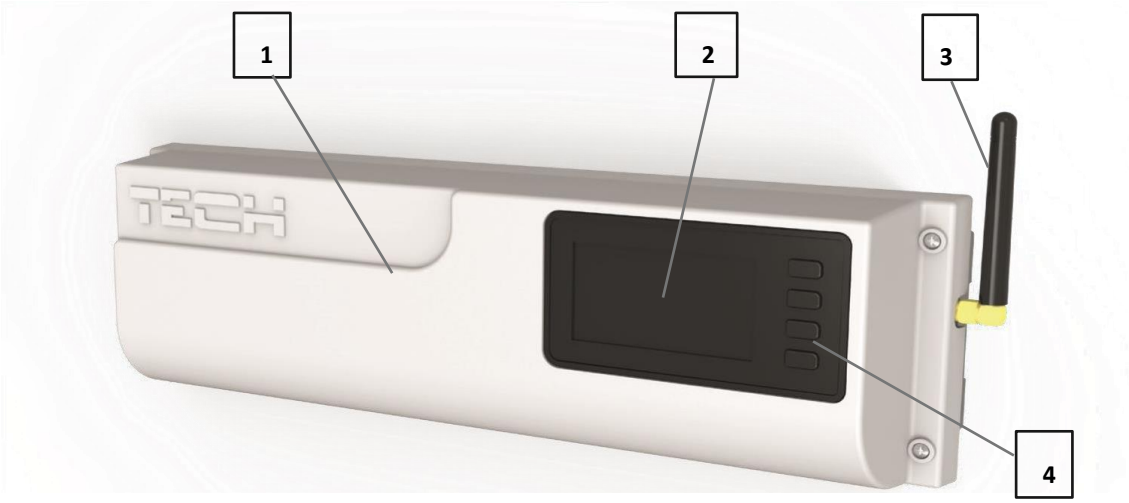
NOTE

Incorrect connection of cables may lead to controller damage.

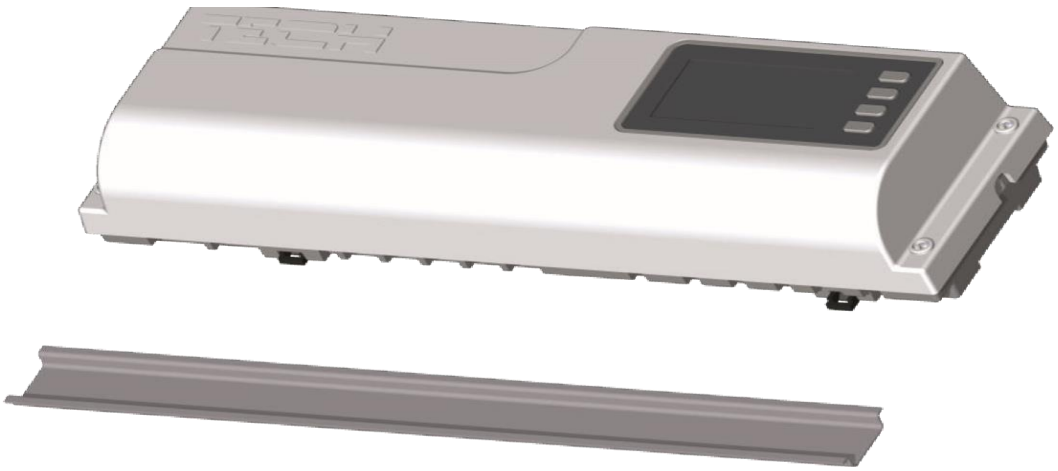
WARNING

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.

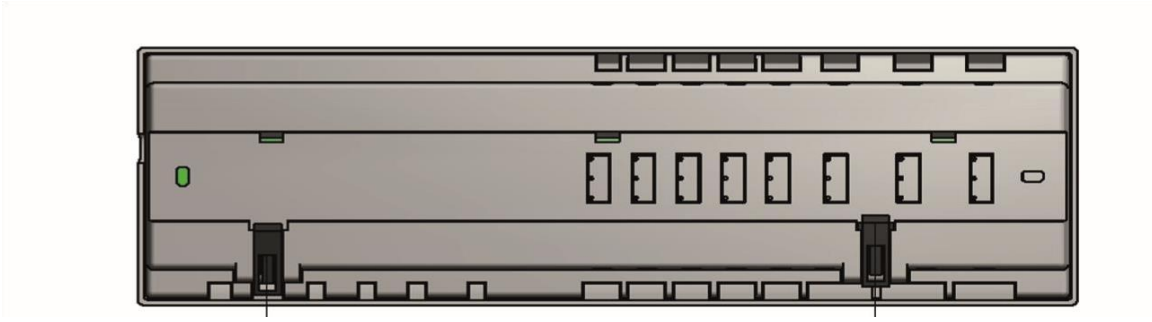


1. Cover (it should be removed to connect the devices to be controlled)
2. Display
3. Aerial – for wireless communication
4. Buttons



WARNING

The controller may be installed on a DIN strip.



IV. FIRST START-UP

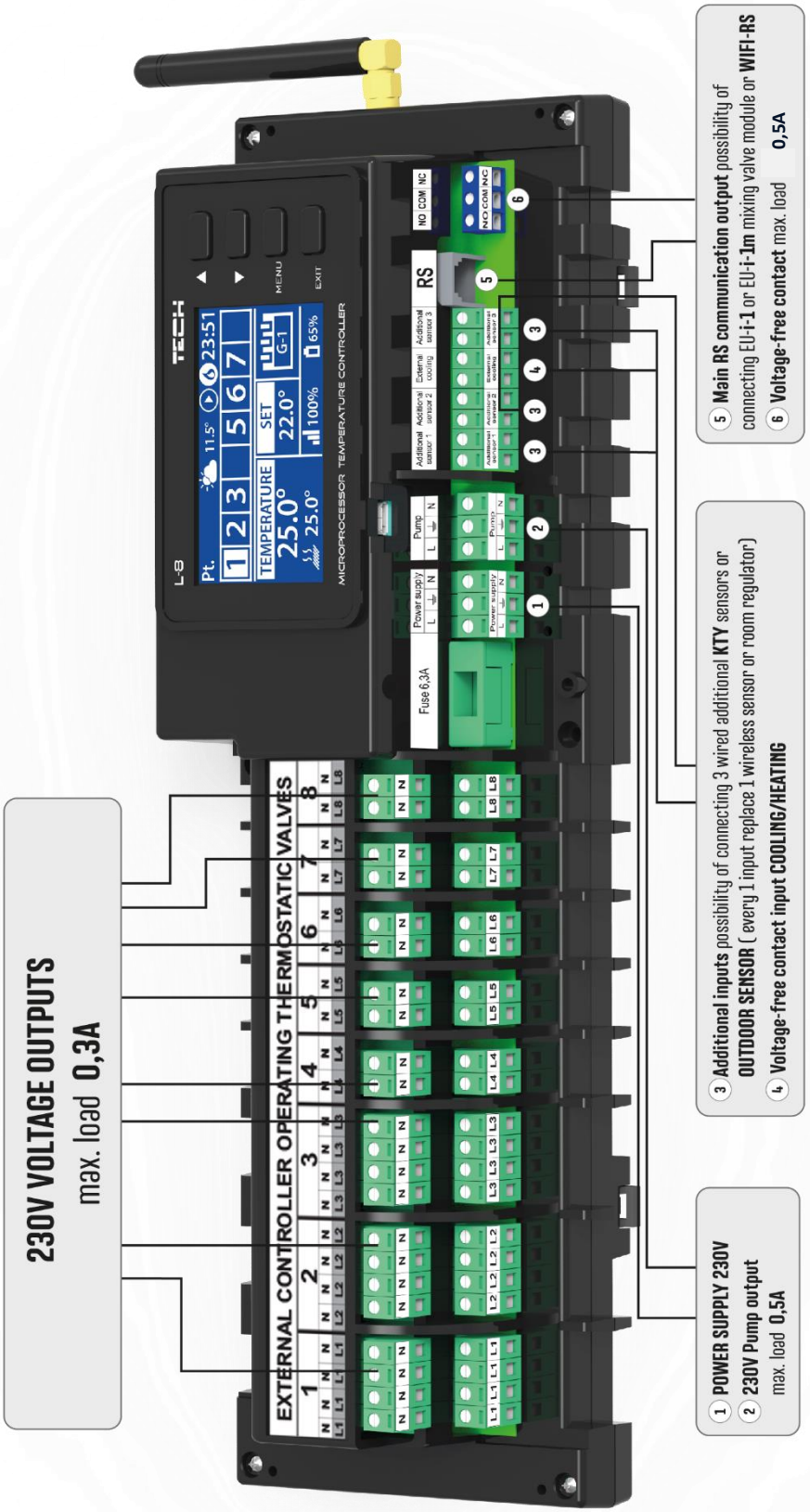
Follow these step while starting the device for the first time to ensure its failure-free operation:

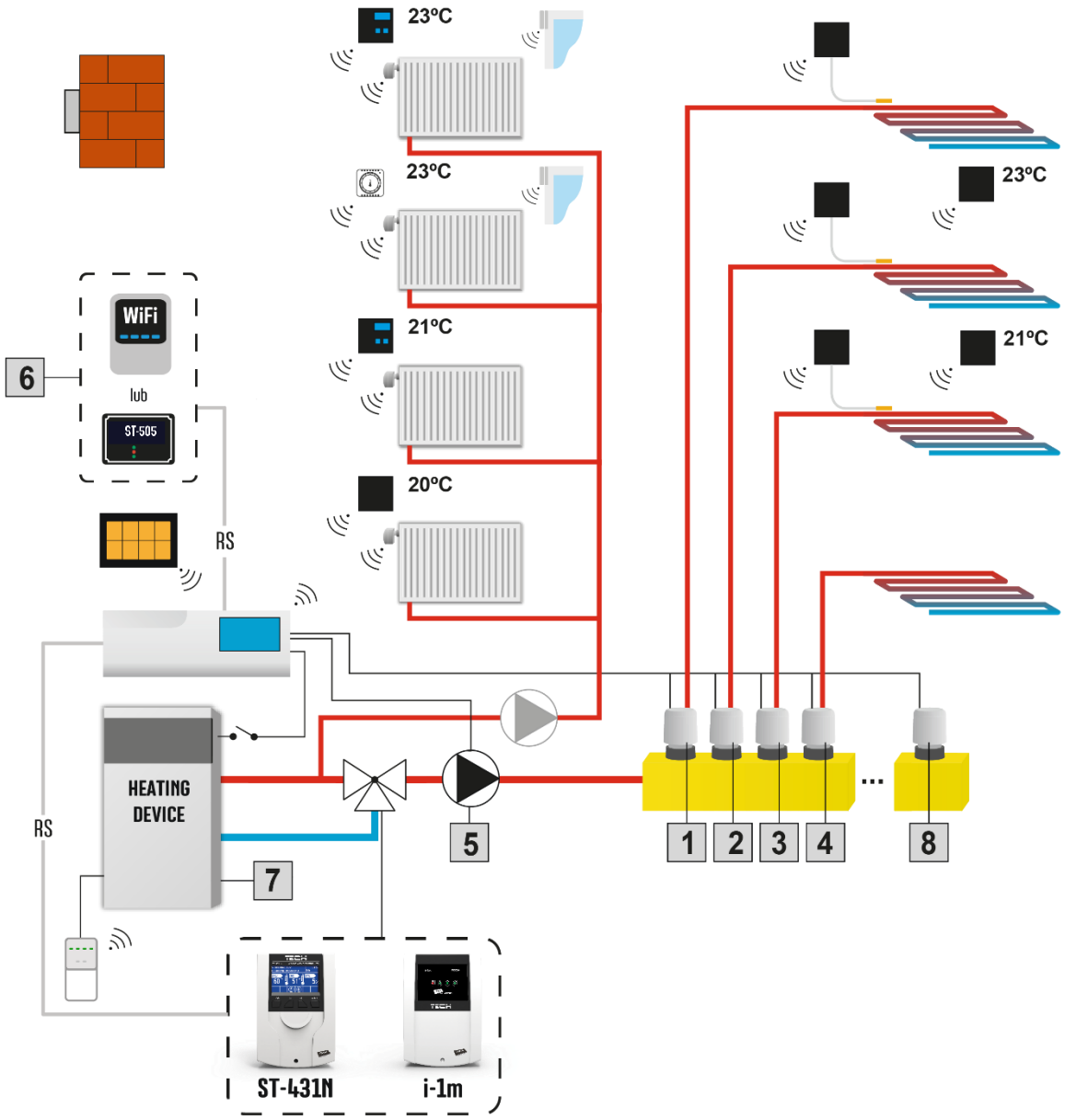
Step 1. Connect L-8 controller with all the devices to be controlled

In order to connect the cables, remove the controller cover and connect the cables as indicated on connector labels and diagrams below:

- All the necessary valve actuators ST-230/2 (connectors 1-8)
- Internet module (using RS cable)
- Pump
- An additional device

Pictorial diagram presenting wiring and communication with other devices in the system:





SYSTEM ELEMENTS:

- Control panel M-8
- Room regulator LED R-8z
- Room regulator LCD R-8b
- Temperature sensor C-8r
- Floor temperature sensor C-8f
- Temperature sensor C-mini
- Window opening sensor C-2
- External temperature sensor C-8zr
- Internet module ST-505
- Internet module WIFI RS
- Wireless electric actuators STT-868 lub STT-869
- Thermoelectric actuator STT-230/2 or STT-230/2 S
- Valve controlled by the controller i-1/i-1m
- Executive module MW-1 lub MW-1-230V

Step 2. Switch on the power supply and check if the devices work properly

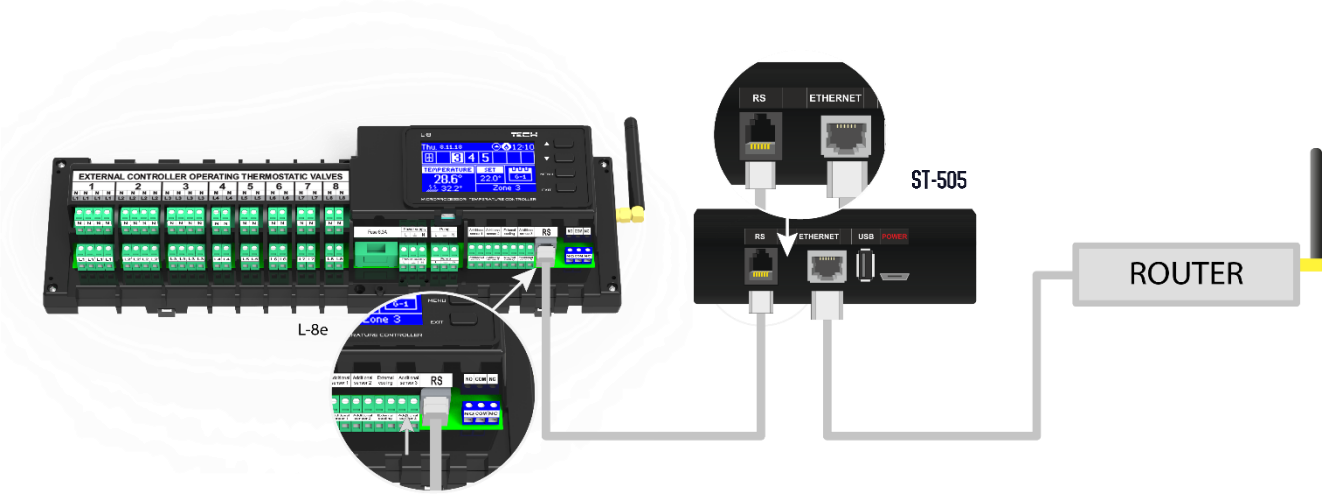
Once all the devices has been connected, switch on the power supply.

Use the Manual mode function to check if each device works properly – use the buttons ▲ and ▼ to select the device and press MENU button - the device should be activated. Follow the procedure to check all the devices.

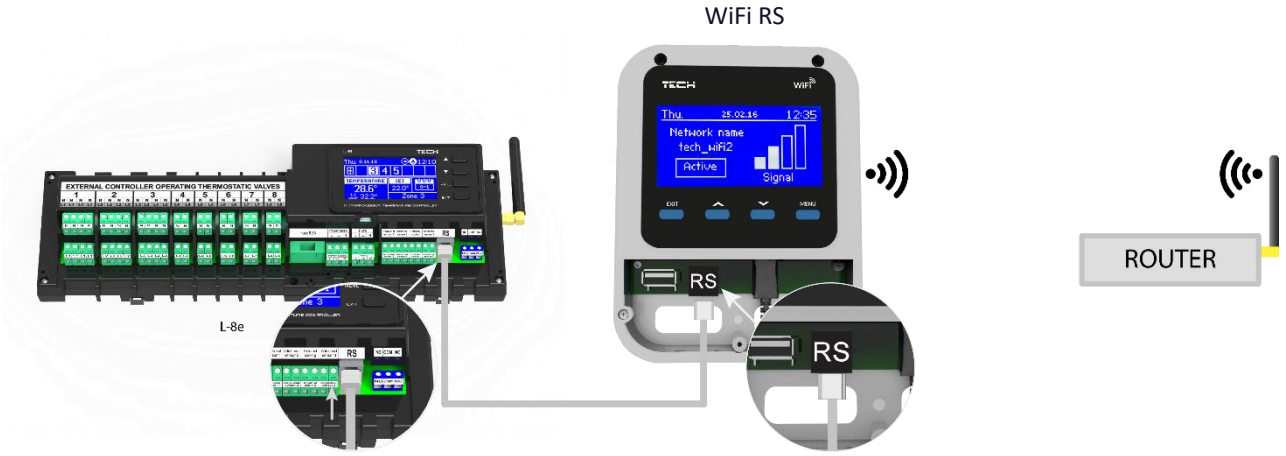
Step 3. Activate the Internet module

EU L-8 external controller is compatible with ST-505 and WiFi RS.

WiFi RS uses WiFi wireless network whereas ST-505 needs to be connected to a router with RJ45 network cable.



Connection diagram for ST-505 Internet module.



Connection diagram for WiFi RS

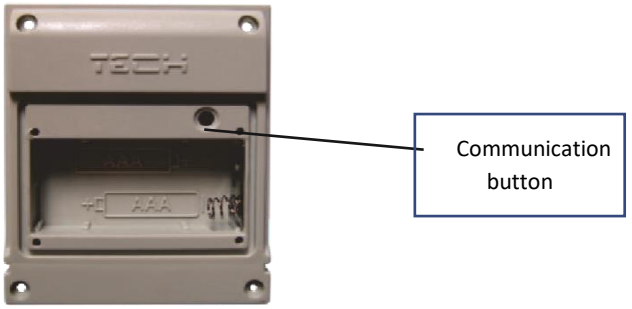
ST-505 Internet module or WiFi RS should be connected as illustrated in the diagrams above. Next, activate the module: Main menu/Fitter's menu/Internet module/ON. Further steps are described in detail in the instruction manual for the Internet module.

NOTE

The user should enable the Internet module to connect with data servers listening on TCP/2000 port. Most computer networks are protected by various software (firewalls, anti-virus software etc.) which may block data exchange with the above mentioned port. If any problems arise, contact technical support or your computer network administrator.

Step 4. Activate the external sensor

The external sensor should be registered by selecting Registration (in the controller's menu) and pressing communication button on the external sensor. Completing the registration procedure activates the sensor automatically. It may be switched off at any time by selecting OFF option.



NOTE

Deactivating the sensor in the controller menu only interrupts communication (the external temperature is no longer displayed on the controller screen) but it does not disable the external temperature sensor. The sensor remains active until the battery gets empty.

Step 5. Set current time and date

Set current time and date in the fitter's menu.

Step 6. Configure the settings for wireless thermostatic actuators STT-868 /STT-869

If you also use wireless actuators STT-868 or STT-869, it is necessary to register each actuator in a zone.

NOTE

The maximum of 6 actuators may be registered in each zone.

Registration process:

1. Install the thermostatic actuator on the radiator and wait until it calibrates.
2. Go to the controller menu, select the number of zone in which the actuator is to be registered and select Registration/Register valve.
3. Press the registration button on the actuator within 120 seconds from selecting Register valve option. After this time EU L-8 considers the registration attempt as unsuccessful.
4. If the registration process has been completed successfully, the display shows an appropriate message and informs about the number of valves registered. In the case of any errors, the display shows appropriate message. There are 3 possible causes of errors in the registration process:

   - An attempt to register more than 6 actuators.
   - An attempt to register the actuator which has already been assigned to a different zone
   - No signal from the valve actuator within the period of 120 seconds.

Step 7. Configure the settings for the temperature sensors and the room regulators

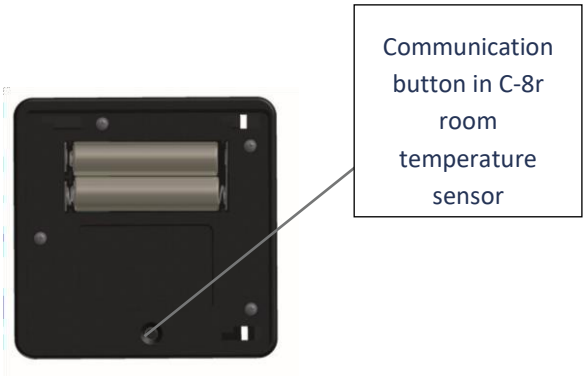
To enable EU L-8 external controller to control a given zone, it is necessary to provide it with current temperature value. The easiest way is to use C-8r temperature sensor. If the user wants to be able to change the pre-set temperature value directly from the zone, it is advisable to use R-8b, R-8z room regulators.

The user may also choose M-8 room regulator which offers additional functionalities apart from sending the current temperature readings. It serves as a master controller enabling the user to change the pre-set zone temperatures, adjust the local and global weekly schedules etc. Only one room regulator of this type may be installed in the heating system.

Regardless of the type of temperature sensor / room regulator chosen, it must be registered in a particular zone in EU L-8 controller menu.

Room temperature sensor C-8r, C-mini, M-8 - In order to register, go to *Registration* in the submenu of a given zone (*Zones / Zone 1-8 / Room sensor / Registration*) and press the communication button on the sensor to register the sensor in the controller.

If the process has been completed successfully, EU L-8 external controller display and the room regulator display will show an appropriate message. Otherwise, the process must be conducted again.



NOTE

In some versions of room regulators there is no communication button at the back of the device - then you should use PLUS button in the registration procedure. Only one regulator may be assigned to one zone.

The following rules must be kept in mind:

- The maximum of one temperature sensor may be assigned to each zone.

- Once registered, the sensor cannot be unregistered, but only switched off in the submenu of a given zone

- If the user attempts to assign a sensor to the zone to which other sensor has already been assigned, the first sensor becomes unregistered and it is replaced by the second one

- If the user attempts to assign a sensor which has already been assigned to a different zone, the sensor is unregistered from the first zone and registered in the new one

It is possible to set individual pre-set temperature value and weekly schedule for each room sensor assigned to a given zone. The settings may be configured both in the controller menu and via www.emodul.eu (using ST-505 module or WIFI RS).

V. WIRELESS COMMUNICATION

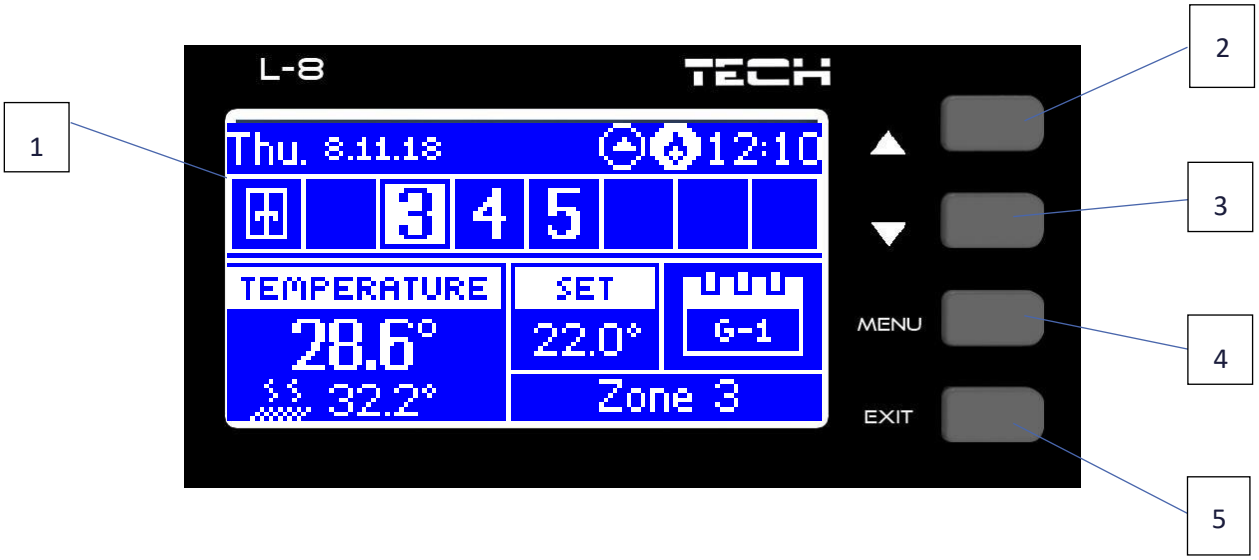
EU L-8 external controller may communicate with certain devices using radio signal:

	Device	Function	How to configure
	C-8-r – room temperature sensor	Sending current room temperature data	The sensor should be registered in the external controller
	C- mini - room temperature sensor	Sending current room temperature data	The sensor should be registered in the external controller
	R-8b - two-state room regulator; power supply: 2xAAA 1,5V	- Sending current zone temperature data - Adjusting pre-set temperature directly from the zone	The room regulator should be registered in the external controller
	R-8z - two-state room regulator; power supply: 230V 50Hz	- Sending current zone temperature data - Adjusting pre-set temperature directly from the zone	The room regulator should be registered in the external controller
	M-8 - master room regulator (control panel)	- Sending current zone temperature data - Adjusting pre-set temperature and schedule settings directly from the zone - Adjusting settings for different zones	The room regulator should be registered in the external controller
	C-8zr - external temperature sensor	- Monitoring external temperature value	The sensor should be registered in the external controller
	STT-868 - wireless thermostatic actuator	- Opening/closing the valve in order to maintain desired temperature value	The actuator should be registered in the external controller

	STT-869 – wireless thermostatic actuator	- Opening/closing the valve in order to maintain desired temperature value	The actuator should be registered in the external controller
	C-2 – window sensor	- It sends information to the main controller when the window is opened/closed.	The sensor should be installed in the window of a given zone and it should registered to a the zone.
	C-8f – floor sensor	- It sends information about current floor temperature.	The sensor should be registered in a given zone.
	MW-1 – executive module	- It enables wireless activation of a given output in the external controller. Depending on selected operation mode, MW-1 may be used to activate CH boiler operation, the pump or valve actuators.	The module should be registered i the fitter's menu.

VI. MAIN SCREEN VIEW AND DESCRIPTION

The user navigates in the menu structure using the buttons located next to the display.



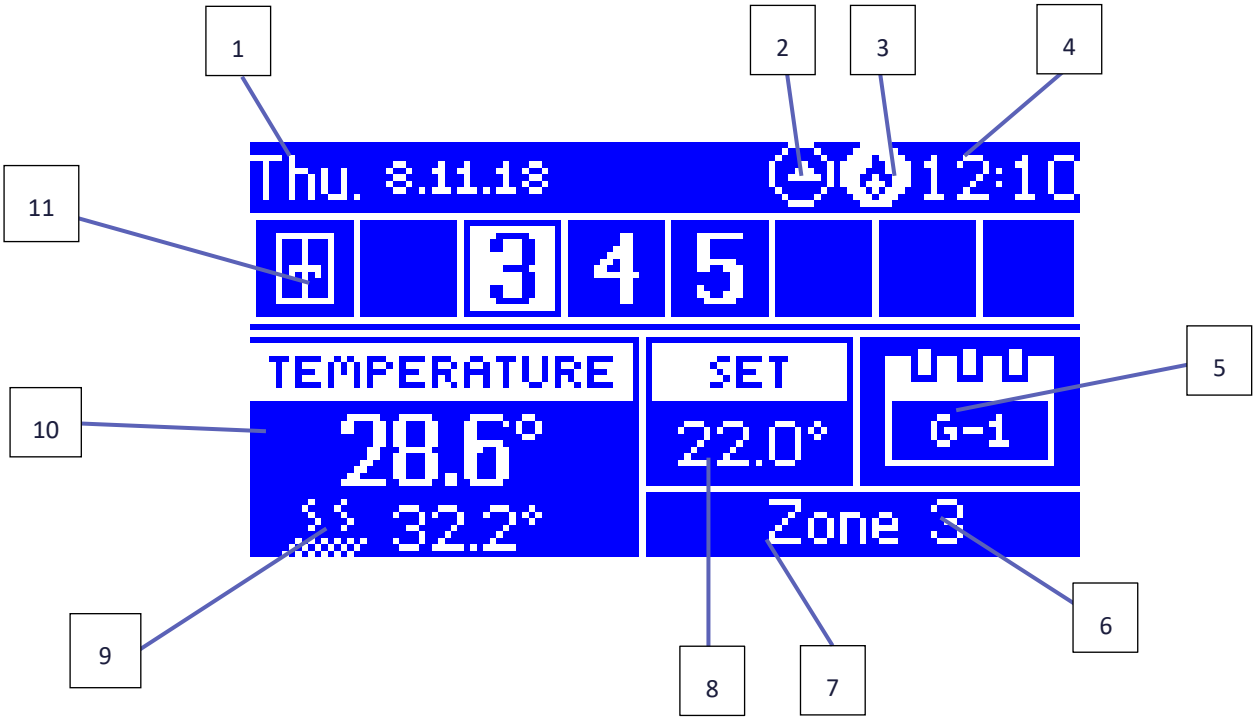
1. Display.

2. ▲ - „up” „plus” - it is used to view the menu options and increase the value while editing parameters. During standard operation the button is used to switch between different zones parameters.

3. ▼ - „down” „minus” - it is used to view the menu options and decrease the value while editing parameters. During standard operation the button is used to switch between different zones parameters.

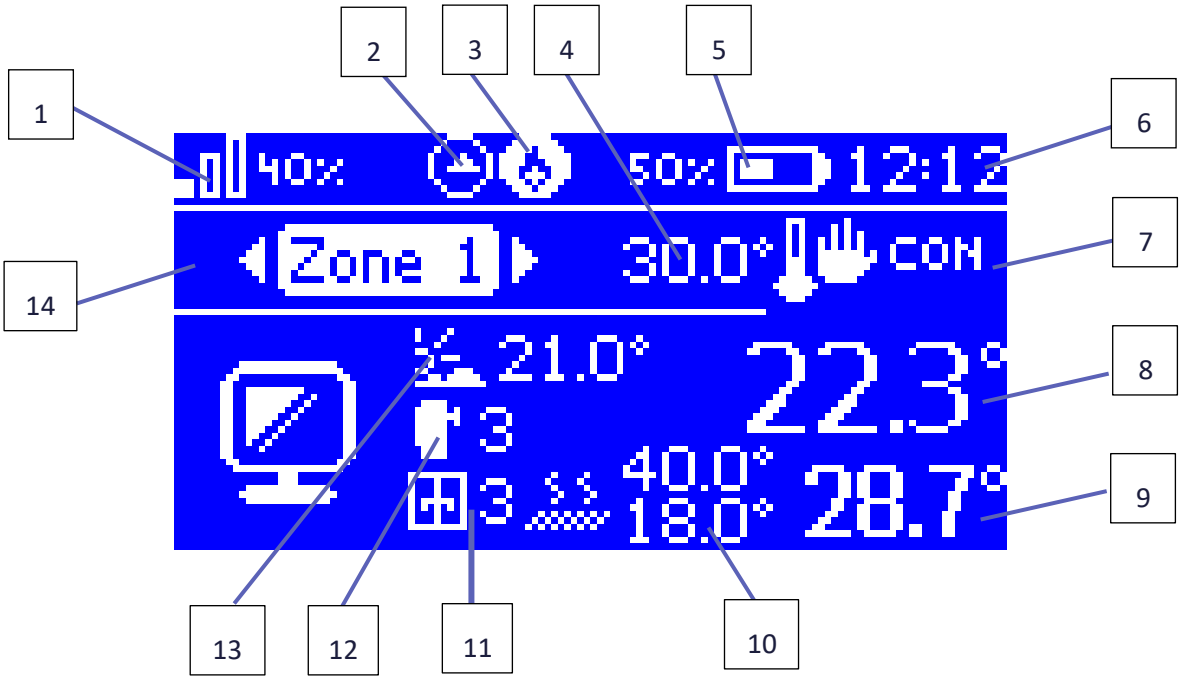
4. MENU button – it is used to enter the controller menu and confirm the new settings.

5. EXIT button – it is used to exit the menu and cancel the settings.

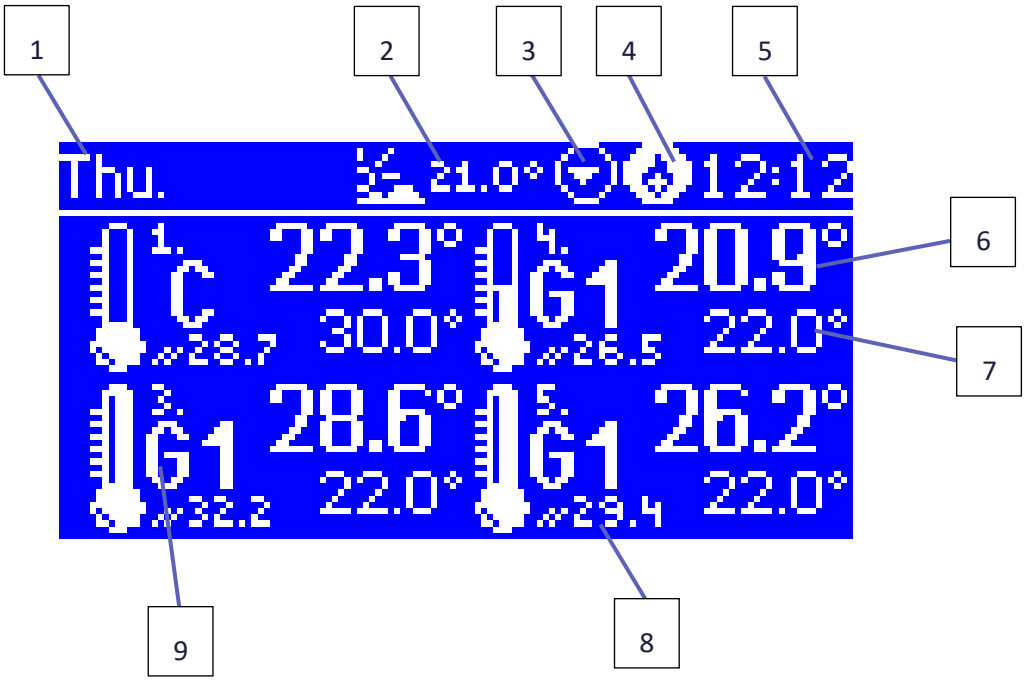


1. Current day of the week
2. Pump ON
3. Voltage-free contact ON
4. Current time
5. Current weekly schedule
6. C-8r battery level in a given zone (backlit numer in the zone bar – see: description np.12)
7. C-8r sensor signal strength in a given zone (backlit numer in the zone bar – see: description no.12)
8. Pre-set temperature in a given zone (blacklit numer in the zone bar – description no.12)
9. Current temperature of C-8f floor sensor in a given zone (blacklit numer in the zone bar – see: description no.12)
10. Current temperature of C-8r room sensor in a given zone (blacklit numer in the zone bar – see: description no.12)
11. Zone information:

- The digit displayed indicates that the corresponding room sensor is connected and sends current temperature information. If the zone temperature is too low, the digit flashes. In the event of a zone alarm, an exclamation marki s displayed instead of the digit .
- In order to view the operation parameters of a given zone, select its numer using ▲ or ▼



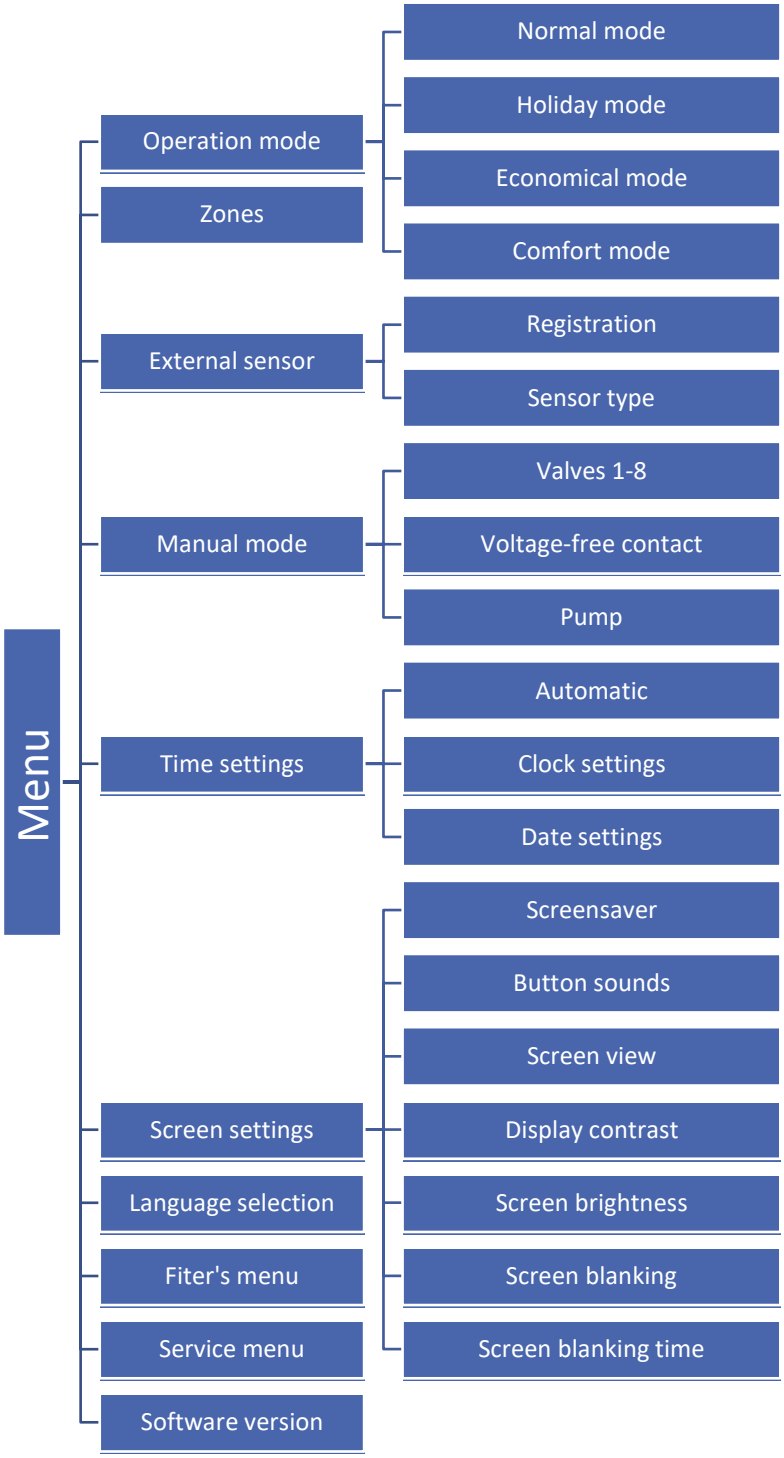
1. C-8r sensor signals strength in a given zone
2. Pump ON
3. Voltage-free contact ON
4. Pre-set temperature in a given zone
5. C-8r sensor battery level in a given zone
6. Current time
7. Current weekly schedule
8. Current room temperature in a given zone
9. Current floor temperature in a given zone
10. Maximum and minimum floor temperature
11. The numer of registered window sensors (C-2) in a given zone
12. The numer of registered thermostatic actuators (STT-868 or STT-869) in a given zone
13. External temperature
14. Zone name



1. Current day of the week
2. External temperature
3. Pump ON
4. Voltage-free contact ON
5. Current time
6. Current temperature in zone 3 3
7. Pre-set temperature in zone 3
8. Floor temperature in zone 4
9. Current schedule:
    - G1 – global schedule 1
    - L – local schedule
    - T – time left before the next change of the pre-set temperature
    - C – constant temperature
    - QA – other than standard mode has been selected in the external controller

VII. CONTROLLER FUNCTIONS

1. BLOCK DIAGRAM – CONTROLLER MENU



2. OPERATION MODE

This function enables the user to select the operation mode for a given zone.

- **Normal mode** – pre-set temperature depends on the selected schedule.
- **Holiday mode** pre-set temperature depends on *Temperature settings* parameters (Menu > Zones > User settings > Temperature settings > Holiday)
- **Economical mode** – pre-set temperature depends on *Temperature settings* parameters (Menu > Zones > User settings > Temperature settings > Economical)
- **Comfort mode** – pre-set temperature depends on *Temperature settings* parameters (Menu > Zones > User settings > Temperature settings > Comfort temperature).

NOTE

Changing the mode to holiday, economical and comfort applies to all zones. It is possible to edit the pre-set temperature of the selected mode for a particular zone. In the operation mode other than normal, it is not possible to change the pre-set temperature from the level of a regulator.

3. ZONES

Zones menu is described in detail in section VIII.

4. EXTERNAL SENSOR

It is possible to connect an external temperature sensor which enables the user to view the current temperature value on the main screen. It is also used in weather-based control.

There are two types of weather sensor - wired and wireless. After the external sensor has been installed, it is necessary to register it in the external controller. The registration process is described in detail in *Installation* section.

Once the sensor has been installed and connected to the valve module, it is necessary to activate <Weather-based control> function in the controller menu. When the external sensor is active, the main screen displays external temperature and the controller menu offers average external temperature.

- **Averaging time** – the user sets the time period based on which the average external temperature is calculated. The settings range is 6-24 hours.

- **Temperature threshold** – this function protects the zone against excessive temperature. The zone in which weather-based control has been activated will not be heated when the average daily temperature outside exceeds the pre-set threshold value. For example, when the temperature rises in spring, the controller will prevent the zones from being heated unnecessarily.

5. MANUAL MODE

This function enables the user to activate particular devices (pump, voltage-free contact and valve actuators) independently of the others in order to check if they operate properly. It is advisable to check the devices using this procedure at the first start-up.

6. TIME SETTINGS

This function enables the user to set current date and time, which will be displayed in the main screen view.

7. SCREEN SETTINGS

These parameters enable the user to adjust the main screen view to individual needs. Select <Screen view> to decide what data will be displayed on the controller screen.

The user may also adjust the display contrast and screen brightness. <Screen blanking> function is used to adjust the blank screen brightness. <Screen blanking time> parameter defines the time of inactivity after which the screen goes blank.

8. LANGUAGE

This option is used to select the language version.

9. FITTER'S MENU

This menu is described in section IX.

10. SERVICE MENU

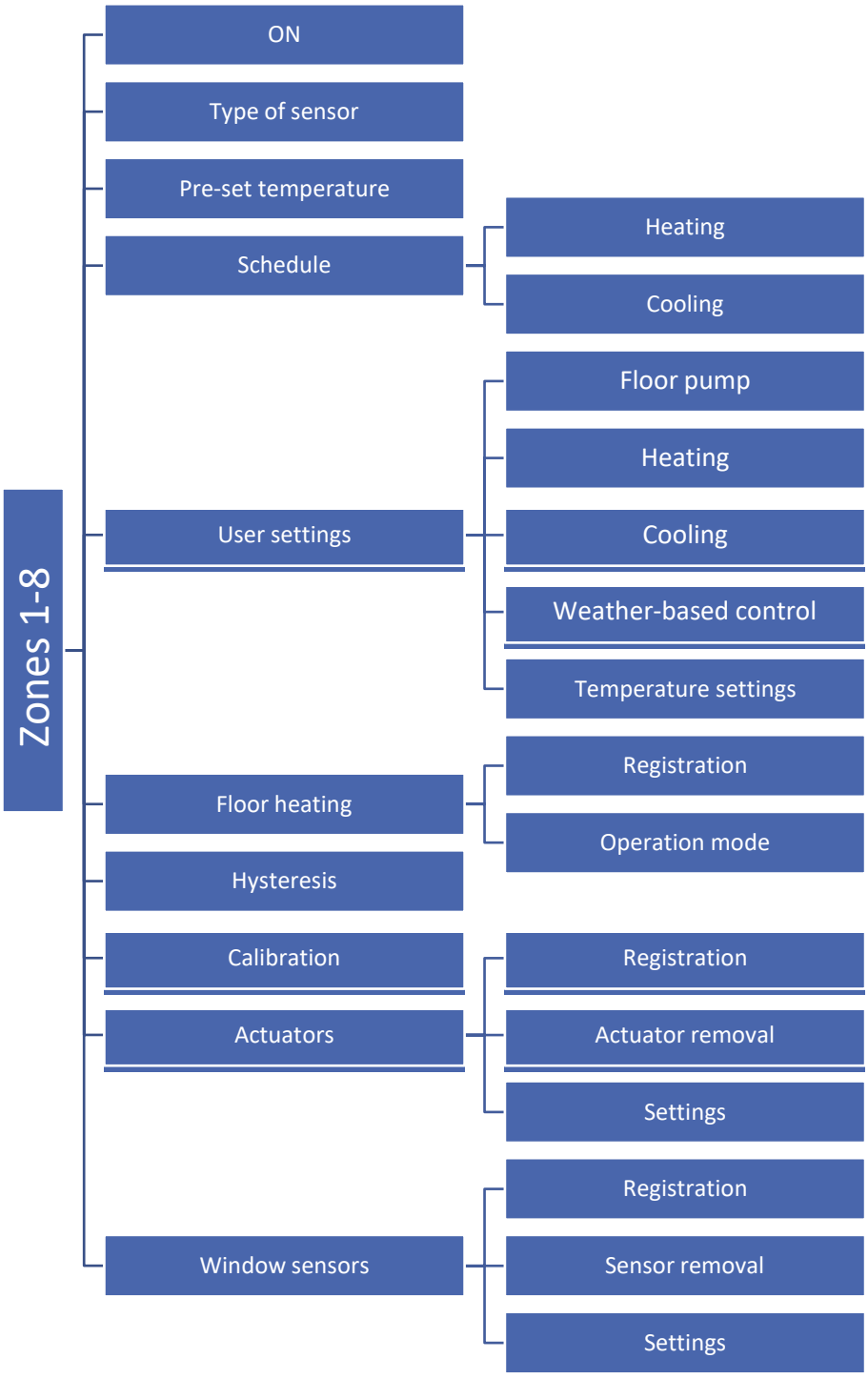
In order to activate service options, it is necessary to enter a 4-digit code provided by TECH company.

11. SOFTWARE VERSION

When this option is selected, the display shows the logo of the CH boiler manufacturer and the controller software version.

VIII. ZONES

1. BLOCK DIAGRAM – ZONES MENU



This submenu enables the user to configure operation parameters for particular zones. When the pre-set temperature value in a zone is reached, L-8 controller labels the zone as sufficiently heated and the status remains unchanged until the temperature drops below the pre-set temperature by hysteresis value. When the temperature in all the zones is sufficient, the controller disables both the pump and the voltage-free contact.

2. ON

After the room sensor has been activated and registered in a given zone, it is used by L-9 controller. The function is inactive by default, but it may be activated when the room sensor has been register.

3. TYPE OF SENSOR

This function is used to select the wired or wireless sensor type.

4. PRE-SET TEMPERATURE

The pre-set zone temperature depends on the weekly schedule settings. However, this function enables the user to change this value separately. After the value has been set, the user defines how long the temperature should apply. When the time elapses, the pre-set temperature depends on the weekly schedule again. The main screen displays current pre-set temperature value and the time left (see: Main screen description).

NOTE

If the user sets 00:00 as the time, the temperature applies for indefinite period of time.

5. SCHEDULE

L-8 controller enables the user to configure a weekly schedule both for house heating and cooling. For each zone there are 6 weekly schedules available - 1 local schedule and 5 global schedules.

- **Local schedule** - it is a weekly schedule assigned to a given zone only. It may be edited freely.
- **Global schedule 1-5 -** these schedules have the same settings for all zones.

NOTE

Schedule settings are described in detail in section X.

Apart from schedules, the user may set constant temperature or temperature with time limit.

- **Constant temperature** – this function enables the user to define the pre-set temperature which will apply in a given zone regardless of the time of the day.
- **Temperature with time limit** – this function enables the user to define the pre-set temperature which will apply for a specified period of time. When the time is over, the temperature will depend on the previous mode (schedule or constant temperature).

6. USER SETTINGS

This function enables the user to activate/deactivate house heating, cooling and weather-based control. If the user selects <OFF>, a given zone will no longer be controlled with the heating-cooling algorithm configured in the fitter's menu.

Example: If the user selects *Heating* as operation mode (fitter's menu > heating/cooling > operation mode > heating), the heating algorithm will apply only in these zones where heating option has been activated (menu > zones 1-8 > user settings > ON).

This option also enables the user to define the pre-set temperatures for 3 operation modes (comfort mode, economical mode, holiday mode).

7. FLOOR HEATING

7.1. REGISTRATION

Activate *Registration* option in L-8 external controller and press the communication button in the selected floor temperature sensor C-8f. If the registration has been completed successfully, L-8 display will show an appropriate message and C-8f control light will flash twice to confirm.

7.2. OPERATION MODE

- **Floor protection – t**his function serves to maintain the floor temperature below the maximum temperature value in order to protect the system against overheating. When the floor temperature reaches the maximum temperature, the zone heating is disabled.

- **Comfort profile –** this function serves to maintain comfort floor temperature. The controller monitors the floor temperature and disables the zone heating when zone temperature reaches the maximum temperature in order to prevent overheating. When the floor temperature drops below the pre-set minimum temperature, the zone heating will be enabled.

8. HYSTERESIS

This function is used to define tolerance of the pre-set temperature in order to prevent undesired oscillation in case of small temperature fluctuation. The setting range is 0,1 - 10^{O}C with the accuracy of 0,1°C.

9. CALIBRATION

Room sensor calibration should be performed while mounting or after it has been used for a long time, if the external temperature displayed differs from the actual temperature. Calibration setting range is from -10^{O}C to +10^{O}C with the accuracy of 0,1^{O}C.

10. ACTUATORS

10.1. REGISTRATION

This option concerns wireless actuators STT-868 or STT-869 - the registration process is described in detail in the user manual for particular actuators.

Next to *Registration* icon, the display shows the number of registered valves (max.6).

10.2. VALVE ACTUATORS

This option is used to remove the actuators STT-868 or STT-869 from the controller memory.

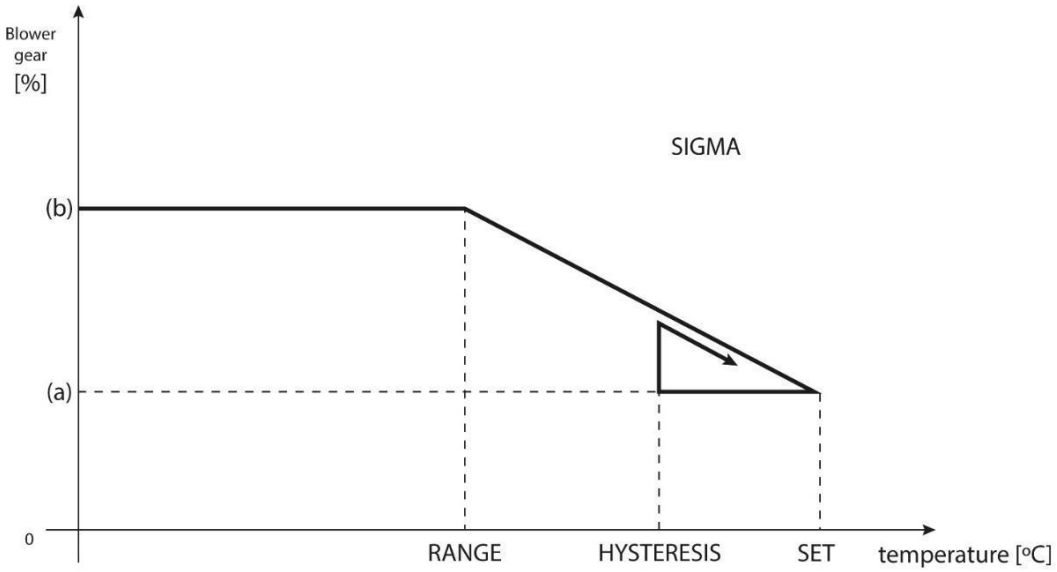
10.3. SETTINGS

- **Sigma -** SIGMA function enables smooth control of the thermostatic actuator. The user may define the maximum and minimum valve opening – the level of valve opening and closing will never exceed these values.

  Moreover, the user configures *Range* parameter, which defines the room temperature at which the valve starts closing and opening.

NOTE

SIGMA function is available only with STT-868 and STT-869 actuators.



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

Example:

Pre-set zone temperature: 23˚C
Minimum opening: 30%
Maximum opening: 90%
Range: 5˚C
Hysteresis: 2˚C

With the above settings, the valve starts closing if the zone temperature reaches 18˚C (the pre-set value minus range: 23-5). The minimum opening is reached when the zone temperature reaches the pre-set value.

After the pre-set value has been reached, the zone temperature starts falling. When it reaches 21˚C (pre-set value minus hysteresis: 23-2) the valve starts opening. It reaches the maximum opening when the zone temperature is 18˚C.

- **Protection** - When this function is selected, the external controller monitors the temperature. If the pre-set temperature is exceeded by the value specified in <range> parameter, all actuators in a given zone will be closed (0% opening). This function is active only when sigma function has been activated.

- **Emergency mode** – This function enables the user to program valve opening, which will be performed in the event of an alarm in a given zone (sensor failure, communication error).

11. WINDOW SENSORS

11.1. REGISTRATION

In order to register a sensor, select *Registration* option and quickly press the communication button on the window sensor. Release the button and watch the control light.

- the control light flashes twice - successful communication
- the control light goes on permanently - no communication with the main controller

11.2. SENSOR REMOVAL

This function is used to remove the sensors from a given zone.

11.3. SETTINGS

- **ON** – this function is used to enable the window sensor (it is possible only after the sensor has been registered).
- **Delay time** – this function is used to set the delay time. When the time elapses, the main controller sends signal to the actuators in order to close them. The time range is 0-30 minutes.

  Example: Delay time is set at 10 minutes. When the window is opened, the sensor sends a signal to the main controller. From time to time the sensor sends information about current status of the window. If the window is still open when the delay time is over (10 minutes), the main controller closes the actuators and disables the heating in a given zone.

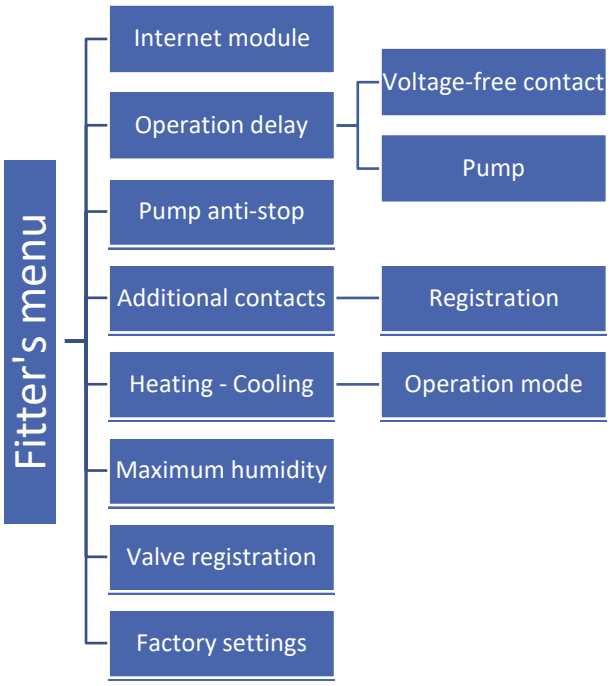
NOTE

If the delay time is set at 0, the controller will immediately send a signal to the actuators in order to close them.

IX. MENU

Fitter's menu is intended to be used by a qualified person in order to configure advanced controller settings.

1. BLOCK DIAGRAM – FITTER'S MENU



2. INTERNET MODULE

The Internet module may be connected to EU L-8 via RS cable. After it has been connected, select Registration. The controller generates a code which the user should enter on the Internet website. Detailed description of the procedure is available in the Internet module instruction manual.

After switching the module on and selecting DHCP option, the controller automatically downloads such parameters as IP address, IP mask, gateway address and DNS address from the local network. If any problems arise when downloading the network parameters, they may be set manually. The procedure of obtaining these parameters is described in detail in the instruction manual of the Internet Module.

NOTE

EU L-8 controller may cooperate with the Internet module, which enables the user to view and adjust certain parameters via the Internet. Such online control is possible only after purchasing and connecting an additional module ST-505 or WiFi RS.

3. OPERATION DELAY

3.1. VOLTAGE-FREE CONTACT

The regulator will enable the voltage-free contact after the pre-defined delay time if any of the zones has not reached the pre-set temperature (heating - if the temperature is too low; cooling - if the temperature is too high). The controller disables the contact when the pre-set temperature has been reached.

3.2. PUMP

L-8 controls the pump operation - it enables the pump after the pre-defined delay time if any of the zones has not reached the pre-set temperature. When all the zones reach the pre-set temperature, the pump is disabled.

Delay function enables the user to define the delay time for pump activation after the temperature drops below the pre-set value in any of the zones. Pump activation delay is used to ensure enough time for the actuator to open.

4. PUMP ANTI-STOP

This function forces pump operation and prevents scale deposit outside the heating season when the pump inactivity periods are long. When this function is switched on, the pump is enabled every 10 days for 5 minutes.

5. ADDITIONAL CONTACTS

After registering MW-1 module, the following options appear:

- **Information** – the controller screen shows information about the status, operation mode, range and delay time.
- **ON**
- **Delay time** – the regulator enables the contact after the pre-defined delay time if any of the zones has not reached the pre-set temperature. When all the zones reach the pre-set temperature, the contact is disabled.
- **Operation mode** – this option is used to activate the operation mode as a pump, voltage-free contact or for a given zone from 1 to 8.

6. HEATING - COOLING

This function enables the user to select the operation mode:

- **Heating** – all the zones are heated.
- **Cooling** – all the zones are cooled.
- **Automatic** – two-state input from the heat pump. Selecting between heating and cooling.

7. MAXIMUM HUMITIDY

If the current humidity level is higher than the maximum humidity, cooling will be disabled in a given zone.

NOTE

This function is active in the Cooling mode when the humidity protection function is switched on (Menu -> Zone -> User settings -> Cooling -> Humidity protection) and a humidity sensor is registered in the zone.

8. VALVE REGISTRATION

L-8 may control an additional valve via a valve module (e.g. i-1m). The regulators connect using RS communication but the registration process is necessary. There is a range of parameters enabling the user to adjust the valve operation to individual needs.

Configuring additional valve parameters is possible after the valve has been properly registered by entering the module number (found on the rear part of the module housing or in software version screen).

8.1. ON/OFF

This function enables the user to enable or disable the valve.

8.2. PRE-SET VALVE TEMPERATURE

This function is define the pre-set valve temperature. The temperature is read from the valve sensor.

8.3. CALIBRATION

This function enables the user to calibrate the built-in valve at any time. During this process the valve is restored to its safe position – in the case of CH valve it is fully opened whereas in the case of floor valve it is closed.

8.4. SINGLE STROKE

This is the maximum single stroke (opening or closing) that the valve may make during one temperature sampling. The smaller the single stroke, the more precisely the set temperature can be achieved. However, it takes longer for the set temperature to be reached.

8.5. MINIMUM OPENING

The parameter determines the smallest valve opening. Thanks to this parameter, the valve may be opened minimally, to maintain the smallest flow.

8.6. OPENING TIME

This parameter defines the time needed for the valve actuator to open the valve from 0% to 100% position. This value should be adjusted to the value given on the actuator rating plate.

8.7. MEASURMENT PAUSE

This parameter determines the frequency of water temperature measurement (control) downstream of the CH valve. If the sensor indicates a change in temperature (deviation from the pre-set value), the electric valve will open or close by the pre-set stroke, in order to return to the pre-set temperature.

8.8. VALVE TYPE

This option is used to select the valve type:

- **CH** – select this option if you want to control CH circulation temperature.
- **FLOOR** – select this option if you want to control the floor heating temperature. It protects the underfloor heating installation against dangerous temperature. If the user selects CH as the valve type and connects it to the underfloor heating system, the fragile floor installation may be damaged.

8.9. WEATHER-BASED CONTROL

For the function of weather control to be active, the external sensor mustn't be exposed to sunlight or influenced by the weather conditions. After it is installed in an appropriate place, <Weather-based control> function needs to be activated in the controller menu.

In order for the valve to operate correctly, the user defines the pre-set temperature for 4 intermediate external temperatures: -20ºC, -10ºC, 0ºC and 10ºC. The user selects external temperature value using LEFT and RIGHT arrows and defines a corresponding pre-set temperature value using DOWN and UP arrows.

Heating curve – a curve according to which the pre-set controller temperature is determined, on the basis of external temperature. In our controller, this curve is constructed on the basis of four pre-set temperatures. The more points constructing the curve, the greater its accuracy, which allows its flexible shaping. In our opinion, four points seem a very good compromise ensuring decent accuracy and easiness of setting the course of this curve.

NOTE

After weather-based control has been activated, <Pre-set valve temperature > parameter is not available.

8.10. PROPORTIONALITY COEFFICIENT

Proportionality coefficient is used for defining valve stroke. The closer to the pre-set temperature, the smaller the stroke. If the coefficient value is high, the valve takes less time to open but at the same time the opening degree is less accurate. The following formula is used to calculate the percent of a single opening:

(PRE-SET_TEMP - SENSOR_TEMP) * (PROP_COEFF /10)

8.11. MAXIMUM FLOOR TEMPERATURE

This setting is used when the valve type is set as floor valve. After this temperature has been reached, the valve closes completely. When the maximum floor temperature is reached, <CH boiler protection> function is deactivated. In such a case, protection of the underfloor heating installation is assigned higher priority.

8.12. RETURN PROTECTION

This function enables the user to set boiler protection against too cool water returning from the main circulation, which could cause low-temperature boiler corrosion. The return protection involves closing the valve when the temperature is too low, until the short circulation of the boiler reaches an appropriate temperature level. Once it is activated, the user presets the minimum acceptable return temperature.

8.13. VALVE REMOVAL

This option is used to remove the valve from the controller memory. Valve removal is used e.g. at disassembling the valve or module replacement (re-registration of a new module is necessary).

8.14. FACTORY SETTINGS

This parameter is used to restore the factory settings of a given valve.

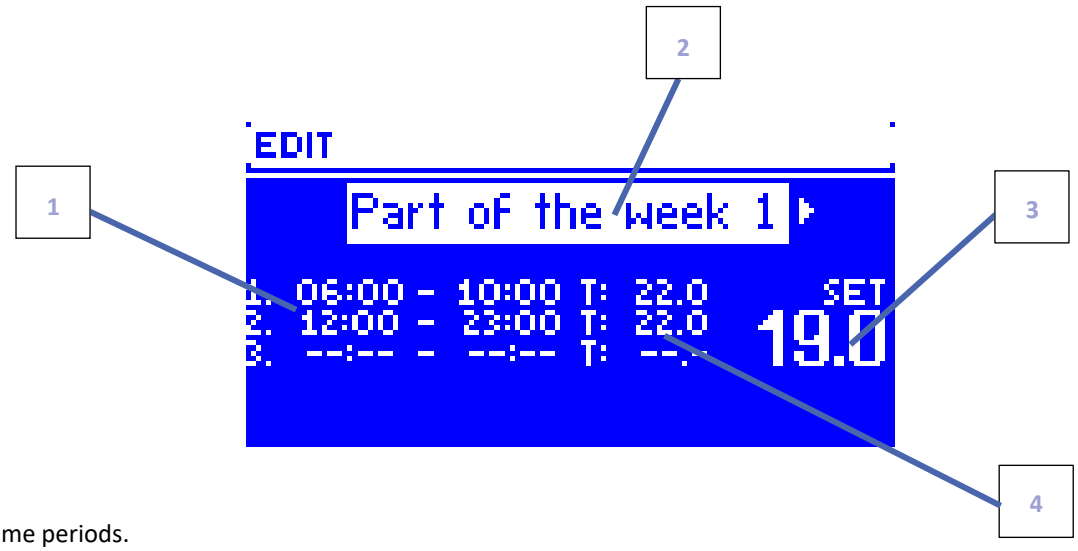
9. FACTORY SERRINGS

This function enables the user to restore the valve settings saved by the manufacturer.

X. OWN SCHEDULE SETTINGS

Once the schedule has been selected (Menu -> Zones -> Zone 1-8 -> Weekly control), the user may select, view and edit a given schedule.

Schedule view screen:



1. Time periods.
2. Pre-set temperature for time perdiods.
3. Pre-set temperaturę outside time periods.
4. Days when the above settings will apply.

Follow these steps to configure a schedule:

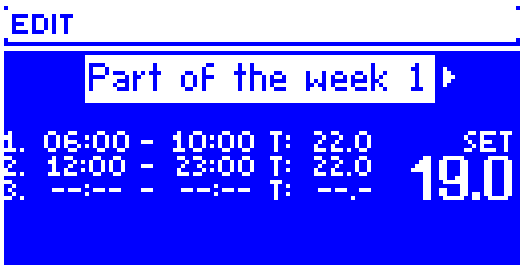
- Select the part of the week when the daily schedule will apply (part 1 or part 2).

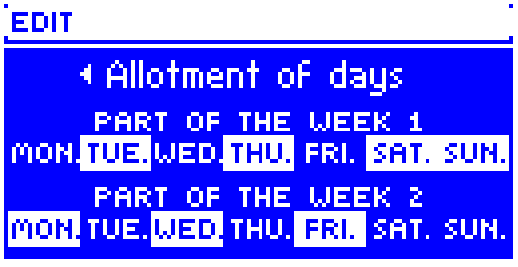
  In order to assign days to a given part of the week, follow the steps:

  - Use arrows UP and DOWN to select <Assign days>. Press MENU in order to edit.

  - Use arrows UP and DOWN to switch between days. Confirm by pressing MENU. Active days are highlighted in white.

  - In order to confirm the settings, press EXIT and select <Confirm> and move on to editing daily schedule.





- Use arrows UP and DOWN to select the pre-set temperature to apply outside the time periods. Confirm by pressing MENU.

- Use arrows UP and DOWN to select the starting time of the first time period. Confirm by pressing MENU.
- Use arrows UP and DOWN to select the finishing time of the first time period. Confirm by pressing MENU.
- Use arrows UP and DOWN to select the pre-set temperature to apply within this time period. Confirm by pressing MENU.

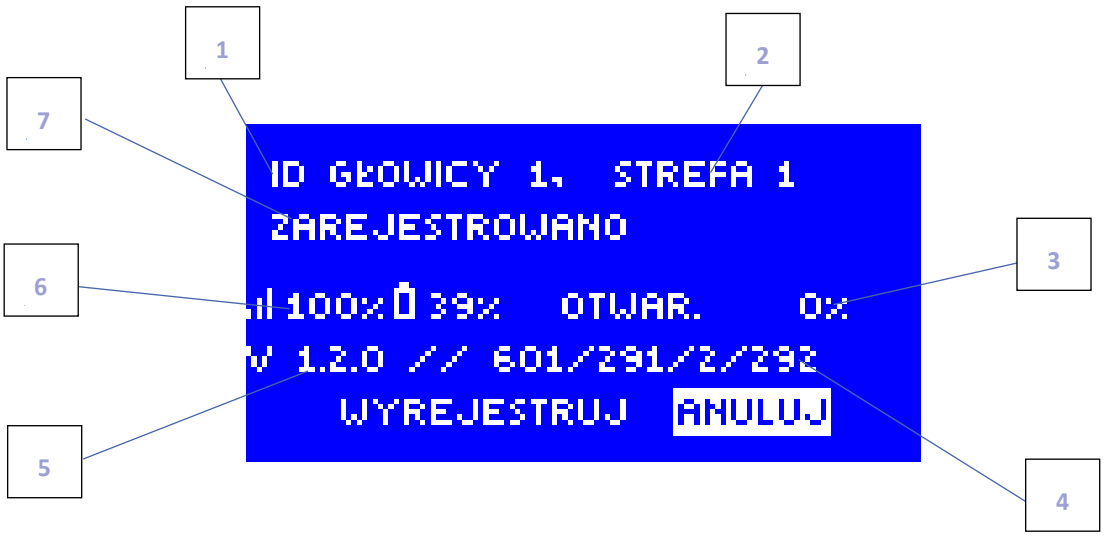
When the schedule for all days of the week is ready, confirm the settings using EXIT button and select <Confirm>. Active option will be highlighted in white.

NOTE

The user may program 3 different time periods in a given schedule (with the accuracy of 15 minutes).

XI. UNREGISTER A SINGLE ACTUATOR

The user may unregister a single actuator by forcing communication. In order to do it, press the communication button on a given actuator and hold it until the control light flashes twice. The following screen will appear on EU L-8 display:



1. Actuator ID
2. Actuator zone
3. % opening actuators
4. Service details
5. Actuator software version
6. Range and battery level
7. Actuator status info

In order to unregister a given actuator, use ▲ or ▼ to select <Unregister> and confirm by pressing MENU button.

XII. PROTECTIONS AND ALARMS

In order to ensure safe and failure-free operation, the regulator has been equipped with a range of protections. In case of an alarm, a sound signal is activated and the display shows a message informing about the detected problem.

Type of alarm	Possible cause	How to fix it
Alarms with actuators STT-868		
Actuator alarm - ERROR #0 - low battery level	Flat battery in the actuator	Replace the batteries
Actuator alarm - ERROR #1 – possible damage of mechanical or electronic parts	Some parts have been damaged	Call the service staff
Actuator alarm - ERROR#2 – the maximum actuator stroke has been exceeded	- No piston controlling the valve - Too big stroke (movement) of the valve - The actuator has been incorrectly mounted on the radiator - Inappropriate valve on the radiator	- Install a piston controlling the actuator - Check the valve stroke - Install the actuator correctly - Replace the valve on the radiator
Actuator alarm - ERROR#3 – too little piston movement	- The valve got stuck - Inappropriate valve on the radiator - Too little stroke (movement) of the valve	- Inspect the valve operation - Replace the valve on the radiator - Check the valve stroke
Actuator alarm - ERROR #4 – no return communication (to the actuator)	- Out of range - No batteries	- The actuator i stoo far from the controller - Insert batteries into the actuator After the communication is re-established, the alarm is deactivated automatically
Alarms with actuators STT-869		
Error #1 - Calibration error 1 – Moving the screw to the mounting position took too much time	- The limit switch sensor is damaged	- Calibrate actuator again by holding the communication button until the third flash of green light - Call the service staff
Error #2 - Calibration error 2 – The screw is maximally pulled out. No resistance while pulling out	- The actuator has not been screwed to the valve or has not been screwed completely - The valve stroke is too big or the valve dimensions are not typical - Actuator current sensor is damaged	- Check if the controller has been installed properly - Replace the batteries - Calibrate actuator again by holding the communication button until the third flash of green light

		- Call the service staff
Error #3 - Calibration error 3 - The screw has not been pulled out enough - the screw meets resistance too early	- The valve stroke is too small or the valve dimensions are not typical - Actuator current sensor is damaged - Low battery level	- Replace the batteries - Call the service staff
ERROR #4 – No feedback	- The master controller is switched off - Poor range or no range in the master controller - Radio module in the actuator is damaged	- Check if the master controller is on - Reduce the distance from the master controller - Call the service staff
ERROR #5 – Low battery level	The battery is flat	Replace the batteries
ERROR #6 – Encoder is locked	The encoder is damaged	- Calibrate actuator again by holding the communication button until the third flash of green light - Call the service staff
ERROR #7 – To high voltage	- Unevenness of the screw, the thread etc. may cause excessive resistance - Too high resistance of gear or motor - Current sensor is damaged	
ERROR #8 – Limit switch sensor error	Limit switch sensor damaged	

Automatic sensor control

In the event of temperature sensor damage or external sensor damage, an alarm is activated informing the user about the type of failure e.g. 'Alarm. No communication".

The alarm remains active until the problem is solved (inserting new batteries or replacing the sensor) and the alarm is deleted from the external controller level.

How to delete the alarm in the external controller

Select the zone where the alarm has occurred (an exclamation mark is displayed instead of the external controller number). Press EXIT - the screen will display two options: Reset.

The external controller will attempt to communicate with the sensor for a few minutes. The valve remains in alarm position (closed - pre-set zone temperature reached) until the communication is established. If the communication attempt is not successful, the alarm will be activated again.

OFF

This function is used to deactivate the zone. The zone may be activated again with ON option - Main menu / Sensors / Zone 1...8.

This alarm may also be deleted via the website. If the alarm has been caused by flat batteries, it will be deactivated automatically when the batteries are replaced.

Fuse

The regulator has a WT 6,3A tube fuse-link (5x20mm) protecting the network.

NOTE

Higher amperage fuse should not be used as it may damage the controller.

XIII. SOFTWARE UPDATE

In order to install new software, the controller must be unplugged from the power supply. Next, insert the memory stick with the new software into the USB port. Connect the controller to the power supply at the same time holding EXIT button. It is necessary to hold EXIT button until a single sound signal is heard – it signalises that the software update process has been initiated. After it has been completed, the controller restarts automatically.

NOTE

Software update shall be conducted only by a qualified fitter. After the software has been updated, it is not possible to restore previous settings.

NOTE

Do not switch the controller off while updating the software.

XIV. TECHNICAL DATA

Power supply	230V +/-10% / 50Hz
Maximum power consumption	6 W
Ambient temperature	$5^0 \div 50^0$C
Potential contacts 1-8 max. output load	0,3 A
Pump max. output load	0,5 A
Pot.-free cont. nom. out. load	230V AC / 0,5A (AC1) * 24V DC / 0,5A (DC1) **
Operation frequency	868MHz
Fuse	6,3 A

* 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-L-8e** 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

PN EN IEC 63000:2019-01 RoHS.

Wieprz, 18.09.2018

Paweł Jura Janusz Master

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