VERANO

GLOBAL

USER'S MANUAL VER-24

TABLE OF CONTENTS

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.
- The regulator should not be operated by children.

WARNING

- 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 July12h 2017. 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.

Care for the natural environment is our priority. Being aware of the fact that we manufacture electronic devices obligates us to dispose of used elements and electronic equipment in a manner which is safe for nature. As a result, the company has received a registry number assigned by the Main Inspector of Environmental Protection. The symbol of a crossed out rubbish bin on a product means that the product must not be thrown out to ordinary waste bins. By segregating waste intended for recycling, we help protect the natural environment. It is the user's responsibility to transfer waste electrical and electronic equipment to the selected collection point for recycling of waste generated from electronic and electrical equipment.

II. DESCRIPTION OF THE DEVICE

VER-24 regulator offers the following functions:

- Room temperature control
- Smooth control of fan speed
- Smooth control of the actuator (0-10V)
- ON/OFF actuator control
- Daily schedule
- Alarm clock
- Parental lock

Controller equipment:

- Large colour touch screen
- Built-in temperature sensor
- Control output 0-10V DC for electronically commutated fan (EC)
- Control output 0-10V or ON/OFF (24V actuator)

VER-24 controller enables the user to disable the fan manually during operation in heating mode (when the thermostatic valve is open).

III. INSTALLING THE CONTROLLER

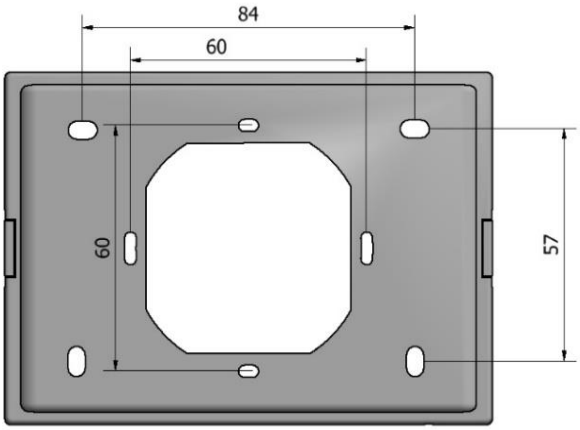
The controller should be installed by a qualified person.

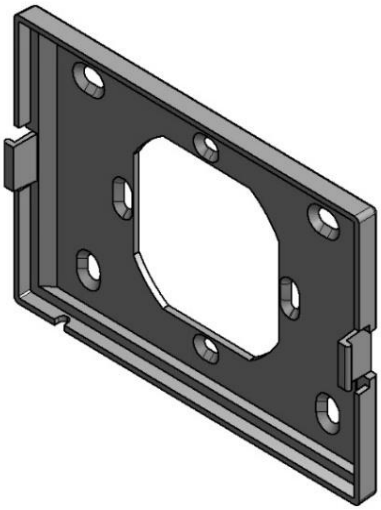
WARNING

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

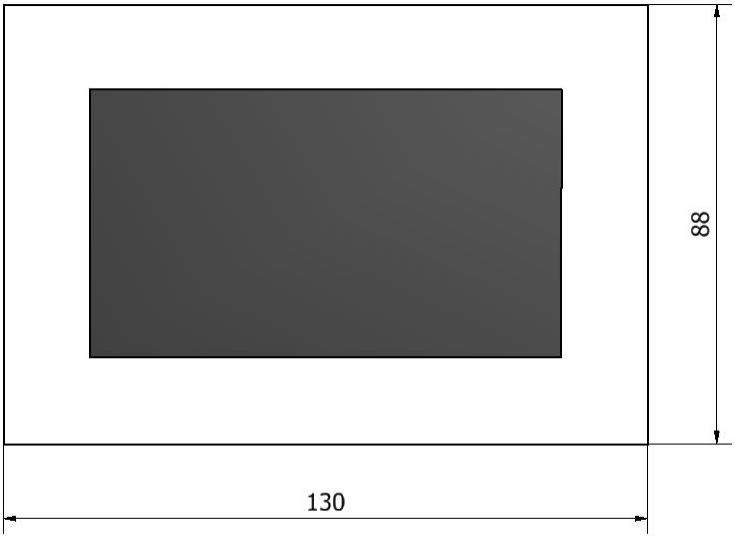
The VER-24 regulator may be installed as a panel mountable on a wall.

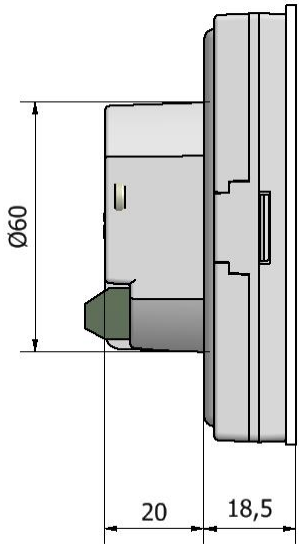
First, the user should mount the rear installation cover to the wall where the room regulator will be connected in the electrical junction box. Then, the user should connect the power supply cables.

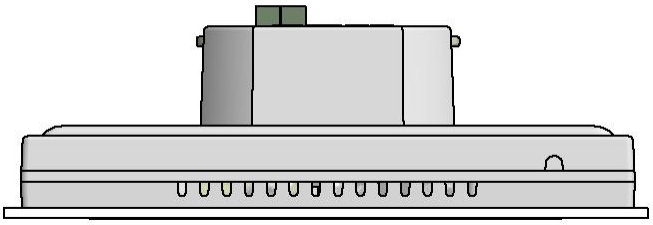


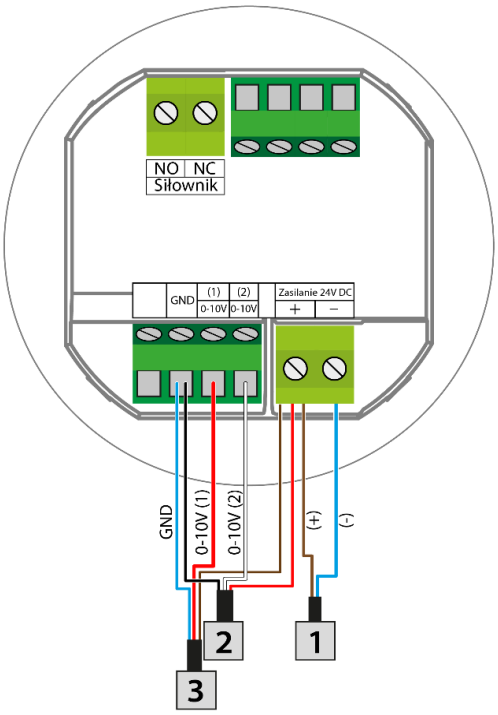


The room regulator should be installed on catches



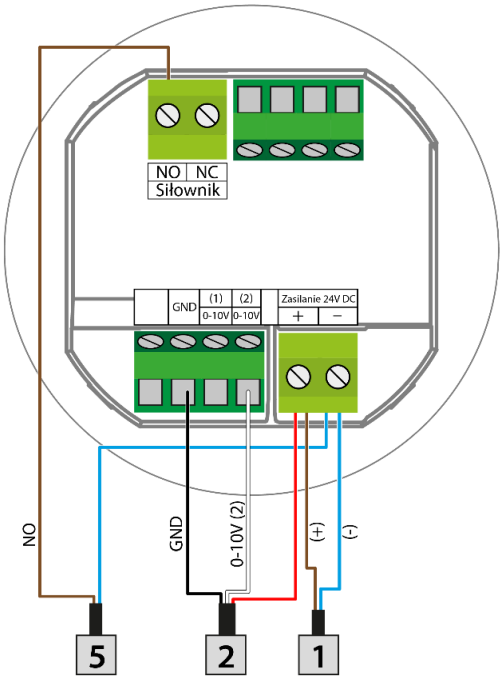




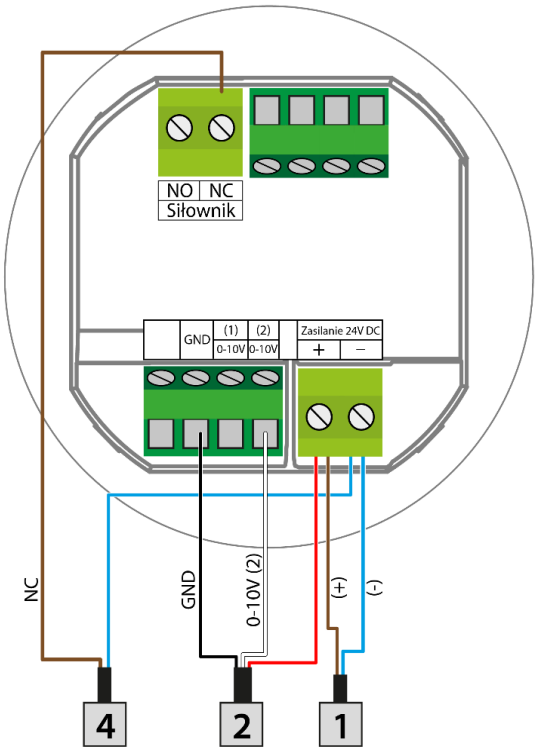


1. Power supply 24V
2. 0-10V signal controlled fan
3. 0-10V signal controlled actuator
4. NC actuator
5. NO actuator

1. How to connect 0-10V signal controlled fan and actuator



2. How to connect NO actuator



1. Power supply 24V
2. 0-10V signal controlled fan
3. 0-10V signal controlled actuator
4. NC actuator
5. NO actuator

3. How to connect NC actuator

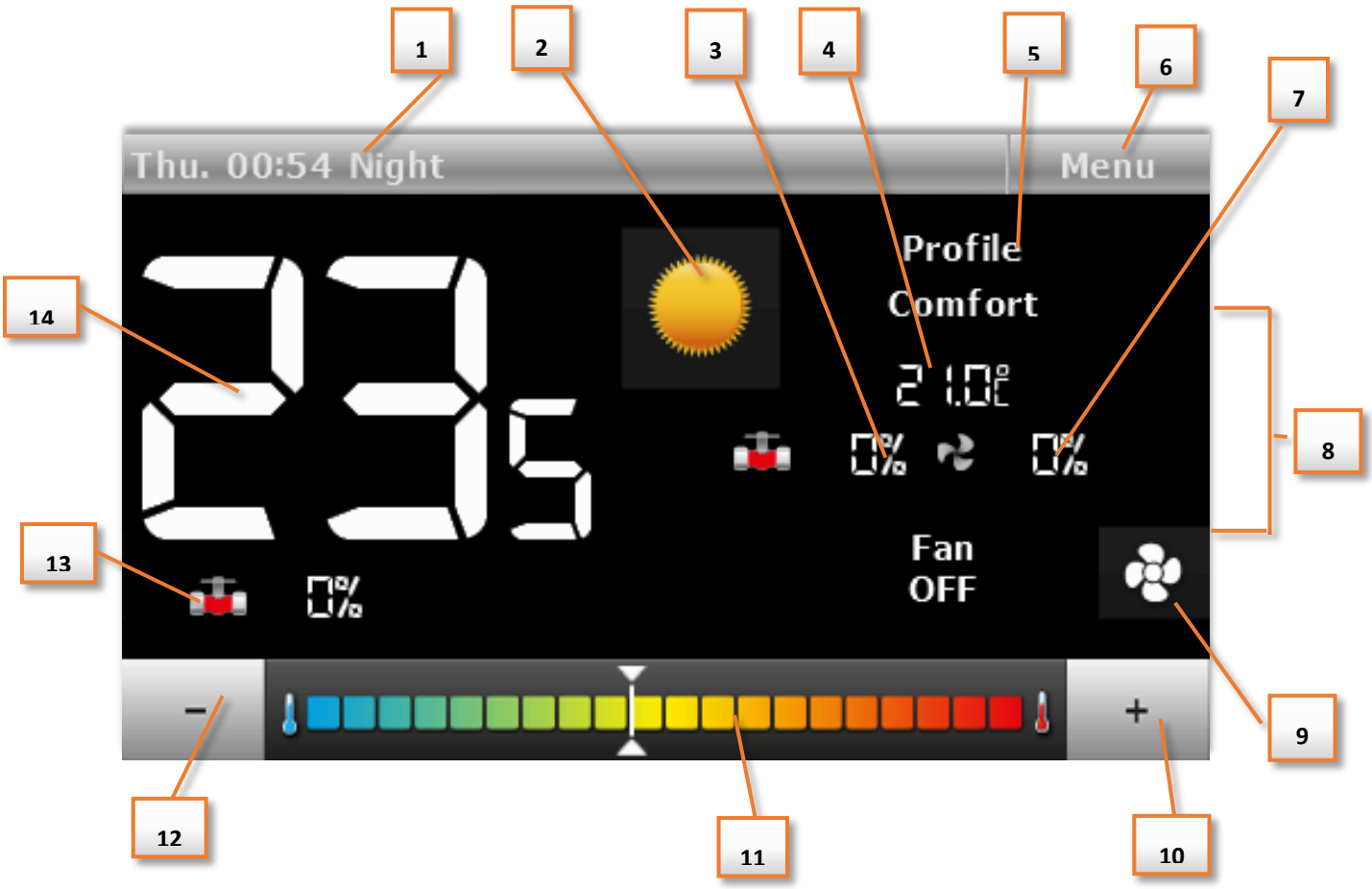
IV. PRINCIPLE OF OPERATION

The VER-24 regulator controls the fan as well as the valves in order to maintain the set temperature in the room. Depending on the selected mode, it increases the temperature in the room (heating mode) or decreases it (cooling mode). The controller smoothly controls the fan's operation (depending on the need, it gradually increases or decreases its revolutions) and the valve's operation (depending on the need, it gradually increases or decreases the degree of its opening). Additionally, the controller may adjust the operation of the second valve – opening or closing it, depending on the need.

V. MAIN SCREEN DESCRIPTION

The controller has a large graphic display with a touch panel. The main screen enables the user to monitor current status of basic controller parameters. Two main screen views are available: Large digits and Round thermometers. The screen view for a particular time of the day may be select in *Screen settings* submenu.

1. DESCRIPTION OF THE MAIN SCREEN



1. Information on the day of the week, hour and time of day
2. Icon for changing the operation mode:
   - Heating – Sun icon
   - Cooling – Snowflake icon

CAUTION

Function active when the option ***Manual heating /cooling*** is marked in the submenu ***Mode selection*** in the service menu. When another mode is selected, the icon for changing the operation mode is invisible and an icon informing on the enabled active mode appears in the top right-hand corner.

3. Degree of valve opening with smooth adjustment.
4. Valid set temperature (depending on the selected profile and operation mode).
5. Information on the controller's active operation profile.
6. Entering the controller's main menu.
7. Fan revolution speed
8. Icons informing on the current fan speed:

- all three icons displayed – the fan operates with full speed

- two icons displayed – the fan operates with medium speed

- one icon displayed – the fan operates with minimum speed

- no icon – fan does not operate

9. Icon for changing the fan's operation mode. The fan may operate in the following modes:

- automatic – the fan's speed is adjusted by the controller's operation algorithm

- manual – three speeds

- disabled

CAUTION

Information on the current fan operation mode is saved in the controller's memory after 6 seconds from the last change of parameter.

10. Button used for increasing the set temperature – option active only in the profile Comfort. The set temperature changed in this place is valid only until the user enters the controller's menu or an automatic change of the operation profile (e.g. according to the schedule settings).
11. Strip for changing the set temperature settings – option active only in the profile Comfort. The set temperature changed in this place is valid only until the user enters the controller's menu or an automatic change of the operation profile (e.g. according to the schedule settings).
12. Button used for reducing the set temperature – option active only in the profile Comfort. The set temperature changed in this place is valid only until the user enters the controller's menu or an automatic change of the operation profile (e.g. according to the schedule settings).
13. Valve icon
    - red – valve configured as heating,
    - blue – valve configured as cooling
    - crossed out valve icon – valve disabled
14. Current room temperature.

2. MAIN SCREEN DESCRIPTION - ROUND THERMOMETERS

1. Day, hour and time of the day
2. Current controller operation mode
3. Enter main menu
4. Pre set teperature/temperatures
5. Current temperature

VI. CONTROLLER OPERATION MODES

The controller may operate in two modes, regardless of the selected profile: heating or cooling. The user selects the possibility to adjust particular modes in the submenu **Service menu / Mode selection**. It is possible to adjust only one valid operation mode – marking the option ***Heating*** or ***Cooling***, or allow the manual switching of modes from the main screen position – marking the option ***Manual heating / cooling***.

Operation mode Heating

After the user selects this mode, the controller activates the fan and opens the valves in order to increase the temperature when it detects that the temperature in the room is lower than the set temperature (setting in the submenu ***Temperature settings***). After the room temperature is increased to the set value reduced by the value determined by the user (setting in the service menu in the submenu ***Temperature settings***), the controller switches into gradual reduction of the fan's revolutions and closing the valve.

After the set temperature is reached in the room, the fan is disabled and the valves are closed (the fan's automatic mode is enabled).

Operation mode Cooling

After the user selects this mode, the controller activates the fan and opens the valves in order to reduce the temperature when it detects that the temperature in the room is higher than the set temperature (setting in the submenu ***Temperature settings***). After the temperature in the room is decreased to the set value increased by the value determined by the user (setting in the service menu in the submenu ***Temperature settings***), the controller switches into gradual reduction of the fan's revolutions and closing the valve.

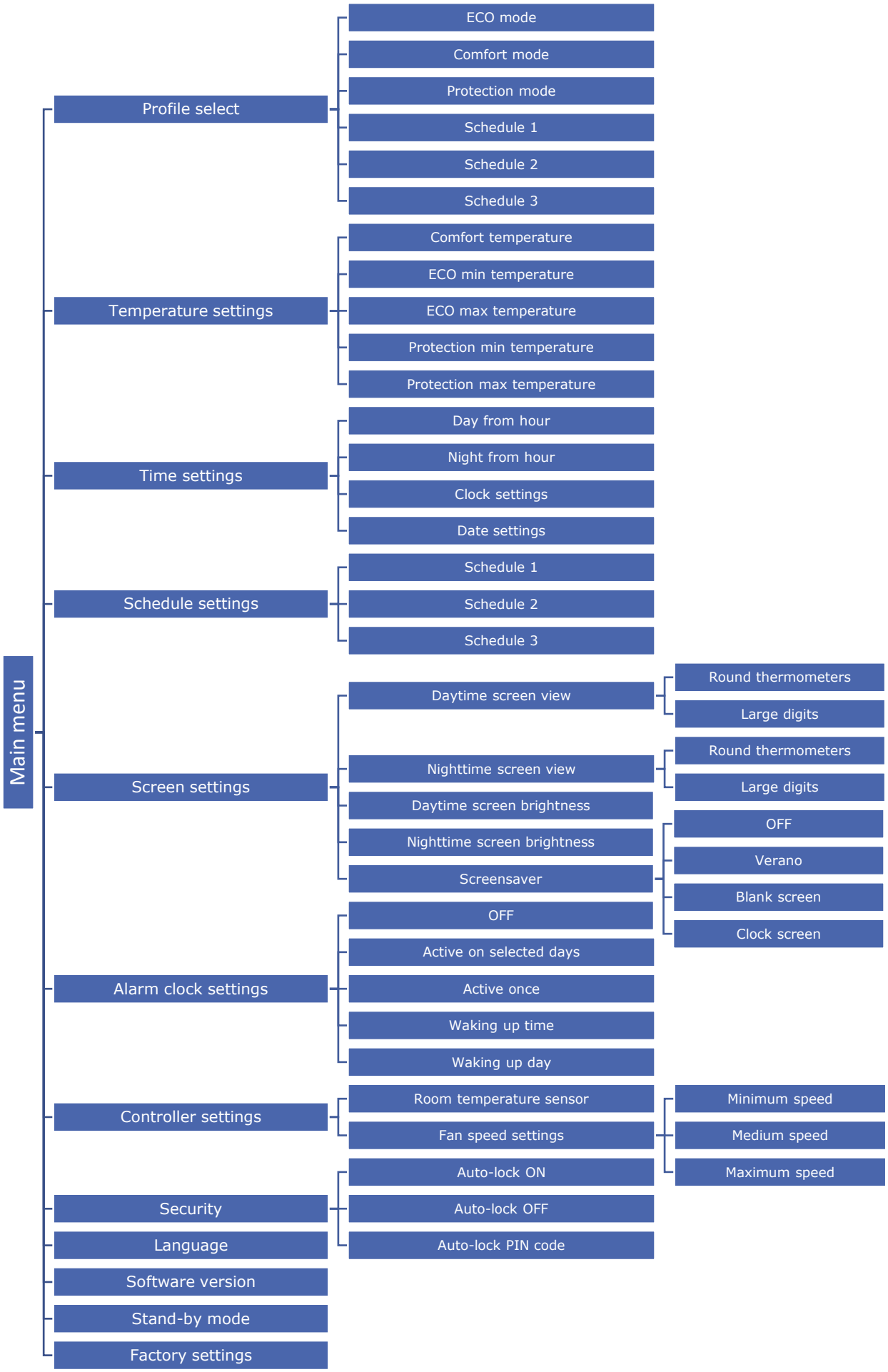
After the set temperature is reached in the room, the fan is disabled and the valves are closed (the fan's automatic mode is enabled).

VII. CONTROLLER FUNCTIONS

During the regulator's normal operation **the graphic display** displays *the main screen.*. After the user presses the menu button, it is possible to edit the controller's functions.

Due to the controller's complexity (great number of parameters to be edited), the menu was divided into the main menu and the service menu – protected with a four-digit code. The main menu contains the controller's basic operation parameters, e.g. mode selection, settings of set temperatures, appearance of the main screen etc.

1. BLOCK DIAGRAM OF MAIN MENU

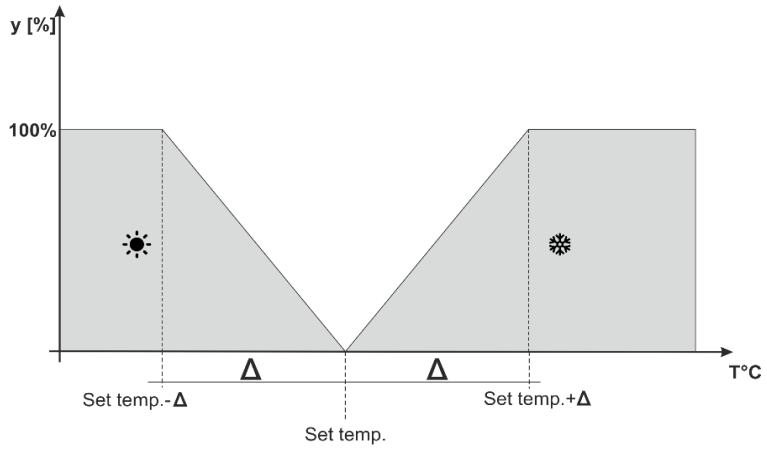

Main menu
Profile select
ECO mode
Comfort mode
Protection mode
Schedule 1
Schedule 2
Schedule 3
Temperature settings
Comfort temperature
ECO min temperature
ECO max temperature
Protection min temperature
Protection max temperature
Time settings
Day from hour
Night from hour
Clock settings
Date settings
Schedule settings
Schedule 1
Schedule 2
Schedule 3
Screen settings
Daytime screen view
Round thermometers
Large digits
Nighttime screen view
Round thermometers
Large digits
Daytime screen brightness
Nighttime screen brightness
Screensaver
OFF
Verano
Blank screen
Clock screen
Alarm clock settings
OFF
Active on selected days
Active once
Waking up time
Waking up day
Controller settings
Room temperature sensor
Fan speed settings
Minimum speed
Medium speed
Maximum speed
Security
Auto-lock ON
Auto-lock OFF
Auto-lock PIN code
Language
Software version
Stand-by mode
Factory settings

2. PROFILE SELECT

The parameters in this submenu are used to select the controller's operation profile.

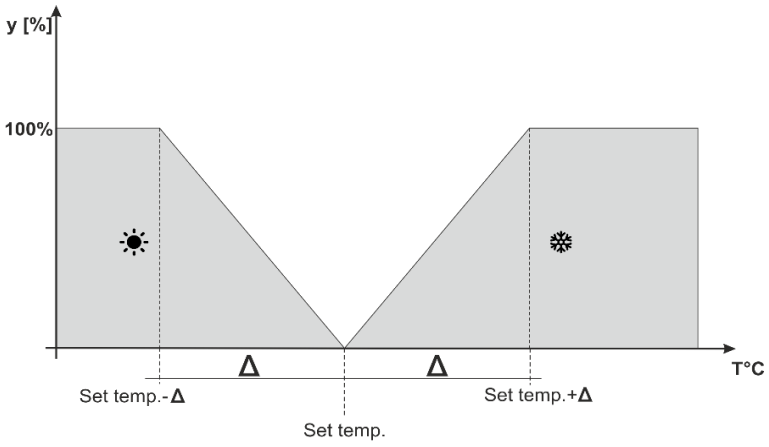
Profiles available in the controller are used to maintain the temperature in the room at the set level. The user may select 3 various profiles (comfort, eco, protection) as well as three different schedules (1, 2, 3).

- **COMFORT** - In this profile, the user adjusts one set temperature (Tzad), Fig. 1, 2. If the temperature in the room decreases (**heating mode**) or increases (**cooling mode**) by 0.1 °C, the controller will gradually begin to open the valve and will activate the fan. When the temperature in the room is still decreasing (**heating mode**) or increasing (**cooling mode**), the controller will gradually open the valve. The valve will be completely open below the temperature Tzad – delta (or above Tzad + delta). Fig. 2 presents the fan's operation.



Δ - Delta comfort temperature
y - Valve operation

Figure 1. Chart of valve operation in the profile Comfort



Δ - Delta comfort temperature
y - Fan operation

Figure 2. Chart of fan operation in the profile Comfort

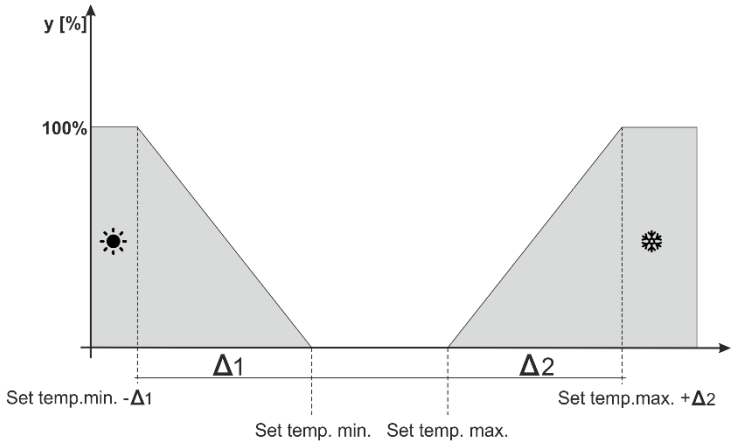
- **ECO, PROTECTION** - The profile PROTECTION operates similarly to the ECO profile. The only difference are the default values of set temperatures settings:

Minimum temperature PROTECTION < minimum temperature ECO

Maximum temperature PROTECTION > Maximum temperature ECO

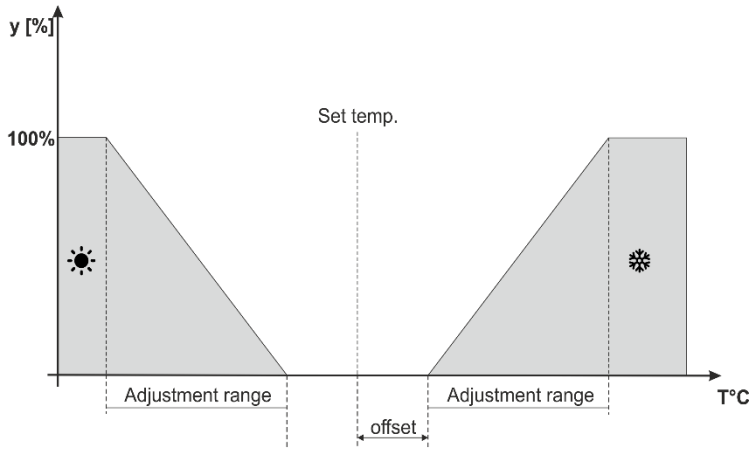
The profile PROTECTION is used to maintain optimum values in the room protecting the system against freezing or overheating.

In this profile, the user adjusts two temperatures (Tzad_min, Tzad_max), Fig. 3.4. If the temperature in the room decreases (**heating mode**) below the temperature Tzad_min by 0.1 °C, the controller will update the valve's and the fan's settings (according to the settings) in order to achieve the set temperature in the room. If the temperature increases (**cooling mode**), the adjustment takes place similarly to the previous case.



Δ1-Set temperature minimum delta
Δ2-Set temperature maximum delta
y - Valve operation

Figure 3. Chart of valve operation in the profile ECO, PROTECTION



y - Fan operation

Figure 4. Chart of fan operation in the profile ECO, PROTECTION

- **Profile schedule 1, 2, 3** - Enabling one of the three schedules will cause the controller to operate according to the previously defined program – the parameter ***Schedule settings***
  The schedules allows the user to adjust the requested profile (comfort, eco, protection) in a given hour of the day (**Menu / Schedule settings**).

3. TEMPERATURE SETTINGS

The parameters in this submenu allow the user to adjust the set temperatures for the controller's particular profiles (see the previous chapter). The user may change the following temperatures:

- **Comfort temperature** - changing (editing) the room's set temperature in the profile Comfort.
- **ECO min temperature** - changing (editing) the room's minimum set temperature in the profile ECO.
- **ECO max temperature** - changing (editing) the room's maximum set temperature in the profile ECO.
- **Security min temperature** - changing (editing) the room's minimum set temperature in the profile PROTECTION.
- **Security max temperature** - changing (editing) the room's maximum set temperature in the profile PROTECTION.

4. TIME SETTINGS

After the user presses the Time icon in the main menu, a screen allowing the user to change the timer settings, the current date as well as to determine the time frames for day and night appears.

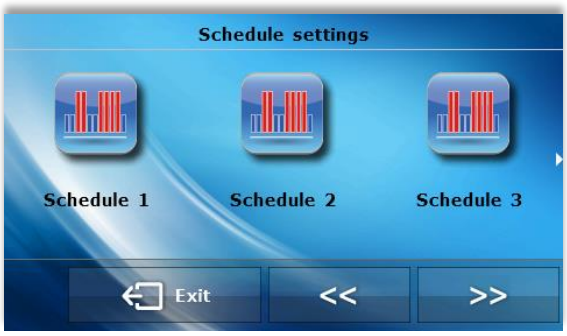
- **Day from / Night from** - This option allows the user to change the hours in which the controller switches to the night mode (Night from) as well as will return to the day mode (Day from).

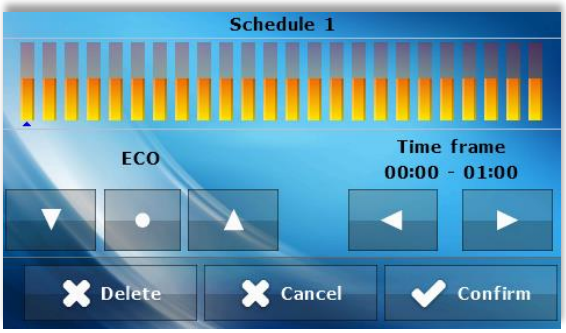
- **Clock settings** - This function allows the user to change the currently displayed time.

- **Date settings** - This function allows the user to change the currently displayed date.

5. SCHEDULE SETTINGS

The parameters in this submenu are used for programming particular schedules.





After the user selects the schedule the settings of which the user wishes to edit, the display will show the following settings screen. Using the icons ◀ or ▶ the user changes the time interval (settings with accuracy to one hour). The icons ▲ and ▼ allow the user to change the profile assigned to a given hour. If the user wishes to copy a setting to neighboring hours, the user should just press the icon ● and then the icon ◀ or ▶ .

6. SCREEN SETTINGS

This submenu enables the user to adjust the screen settings to individual needs. Main screen view may be different depending on the time of the day.

- **Daytime screen view / Nighttime screen view** - Tap on this icon to select the screen view for night and day. The screenviews are described in detail in *How to use the contoller*.

- **Daytime screen brightness / Nighttime screen brightness -** Tap on this icon to adjust the screen brightness (in percentages) both for the daytime and the nighttime.

- **Screensaver -** The user may activate a screensaver which will appear after a pre-defined time of inactivity:

  - OFF – when this option is selected, the selected view will be displayed on the screen regardless of the time of inactivity.

  - Verano – when this option is selected, Verano logo will appear on the display after a pre-defined time of inactivity.

  - Blank screen – when this option is selected, the screen will go blank after a pre-defined time of inactivity.

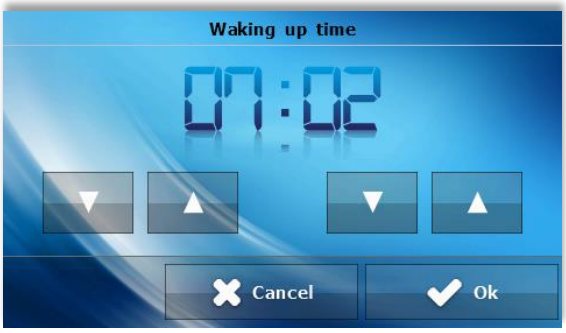
  - Clock screen – when this option is selected, a clock will appear on the screen after a pre-defined time of inactivity.

7. ALARM CLOCK SETTINGS

In this function, the user adjusts the alarm clock. It is possible for the alarm clock to be activated only on selected days of the week (active on selected days) or to be activated once.

- The user adjusts the waking hour with the use of the "up" and "down" arrows.

- When the alarm clock is to be active only on selected days of the week, the user should mark the days on which the alarm clock is to be activated.



8. CONTROLLER SETTINGS

- **Room temperature sensor** - In this submenu, the user may calibrate the room temperature sensor.
  The calibration is performed during the installation or after a longer period of using the regulator if the room temperature measured by the internal sensor differs from the actual temperature. Adjustment range: -10 to + 10ºC with accuracy to 0.1^{o}C.

- **Fan revs settings** - This function allows the user to adjust the value of the fan's revolutions in the manual operation mode (see chapter Description of main screen) for particular speeds.

9. SECURITY

After the user presses the icon Protections in the main menu, a panel used for changing the parental lock settings appears. After the autolock is activated (the user marks the option Auto-lock enabled) changes of the controller's settings will be protected with a four-digit PIN code - after the screensaver is activated after a period of inactivity, it is not possible to browse the menu options without entering the code.

In order to adjust the PIN code necessary to operate the regulator (when the lock is active), the user should press the icon *Auto-lock PIN code*.

CAUTION

The factory set PIN code is "0000".

10. LANGUAGE SELECTION

After the user presses the icon Language selection in the main menu, a panel used for changing the language appears.

11. INFORMATION ABOUT SOFTWARE

After the user presses this icon, the display will show the manufacturer's logo along with the software version.

12. STAND-BY MODE

This function is used to activate the stand-by mode – the controller proceeds to the stand-by mode. It will not control the operation of the fans or valves. This is an energy-saving mode. The controller proceeds into its regular operation mode after the user touches the main panel.

13. SERVICE SETTINGS

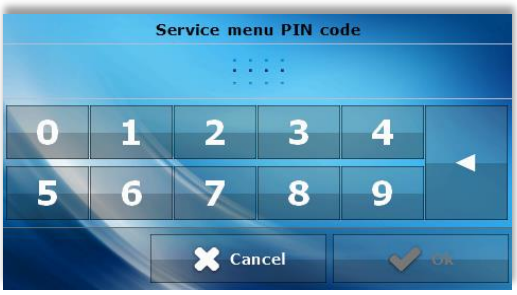
The service settings are used to adjust the advanced parameters of the controller's operation and should be operated by qualified persons. The detailed description of these parameters may be found in the next chapter. Access to parameters in the service menu is protected with a four-digit code.

14. FACTORY SETTINGS

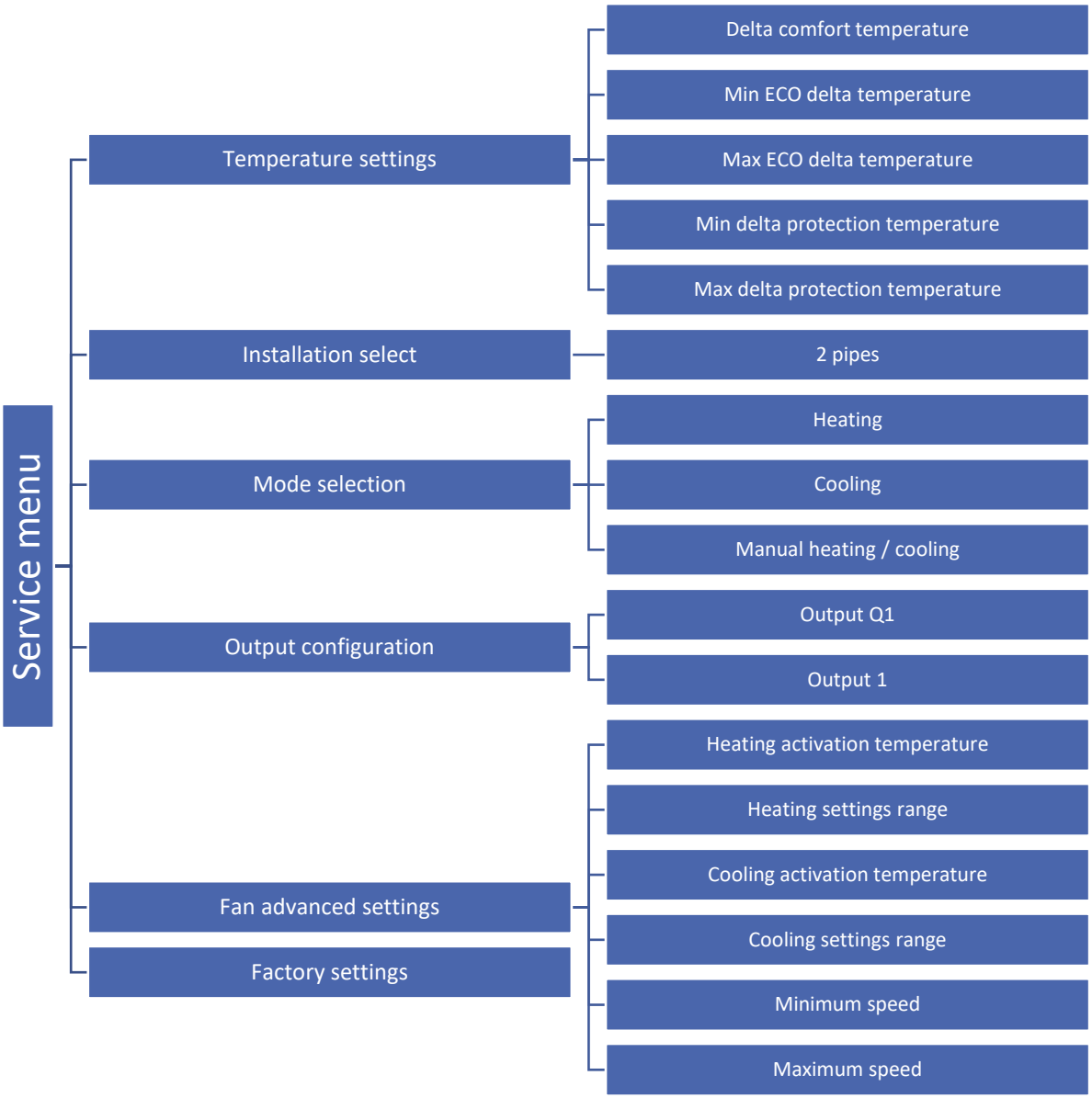
This function is used to restore factory settings in the main menu of the controller (excluding service settings).

VIII. SERVICE MENU

The service menu should be operated by appropriately qualified persons and is used primarily for settings of the controller's additional functions such as set temperature of deltas, output configuration etc.



1. BLOCK DIAGRAM OF SERVICE MENU



2. TEMPERATURE SETTINGS

The parameters in this submenu are used to adjust the deltas temperature values for particular operation profiles. The delta value determines the moment in which the controller switches into smooth control over the valve and the fan – this is described in detail in the chapter Profile selection.

The delta parameters may be adjusted for each set temperature:

- **Comfort delta temperature** - applies to the profile Comfort.
- **ECO delta minimum temperature** - applies to the profile ECO, the minimum set temperature
- **ECO delta max temperature** - applies to the profile ECO, the maximum set temperature
- **PROTECTION delta minimum temperature** - applies to the profile PROTECTION, the minimum set temperature
- **PROTECTION delta max temperature** - applies to the profile PROTECTION, the maximum set temperature

3. INSTALLATION SELECT

This option is used to select the type of system for which the controller is intended.

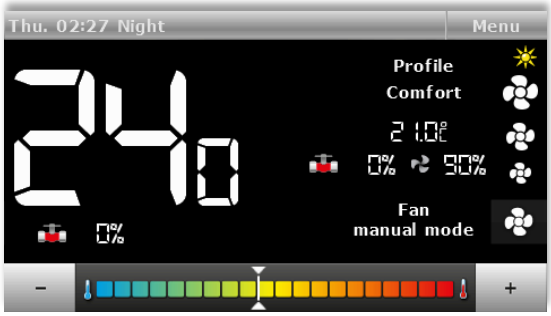
4. MODE SELECTION

The parameters in this submenu are used to determine the controller's valid operation mode.

- **Heating** – no possibility to switch to Cooling mode from the level of the main screen. The user marks this option if the system is planned for heating.

- **Cooling** – no possibility to switch to Heating mode from the level of the main screen. The user marks this option if the system is planned for cooling.

If the user selects the Heating or Cooling function, the icon for changing the operation mode disappears from the controller's main screen. An icon signaling which mode is valid is displayed in the right-hand top corner instead, this may be seen on screenshot below – the valid mode in this case is Cooling.



- **Manual heating / cooling** – the user may change the operation mode from the level of the main screen – by pressing the icon for changing the operation mode.

5. OUTPUT CONFIGURATION

The parameters in this submenu are used to configure the operation of outputs:

- **Output Q1**

These settings apply to the operation of the valve controlled with the use of the output ON/OFF.

The user determines the valve's role in the submenu ***Type of output***:

- **Heating** – after the user marks this option, the valve controlled from the output ON/OFF will operate in the heating mode.

- **Cooling** – after the user marks this option, the valve controlled from the output ON/OFF will operate in the cooling mode

- **OFF** – after the user marks this option, the valve's operation will be disabled.

Additionally, the user may change the settings of the following parameters:

- **Heating hysteresis** - This option is used to adjust the heating hysteresis used in the heating mode. This is the difference between the set temperature and the temperature of return to operation.

for example: when the set temperature has the value of 20°C and the hysteresis is 2°C. After the set temperature is reached, namely 20°C, the valve is closed. The valve will open again after the temperature decreases to 18°C.

- **Cooling hysteresis -** This option is used to adjust the cooling hysteresis used in the cooling mode. This is the difference between the set temperature and the temperature of return to operation.

for example: when the set temperature has the value of 22°C and the hysteresis is 2°C. After the set temperature is reached, namely 22°C, the valve is closed. The valve will open again after the temperature increases to 24°C.

- **Output 1**

These settings apply to the operation of the valve controlled with the signal 0-10V:

- **Heating** – after the user marks this option, the valve controlled with the signal 0-10V will operate in the heating mode.

- **Cooling** – after the user marks this option, the valve controlled with the signal 0-10V will operate in the cooling mode.

- **OFF** – after the user marks this option, the valve's operation will be disabled.

6. FAN ADVANCED SETTINGS

The parameters in this submenu are used to adjust the fan's operation.

- **Heating activation temperature** - This parameter determines the shift downwards in the scope of the fan's adjustment as compared to set temperature in the heating mode.

- **Heating adjustment range** - The parameter determines the width of the range of temperatures in which the controller is to smoothly change the fan's revolutions in the heating mode.

Example:

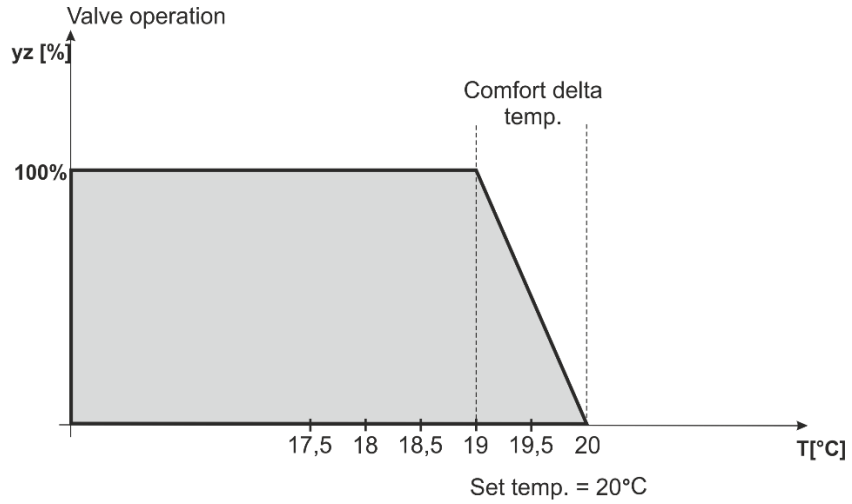
The scheme below presents the operation of the valve and the fan with the following settings:

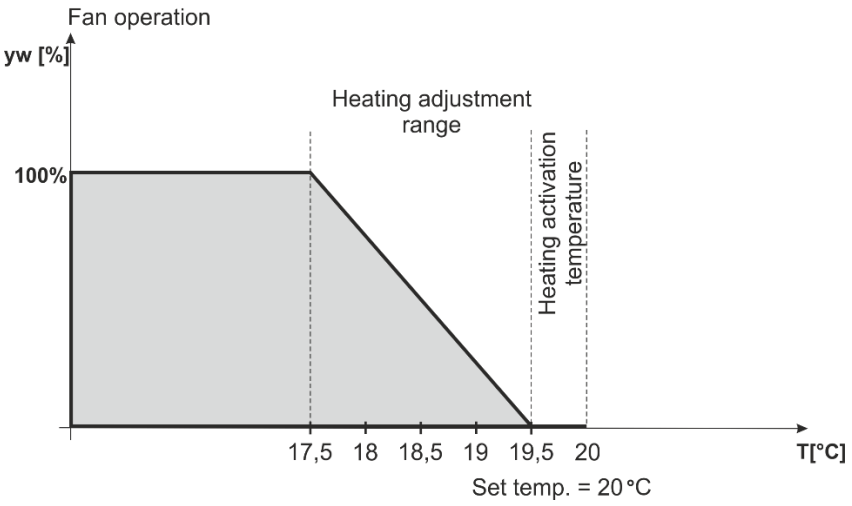
Set temperature: 20°C

Comfort delta temperature: 1°C

Heating activation temperature: 0,5°C

Heating adjustment range: 2°C





With the settings above, the valve will be open until the temperature 19°C is reached in the room (Tzad – delta comfort). After this value is reached, the valve will gradually begin to close. When the set temperature is reached in the room, the valve will close completely.

The fan will operate with full speed until the temperature 17.5°C in the room is reached (Tzad – Heating activation temperature – Heating adjustment range) – after this value is reached, the fan will gradually begin to reduce the revolutions until it is completely disabled when the temperature 19.5°C is reached (Tzad – Heating activation temperature).

- **Cooling activation temperature -** This parameter determines the shift upwards in the scope of the fan's adjustment as compared to the set temperature in the cooling mode.
- **Cooling adjustment range -** This parameter determines the width of the range of temperatures in which the controller is to smoothly change the fan's revolutions in the cooling mode.
- **Minimum revolutions -** This parameter allows the user to determine the fan's minimum revolutions.

Calibration procedure for minimum revolutions:

- The user enables the function Minimum revolutions in the controller.

- The user gradually increases the settings in the controller until the moment when the user sees that the fan begins to revolve.

- The user accepts the selection with the OK button.

- **Maximum revolutions** - This parameter allows the user to determine the fan's maximum revolutions.

Calibration procedure for maximum revolutions:

- The user enables the function Maximum revolutions in the controller.

- The user gradually increases the settings in the controller – the fan accelerates to maximum revolutions.

- When the user sees that the fan does not accelerate despite the increased settings, the user accepts the settings with the OK button.

7. FACTORY SETTINGS

This function is used to restore factory settings in the service menu (excluding main menu settings).

IX. ALARMS

The VER-24 room temperature regulator will signal all alarms that occur in the controller. When an alarm is activated, the room regulator will send an acoustic signal and the display will show an appropriate message. When an alarm occurs, the controller disconnects the outputs. When the internal sensor is damaged, the alarm "*Room temperature sensor damaged*" will appear.

X. TECHNICAL DATA

Room temperature settings range	5°C - 40°C
Power supply voltage	24V
Power consumption	1,3W
Room temperature measurement error	+/- 0,1°C
Operation temperature	5°C - 50°C
Maximum number of fans	12 pcs.
Output load	24W

EU Declaration of conformity

Hereby, we declare under our sole responsibility that **VER-24** manufactured by TECH, headquartered in Wieprz Biała Droga 31, 34-122 Wieprz, is compliant with:

- Directive 2014/35/EU of the European Parliament and of the Council of February 26, 2014 on the harmonisation of the laws of Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (EU Journal of Laws L 96, of 29.03.2014, p. 357),
- Directive 2014/30/EU of the European Parliament and of the Council of February 26, 2014 on the harmonisation of the laws of Member States relating to electromagnetic compatibility (EU Journal of Laws L 96 of 29.03.2014, p.79),
- Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products,
- the regulation by the Ministry of Economy of May 8, 2013 concerning the essential requirements as regards the restriction of the use of certain hazardous substances in electrical and electronic equipment, implementing provisions of RoHS directive 2011/65/EU**.**

For compliance assessment, harmonized standards were used: **PN-EN 60730-2-9:2011, PN-EN 60730-1:2016-10.**

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Regulator_VER-24

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After the editing of this manual was completed on July 12, 2017, changes in products specified in the manual could have taken place. The manufacturer reserves the right to change the structure or change the determined colors. The illustrations may contain additional equipment. The printing technology may affect differences in shown colors. Current information will be provided by dealers of Verano-konwektor products.