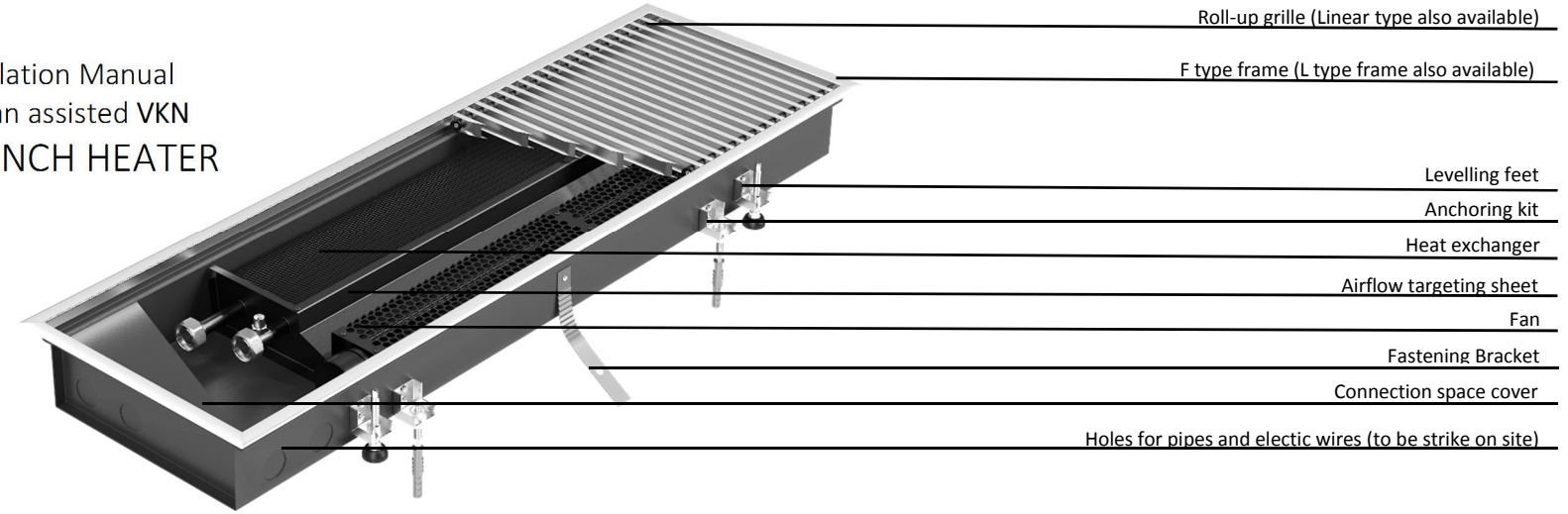
VERANO KONWEKTOR

Instalation Manual
Of Fan assisted VKN
TRENCH HEATER



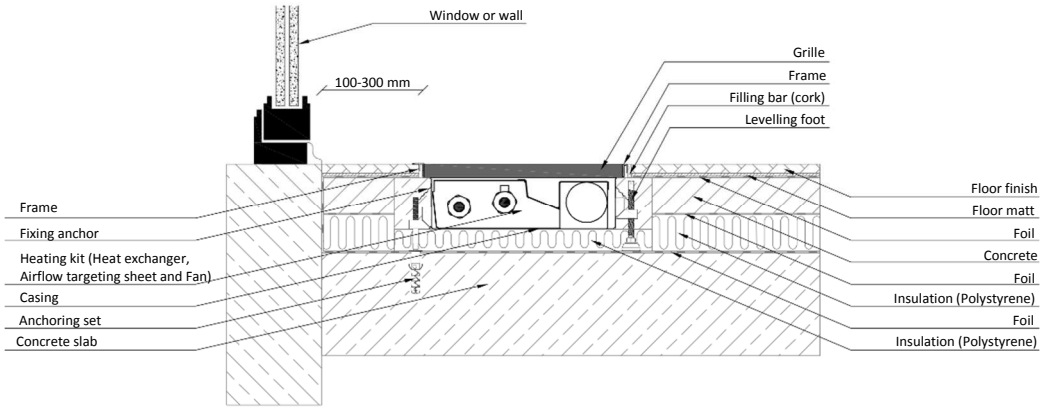
Date

Equipment schedule

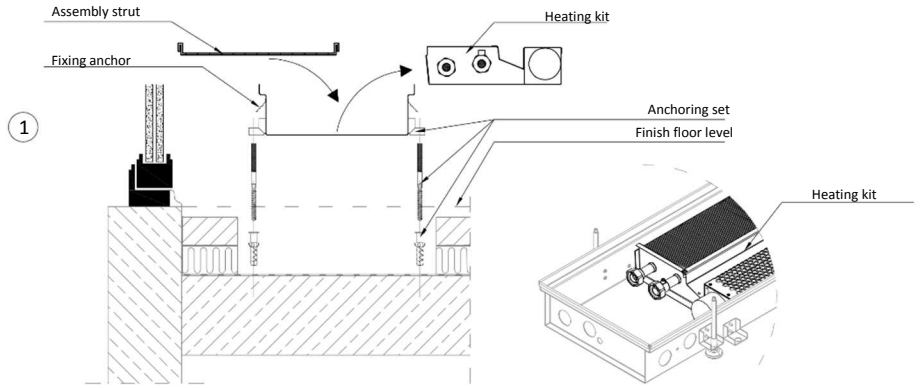
Type	Heater length VKN [mm]										
	950	1100	1250	1450	1650	1800	2000	2150*	2300*	2500*	2750*
Assembly equipment (standard)	**Number of elements [pcs.]**										
Connection space cover	1										
Air vent	1										
Connector 1/2" female thread → 5/8" male thread (VKN1 only)	2										
Assembly struts	2	2	2	3	4	4	4	5	5	6	6
Fastening brackets	2	2	2	2	4	4	4	4	4	6	6
Anchoring kit	4	4	4	4	6	6	6	6	6	8	8
Levelling feet	4	4	4	4	6	6	6	6	6	8	8
Assembly equipment (additional)	**Number of elements [pcs.]**										
Support system for raised floor**	2	2	2	3	3	4	4	4	5	5	6
Bimetallic temperature sensor**	1										
Assembly fibreboard cover**	1										
Heater tray protective film**	1										
Foil sleeve for heat exchanger**	1										
Grilles, frames and control devices (additional)	**Number of elements [pcs.]**										
Frame L / F type**	1 kit										
Grille**	1 pc.										
Controls**	Thermostatic valve 1 pc.		Lockshield valve 1 pc.		Thermal actuator 1 pc.			Thermostat 1 pc.		Rail power supply 1 pc.	

Packing list:

* VKN5 only
** Additional accessories



The example of VKN fan assisted heater assembly



8. Prepare a trench for the heater

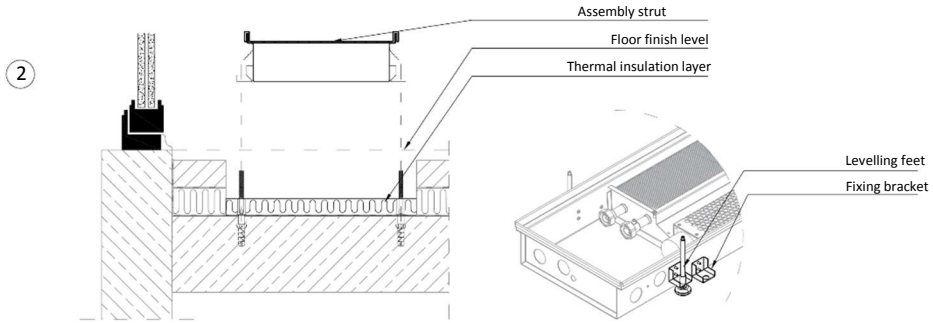
Before starting the assembly works take out and secure the heating kit (fan, airflow targeting sheet and heat exchanger). After that, install assembly struts on the casing.

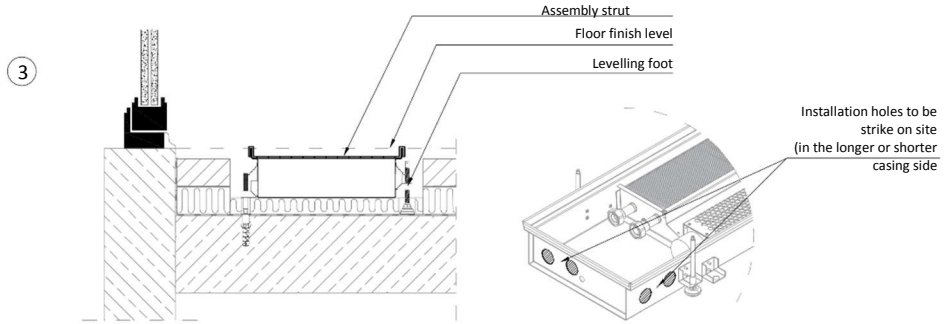
Prepare a trench 100 mm wider and longer than heater casing. The depth of the trench should be planned in the way that the top of the grille is on the same level as floor finish level (take into account insulation in the bottom of the trench).

Put the heater casing in the centre of the trench. Point the places for fixing anchors holes on the concrete. Put out the heater casing of the trench.

NOTE!

Fans contaminated by dirt and dust while building or renovation works might cause damage of fans or higher sound power level of fans (louder fan work). Damage caused by fan contaminations are not covered by the warranty.





9. Heater fixing and thermal insulation

Prepare an appropriate holes for anchoring screws in concrete slab. Drill the holes on marked points and hammer the rawplugs into them.

Place the thermal insulation on the bottom of the trench (on the concrete slab). Remember to do the holes for fixing anchors and levelling feet in insulation. The recommended thermal insulation is Polystyrene.

The thermal insulation layer under the casing should be done of materials of relative deformation factor not less than 70 kPa while compressive strength is at 10%.

The minimum insulation thickness should be not less than:

- 20 mm for heaters installed in an upper levels (above the floor with central heating system),
- 140 mm for heaters installed on the ground floor (Polystyrene declared properties λ = 0,004 W/m*K, Umin = 0,30 W/m^{2}K).

10. Install the heater casing in the trench

Strike the holes for connection pipes and for electric wires. You should strike 3 holes in one side of the casing (longer or shorter side).

Put the casing with levelling feet in the trench. Levelling feet should be placed on the concrete slab. Do not install levelling feet on thermal insulation. Use the screwdriver to level the levelling feet.

Screw the heater casing using fixing anchors kits. Screw the M8 nut on the fixing anchor until resistance is felt.

Fill the rest of the free areas between the heater casing and thermal insulation with low expandable foam.

Leaving free space between the casing and thermal insulation can lead to increased volume of device.

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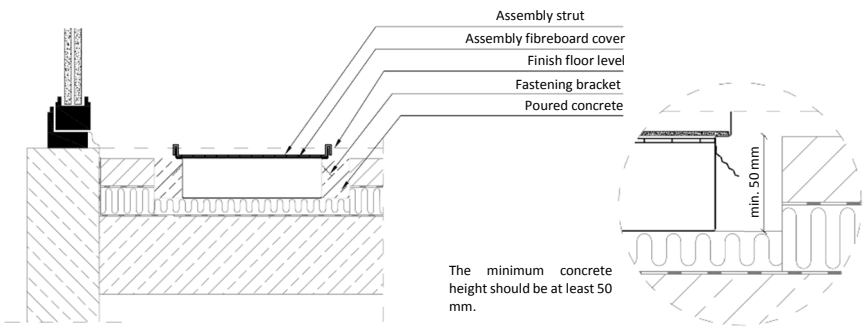

11. Do the hydronic and electric connections, pour the concrete around the casing

Install all pipes and electric wires. Secure the connections and all the holes in the casing by using low expandable thermal foam insulation.

Make sure that the casing is properly settled in the trench and all connections are done. Make sure that assembly struts are installed on the top edge. Put assembly fibreboard cover on the casing to avoid contamination inside the casing.

Pour the concrete around the casing. The minimum height of concrete should be at least 50 mm.

Tray of fan assisted trench heaters VKN are standardly equipped with a connection for connecting the grounding installation. To be used depending on local or special guidelines (the requirement to use PELV circuits for example).

According to the current regulations, low voltage devices (fan assisted trench heaters VKN) should not be connected to the grounding of other installations.

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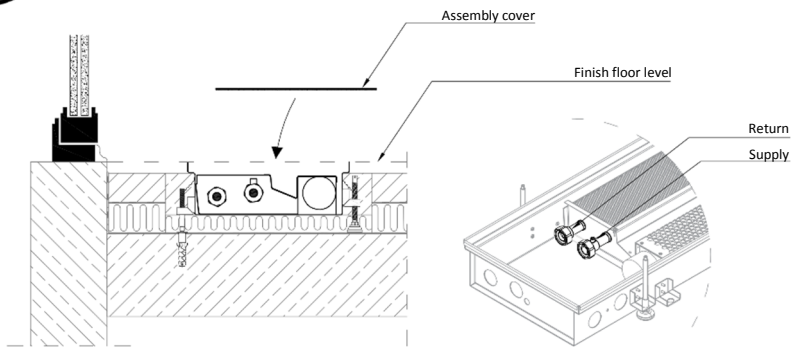

13. Do the hydronic and electric connections to the heating kit

Install valves and thermal actuators (if required) on the pipes of heat exchanger. Connect the pipes to the valves. Supply pipe is to be connected to the heat exchanger pipe with air vent (on the room side). Connect electric wires to the fan. Use the electric scheme to do the wiring for the thermal actuator and the controls.

Carry in the tightness test for hydronic connections.

After completing installation works, cover the heater with the assembly fibreboard cover to avoid contamination of fan and heat exchanger with dust of the rest of building works. Damage caused by the heating kit contamination is not a subject to complain.

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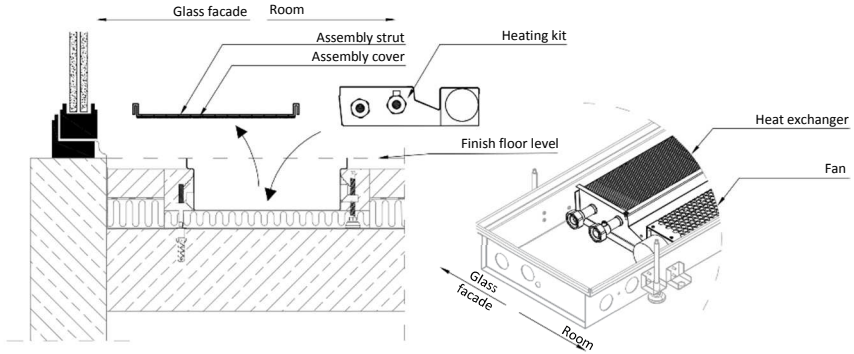

12. Install the heating kit

When the concrete gets dry, remove the assembly fibreboard cover and struts. After that, clean the inside of the casing and install the heating kit. **In fan assisted trench heater type VKN the heat exchanger should be on the glass façade / wall side.**

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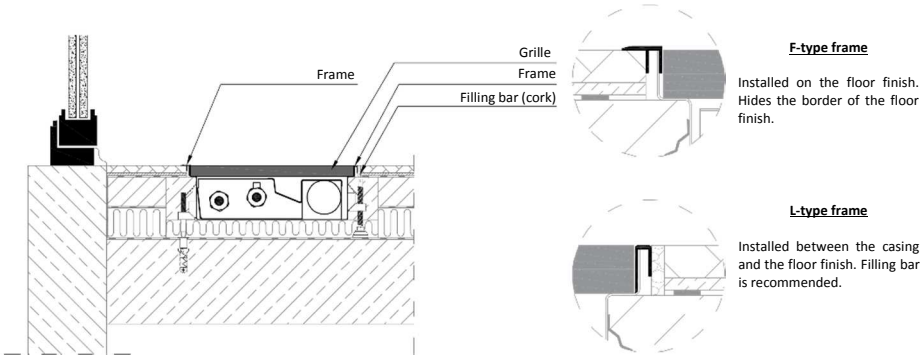


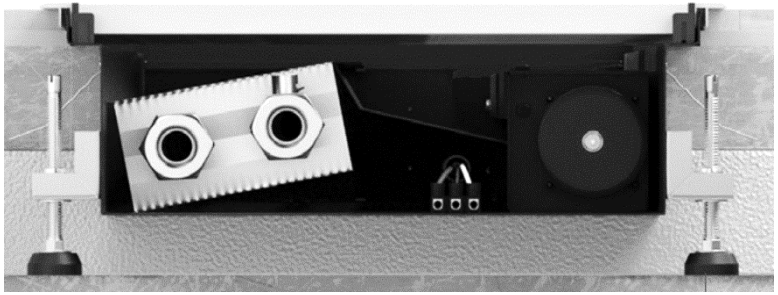
14. Install the grille and frame

After finishing the rest of building works remove the assembly fibreboard cover. Then install the grille and frame on the casing edge.

Note!

Grilles, frames, thermostatic and lockshied valves, thermal actuators, rail power supplies and protective fibreboard are additional equipment accessories.

Electric connection

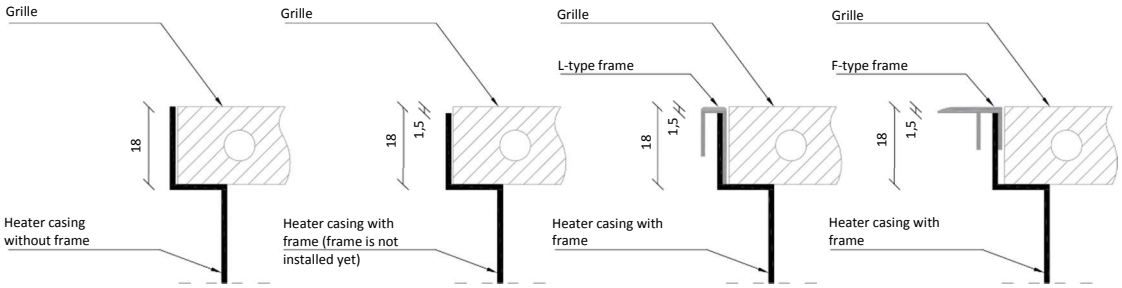


Fan electric connection:

- Red – positive (+) 24 V DC
- Black – negative (-) 24 V DC
- White – control voltage 0-10 V DC

Recommended wire type: LIYCY
Allowed wire type : LIYY
Electrical wires routing should be done in accordance with the applicable standards of the electrical industry.
The cable cross-section should be determined in accordance with electrical installation project based on the voltage drop calculations for the planned wires routing.

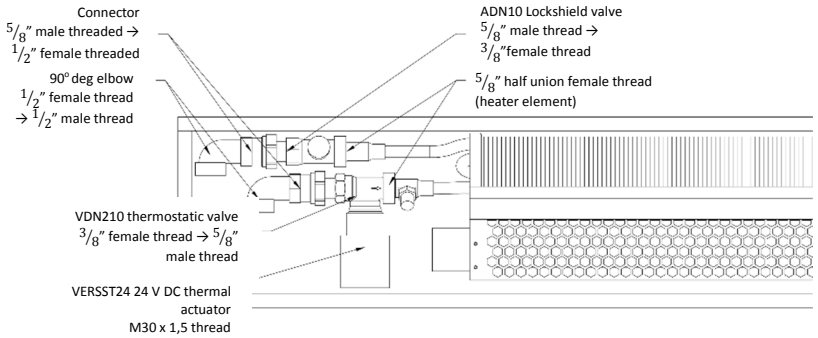
Frame type and heater height



The height of the casing edge depends of the frame type. It is recommended to order heater with frame at the same type (if heater is going to be finished with frame).
Casing edge for grille without frame is 18 mm high – the same as the grille. Casing edge for grille with frame is 16,5 mm high. Thanks to that, after installing the frame, grille and frame are on the same level.
Frame is usually off the casing for transporting. Frame should be installed on the casing after completing all installation and building works, according to the point ⑦ of this manual.

Hydronic connection

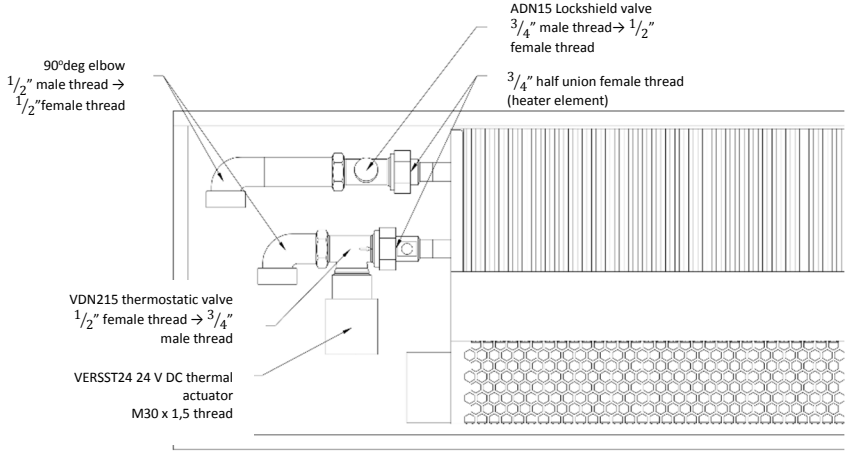
Example of hydronic connection of fan assisted VKN1 trench heater



For VKN1 heater thermostatic and lockieshield valves should be DN 10 diameter. E.g. Siemens VDN210 as a thermostatic valve and Siemens ADN10 as a lockieshield valve. Connector 5/8" male threaded -> ½" female threaded is as standard heater equipment.

VERANO WEBSIDE –
Fan assisted trench heater type VKN1

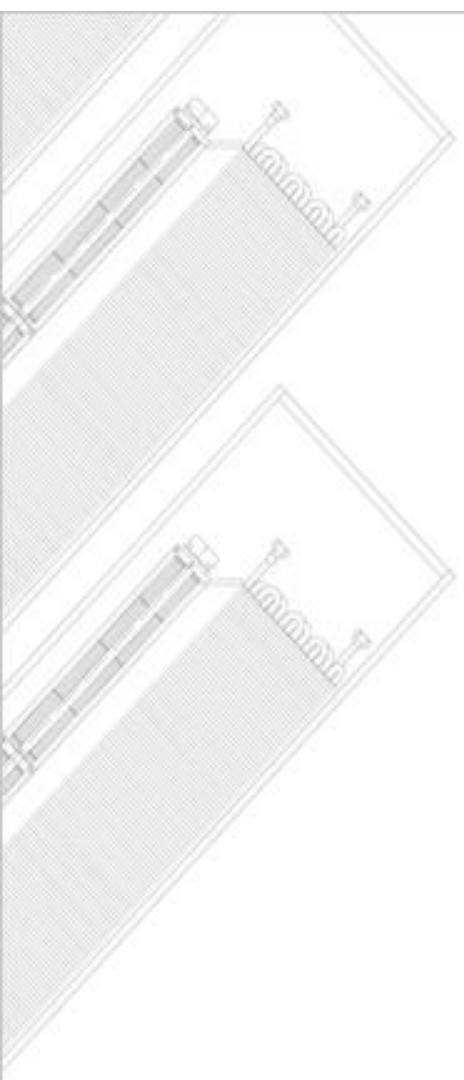
Example of hydronic connection of fan assisted VKN5 trench heater



VERANO WEBSIDE –
Fan assisted trench heater type VKN5

If you have any questions or doubts concerning installation works, please contact us:

VERANO OFFICE
Tel. +48 533 009 415
e-mail: export@v-k.pl



VERANO®
KONWEKTOR

USER'S MANUAL VER-24 WIFI

SPIS TREŚCI

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

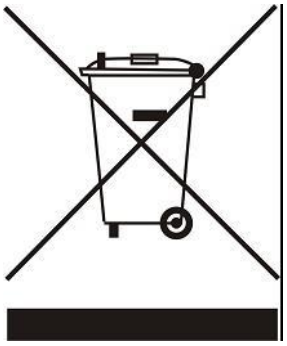
- High voltage! Make sure the regulator is disconnected from the mains before performing any activities involving the power supply (plugging cables, installing the device etc.).
- The device should be installed by a qualified electrician.
- Before starting the controller, the user shoud measure earthing 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 February 2th 2019. 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

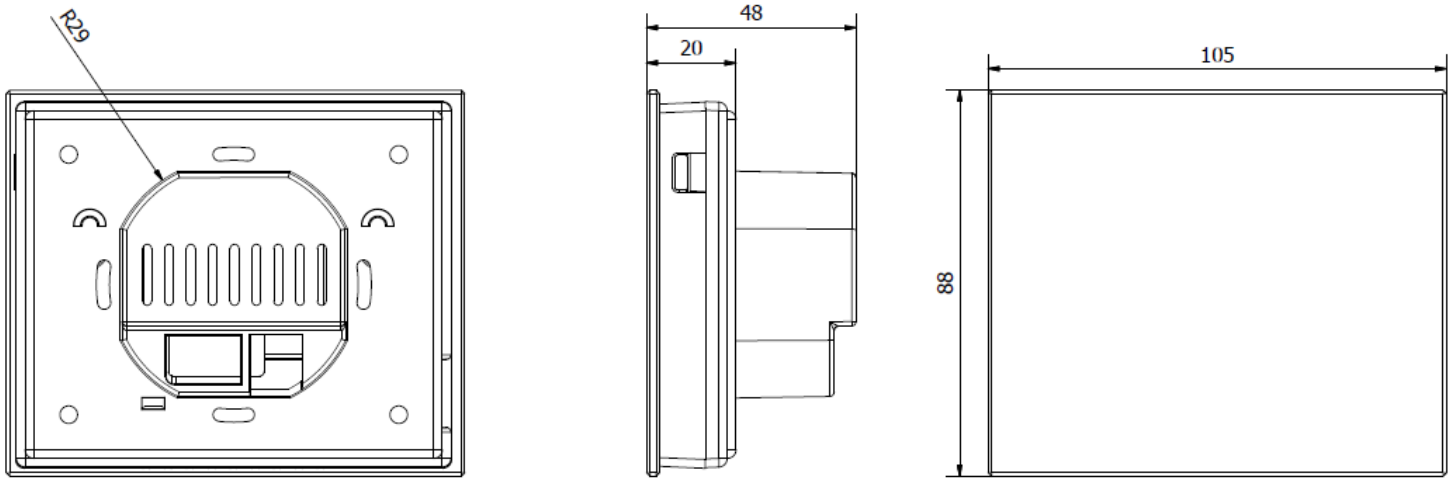
VER-24 WiFi regulator enables convenient control of Verano fan-coil.

VER-24 WiFi offers the following functions:

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

Controller equipment:

- Built-in room temperature sensor
- Control output 0-10V (F) for electronically commutated fan (EC)
- Control output 0-10V or ON/OFF (24V actuator)



III. HOW TO INSTALL THE CONTROLLER

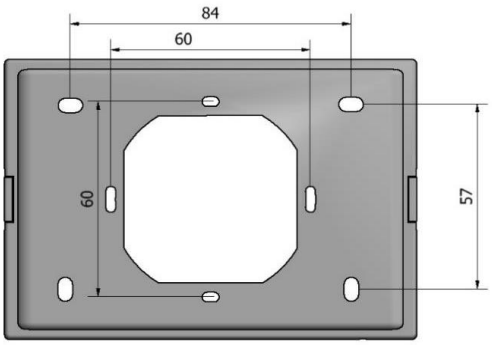
The controller should be installed by a qualified person.

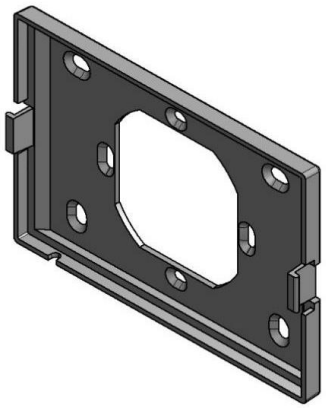
WARNING

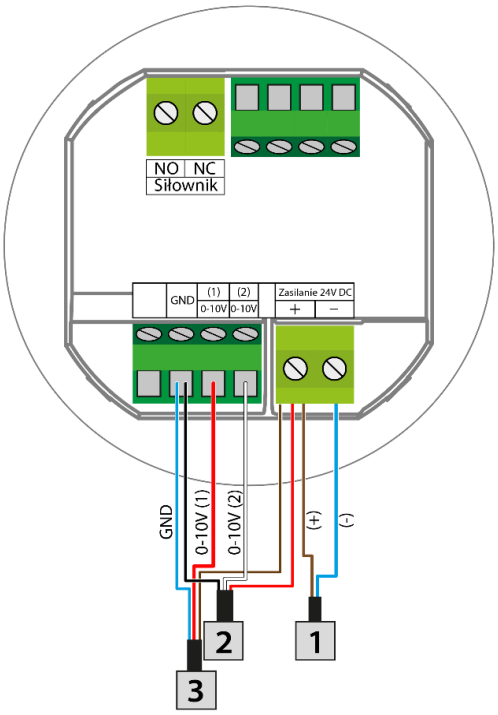
Risk of fatal electric shock from touching live connections. Before working on the controller switch off the power supply and prevent it from being accidentally switched on.

VER-24 WiFi regulator is intended to be installed on the wall.

First, attach the back cover to the wall in the place where the room regulator in the electrical box will be installed. Next, connect the power supply wires and mount the device on the latches.

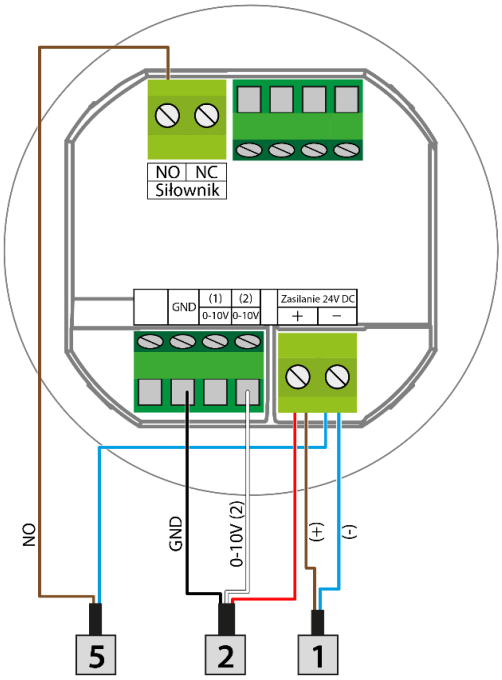






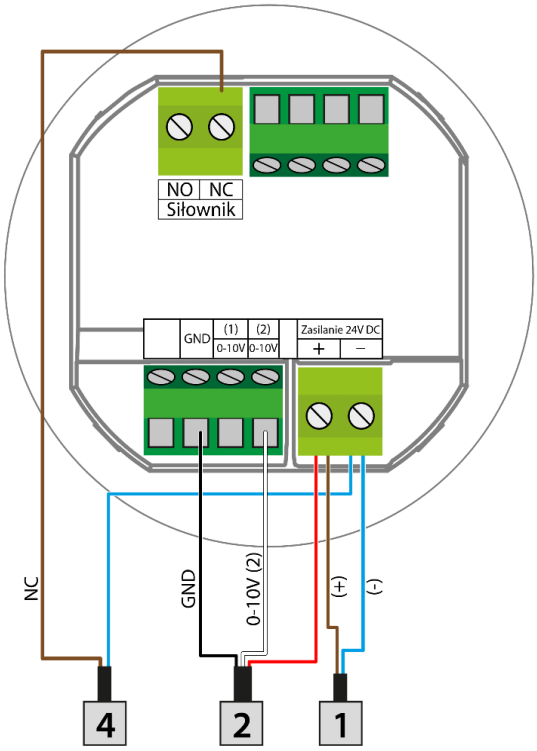
1. Power supply 24V
2. 0-10V signal controlled fan
3. 0-10V signal controlled actuator
4. NC actuator
5. NO actuator

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



6. Power supply 24V
7. 0-10V signal controlled fan
8. 0-10V signal controlled actuator
9. NC actuator
10. NO actuator

2. How to connect NO actuator



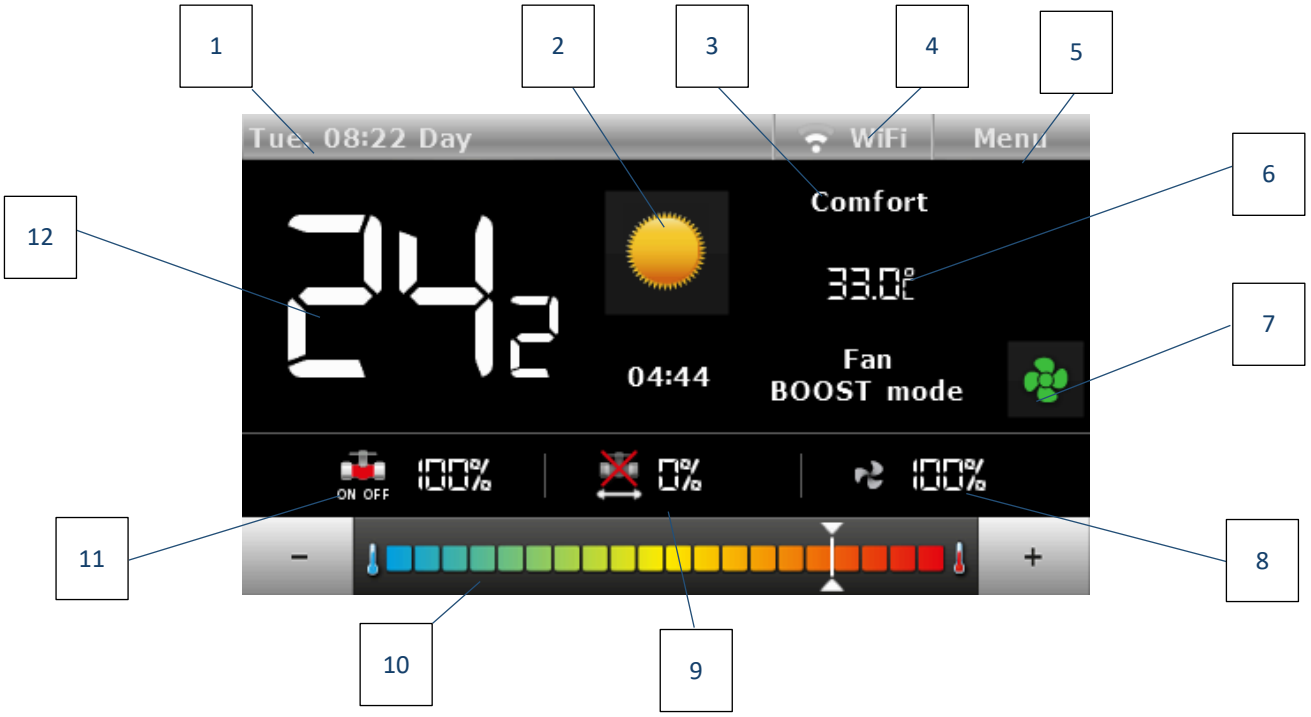
3. How to connect NC actuator

IV. PRINCIPLE OF OPERATION

VER-24 WiFi controls the fan and the valves in order to maintain the pre-set room temperature. Depending on selected operation mode, the device may increase the temperature (heating mode) or decrease the temperature (cooling mode). It controls smoothly the fan operation (increasing or decreasing its speed when needed) and the valve operation (increasing or decreasing the level of valve opening depending on current needs). Additionally, the device may be used to control another valve by opening it or closing as needed.

V. MAIN SCREEN DESCRIPTION

The main screen displays current status of basic controller parameters.



1. Day of the week and time
2. Current operation mode. This icon may also be used to change the operation mode:
   - Heating– sun icon
   - Cooling – snowflake icon

NOTE

This function is active when **Manual heating/cooling** option is selected in the service menu, in **Mode selection** submenu.

3. Current controller operation profile
4. WiFi signal
5. Enter the controller menu
6. Current pre-set temperature (depending on selected profile and operation mode)
7. Fan mode change icon. The fan may operate in the following modes:

   - Automatic – the fan speed is controlled with the controller operation algorithm
   - Manual – three speed levels

- BOOST - the pre-set temperature will be reached in the shortest possible time. When the operation time is over or the pre-set temperature has been reached, the fan will enter automatic operation mode.
- OFF

NOTE

Information about current fan operation mode is saved in the controller memory 6 seconds after the last parameter change.

8. Fan speed
9. 0-10V actuator opening degree
10. Pre-set temperature change bar
11. NO/NC actuator opening degree
12. Current room temperature

VI. CONTROLLER OPERATION MODES

Regardless of the selected profile, the controller may operate in three modes: heating, cooling or automatic heating/cooling. In **Service settings/Mode selection** submenu the user configures particular mode. The user may select one operation mode - by selecting H**eating** or C**ooling** or allow manual mode change from the main screen view - by selecting **Manual heating/cooling**.

Heating

Once this mode has been selected, when the controller detects that the room temperature is lower than the pre-set value (setting in ***Temperature settings*** submenu), it activates the fan and opens the valves in order to raise the temperature. When the room temperature reaches the pre-set value minus user-defined value (setting in **Service menu/Temperature settings**), the controller gradually starts decreasing the fan speed and closing the valve.

Once the pre-set room temperature has been reached, the fan is disabled and the valves are closed (fan automatic mode is active).

Cooling

Once this mode has been selected, when the controller detects that the room temperature is higher than the pre-set value (setting in **Temperature settings** submenu), it activates the fan and opens the valves in order to decrease the temperature. When the room temperature drops to the pre-set value plus user-defined value, the controller gradually starts decreasing the fan speed and closing the valve.

Once the pre-set room temperature has been reached, the fan is disabled and the valves are closed (fan automatic mode is active).

Automatic heating/cooling

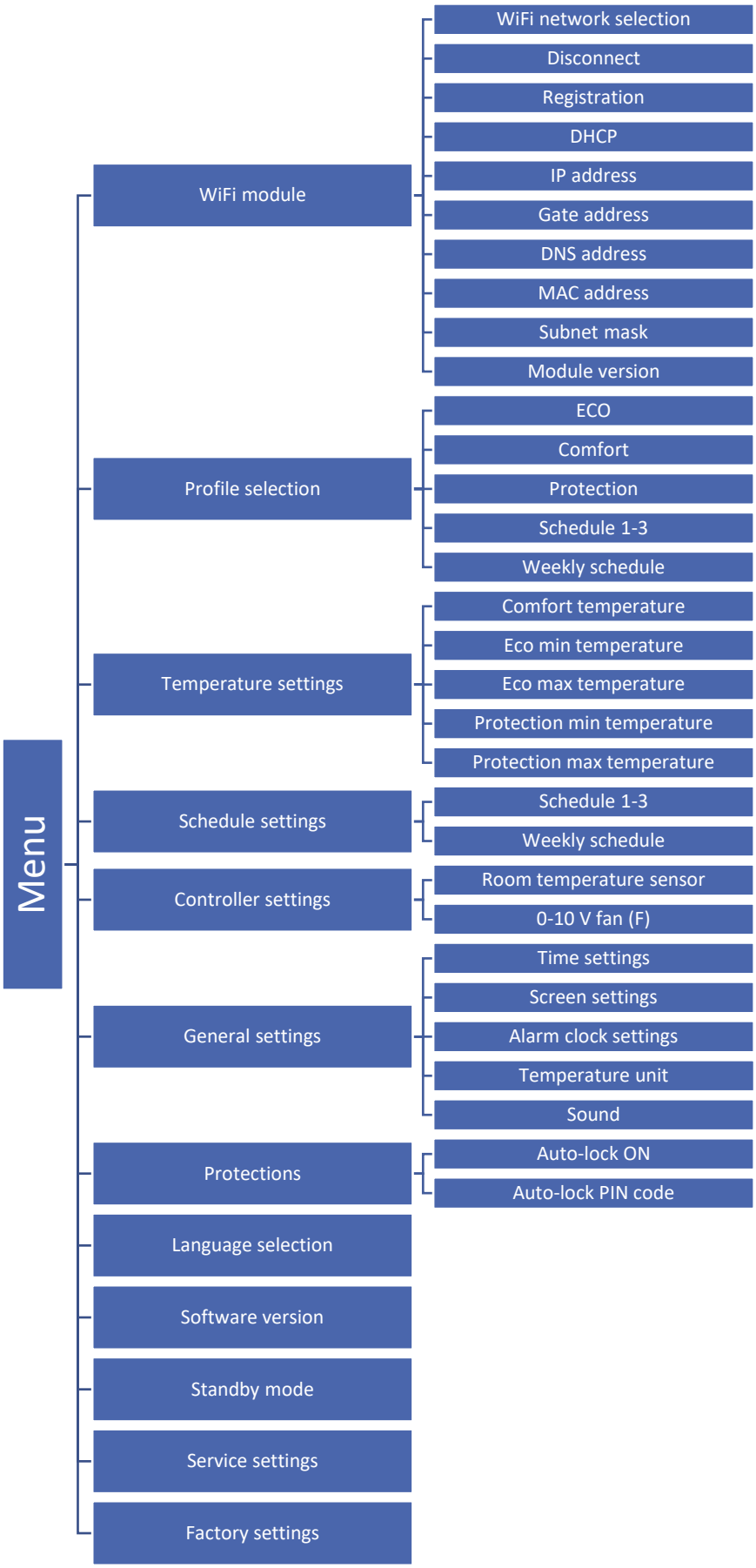
The heating mode changes automatically depending on the current room temperature and the pre-set value.

VII. CONTROLLER FUNCTIONS

During standard controller operation, the display shows the *main screen*. By pressing menu button the user may configure the controller functions.

Due to the controller complexity (a wide range of configurable parameters), the controller menu is divided into the main menu and the service menu secured with a 4-digit code. The main menu includes basic controller parameters such as operation mode, pre-set temperature setting, main screen view etc.

1. BLOCK DIAGRAM - MAIN MENU



2. WIFI MODULE

The controller features a built-in Internet module enabling the user to monitor the status of all system devices on a computer screen, a tablet or a mobile phone.

Apart from the possibility to view the temperature of every sensor, the user may adjust the pre-set temperature values.

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.

3. PROFILE SELECTION

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

The profiles offered by the controller are used to maintain the room temperature at a pre-defined level. The user may choose from 3 profiles (comfort, eco, protection), 3 daily schedules (1,2,3) and a weekly schedule.

- **COMFORT** - In this profile the user defines one pre-set temperature (SetT) in **Temperature settings,** fig.1,2. In case of room temperature decrease (**heating mode**) or increase (**cooling mode**) by 0.1 °C, the controller starts opening the valve gradually and the fan is enabled. If the temperature continues to fall (**heating mode**) or grow (**cooling mode**), the controller will gradually open the valve. Below the pre-set temperature SetT - delta (or above the pre-set temperature SetT+ delta) the valve will be completely open. Figure 1 illustrates the fan operation.

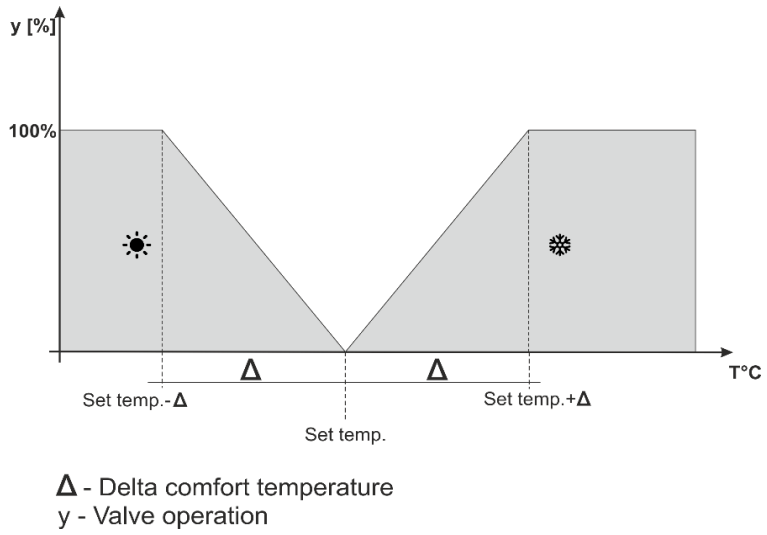
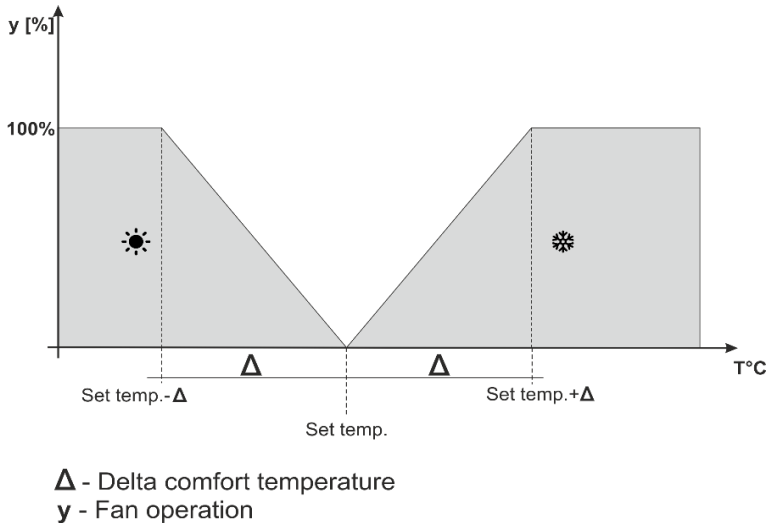


Figure 1. Chart of valve operation in the profile Comfort



Δ - Delta comfort temperature
y - Fan operation

Figure 2. Chart of fan operation in the profile Comfort

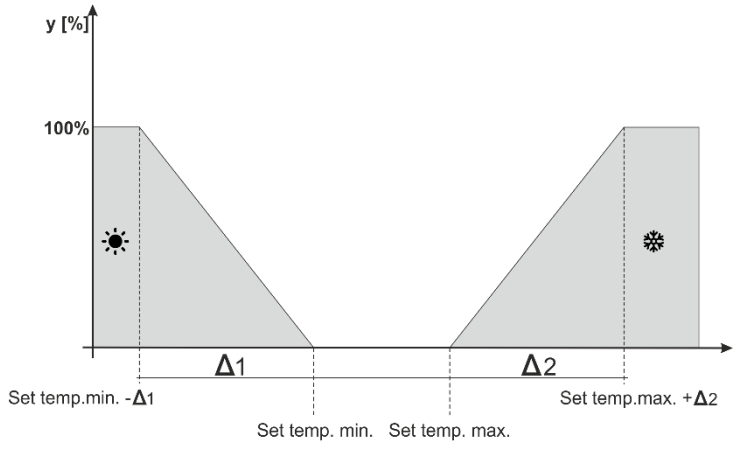
- **ECO, PROTECTION** - PROTECTION profile functions similarly to ECO profile. The only difference is the default pre-set temperature values:

PROTECTION min temperature < ECO min temperature

PROTECTION max temperature > ECO max temperature

PROTECTION profile is intended for maintaining optimum room parameters in order to protect the heating/cooling system against freezing or overheating.

In this profile, the user sets two temperatures (SetT_min, SetT_max), fig. 3.4. When the room temperature drops below SetT_min by 0.1 °C (**heating mode**), the controller will update the valve and fan settings (according to the settings) in order to reach the pre-set room temperature. In case of room temperature increase (**cooling mode**), the controller undertakes a similar procedure.



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

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

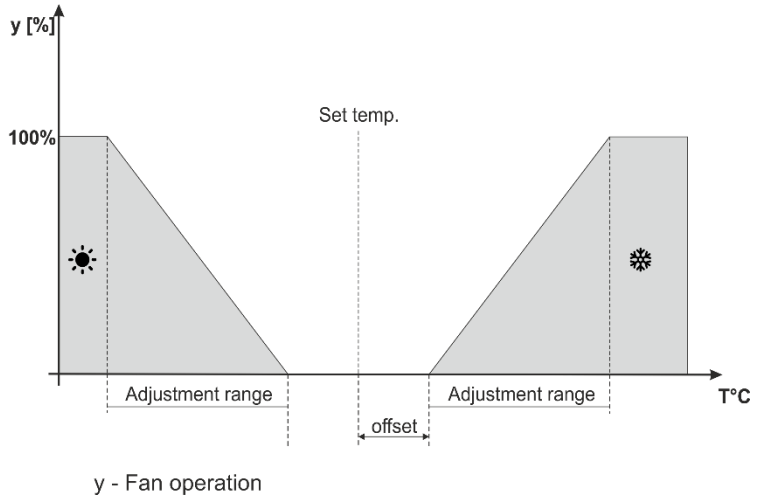


Figure 4. Chart of fan operation in the profile ECO, PROTECTION

- **Schedule 1,2,3 profile, weekly schedule** - If one of the schedules is activated, the controller functions according to pre-defined program - ***Schedule settings*** parameter.

  Schedules enable the user to select set the temperature for a particular period of time.

4. TEMPERATURE SETTINGS

These parameters enable the user to configure pre-set temperatures for particular operation profiles (see: the previous section). The user may configure the following temperatures:

- **Comfort temperature** – pre-set room temperature change (editing) in comfort profile.
- **ECO min temperature** – minimum pre-set room temperature change (editing) in ECO profile.
- **ECO max temperature** – maximum pre-set room temperature change (editing) in ECO profile.
- **Protection min temperature** – minimum pre-set room temperature change (editing) in PROTECTION profile.
- **Protection max temperature** – maximum pre-set room temperature change (editing) in PROTECTION profile.

5. SCHEDULE SETTINGS

These parameters are used to configure particular schedules (schedules 1-3 and weekly schedule).

Once the schedule to be edited has been selected, the display shows the following settings screen:

Use arrows UP and DOWN to change the time period (with the accuracy of 15 minutes) and the corresponding pre-set temperature.

Selecting the weekly schedule the user may copy the settings into next days.

6. CONTROLLER SETTINGS

6.1. ROOM TEMPERATURE SETTINGS

In this submenu the user may calibrate the room temperature sensor. Sensor calibration is performed while mounting or after the regulator has been used for a long time, if the room temperature measured by the interior sensor differs from the actual temperature. Calibration range is from -10°C to +10°C with the accuracy of 0,1°C.

6.2. FAN 0-10 V (F)

- **Activation delay** – This function is used to set the time after which the fan will be enabled. The delay time is counted down from the moment the valve opens.

- **Manual mode** – The function is used to set the fan speed in percent (minimum speed, average speed, maximum speed). The fan will operate at a constant speed according to the set parameters only when at least one valve is open. After the valve has been opened, the delay time begins to count down (setting in 'Activation delay' function). After the delay time is over, the fan will be enabled.

- **BOOST mode** – in BOOST mode, the valves are 100% so that the pre-set temperature is reached in the fastest possible way. The fan operates at a pre-defined speed for the time specified in the 'Operation time' function. When the operation time is over or the pre-set temperature is reached, the fan will switch into automatic operation mode.

NOTE

When BOOST mode is activated at optimum temperature, it switches into automatic operation mode.

7. GENERAL SETTINGS

7.1. TIME SETTINGS

Once *Time settings* option has been selected, the main screen displays a panel enabling the user to configure clock and date settings. **Automatic synchronization** enables the user to download the data from the network.

This function allows you to change the hours in which the controller will go to night mode (Night from hour) and also return to day mode (Day from hour).

7.2. SCREEN SETTINGS

This submenu enables the user to adjust the screen settings to individual needs.

- **Daytime screen view / nighttime screen view** – after selecting this option, the user can choose the daytime or nighttime screen view. The option is available only when the temperature unit is Celsius.

- **Daytime screen brightness/nighttime screen brightness** – once this option has been selected, the user may adjust the screen brightness in percent.

- **Screensaver** – this function enables the user to enable and configure the screensaver.

7.3. ALARM CLOCK SETTINGS

This function is used to configure the alarm clock.

- **OFF** – when this option is selected, the alarm clock does not go off.
- **Active on selected days** – the alarm clock goes off on selected days.
- **Active once** – the alarm clock goes off once at a pre-set wake-up time.
- **Wake-up time** – Use the icons UP and DOWN to set the wake-up time and confirm by pressing <OK>.
- **Wake-up day** - Use the icons UP and DOWN to set the wake-up day and confirm by pressing <OK>.

7.4. TEMPERATURE UNIT

This function enables the user to choose the temperature unit: Celsius of Fahrenheit.

7.5. SOUND

This function is used to enable/disable the button sound.

8. PROTECTIONS

Tapping on *Protections* icon in the main menu opens up a screen enabling the user to configure the parental lock function. When this function is activated by selecting *Auto-lock ON*, the user may set the PIN code necessary to access to the controller menu after the pre-set time of inactivity.

In order to set the PIN code necessary to operate the regulator (when the lock is active), press the *Autolock PIN code* icon.

NOTE

The default PIN code is 0000.

9. LANGUAGE SELECTION

This function is used to select the language version.

10. SOFTWARE VERSION

When this option is selected, the screen displays the manufacturer's logo and the software version.

11. STANDBY MODE

This function is used to activate the standby mode - the controller screen will go blank.. The device does not control the operation of fans or valves in this mode. It is a power saving mode.

12. SERVICE SETTINGS

Service settings are used to adjust advanced controller operation parameters and are intended for qualified staff. Access to the service menu parameters is protected with a four-digit code.

13. FACTORY SETTINGS

This function enables the user to return to the factory settings of the main menu (except fro the service settings).

VIII. ALARMS

The VER-24 WiFi room temperature regulator will signal all the alarms which occur in the controller. When an alarm is activated, the room regulator will inform about it with a sound signal and a corresponding message will appear on the display. In the event of an alarm, the controller disconnects the outputs. If the internal sensor is damaged, 'Room temperature sensor damaged' alarm will appear.

IX. TECHNICAL DATA

Power supply	24V/DC
Power consumption	< 2,5W
Ambient temperature	5°C - 40°C
Measurement error	+/- 1°C
Valve control signal	0-10V
Fan control signal	0-10V
Transmission	IEEE 802.11 b/g/n

EU Declaration of conformity

Hereby, we declare under our sole responsibility that **VER-24 WiFi** 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 WiFi

Manual valid from February 2, 2019

After the editing of this manual was completed on February 2, 2019, 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.