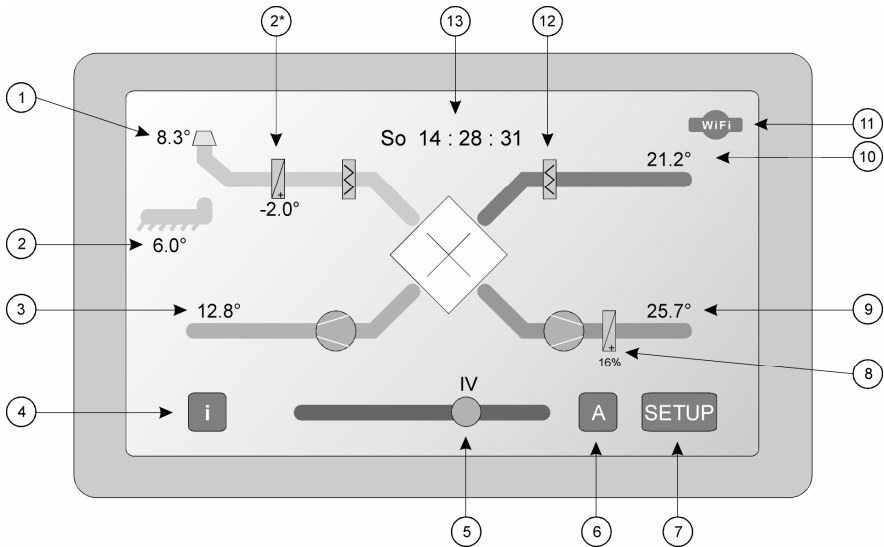


I. Basic (view) mode screen



1. Outside (external inlet) temperature **To**
2. Ground Heat Exchanger temperature **Tg** or (2*) pre-heater temperature
3. Exhaust air temperature **Tx** (*) - option
4. View mode icon: **i**: View screen → basic settings → recorded parameters
5. In manual mode – change speed slider
6. Speed mode icon: manual [**M**] → ventilation [**V**] → automatic [**A**]
7. Configuration mode icon
8. Heater symbol and opening value of valve
9. Supply air temperature **Ts**
10. Extract air temperature **Te**
11. WiFi connection symbol - (*) option. Green = logged, Red = no network
12. Filter symbols
13. Clock: Day and Time

II. Manual setting of the fan speed

Pressing the icon "**A**" allows to manual change of rotation's value. In this mode the icon is marked "**M**". Moving slider change speed between 0÷100%. Value of the speed is above slider. Below the value of 10% the slider changes to red – fans stopped. Between 10÷30% the slider is in yellow color. It means that this value is allowed but not recommended.

!!! Active *defrost* or digital input **WES causes cancel manual mode and set the AUTO mode.**

!!! The controller in manual mode "**M**", after power reset remains in this mode but with ~ 30% speed value.

III. Ventilation

Pressing icon "**M**" change into ventilation mode. In this mode the icon is marked "**V**". Moving slider can set value of ventilation time. Permissible values are 15, 30, 45, 60 minutes. The speed of the fans in this mode is 100%. At the end of the ventilation, controller turn into auto "**A**" mode.

!!! Active **defrost** or digital input **WE5** causes cancel ventilation mode and set the AUTO mode.

IV. The controller configuration

The icon marked "SETUP" allows to switch to the configuration mode. The main screen is changed. On the left side there are icons showing the particular functions. The icon SETUP now is "EXIT". Arrows "up" and "down" are used to change function. Pressing icon activates setting mode. On the right side of the screen icon EXIT changes into two new small icons:

- red "cancel" – escape, exit without saving
- green "OK" – enter, approve, saving,...

1. **CLOCK** – setting day of the week, hours, minutes.
2. **GHE** – the configuration of the Ground Heat Exchanger or glycol pump.
 - a. OFF – turning valve GHE off. The air always taken from the external inlet
 - b. ON – the valve is always turned on for taking the air from GHE regardless of temperatures
 - c. AUTO – the valve is controlled basing on the temperatures measurements T_o , T_g and Comfort
 - COOL – the controller selects a lower temperature air source in between T_o and T_g (usually spring, summer)
 - HEAT – as above but higher temperature (usually autumn, winter)
 - TEMP.To – automatic selection comfort mode. It depends on outside temperature T_o . Settings:

<u>Heating $T_o < ??$</u>	[range $0^\circ \div 10^\circ$]
<u>Cooling $T_o > ??$</u>	[range $15^\circ \div 25^\circ$]
 - d. AUTO+R – the same as above with the additional option "regeneration"

!!! If the damper is set for a longer time into External Intake, the controller automatically switches the damper on the GHE in each full hour (00 minutes) for 5 minutes to update the temperature T_g .

!!! If in the "Defrost" mode is selected preheater option, then GHE will automatically turn OFF. The possibility of this change is also blocked.

3. **BYPASS** – the configuration of the bypass damper.
 - a. OFF – turning off
 - b. ON – the damper is always turned on – no heat recovery
 - c. AUTO – automatic mode is defined by three rules:

- the outside temperature T_o must be above $T_o > ??$ [range $5^\circ \div 40^\circ$]. It is a protection against the turn on damper during low temperature, eg in winter
- the extract air temperature T_e must be above $T_e > ??$ [range $15^\circ \div 40^\circ$]
- the temperature T_o or T_g can not be higher then T_e
- $22.00 - 6.00 \pm ??$ [range $-5^\circ \div 5^\circ$] increasing or decreasing T_e at night to improve thermal comfort

4. DIGITAL INPUT – the controller has an input, marked on the relay board as WE5. To this input we can connect any switch with floating contacts, such as a relay output of fire protection system, alarm, ... This option lets you determine how controller should respond to the appearance of the signal in input.

- OFF** – inactive
- VENTIL** – (ventilation), the option can be used for short-term switch to maximum speed for the intensive ventilation of rooms such as kitchen, bathroom... To control in this mode you should use monostable switch such as bell switch type. Pressing the switch will cause that controller sets fans to maximum speed for 30 minutes. After this time the controller will return to normal operation. If you press the switch again during this operation it will cause the break of the procedure and earlier return to normal mode
- FIRE** – this mode is intended to cooperate with the fire protection installation. When the signal is on WE5, the controller turns off supply air fan and exhaust fan switches to the maximum speed until the signal from a fire protection system does not change state.
- ALARM** – configuration that can work with home alarm (security) systems. Arming the alarm system during the absence of occupants, make controller go into the minimum air exchange.
- HYGR** – after exceeding a certain value of humidity, the controller will increase fan speed by one degree. If the humidistat continues giving a signal after about 20 minutes the controller automatically will increase fan speed for the next step. This will remain until the signal disappears from humidistat or if will remain max speed.
- THERM** – signal from the thermostat protecting the electric or water heater. In the case of an electric heater (the thermostat reacts to exceeding the over temperature), after detecting a signal at the input WE5, the controller switches off the heater and switches the fans on for maximum speed for 5 minutes to cool the system. For the water heater (anti-freeze thermostat) the signal to WE5 causes maximum opening of the heater valve and the fans stop for 5 minutes. The procedure is repeated until the signal disappears.
- USER** – reaction configurable by the user by setting the fan speed.

5. SCHEDULE - this option allows to programme various fans' speeds, suitably for the individuals' needs. In this way for the every hours of any day of the week there are various speeds' values.

- to start edition press "day of the week" icon . At the bottom of the screen shows new line "from ... to ... gear ..." and two icons [-] & [+]
- the change of the initial time can be made with the [-] & [+] icons. The approval of the change should be made with "OK" icon, which simultaneously activates the edition of the next parameter
- after change fans' gear (speed), the controller automatically goes to another time slot or finishes editing

COPY – possibility to copy settings

- to start press "COPY" icon . At the bottom of the screen shows new line "from ... to ..."
 - set reference day of the week and OK
 - set day or days of the week, which should be modified – and OK
- 6. SPEED** - function allows to ascribe particular speeds to particular gears of ventilation. Given values [%] match the value of output voltage. The range of permissible values is 10% ÷ 100%. Nevertheless, one has to remember that 0-10% value is considered as a STOP. So that the useful range is above. During selecting particular speeds, the controller automatically verifies, that setting the gear with the bigger number has got bigger percentage than previous one.
- 7. O.PRESS** – possibility to set difference between intake air and extract air which creates overpressure or underpressure in rooms
- a. GWC ON/OFF – Generally installation supplying the air from the external inlet has got different resistances than power installation of exchanger GHE. So that it is possible to correct the pressure independently for the external inlet and exchanger GHE in the controller. It's important for ground exchanger but irrelevant for glycol exchanger. In this case settings should be the same.
- 8. DISPLAY** – controller is provided with backlight display LCD. The intensity can be set by user
- a. LCD Backlight
- CONST – constant level
 - Brightness – [range 1÷100%]
 - SHUT DOWN – "screen saver" type
 - Brightness – normal level [range 40÷100%]
 - Shut down level – low level [range 0÷40%]
 - Screen timeout – noactivity time [range 0÷60sec]
- 9. DEFROST** – configuration procedures for protection against freezing of the heat exchanger
- a. OFF – inactive (no protection)
- b. HEATER – protection through preheater. Activating the preheater automatically deactivates GHE support. Relay output GHE/PHEAT is used to controll preheater.
- Temp. preheater Tph [-10°÷0°]
- c. TEMP/TIME – the procedure is based on temporary heating of the exchanger by turning off the supply fan and turned on the exhaust fan to full power.
- Temp. To < [-20°÷0°] active below this outside temperature
 - Defrost [1÷20min] duration of defrosting
 - Work [10÷720min] Normal work, defrosting inactive. After this period To is checked and if it is necessary the defrosting is repeated.
- d. FIRM – Information that the defrosting procedure has been defined in the "service" menu by the recuperator manufacturer.
- 10. HEATER** – configuration of the heater or cooler, controlled by 0-10V signal
- a. OFF – inactive
- b. ELECTR – electric type heater
- IS – supply air temperature [range 15°÷50°]
 - IE – limitation with respect to extract air temperature [15°÷30°, OFF]

- 22.00-6.00 ± ?? [range -5°÷0°]- decreasing TS at night to improve thermal comfort
- K_p – its a gain factor of the proportional part PI algorithm [1÷100%]
- T_i – its a integration time PI algorithm [10÷990sec]
- !!! When thermostat is ON, the heater control output is set to Uh=0%
- !!! Turning off the fans activates the cooling procedure of the heater. Output Uh=0% and fans still work for 10 sec.
- c. WATER – water type heater. Configuration as above.
- !!! When thermostat is ON, the heater control output is set to Uh=100%.
- d. COOLER – freon type cooler. Configuration as above.

11. INTERNET - option that is available on request! It allows to connect the controller to the network by WiFi. With the browser or ModBus application one can observe and change some parameters.

- a. OFF – inactive
- b. WWW – configuration of the Internet connection. To read / modify some control parameters through the web browser, type the IP address of the controller with the password, eg. <http://192.168.1.100/secret/>
After connecting will see controller site.
 - SSID – name of the local network. If the name is unknown then you can search the available networks by typing the letter ? and OK. The screen displays seven fields with available networks. If there are more networks in the range, you can narrow your search to SSIDs starting with a specific letter, such as ?**B** Controller displays only networks starting with letter "**b**" or "**B**".
 - PASS – password of the local network
 - IP – address of the controller, eg. **192.168.1.100**
!!! Address must be between Start IP and End IP address pool.
 - CODE – its password to website. It must have 6 letters, eg. "**secret**"

!!! SSID, PASS and CODE can not contain national letters.

- c. MODBUS –communication with controller by application MODBUS RTU TCP/IP port 502
 - SSID, PASS, IP – as above
 - ID – it is ModBus "slave" number [range 1÷247]

12. SERVICE – advanced settings

- a. additional functions after entering the access code. Standard code **1111**
 - LANG – change the menu language
 - REGENER GHE – regeneration of GHE. Day/night settings when the GHE is regenerated depending on the season
 - RELAYS INVERSION – change of the GHE and BYPASS relays state
 - FILTERS CONTROL – type of the filters checking
 - 0-10V – controlled by differences pressure analog sensor
 - PRESSOSTAT – controlled by differences pressure switch
 - TIME – reminder of control every 180 days
- b. RESET – reset to default values. Press the icon for more than 3 sec.

V. Alarm and information messages

1. FILTERS – this message is displayed every 6 months or after filter pressure test. This information will be cancelled after power reset, confirming message receipt.
2. ERROR – red message indicating damage or lack of sensor.

3. CONNECTION ERROR – red message indicating no connection with relay module.
4. YELLOW ICON above fan speed slider – indicating active digital input.

VI. Installing / dismantling the controller

1. TFT panel
 - **Ensure that the power is turned off !**
 - Cable for connecting the controller should be derived from the wall – preferably, it is mounted in a typical box as electrical equipment (power sockets, switches etc.)
 - Next, drill two holes in the wall for wall plugs, symmetrically to the can.
 - Mount to the wall with screws.
 - The cable should be connected to the upper half of the housing containing the electronics controller. Excess cable should be put in a box in the wall.
 - The cable mustn't be shortened or extended!
 - Connect gently upper and lower half
2. Relay module
 - **Installation and wiring must be carried out with power off!**
 - Diagrams are supplied separately
 - The module should be mounted in a recuperator or as close as possible so that the fan power cables are as short as possible.
 - To connect wires use screwdriver type philips PH0
 - **The recuperator power supply must be protected with appropriate fuse.**
 - **The electrical connection should be made by person with the appropriate permissions**

To dismantling controller to pieces use screwdriver PH0

NOTE !!! – Connecting should be done carefully and accurately according to the scheme. Connect the adequate colors in the appropriate connector line in the module relays. Different connection from the schema can cause damage to the driver! Figure below shows the arrangement of colors used in the supplied cable



VII. Technical data

1. power supply 230VAC, protection fuse 160mA
2. power consumption ~15mA
3. control fans output type voltage standard 0÷10VDC
4. TFT module voltage supply 12VDC supported from relay module
5. colour graphic TFT 4.3" (480x272px) with backlight
6. Real Time Clock with battery (2032 type) supply
7. temperature sensors type KTY81-110. You can apply your own temperature sensors based on DS18B20 1-WIRE. Connection type - "parasite power". After reset, the controller recognizes itself the type of sensor
8. digital input WE5 for only "floating type" – active when contacts closed
9. mechanical dimension TFT panel 125*80*25 mm
10. mechanical dimension relay module 180*125*55 mm