



Operation instruction

EcoVENT MIDI Controller Manual





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The device is manufactured in accordance with the European standard EN1886, EN13053

This documentation must always be handed over to the customer!

In case of non-compliance with the conditions stated in this documentation, VentiAir s.r.o. reserves the right to refuse the warranty.

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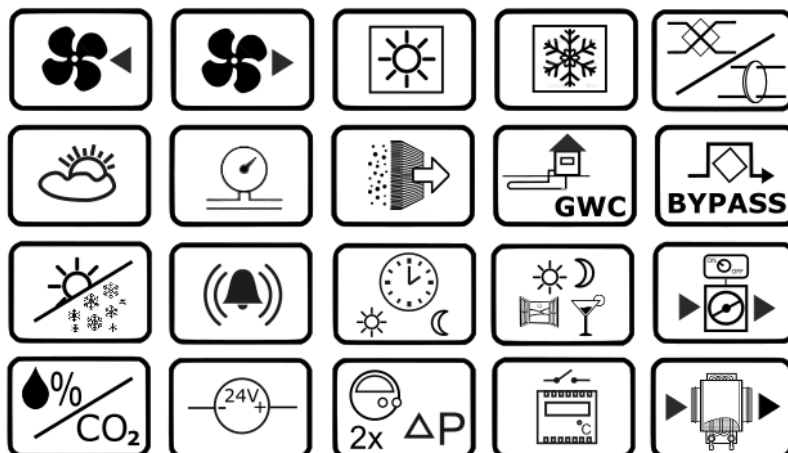
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2 BASIC INFORMATION



ELECTRIC DEVICE UNDER VOLTAGE!

Before any action related to the power supply (cables connection, device installation etc.) check if the controller is not connected to the mains!

Installation should be done by a person with appropriate electrical qualifications. Improper cables connection could result in the controller damage.

The controller cannot be used in steam condensation conditions and cannot be exposed to water.

3 SAFETY RECOMMENDATIONS

Requirements concerning safety are described in detail in individual chapters of this manual. Apart from them, apply to the following requirements in particular.

- Before taking any actions regarding controller: assembly, repairs or maintenance, as well as during any connection works, read manual and manufacturer recommendations, please make sure that the mains power supply is disconnected and that terminals and electric wires are devoid of voltage.
- After the controller is turned off using the touch buttons, dangerous voltage still can occur on its terminals. The controller does not replace the electricity switch for cooperating modules.
- Installation should be done by a person with appropriate electrical qualifications in accordance with technical documentation and applicable regulations. Improper cables connection can result in the controller damage.
- The controller cannot be used in conditions of water vapor condensation and exposed to water. Provide protection against dust and water.
- The controller is designed to be built-in. Installation of the controller must prevent access to hazardous parts and ensure air exchange in the housing.
- Adjust value of programmed parameters to specific installation type, including all operation conditions. False adjustment of parameters may result in emergency state. Modification of preset parameters should be done only by person familiar with manual.
- Device software does not provide high security level against false installation operation, this should be provided by applying external, controller independent protections.
- It is necessary to use additional elements to protect against the consequences of controller malfunctions or errors in its software.
- The controller has following procedures: turning off heater while overheating, which protects water heaters against freezing, it disables fans when alarms occur, however elements used must have own, controller independent protections.
- In controller power output circuits fuses are used. Fuses value must be applied to the load.
- The electric system in which the controller operates must be protected by means of a fuse, selected appropriately to the applied loads.
- The device must be used as intended, and within the operating parameters range for which it has been designed. Otherwise, the manufacturer does not bear any responsibility for the effects resulting from such action.
- Under no circumstances should modifications of the controller structure be made. It is forbidden to use a faulty or repaired device by an unauthorized service.
- The 230 VAC mains cables should be run in a way that prevents them from coming into contact with low-voltage components.

- Cables should not come into contact with surfaces with a temperature exceeding the nominal operating temperature.

4 GENERAL INFORMATION

The ecoVENT MIDI controller controls the recuperator of mechanical ventilation with a cross-flow or rotary exchanger. Performs the function of heat recovery from ventilated rooms based on readings from sensors and has the function of balanced ventilation. Smoothly controls the air supply fan and exhaust fan providing high efficiency of heat recovery and air exchange in rooms based on programmed schedules or manual control. The controller smoothly controls additional electric heaters, water cooler and fan convector to provide the highest comfort and precision regulation of ventilated air. Controls the bypass and works with ground heat exchanger GHE. It has the function of filters support and detects their replacement and overpressure/flow control function. The controller works closely with the Web module ecoNET300. It allows connection of external control signals from the fire alarm system, air quality sensors and other automation systems through digital and analog inputs. Controller signalizes and records emergency states providing accurate system reaction. It saves the cumulative operation time of individual components into the counters and calculates recuperator efficiency. It enables communication via Modbus RTU protocol - provides control and monitoring of action controller with external building management system. Additional function of the controller is anti-freezing protection.

The controller can be used in households, hotels, offices or industrialized buildings.

5 INFORMATION ABOUT DOCUMENTATION

The controller manual is a supplement for the recuperator manual. In particular, except for this manual, the recuperator manual should also be observed. The controller manual is divided into two parts: for user and installer. Yet, both parts contain important information, significant for safety issues, hence the user should read both parts of the manual.

We are not responsible for any damages caused by failure to observe these instructions.

6 APPLIED SYMBOLS

In this manual the following graphic symbols are used:



The symbol means important information, failure to observe these can cause damage of property and threat for human health and life.

7 DIRECTIVE WEEE 2012/19/EU

Purchased product is designed and made of materials of highest quality. The product meets the requirements of the **Directive 2012/19/EU of 4 July 2012 on waste electrical and electronic equipment (WEEE)**, according to which it is marked by the symbol of crossed-out wheeled bin (like below), meaning that product is subjected to separate collection.





Responsibilities after finishing a period of using product:


- dispose of the packaging and product at the end of their period of use in an appropriate recycling facility,
- do not dispose of the product with other unsorted waste,
- do not burn the product.

By adhering obligations of waste electrical and electronic equipment controlled disposal mentioned above, you avoid harmful effects on the environment and human health.


8 OPERATING THE CONTROLLER


8.1 USER-MENU STRUCTURE

The ecoTOUCH panel:


	Operation modes device
Recuperator operation mode	
<ul style="list-style-type: none"> • Main mode <ul style="list-style-type: none"> - Pause 	
<ul style="list-style-type: none"> • Time mode: <ul style="list-style-type: none"> - Off, Out, Party, Airing 	
<ul style="list-style-type: none"> • Summer/Winter <ul style="list-style-type: none"> - Auto, Summer, Winter, Ventilation 	
<ul style="list-style-type: none"> • Fireplace <ul style="list-style-type: none"> - No, Yes - Velocity 	
<ul style="list-style-type: none"> • Schedules <ul style="list-style-type: none"> - No, Yes 	
Summer/winter mode	
<ul style="list-style-type: none"> • Summer/winter mode settings: <ul style="list-style-type: none"> - Auto, Summer, Winter, Ventilation - Winter mode on - Hysteresis of summer mode on 	
Operation states settings	
<ul style="list-style-type: none"> • User modes 1...4 settings <ul style="list-style-type: none"> - Air supply, Exhaust, preset temp. 	
<ul style="list-style-type: none"> • Time modes settings 	


<ul style="list-style-type: none"> - Airing: Duration, Velocity - Party Duration, Preset temperature, Air supply, Exhaust - Out: Duration
<ul style="list-style-type: none"> • Schedules settings <ul style="list-style-type: none"> - Time 1...5 - Monday...Sunday - Start, Stop - Mode, Reset, Copy schedule
<ul style="list-style-type: none"> • Leading control sensor <ul style="list-style-type: none"> - Air supply sensor, Exhaust sensor, Panel sensor - Panel address


	User modes
Mode 1, Mode 2, Mode 3, Mode	
Air supply, Exhaust, preset temp	

	GHE*
GHE settings	
<ul style="list-style-type: none"> • Auto, Close, Open 	
Summer opening temp.	


Winter opening temp.
Regeneration settings
<ul style="list-style-type: none"> Maximum opening time Regeneration time Manual start


 Filters*
Override filters replacement procedure - No, Yes
<ul style="list-style-type: none"> Filters replacement procedure
Air supply filter – class:
- G4G5 standard
- M5/M6 medium
- F7/F8 accurate
Exhaust filter – class:
- G4G5 standard
- M5/M6 medium
- F7/F8 accurate
Was air supply filter replaced? - Yes, No
Was exhaust filter replaced? - Yes, No
<ul style="list-style-type: none"> Was filters replacement procedure finished? - Yes, No





 Bypass/Heat recovery
Open, Closed, Auto, No recovery, Maximum recovery, Auto*

 Alarm central
Alarm central support
Logical state, NO, NC
Recuperator reaction
<ul style="list-style-type: none"> Recuperator off, Exhaust, Air supply
Airing: YES, NO
<ul style="list-style-type: none"> Air supply fan speed Exhaust fan speed

<ul style="list-style-type: none"> Airing duration Periodic airing time Secondary heater operation while airing: Yes, No

 Exchanger cleaning
Cleaning start hour

 General settings
Language
Date
Clock
Brightness
Screen saver settings
<ul style="list-style-type: none"> On/Off screen saver Time till screen saver Screen saver backlight
Button sound
Alarms sound
Default settings
Software update
Parental control
Address setting
ecoNET settings* (ecoNET nastavení*)
SSID
WiFi encryption type
Password

 Alarms
 Service settings
 Information
 Turn on/off controller

Individual menu options may be unavailable without proper sensor, device, menu setting or if controller is off. Such options are marked with “*”.

Panel simTOUCH2:

Information

Operation modes device
Operation mode
<ul style="list-style-type: none"> Pause, Mode 1, Mode 2, Mode 3, Mode 4
Timed operation mode
<ul style="list-style-type: none"> Off, Out, Party, Airing
Summer/Winter
<ul style="list-style-type: none"> Auto, Summer, Winter, Ventilation
Fireplace function
<ul style="list-style-type: none"> No, Yes, Speed
Operation states settings
<ul style="list-style-type: none"> Party mode settings <ul style="list-style-type: none"> Party duration Air supply fan speed Exhaust fan speed Preset temperature Airing mode settings <ul style="list-style-type: none"> Airing duration Fan speed Out mode duration Fireplace mode settings <ul style="list-style-type: none"> Speed Exit mode time Winter mode activation Hyst. of turn. on summer mode 1...4 User mode <ul style="list-style-type: none"> Preset temperature Air supply fan speed Exhaust fan speed Schedules <ul style="list-style-type: none"> Schedules support Schedule

Preset temperature
Preset temperature*
Control leading sensor
<ul style="list-style-type: none"> Air supply sensor Exhaust sensor

➤ Panel sensor
Panel address*

GHE*
GHE control
<ul style="list-style-type: none"> Close, Open, Auto
Summer opening temp.
Winter opening temp.
Regeneration settings
<ul style="list-style-type: none"> GHE max. duration GHE regeneration time Reg. manual start

Filters*
Override filters replacement procedure - No, Yes
Filters replacement procedure
Air supply filter – class:
<ul style="list-style-type: none"> G4G5 standard M5/M6 medium F7/F8 accurate
Exhaust filter – class:
<ul style="list-style-type: none"> G4G5 standard M5/M6 medium F7/F8 accurate
Was air supply filter replaced? - Yes, No
Was exhaust filter replaced? - Yes, No
<ul style="list-style-type: none"> Was filters replacement procedure finished? - Yes, No

Bypass/Heat recovery*
No recovery, Max. recovery, Auto Close, Open, Auto*

General settings
Button sound
Alarm volume
Alarm sounds
Screen saver settings

• Time till screen saver
• Screen saver mode
➤ Off, On, Clock
ecoNET settings
➤ WiFi encryption type
➤ WiFi Name
➤ WiFi Password
Address settings
Brightness
Contrast
Language
Date and Clock
Default settings
Panel software update
Controller software update

Alarm system settings

Alarm system support

Input logical state

Recuperator reaction

- Turn off recuperator, Velocity change

Airing function

- Air supply fan speed
- Exhaust fan speed
- Airing duration
- Cyclic airing time
- Af. heat. work

Exchanger cleaning

Time of cleaning start)

Service settings

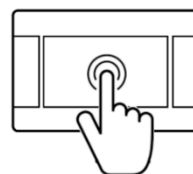
Individual items of the menu may not appear if there is no suitable sensor, devices, menu settings or the controller is turned on. These positions are marked with “*” symbol.

8.2 CONTROLLING THE CONTROLLER

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The EcoTOUCH panel:

A touch screen has been used to control the device
















Settings change is done using rotary menu

Selection and edit in the menu is done by pressing desired symbol on the screen. Grouped parameters the selected menu are displayed on one screen. An example of such parameters grouping is shown in the figure below.



from

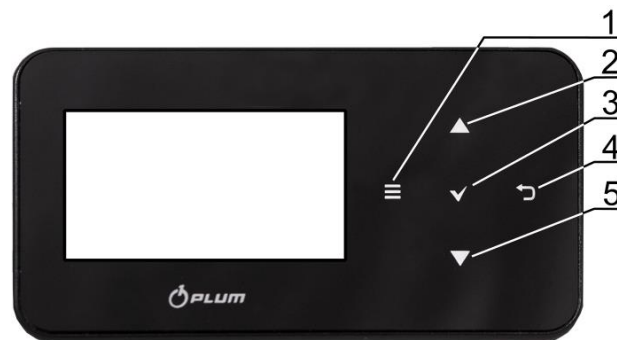
On-screen symbol meanings:

-   - return to the previous menu or no acceptance of parameter setting
-  - fast return to the main screen from each menu level
-  - information about selected parameter
-  - main menu
-   - decrease or increase parameter value
-  - service menu
-   - sliding list of parameters
-  - enter selected menu option or accept selected parameter setting
-   - decrease or increase value of the on-screen selected parameter

The simTOUCH2 panel:

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The controller is operated via touch buttons that allow selecting items from the menu and edition of parameters.



Buttons description:

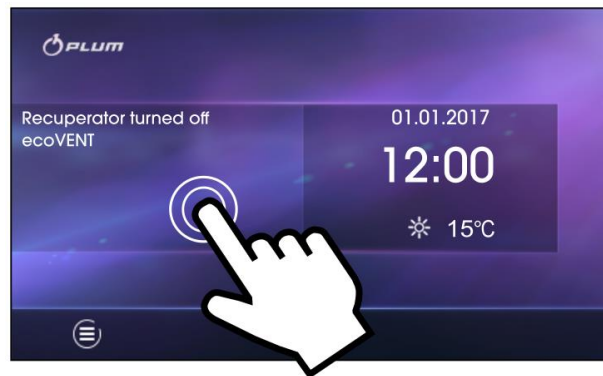
1. MENU - entry button.
2. The parameters selection from the list button, increases the value of the edited parameter and switches between main screens.
3. ENTER – confirmation.
4. EXIT.
5. The parameter selection from the list button, reduces the value of the edited parameter and switches between the main screens



8.3 SWITCHING CONTROLLER ON AND OFF

The ecoTOUCH panel:

After switching on the controller recalls its status from the moment of switching it off. If the controller was not active before, it will start in the "Stand-by" mode. In this mode it displays the current date and time, external temperature and information: "Recuperator turned off".

To start the controller, press anywhere on the screen, then the following message will appear: "Turn on the recuperator?".

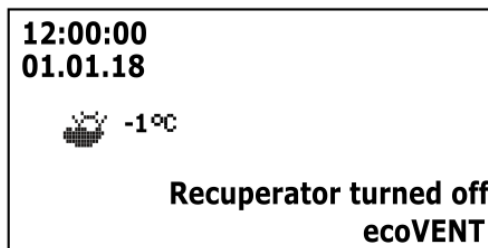




There is also another method of controller turn on. Press Menu button, find and press  symbol in a pie menu. To turn off the controller - press Menu button, find and press  symbol in a pie menu.


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simTOUCH2 panel:

After switching on the controller recalls its status from the moment of switching it off. If the controller was not active before, it will start in the "Stand-by" mode. In this mode it displays the current date and time, external temperature and information: "Recuperator turned off".



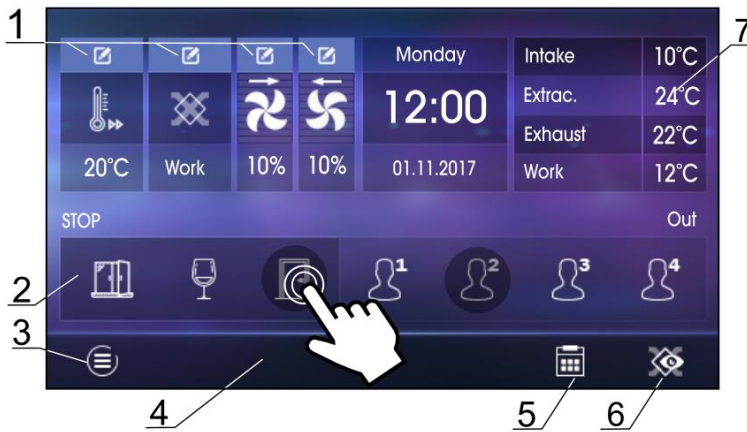
To start the controller, touch the  button, then a message will appear: "Turn on the recuperator?". Confirm by pressing  again, which turns the controller on.

To turn off the controller, on any of the main screens, touch the  button and confirm to turning the controller off.

8.4 MAIN SCREENS

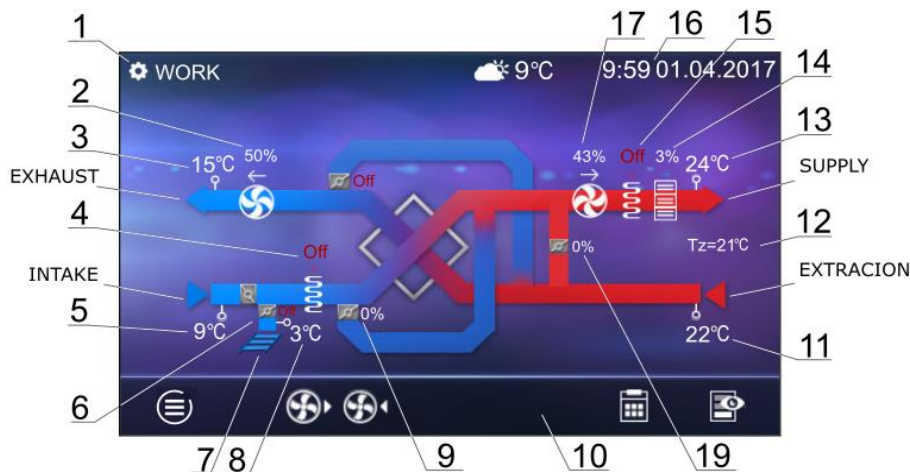
ecoTOUCH panel:

The controller has two main screens. First: with the displayed parameters and operation modes, with the function of editing and reading information, second: with automation scheme displayed. The view between these screens can be switched.



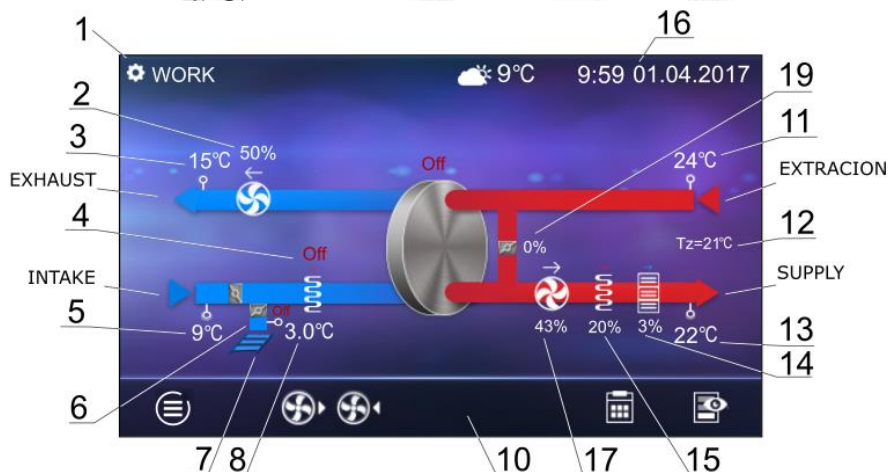
Main screen with options to read information and change selected parameters.

1. Settings for main mode and user modes.
2. Additional mode selection.
3. Main menu access.
4. Information field, e.g.: Active alarms - press to display a list of all current alarms.
5. Schedules settings.
6. Switching between main screens.
7. Basic information – press to display all available information about controller operation status.



Main screen with cross-flow exchanger

Individual items of the menu may not appear if there is no suitable sensor, devices, menu settings or the controller is turned on. These positions are marked with "*" symbol.



Main screen with rotary exchanger

Legend:

1. Regulation modes: OPERATION, OPERATION-Heating, OPERATION-Cooling, DEFREEZING, PAUSE, Exchanger cleaning, Heater cooling, Airing.

2. Exhaust fan adjustment:



- exhaust fan work (along with the current control);

3. Exhaust temperature.

4. Operation of the heater primary electricity or water.

5. Intake temperature (outside temp.).

6. Ground heat exchanger throttle actuator position.

7. Ground heat exchanger (GHE).

8. GHE temperature.

9. Bypass throttle actuator position.

10. Information:

[R1], [R2] – exceeding the demand for expenditure change threshold;

[SAP] – signal from the fire control unit;

[ECO] – signal from the alarm central;

[TR1] – primary heater thermostat trip

[TR2] – secondary heater thermostat trip;

[R1], [R2] – prekročení limitu zmeny požiadavku na výkon

[SAP] – signál od systému požiarnej ochrany

[ECO] – signál z centrálného alarmu

[TR1] – vypnutie termostatu predhrievača

[TR2] – vypnutie termostatu dohrievača

11. Extraction temperature;

12. Preset temperature;

13. Air supply temperature;

14. Cooler work (Freon- or water-);

15. Working secondary heater (electrical- or water-).

16. Time and working day.

17. Supply fan control:



- supply fan work (along with the current control).

Position of the mixer actuator.

simTOUCH2 panel:

The controller has two main screens: information screen with basic parameters and automation scheme screen. Switching between screens is done by touching the (2) and (5) buttons.



- *Operation* – the controller, including user settings, controls the ventilation to achieve the preset temperature in the room.
- *Operation-Heating* – the controller, disregarding low external temperature, seeks to keep preset temperature in the room; to achieve it first selects the source with the highest available air temperature, then depending on fulfilling conditions, starts secondary heater.
- *Operation-Cooling* – the controller, disregarding high external temperature, seeks to keep preset temperature in the room; to achieve it first selects the source with the lowest available air temperature, then depending on fulfilling conditions, starts the cooler.
- *Defrosting* – the controller prevents exchanger to freeze, by adjusting fans speed and starting primary heater.
- *Pause* – the controller stops recuperator operation, only protection functions are operational.
- *Exchanger cleaning* – the controller activates the cleaning mode by switching on the fans to maximum power.
- *Exchanger dehydration* – controller starts exchanger dehydration function, while holds fans operation.
- *Heater cooling* – the controller sustains air supply fan work for a set time, to cool electric heaters.
- *Airing* – the controller turns on airing function.

8.6 DEVICE OPERATING MODES

Settings regarding controller operation modes, according to which control will be performed, are in the menu:

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Menu → Operation modes

Menu → Operation modes device

The ecoTOUCH screen allowing setting of active controller functions is in the menu:

Menu → Operation modes → Recuperator operation modes

- *Recuperator operation mode (Operation mode)* – recuperator mode settings. Selecting *Pause* mode will stop recuperator, only protection functions stay active. This mode can be applied to prevent unpleasant odors from the outside. It is possible to select one of modes *Mode 1...4*, settings of which can be defined by user.
- *Time mode (Timed operation mode)* – turning on one of the additional recuperator operation modes. Available settings:
 - *Off*: turn off active time mode.
 - *Output mode*: holds on recuperator operation, this mode can be applied e.g. for a period of leaving the room by user.
 - *Party mode*: increases fans expenditure and amends preset temperature value, this mode can be applied e.g. during the presence of large number of people in the room.
 - *Airing mode*: amends exhaust fan expenditure, while turning off air supply fan, this mode can be applied e.g. for fast air exchange in the room.

- *Summer/winter (Summer/winter mode)* – recuperator control mechanism setting
 - *Winter mode*: blocks cooler and Bypass.
 - *Auto mode*: selection of active mechanism according to settings and external temperature
 - *Ventilation*: blocks cooler and heaters.
- *Fireplace (Fireplace function)* – allows turning on fireplace function. If this function is on the control of exhaust fan will be depending on air supply speed and preset difference in *Speed* parameter.
- *Schedules* – allows turning on controller according to user defined schedules.

The ecoTOUCH screen allowing setting of control mode is in the menu:

Menu → Operation modes → Summer/winter

- Setting mode according to which the control will be performed. Similarly to **Summer/winter** menu into **Recuperatio operation mode** menu.
- *Winter mode turn on* – temperature value below which, with auto mode active, winter mode will be turned on.
- *Hysteresis of summer mode on* – hysteresis value of mode amendment, if auto mode is active and external temperature increases above *Winter mode turn on* + *Hysteresis of summer mode on* the summer mode will be activated.

8.7 SETTINGS OF OPERATING STATES

Settings related to operation modes, timed modes and additional operating states of the controller, during which we change the control status of the ventilation unit for a specified period of time, can be found in the menu:

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Menu → Operation modes → Operation states settings

Menu → Operation modes device → Operation states settings

- *User modes settings* – redirects to user modes settings, described in item 7.4
- *Time modes settings* – menu allows to define time modes settings, for *Airing* mode it is possible to set mode duration time (*Duration time* parameter), preset temperature (*Preset temp.* parameter), fans speed: air supply (*Air supply* parameter) and exhaust (*Exhaust* parameter), for *Out* mode it is possible to set its duration time (*Duration time* parameter).
- *Schedules settings* – redirects to schedules setting panel, described in item 7.11
- *Control leading sensor* – setting, according to which sensor the remote temperature control is performed, available: *Air control sensor*, *Exhaust sensor*, *Panel sensor*.
- *Panel address* – if leading sensor is set to panel sensor, then panel address, from which temperature value is read, must be set.

8.8 USER MODES

Menu allows individual setting, for each user mode 1...4, air supply speed (*Air supply*), exhaust speed (*Exhaust*) and preset temperature in *Preset temp.* parameter.



8.9 PRESET TEMPERATUTE SETTING

The preset temperature of the recuperator is set in the menu:

Menu → Preset temperature

Additionally, it is possible to set, according to which sensor the temperature control will be adjusted by the parameter *Control leading sensor*. Available for selection are: *Supply sensor*, *Extraction sensor* and *Panel Sensor* allowing defining address of the panel with leading sensor.

8.10 BALANCED VENTILATION FUNCTION

The controller has balanced ventilation function that adjusts the flow of air flow and pressure in ventilation ducts. The function allows to increase the efficiency of heat recovery, system resistance e.g. against air filter dirtying, exchanger resistances change due to humidity or dirt, starting air flow via ground heat exchanger.

The balanced ventilation function requires the connection of differential pressure sensors

The function turn on and configuration is done in Installer menu.

8.11 GHE SUPPORT

The controller supports ground heat exchanger (GHE) as a part of the ventilation system. The ground temperature is used here, which is higher than air temperature for the most part of the year.

GHE support requires connection of external temperature sensor.

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The *GHE support* parameter allows selection GHE operation mode:

- *Close* – the controller turn off glycol pump or closes the throttle cutting off the air flow via GHE.
- *Open* – the controller turn on glycol pump or opens the air throttle on the GHE pipe GHE.

Auto - the controller turns on or off GHE depending on preset user settings, external temperature and GHE temperature. Turn on can be done in two modes: heating mode – winter turn on and in cooling mode – summer turn on. Winter turn on of GHE will be performed if external temperature drops below *Winter opening temp.* and while GHE sensor temperature is higher than temperature on external temperature sensor. Summer opening will be performed if external temperature increases above *Summer opening temp.* and while GHE sensor temperature is lower than temperature on external temperature sensor

The external temperature value is measured by a temperature sensor mounted on an intake.

In case of no GHE temperature sensor connected or its support is off in installer menu, the GHE control will depend on only from the external temperature sensor readings.

Additional GHE control settings are in the menu:

Menu → GHE → Control settings

- *GHE max. opening time* – maximum duration of GHE throttle opening. After that time the GHE regeneration procedure will start.



- *GHE regeneration time* – duration of the GHE regeneration. During regeneration process the GHE throttle remains closed.
- *Manual start* – manual start of the regeneration without waiting for the fulfilment of the temperature and time condition.

8.12 SUPPORT OF BY-PASS

The Bypass menu contains settings related to the bypass and allows selecting control type for the cross-flow exchanger bypass throttle.

The throttle can be constantly open (*Open* parameter – no heat recovery and exchanger freezing risk), constantly closed (*Close* parameter) or in auto mode (*Auto* parameter), during which throttle will be open depending on fulfilment of open conditions. When bypass is open the inner rooms can be cooled to preset temperature using cooler air from the outside.

8.13 SUPPORT OF ROTARY EXCHANGER

The **Heat recovery** menu contains settings related to the rotary exchanger.

The rotary heat exchanger can be constantly stopped (*No recovery* parameter) or rotate at the maximum speed (*Maximum recovery* parameter). The rotary exchanger can be also controlled according to controller's algorithm with *Auto* parameter. If the rotary exchanger is stopped, the air inside the room is cooled to preset temperature using air from the outside.

8.14 ALARM CENTRAL

Settings related to supporting signal from alarm central. After receiving signal from the alarm central the fans expenditure will be changed according to the following menu settings:

Menu → Alarm central

- *Alarm central support* – turns on/off alarm central support. If the function is active, then after receiving signal from alarm central the controller operation will be amended according to alarm central settings.
- *Logical state* – setting logical state of digital input: *NO* (normally open) or *NC* (normally closed).
- *Recuperator reaction* – setting the recuperator reaction to central alarm signal. If *Turn off recuperator* is selected, then after receiving signal the recuperator will be turned off. Otherwise, fans speed will be amended to the settings defined by *Exhaust* and *Air supply*.
- *Airing* – turn on/off airing function, it works only with central control mode on and *Turn off recuperator* option off.

The airing settings are in the following menu:

Menu → Alarm central settings → Airing settings

- *Exhaust fan speed, Air supply fan speed* – allow setting fans speed during airing.
- *Airing time* – parameter defining time, through which airing is performed.
- *Periodic airing time* – this parameter defines time periods between succeeding airing cycles.



- *Secondary heater work during airing* – turning on/off permission of secondary heater to work during airing.

8.15 SCHEDULES

The menu allows to set the schedules of the recuperator work.

Programmed schedule is stored in internal memory and is not deleted during the power outage.

ecoTOUCH panel:



Schedules support can be turned on in two ways: via *Schedules* parameter, in the menu:


Menu → Operation modes → Recuperator operation modes

or via *Schedules* parameter, in the menu:

Menu → Operation modes → Operation modes settings → Schedules settings

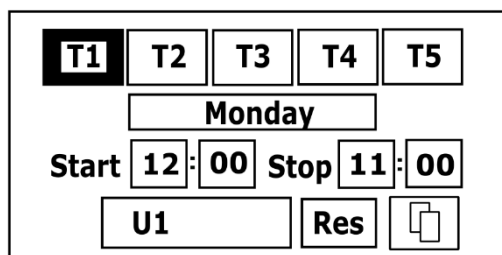
In schedules menu 5 ranges of ventilation central work can be set for each day of the week (*Time 1...5*). For each range the duration time must be set (*Start* and *Stop* parameters: hours and minutes) and active work mode chosen (*Mode* parameter).



The  button allows to copy currently defined schedule to any day of the week.

The simTOUCH2 panel:

The menu allows to set the schedules of the recuperator.



Available *Time schedules support* in the menu:

Menu → Operation modes device → Work modes settings → Time schedule

is responsible for changing the main operation mode of the recuperator. Set the parameter to *ON*.



Up to 5 ranges ($T1...T5$) can be set for the selected day of the week to operate the ventilation system. For each range, set the schedule activation (*Start, Stop* parameters: hours and minutes) and select the active operation mode (*Mode* parameter).



Icon allows to copy currently defined schedule to any day of the week. *Res icon clears set schedule.*









8.16 EXCHANGER CLEASNING

Cleaning start hour parameter allows setting the moment to start cleaning. The procedure will be started at the preset hour after reaching cleaning day.

8.17 GENERAL SETTINGS





The menu contains settings for user to set, related to general controller settings.

The ecoTOUCH panel:

-  *Alarms sound* – enable or disable alarms sound.
-  *Language* – language selection.
-  *Date* – setting the date. After entering the date a day of the week will be set automatically.
-  *Clock* – setting the hour. Changing time in any room panel will trigger time change in the controller.
-  *Brightness* – allows changing screen brightness.
-  *Button sound* – enable or disable the sound while pressing the touch screen.
-  *Software update* - software update of controller module and control panel. Description later in the manual.
-  *Address setting* - allows assigning a unique address of the control panel for the bus, with many room panels connected to the controller.

To ensure the correct system operation the control panel addresses must be from address pool 100...132.



- 
Parental control – when turned on it blocks entering to the menu. Unlock by pressing the screen for 3 sec. (open padlock animation).
- 
ecoNET settings – a WiFi network configuration in case of connecting ecoNET300 internet module to the controller. SSID – network identifier must be entered, WiFi security chosen and password for selected WiFi network entered. Further module configuration should be carried out in accordance with operation and maintenance documentation for ecoNET300.
- 
Screen saver settings – setting *Screen saver On/Off* parameter to *YES* will dim or turn off the screen after set time. Time delay to start the screen saver is set with *Time till screen saver* parameter. The backlight value during active screen saver mode is set with *Screen saver backlight* parameter.
- 
Default settings – restores the default settings of the panel and controller parameters to the customer.

The simTOUCH2 panel:

- Button sound** – turn on or off the sound of pressing the keys.
- Alarm volume** – loudness of the alarm signal.
- Alarm sound** – enable or disable alarms sound.
- Screen saver settings** – set the time to start the screen saver in the *Time till screen saver* parameter. In the parameter *Screen saver mode*, can select the screen saver mode for: *Off*, *On* or *Clock*.
- ecoNET settings** – a WiFi network configuration in case of connection an internet module ecoNET300 to the controller. Enter SSID – network identifier, select type of WiFi protection and enter password for selected WiFi network.
- Address settings** – setting a unique panel address for proper communication with module in case of connecting additional panels.
- Brightness** – allows changing screen brightness.
- Contrast** – contrast of the screen.
- Language** – language selection.
- Clock and Date** – time and date setting. After entering the date, the day of the week will automatic be set.
- Software update** - software update in all devices connected to the controller module. Description later in the manual.



8.18 INTERNET MODULE COOPERATION

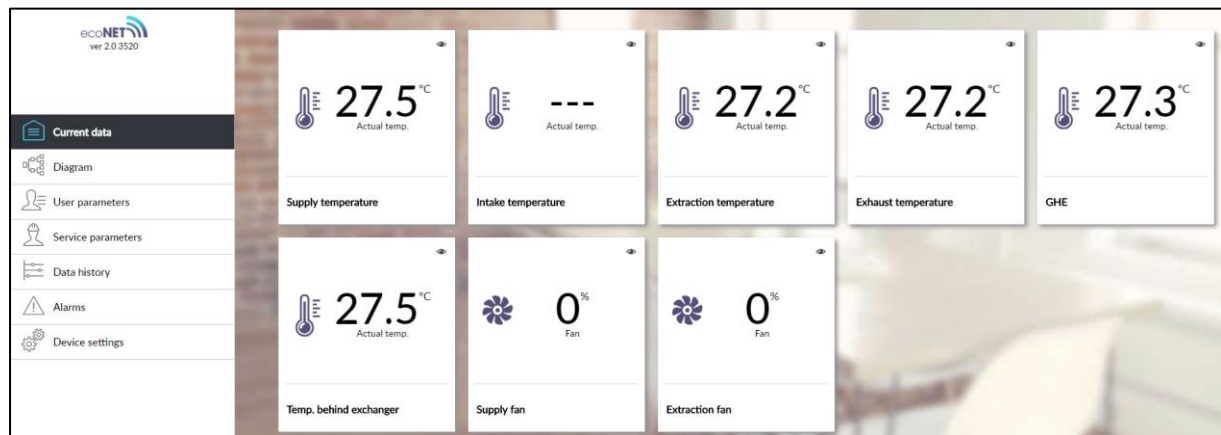
The ecoNET300 internet module enables remote maintenance of controller operation via Wi-Fi or LAN network, using www.econet24.com service.

Internet module will control the controller only with control panel connected to the module.

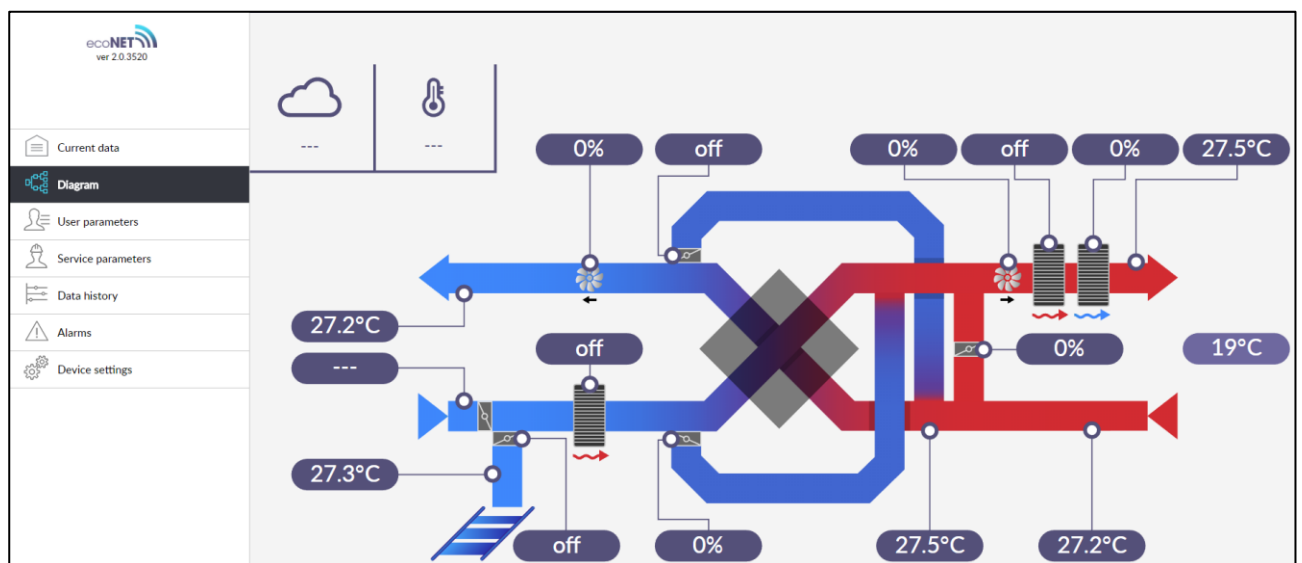
Using computer, tablet or smartphone with web browser installed or convenient application for mobile devices **ecoNET.apk** user can remotely monitor the controller and modify its working parameters. The application can be downloaded free of charge from:



The following is the appearance of the website and the mobile application for remote operation of the ventilation system with exemplary work parameter values.



Main current data



Installation ventilation scheme

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Regular
Production
Surveillance
Safety

www.tuv.com
ID: 0000023065

8.19 ALARMS AND PROMPS



Working in the emergency state is allowed only under your supervision until the arrival of the service and rectify the fault. If the user's supervision is not possible, the controller should be disconnected from the power supply.

Alarm	Possible cause	Due to an alarm	Display
Error air supply temperature sensor	The sensor is damaged, or was not connected or not configured	Signaling alarm, stopping recuperator	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Error temperature behind exchanger			
Error exhaust temperature sensor			
Error intake temperature sensor			
Error extraction temperature sensor			
Error leading temperature sensor	Leading sensor is damaged, falsely connected or not configured.	Signaling alarm, stopping recuperator	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Error GHE temperature sensor	GHE sensor is damaged, falsely connected or not configured.	Signaling alarm, closing GHE	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Active FAS alarm	FAS Alarm - recuperator stopped due to external signal	Signaling alarm, procedure supporting FAS	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Dirt filter replacement deadline approaching	Dirt filter replacement deadline approaching - contact manufacturer's service department.	Signaling alarm	15 days before filter replacement deadline
Filter dirty - operating period expired, contact service	Filter might be dirty - call service to replace filters.	Signaling alarm, no display of energy recovery	Until new inspection date is entered by the installer
Possible dirty filter - R1 pressure switch signal	Pressure switch detected pressure difference before and after the air filter, possible dirty filter	Signaling alarm	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Possible dirty filter - R2 pressure switch signal	Pressure switch detected pressure difference before and after the air filter, possible dirty filter	Signaling alarm	Continually since the occurrence of the cause of the alarm, then the disappearance of the alarm.
Periodic inspection approaches	Periodic inspection approaches - contact service	Signaling alarm	3 days before the general inspection
General inspection required by manufacturer's service	General inspection required - contact service	Signaling alarm	Until new inspection date is entered by the installer



Too high room supply air temp.	Detected too high room supply air temp.	Signaling alarm, protection procedure against too high temperature started	Continually since the occurrence of the cause of the alarm
Too low room supply air temp.	Detected too low room supply air temp.	Signaling alarm, protection procedure against too low temperature started	Continually since the occurrence of the cause of the alarm
Primary water heater thermostat operation noticed – soaking process started	Primary water heater thermostat operation signal noticed – soaking process started	Signaling alarm, soaking procedure	Continually since the occurrence of the cause of the alarm
Too low temperature of secondary heater	Low temperature or signal from secondary heater thermostat – heating procedure started	Signaling alarm, procedure recurring alarm electric heater	Continually since the occurrence of the cause of the alarm
Heaters thermostat operation noticed	Heaters thermostat operation noticed. Reset may be required.	Signaling alarm, procedure recurring alarm electric heater	Continually since the occurrence of the cause of the alarm
Heaters thermostat operation noticed three times	High temperature of electric heater - Heaters thermostat operation noticed three times. Too low airflow, heater thermostat may require alarm confirmation.	Signaling alarm, procedure of periodic recurring alarm electric heater	Continually since the occurrence of the cause of the alarm
Recuperator settings error, possible settings deletion	Deletion or no settings acknowledgement in service menu	Signaling alarm, stopping recuperator	Continually since the occurrence of the cause of the alarm
Manufacturer settings error, possible settings deletion	Deletion or no settings acknowledgement in service menu	Signaling alarm, stopping recuperator	Continually since the occurrence of the cause of the alarm
Device locked – unauthorized start-up	Unauthorized device configuration attempt	Signaling alarm, stopping and blocking recuperator	Continually since the occurrence of the cause of the alarm
No communication with the controller.	Possible damage to the transmission cable connecting the panel with the controller.	Signaling alarm, further work of the recuperator.	Continually since the occurrence of the cause of the alarm.
No communication with pressure/flow sensor for air supply	Communication error between controller and pressure/flow sensor for air supply channel. Possible damage or improper sensor connection.	Signaling alarm, further work of the recuperator.	Continually since the occurrence of the cause of the alarm.
No communication with pressure/flow sensor for exhaust	Communication error between controller and pressure/flow sensor for exhaust channel. Possible damage or improper sensor connection.	Signaling alarm, further work of the recuperator.	Continually since the occurrence of the cause of the alarm.
Air supply filter replacement deadline approaching	The air supply filter counter exceeded value preset with Filter replacement deadline alarm.	Signaling alarm	Continually since the occurrence of the cause of the alarm.
Exhaust filter replacement deadline approaching	The exhaust filter counter exceeded value preset with Filter replacement deadline alarm.	Signaling alarm	Continually since the occurrence of the cause of the alarm.
Air supply filter dirtying - turn off alarm central and replace filter	Possible air supply filter dirtying – replace filter. Alarm available if filter replacement is available for user.	Signaling alarm, ALARM output active	Continually since the occurrence of the cause of the alarm. After alarm acceptance filter replacement procedure starts.



Exhaust filter dirtying - turn off alarm central and replace filter	Possible exhaust filter dirtying - replace filter. Alarm available if filter replacement is available for user.	Signaling alarm, ALARM output active	Continually since the occurrence of the cause of the alarm. After alarm acceptance filter replacement procedure starts.
Air supply filter dirtying - call service	Possible air supply filter dirtying - call service for filter replacement.	Signaling alarm, ALARM output active	Continually since the occurrence of the cause of the alarm.
Exhaust filter dirtying - call service	Possible exhaust filter dirtying - call service for filter replacement.	Signaling alarm, ALARM output active	Continually since the occurrence of the cause of the alarm.
Filters replacement procedure	Alarm after overriding filters replacement procedure.	Signaling alarm, recuperator operation stops.	Continually since the occurrence of the cause of the alarm.
Emergency mode - filters worn out	Alarm in case of filters worn out and with recuperator operational in emergency mode.	Signaling alarm, ALARM output active; if emergency mode is OFF then controller turns off	Continually since the occurrence of the cause of the alarm.
Filters dirtying test - do not turn off central	Starting filters dirtying test procedure.	Signaling alarm	Continually since the occurrence of the cause of the alarm.

9 COOPERATION WITH AIR PARAMETERS SENSORS

The controller has integrated software modules allowing cooperation of recuperation central with selected types of air parameters sensors: digital carbon dioxide level sensor (CO₂), analog carbon dioxide level sensor (CO₂) or analog humidity sensor.

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9.1 DIGITAL CO₂ LEVEL SENSOR

Digital CO₂ level sensor is made to constantly monitor concentration of carbon dioxide in the room. With the moment of exceeding a preset CO₂ value sensor contact output status changes. Controller responds on this status change by proper adjustment of fans speed: air supply and exhaust. It provides faster air exchange in the room, which results in lowering carbon dioxide concentration in the air. After stopping the signal from the sensor and passing the support time controller sets fans speed according with chosen operation mode.

Settings regarding support of digital sensor, fans speed override and support time are in the installer menu and should be adjusted during installation of recuperation central.

9.2 ANALOG CO₂ LEVEL SENSOR

Analog CO₂ level sensor is made to constantly monitor concentration of carbon dioxide in the room. If the sensor detects high CO₂ concentration the controller will immediately override fans speed. It will provide faster air exchange in the room, which results in lowering carbon dioxide concentration in the air. However, if the sensor detects too low CO₂ concentration, controller will immediately lower fans speed. It will provide lowering the amount of outdoor air intake, resulting in successive increase of CO₂ concentration. When CO₂ concentration in the air reaches nominal value the controller will get back to normal operation mode and set fans speeds according to currently selected operation mode.

Settings regarding operation of analog CO₂ sensor are in installer menu and should be adjusted during installation of recuperation central.

9.3 ANALOG HUMIDITY SENSOR

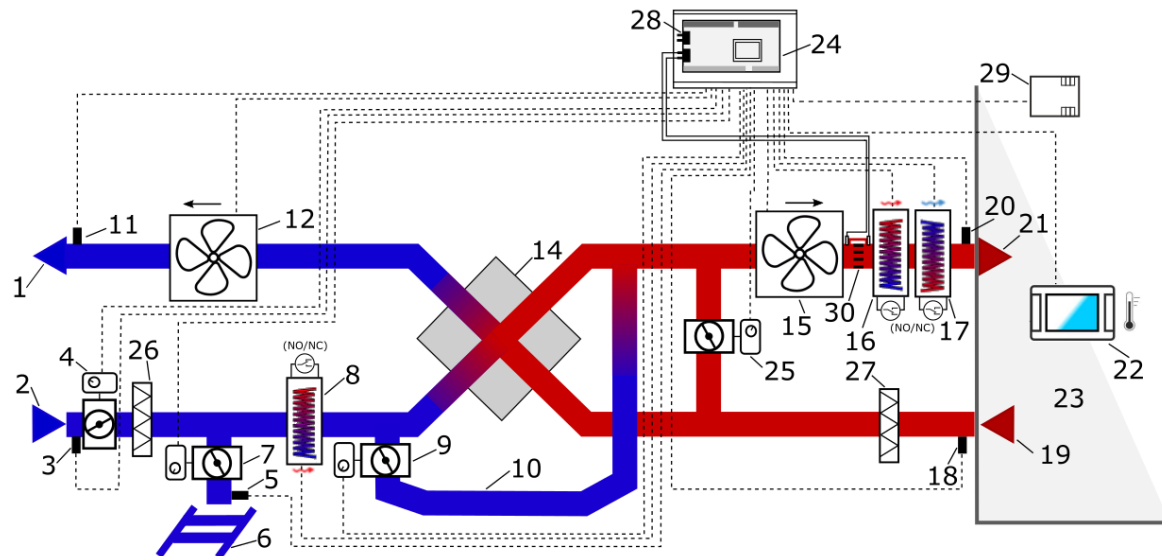
Analog humidity sensor is made to constantly monitor concentration of water vapor in the room. If the sensor detects too high humidity level, controller will immediately override increase of fans speed. It will provide faster air exchange in the room resulting in fast humidity excess removal. However, if the sensor detects too low humidity, the controller will immediately override lowering fans speed. This will provide in lowering outdoor air intake resulting in increasing humidity. When humidity level reaches nominal value the controller will get back to normal operation mode and set fans speeds according to currently selected operation mode.

Settings regarding operation of analog humidity sensor are in installer menu and should be adjusted during installation of recuperation central.

10 INSTALLATION AND SERVICE SETTINGS

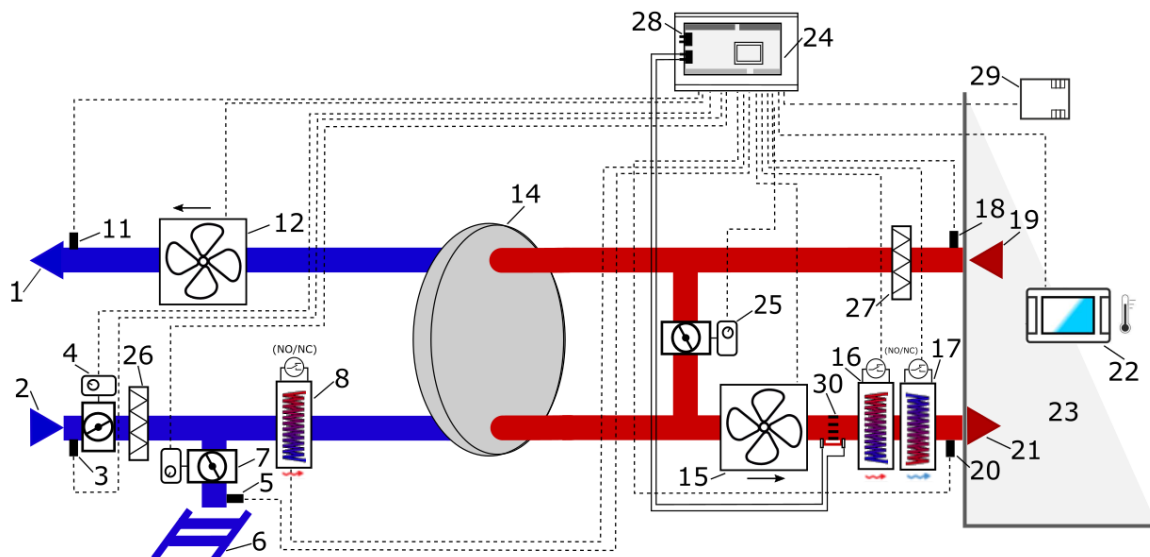
11 AUTOMATION SCHEMATICS

The following sample schemes automation does not replace the design of ventilation systems. It is used only as an example!



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Ventilation diagram with cross-flow exchanger (or countercurrent) and secondary freon or water cooler, and secondary electric heater.



Ventilation diagram with rotary exchanger and secondary freon or water cooler or primary and secondary electric heater.

Description of diagrams: 1 – exhaust, 2 – intake, 3 – intake temperature sensor (outside temp.), 4 – intake throttle actuator, 5 – GHE temp. sensor, 6 – GHE, 7 – GHE throttle actuator, 8 – primary electric or water heater with thermostat (NO-NC), 9 – bypass throttle actuator, 10 – bypass, 11 – exhaust temp. sensor, 12 – extraction fan, 14 – cross-flow or rotary exchanger (heat recovery), 15 – air supply fan, 16 – secondary electric or water heater with thermostat (NO-NC), 17 – secondary freon or water cooler with thermostat (NO-NC), 18 – extraction temp. sensor, 19 – extraction, 20 – air supply temp. sensor, 21 – air supply, 22 – control panel, 23 – room, 24 – enclosing of the controller module, 25 – mixer chamber intake actuator, 26 – intake filter, 27 – extraction filter, 28 - differential pressure sensors, 29 - air quality sensor, 30 - laminar flow limiter.

Brief description of the operation with cross-flow exchanger.

In the moment of turning on the controller, throttles of air supply and extraction are opened by actuators, next the air supply and exhaust fans start to work. Depending on the demand for cooling or heating and fulfilling determined temperature and time requirements, the controller automatically opens or closes the bypass throttle and/or mixing chamber intake, starts up the freon cooler or secondary heater (electric or water) or starts up fan convector and controls it according to actual demand. Anti-freezing protection exchanger is realized, depending on recuperation central configuration, by reducing heat recovery with the help of bypass throttle or by heating up the outdoor air using primary heater. The automation system can be equipped (depending on configuration) with differential pressure sensors signaling contamination of the filters.

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Brief description of the operation with rotary exchanger.

At the time of turning on controller are opened, by air supply actuators and extraction valves and then starts air supply fans and exhaust. Depending on the demand for cooling or heat the controller automatically controls the rotation of the rotary exchanger, or starts up the freon cooler, or water or electric heater. Anti-freezing protection is not needed for this type of exchanger. The automation system is equipped with differential pressure sensors signaling dirtying of the filters.

12 TECHNICAL DATA

The controller power supply	230 V~, 50 Hz
Current consumption	0,04 ¹ A
Max. rated current	6 (6) A
Ambient temp./Storage temperature	0...+40°C/ -25...+50°C
Relative humidity	5...85%, without steam condensation
Temperature measurement range of NTC 10K sensors/ accuracy	-40...+40°C / ±2°C
Measurement range of differential pressure sensor/accuracy	±500 Pa/0,04%
Screw terminals, mains	Cross-section: 0,5...2,5 mm ² , tighten 0,55 Nm, spacing 7 mm
Screw terminals, signals	Cross-section: 0,25...1,5 mm ² , tighten 0,23 Nm, spacing 7 mm
ecoTOUCH panel	Color, graphical: 480 x 272 pix, with touchscreen
simTOUCH2 panel	Graphic: 128 x 64 pix.
Module dimensions	200 x 104 x 50 mm, (9 mm dystanse)
ecoTOUCH panel dimension	148 x 97 x 23 mm
simTOUCH2 panel dimension	126 x 66 x 17 mm
Standards	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A, PN-EN 60730-1
Protection class	Suitable to build-into class 1 devices
Pollution degree	2nd degree, according to PN-EN 60730-1

¹ It is a current taken by controller only. Overall power consumption depends on devices connected to the controller.



13 OPERATION CONDITIONS

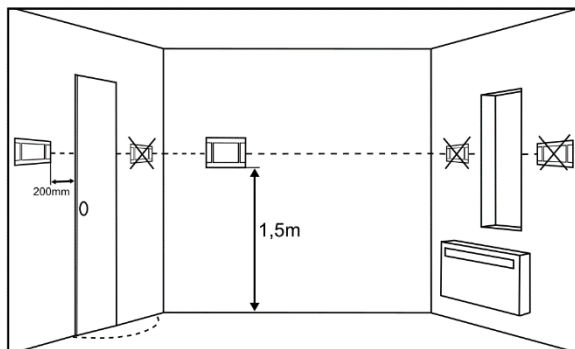
The controller cannot be exposed directly to the weather conditions (rain, sunlight) and vibrations stronger than those during the transport. Do not use the controller under steam condensation conditions, protect from water. Storage and transport temperature should not exceed the range of -25...+50°C. Install in a dry place.

14 THE CONTROLLER INSTALLATION

The controller can be installed only by the ventilation system manufacturer, according to applied norms and regulations and instructions provided in controller documentation. The manufacturer bears no responsibility for damages caused by failure to comply with applied regulations or following this manual.

14.1 MOUNTING OF CONTROL PANEL

The ecoTOUCH and simTOUCH2 control panel is designed for mounting on the wall, inside the room. Cannot be used under steam condensation conditions, protect against water. The control panel should be mounted at a height allowing comfortable operation, typically 1.5 m above the floor.



To reduce measurement disturbances avoid locations exposed to strong sunlight, with poor air circulation, near heating equipment, and directly at the door and windows (typically 0,2 m from the edge of the door).

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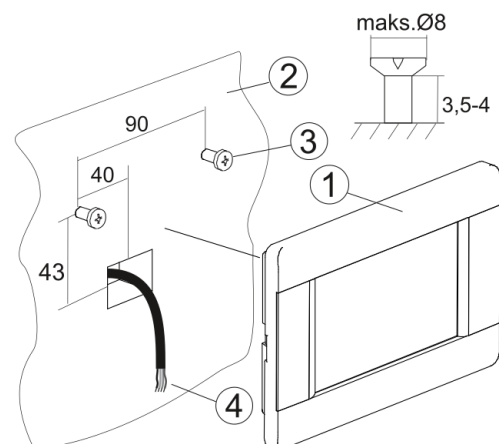
The control panel should be installed by a trained installer.

The control panel installation should be done according to the following guidelines.

The ecoTOUCH panel:

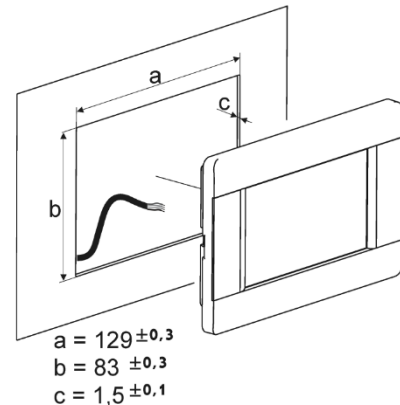
Drill holes in the wall (2) and screw in the screws (3). Then connect the controller's panel (1) with a wire, that can be placed in wall's hollow or on its surface (4).

A rectangular mounting hole can also be cut out (figure).



Next, connect the panel with the controller electrically.

The connection cable cannot be conducted along with the cables of the building mains. The cable should not be routed near devices emitting strong electromagnetic field.

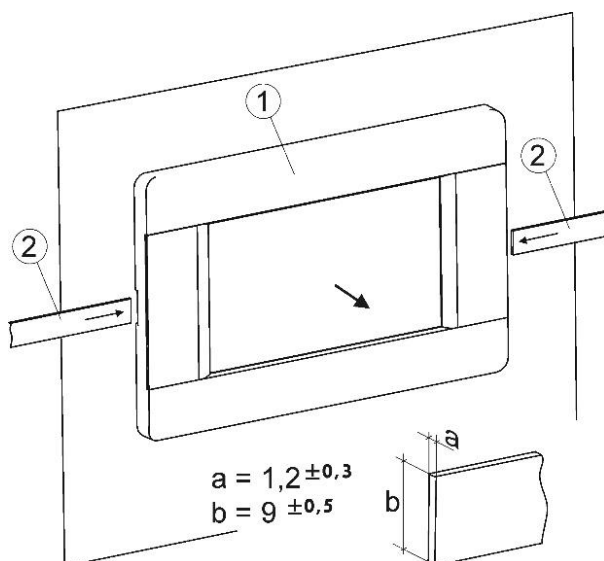
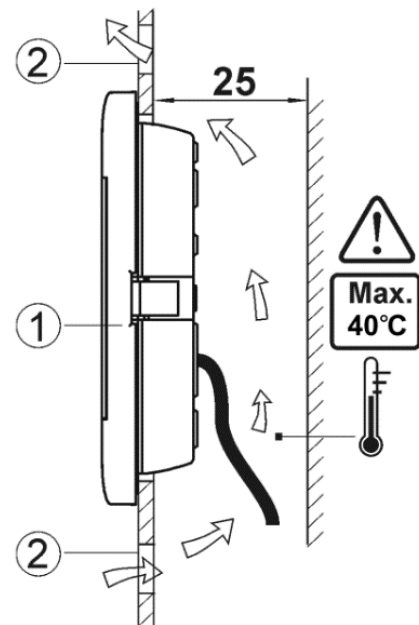


Ensure proper air circulation through vent holes and adequate installation conditions, in order to not exceed maximum temperature in panel's vicinity, which also depends on the room temperature and screen activity settings.

Installation requirements:

- 1 – control/room panel,
- 2 – vent holes to provide air circulation.

The holes cannot decrease required IP protection level and are not required if panel's vicinity temperature is not exceeded.



During panel removal (figure below), to take out panel (1) from the housing, insert flat elements (2) into indicated slots. This will cause housing catches to fold back and panel removal.



The simTOUCH2 panel:

The control panel consists of two parts:

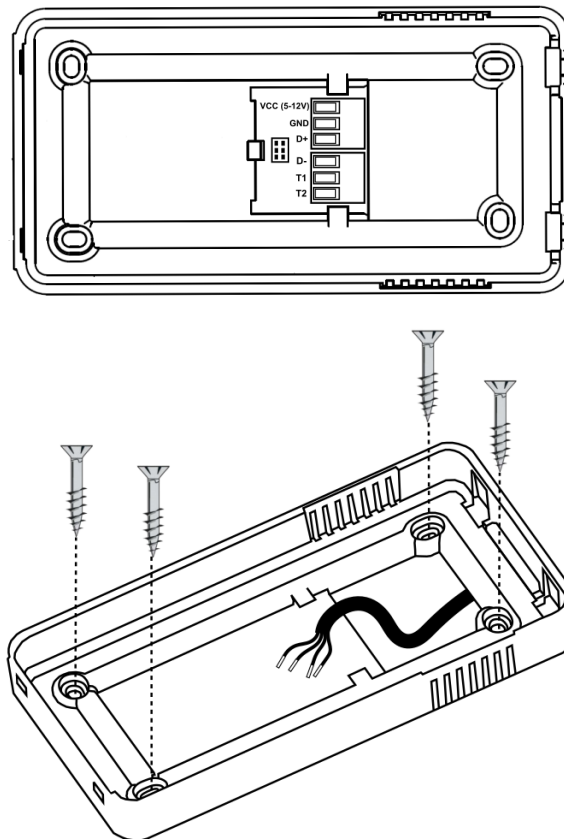
- panel with a display (1), catches (3) and latches (4)
- mounting cover (2).



When installing the control panel, follow the steps below.

STEP 1

Screw the cover (2) to the wall with screws (4 mm x 2.9 mm x 13 mm), necessarily in the orientation according to the figure below.



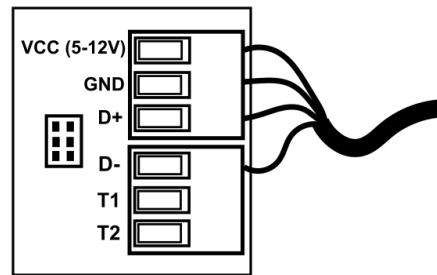
The transmission cable with the module must first be recessed in the wall and guided through the hole in the cover (2).

Do not put connection cable together with the building electrical mains cables. The cable should not be routed near devices that emit strong electromagnetic field.

The maximum length of the transmission cable is up to 30 m, with a cross section of 0.5 mm².

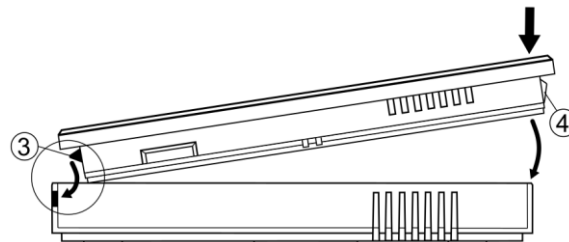
STEP 2

Insert the wires of the cable into the socket in the cover (2).



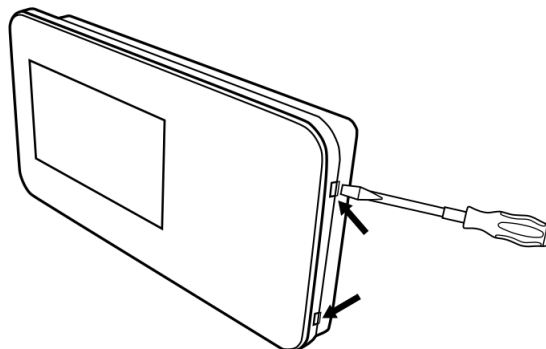
STEP 3

Using the catches (3), place the panel in the cover and click (4) the panel.



Disassembly of control panel.

To remove the panel (1) from the cover (2), insert a flat screwdriver into the indicated slots.



This will bend the catches (4) of the panel housing and allow the panel to be removed (1).

14.2 MAIN MODULE INSTALLATION

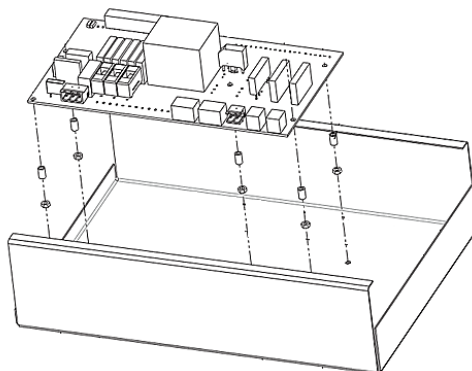
The controller's module must be developed. The development must provide the protection level corresponding to the environmental conditions, under which the controller will be used and prevent users access to the controller terminals.

The IP protection level of undeveloped module is IP00. The dangerous voltage part is accessible here.

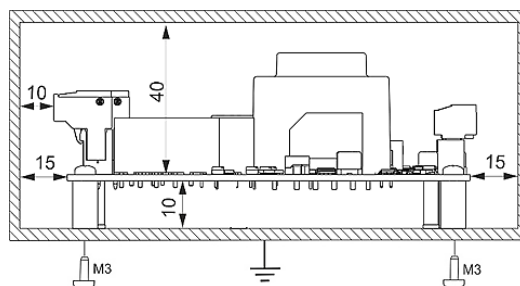
Keep safe spacing between module terminals and conducting casing elements min. 10 mm.




An example of a metal enclosing of the module is shown in the figure below. The minimum required spacing is given.

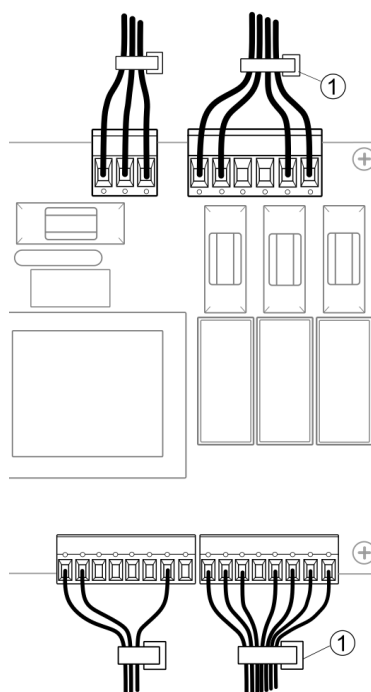


Assembly dimensions of the module are shown in the further part of the manual.



The development must provide protection for cable terminals against ripping, loosening or tension occurrence. Metal enclosing should be grounded .





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Cables connected to the plate should be fastened (1) so that accidental falling out of one of the wires could not cause a hazard.

14.3 CLEANING AND MAINTENANCE PROCEDURES

The outer surface and maintenance of the control panel screen.

-  The device should be cleaned with a soft, dry cloth.
-  It is not allowed to clean the device with a flammable substance (e.g. benzene or any kind of solvent) or a wet cloth. This can cause device malfunction.
-  It is not allowed to scratch the screen with fingernails or sharp objects. It can lead to device damage.
-  It is not allowed to clean the device by spraying water or other liquids on it. If the liquid gets inside the device it can cause fire, electrocution or damage to the device.

Power supply cable:




-  It is not allowed to use damaged: power supply cable, plug or loose electric outlet. Ignoring above recommendations may lead to electrocution or fire outbreak.


14.4 ELECTRICAL CONNECTION

The controller is designed to be supplied by the 230 VAC, 50 Hz voltage – connected to L, N terminals.

The electrical mains should be:

- three-wire (with the protective PE wire),
- in accordance with current regulations.

-  After turning off the controller, dangerous voltage can still occur on the terminals. Before any assembly works, power supply must be utterly disconnected, make sure if there is no dangerous voltage on controller terminals.
-  Connecting the ~230 V mains voltage to transmission terminals and to digital inputs and to outputs analog will results in a controller damage and creates a risk of an electric shock.
-  Connecting electrical mains to digital and analog transmission inputs will damage the controller and may cause electrocution threat.

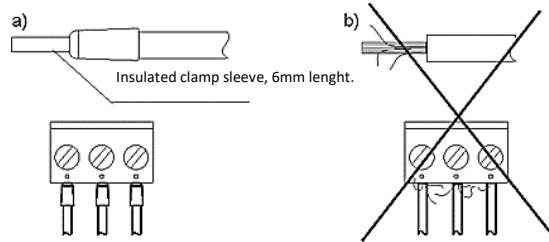
Connect the PE protective wire with module PE input and housing terminal  and protective cables of connected devices.





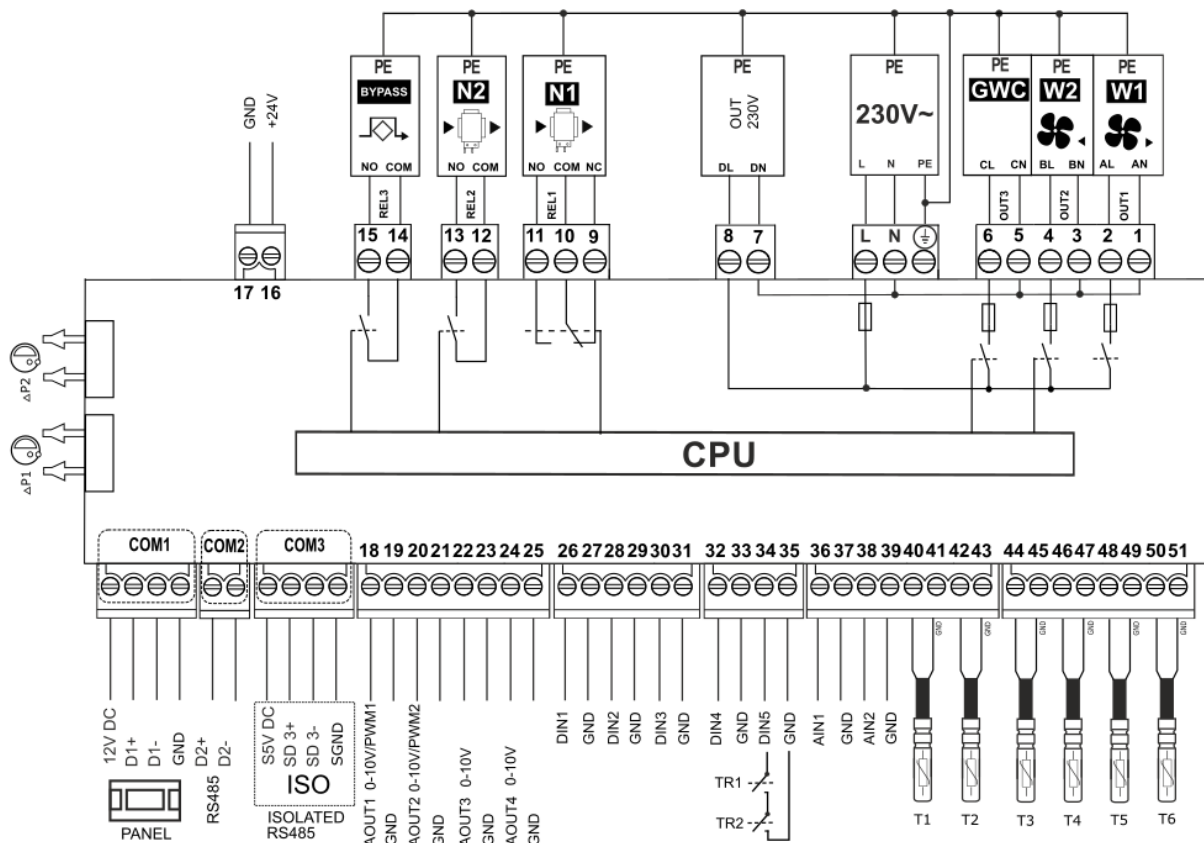
Connection of all peripheral devices has to be done by the installer in accordance with current regulations. Precautions to prevent electrocution should be applied. The controller has to be equipped with a set of plugs inserted into connectors powering devices with 230 V voltage.

The controller has been equipped with screw terminals insertable into sockets, adjusted to use wire with collets. Tips of connection cables, especially mains voltage cables should be secured from splitting by e. g. insulated clamp sleeves. Use wire dimensions and tightening torques provided in technical data.



Securing wires tips: a) – properly secured, b) – improperly secured.

14.5 ELECTRICAL SCHEME



Analog outputs (NTC 10K):

T1 – temp. sensor behind exchanger (optional)

T2 - supply temp. sensor (required)

T3 – extraction temp. sensor (required)

T4 – intake temp. sensor (required)

T5 – GHE temp. sensor (required)

T6 – exhaust temp. sensor (required)

Analog outputs (0-10 V):

AOUT1 – air supply fan

AOUT2 – exhaust fan

Analog outputs (0-10 V)* or PWM*:

AOUT3 – secondary heater

AOUT4 – water or freon cooler

Digital inputs:

DIN1 (IN1) – fans power change (Normally open)

DIN2 (IN2) – digital air quality sensor (Normally open)

DIN3 (SAP) – signal input from FAS (Normally closed)

DIN4 (ECO) – signal input from alarm system (Normally open)

DIN5 – TR1 primary heater thermostat and TR2 secondary heater thermostat (Normally closed)

Analog inputs:

AIN1 – pressure for air supply/analog CO₂ sensor/analog humidity sensor

AIN2 – pressure for extraction

Relay outputs (230 VAC):

W1 – air supply fan

W2 – exhaust fan

GWC – GHE throttle actuator

N1 – primary electric or water heater with thermostat

N2 – secondary electric or water heater with thermostat

BYPASS – Bypass throttle actuator

Transmission channels:

COM1 (PANEL) – control panel (supply power +12 V)

COM2 - transmission socket for additional expansion modules (RS485)

ISOLATED (ISO) – isolated socket RS485 and SGDN (port for external communication)

$\Delta P1$, $\Delta P2$ – differential pressure sensors *ecoPRESS IN1* (optional), where: (+) – pressure before flow limiter in channel, (-) – pressure behind limiter

CPU – control

L N – supply power 230 VAC

PE – peripheral devices grounding.

**available depending on board version.*

The controller allows free outputs configuration depending in used ventilation central. The electrical diagram shows default outputs configuration.

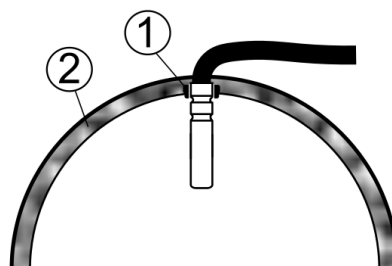
14.6 TEMPERATURE SENSOR CONNECTION AND INSTALLATION

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Sensors necessary to run the controller and the correct operation are the air supply, extraction, exhaust and intake temp. sensors.

Use only the following temperature sensors of NTC10K type. Using different sensor types is forbidden.

Sensors cables can be extended by a cable with cross-sectional area min. 0,5 mm², a total cable length max. 15 m. Make a hole in the ventilation duct in the place designated for temperature measurement, put on the rubber sleeve (1) and install the sensor. The sensor should be attached to the duct using tape to ventilation insulation (2), as shown in the figure below.



Sensors must be properly mounted and protected against loosening from the ventilation ducts according to installation manufacturer recommendations.



It is not allowed to flood sensors with water/oil. Sensor cables should be isolated from mains lines and heat sources to avoid false temperature readings. Minimum spacing between sensor cables should be min. 400 mm.

The sensors must be connected to the controller according to the electrical scheme.

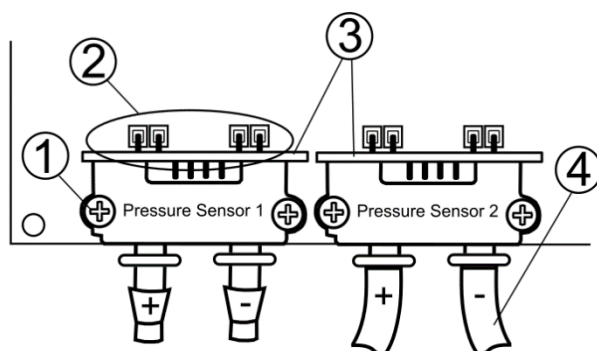
14.7 TEMPERATURE SENSORS TESTING

Sensors are tested by measuring resistance in given temperature. Temperatures with corresponding resistance values are provided in table below.

NTC 10K	
Ambient temp. °C	Nom. Ω
0	33620
10	20174
20	12535
30	8037
40	5301
50	3588
60	2486
70	1759
80	1270
90	933
100	697
110	529
120	407

14.8 CONNECTING OF DIFFERENTIAL PRESSURE SENSORS

The module operates only with ecoPRESS IN1 differential pressure sensors. Using different sensor types is forbidden. Sensors should be placed on the module board at marked place (Pressure Sensor 1 and Pressure Sensor 2) by inserting sensor pins into module sockets, in accordance with figure below.



Mounting the ecoPRESS IN1 pressure sensors:

- 1 - M2.5 x 25 screw + nut,
- 2 - adapter connector pins,
- 3 - sensor,
- 4 - $\varnothing 4$ mm pressure pipe, (+) - pressure before laminar flow limiter, (-) - pressure behind laminar flow limiter.

Pressure sensors must be firmly mounted to the module board with screws, otherwise measurement errors might occur due to mechanical tensions. The pressure tubes connected to the sensor's connectors should be inserted into the ventilation duct with a laminar flow limiter, maintaining proper

connection of pressure values before (+) and after (-) this limiter. The pressure tubes must be properly sealed and secured against being pulling out. When sensors are installed *Air flow pressure* and *Exhaust pressure* parameters should be set in service menu:

Air flow and exhaust control

Setting causes that sensor installed as Pressure Sensor 1 measures pressure difference in air flow channel, and Pressure Sensor 2 in exhaust channel.

Pressure sensor is available at controller or ventilation system manufacturer.

14.9 CONNECTING DIGITAL CO₂ LEVEL SENSOR



It is not possible to simultaneously configure functionality of digital air quality sensor, monitor state of filter pressure switches and hood mode. Functions are available interchangeably.

Digital carbon dioxide sensor should be installed according to sensor manufacturer recommendations. Connection cables can be extended, if not stated differently in sensor manual, its length and cross section must be adjusted according to the manual. Cables must be utterly protected against pulling out.

14.10 CONNECTING ANALOG AIR QUALITY SENSORS



It is not possible to simultaneously configure functionality of analog carbon dioxide sensor and analog humidity sensor. Functions are available interchangeably.



Operation of analog air quality sensor in control mode: *Constant pressure* and *Constant control* is possible only when internal pressure sensors of controller are used for measurement of differential pressure.

Analog air quality sensor should be installed according to sensor manufacturer recommendations. Connection cables can be extended, if not stated differently in sensor manual, its length and cross section must be adjusted according to the manual. Cables must be utterly protected against pulling out.

14.11 CONNECTING THE INTERNET MODULE

The ecoNET300 internet module should be connected and configured according to manufacturer's recommendations.

14.12 VENTILATION FILTERS



Before the first operation of the ventilation central unit, check the condition of the filters. The ventilation central cannot work with dirty filters or with no filters installed!



Depending on the available service functions and filter supervision devices used by ventilation central manufacturer, in service menu **Filter settings** the following elements might be available: dirt detection mechanisms settings, parameters of filter classes, central reaction to excessive dirt, user access to exchange mechanism. Control procedures other than time mechanism are performed under adjustable and repetitive conditions, this is why they cover i.a.: checking central permission to operate, turning off the central from menu level by operator or SAP alarm. If any from above conditions occur, then attempt to start procedure is done at full hour. For testing time switching of some throttles and test start is overridden. After taking priority by this procedure and central started at adjustable operation level of fans a series of tests are performed and the results saved. If test was interrupted or has not ended the procedure will be repeated on the next day at the hour set. Filters operation allows also overriding testing and exchanging procedure.



The system should not run for long periods of time with dirty filters, as this could damage the motors of the fans.

Only the manufacturer or qualified installer can replace or clean the filters.

It is advised to use a throttle with a return spring on the intake side to, which allows cutting off the airflow when the controller is turned off.

15 MODBUS COMMUNICATION

15.1 MODBUS RTU PROTOCOL

The controller has integrated software module allowing communication using Modbus RTU protocol. The protocol enables read from register / group of registers containing current parameters values and a record of values to chosen parameters. The controller supports three Modbus requests: read **0x03**, single register modification request **0x06** and group of registers modification request **0x10**. Communication is done on isolated port of controller (COM3 ISO), which is slave type port.

Communication is performed in RS485 standard. To provide transmission reliability it is obligatory to connect D+ and D- signal cables with proper ports of imperative (master) device and controller (slave).

15.2 COMMUNICATION SETTINGS

Modbus RTU communication settings are in menu:

Service menu → **Modbus settings**

To establish proper communication the following parameters must be set:

- *Modbus address* – controller's address on Modbus bus.



- *Transmission speed* – requested Modbus transmission speed; available settings: 9600, 19200 or 115200.
- *Stop bytes* – number of bytes ending Modbus frame; available settings: 1 byte or 2 byte.
- *Parity* – ability to control errors by comparing frame sum to value of additional parity byte; available settings: none (parity control not applied), even (to control correctness a parity byte is used), odd (to control correctness odd parity byte is used).

Parameters: *Transmission speed*, *Stop bytes* and *Parity* must be configured identically in all devices on the line. Otherwise connection will not be established.

- *Modbus activation* – permission for communication using Modbus protocol; setting parameter to *No* will result in blocking controller.
- *Parameters edit* – permission to edit parameters using Modbus; if parameter is set to *No* modification requests 0x06 and 0x10 will be blocked.
- *Recuperator control* – permission to control with Modbus; if parameter is set to *No* controlling the controller from Modbus level will be disabled.

15.3 READ REQUEST 0x03

Modbus communication protocol allows reading register (or group of registers) containing current parameters values. Read request frame includes (looking at the beginning of the frame):

- address of requested device (1 byte)
- requests (1 byte, in case of read request – 0x03)
- number of first read register (2 bytes)
- numbers of read registers (2 bytes)
- CRC (2 bytes)

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Request sample:

01 03 00 04 00 02 85 CA

According to protocol specification, above request defines read of 2 (**00 02**) data registers counting from register 4 (**00 04**) from device with address 1 (**01**) using read request 0x03 (**03**).

Exemplary answer:

01 03 04 00 03 00 01 CB F3

According to protocol specification, above frame informs, that two following registers (4 bytes together – 04) of the device with address 1 (**01**) have values: 3 (**00 03**) and 1 (**00 01**), and to read these values read request was used (**03**).

15.4 MODIFICATION REQUEST 0x06

Modbus communication protocol allows modification value 1 of register containing current value of parameter. Request frame includes (looking at the beginning of the frame):

- address of requested device (1 byte)
- requests (1 byte, in case of modification request – 0x06)

- number of modified register (2 bytes)
- value to set (2 bytes)
- CRC (2 bytes).

Request sample:

01 06 00 04 00 03 88 0A

According to protocol specification, above request defines modification of data register value number 4 (**00 04**) in the device with address (**01**) to value 3 (**00 03**) using modification request (**06**).

Answer to the modification request depends on that, if value modification operation will be successful. If modification is successful a compatibility frame will be returned. If modification is unsuccessful an error frame will be returned.

Compatibility frame is identical to the previously sent modification request frame.

Error frame includes (looking at the beginning of the frame):

- address of requested device (1 byte)
- request echoes + error marker (1 byte, in case of read request – 0x86)
- error code
- CRC (2 bytes).

Exemplary answer signaling modification error:

01 86 03 02 61

According to protocol specification, above frame informs, that in the device with address 1 (**01**) value modification of single parameter (**86**) was unsuccessful due to forbidden data value (**03**).

15.5 MODIFICATION REQUEST 0x10

Modbus communication protocol allows value modification of many registers containing current values of parameters. Request frame includes (looking at the beginning of the frame):

- address of requested device (1 byte)
- requests (1 byte, in case of modification request – 0x10)
- number of the first modified register (2 bytes)
- number of modified registers (2 bytes)
- number of modified bytes (2x number of modified registers)
- value to set (2 bytes) in register 1, 2, ...
- CRC (2 bytes).

Request sample:

01 10 00 27 00 02 04 00 15 00 16 20 5B

According to protocol specification, above request defines modification of data register value counting from register number 39 (**00 27**) in the device with address 1 using frame 0x10 (**10**). Values 2 (**00 02**) of registers are to be modified, together 4 bytes (**04**). They are to be set to the following values: 21 (**15**) and 22 (**16**).



Answer to the modification request depends on that, if value modification operation will be successful. If modification is successful a compatibility frame will be returned. If modification is unsuccessful an error frame will be returned.

Compatibility frame is an echo of modification request frame, it differs only with no information regarding value to be set.

Error frame includes (looking at the beginning of the frame):

- address of requested device (1 byte)
- request echoes + error marker (1 byte, in case of read request – 0x90)
- error code
- CRC

Exemplary answer signaling modification error:

01 90 03 0C 01

According to protocol specification, above frame informs, that in the device with address 1 (**01**) the modification of multiple parameters (**90**) was unsuccessful due to forbidden data value (**03**).

15.6 MODBUS TABLE

The following table includes full list of controller Modbus parameters. This table is applied to S003.08 programs and newer.

BMS Index	Modbus address	Variable name	Description	Signal type				Variable type	Comments
					Min.	Max. value	Default		
1	0	Program version	Software version	O	0	0xFFFF	0	hex	Format: SXXX.YYY XXX – older byte, YYY – younger byte
2	1	Serial NO	Recuperator serial number	O	1	65535	0	integer	
3	2	STATUS_OK	Operation status	O	0	1	1	integer	
4	3	FAILURE	Failure status	O	0	1	0	integer	
5	4	WORK_MODE	Controller operation mode	I/O	0	6	3	integer	0 – Off, 1 – Pause, 3 – User1, 4 – User2, 5 – User3, 6 – User4
6	5	Tmain	Leading sensor	O	0	2	0	integer	0 – exhaust sensor, 1 – air supply sensor, 2 – panel sensor
7	6	Tsup	Air supply temperature (T2)	O	-40.0	40.0	0.0	integer	999 – sensor failure
8	7	Texh	Extraction temperature (T3)	O	-40.0	40.0	0.0	integer	999 – sensor failure
9	8	Tinl	Intake/outside temperature (T4)	O	-40.0	40.0	0.0	integer	999 – sensor failure
10	9	Tout	Exhaust temperature (B4)	O	-40.0	40.0	0.0	integer	999 – sensor failure
11	10	Trec	GHE temperature (T5)	O	-40.0	40.0	0.0	integer	999 – sensor failure
12	11	Theat	Temperature behind secondary heater (T1)	O	-40.0	40.0	0.0	integer	999 – sensor failure
13	12	Tpanel	Main panel temperature	O	-40.0	40.0	0.0	integer	999 – sensor failure
14	13	Q1-limit	Air quality sensor (Q1-0/1)	O	0	1	0	integer	0 – open contact 1 – closed contact
15	14	-	-	-	-	-	-	-	
16	15	TR1	Primary heater thermostat (N1)	O	0	1	0	integer	0 – open contact 1 – closed contact
17	16	TR2	Secondary heater thermostat (N2)	O	0	1	0	integer	0 – open contact 1 – closed contact
18	17	BYPASS	Bypass actuator state	O	0	1	0	integer	0 - throttle ON, 1 - throttle OFF
19	18	SAP	External SAP signal	O	0	1	1	integer	0 – SAP, 1 – no SAP
20	19	IN1	External signal IN1	O	0	1	0	integer	0 – inactive, 1 – active

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21	20	IN2	External signal IN2	O	0	1	0	integer	0 – inactive, 1 – active
22	21	ECO	External signal ECO (alarm central)	O	0	1	0	integer	0 – inactive, 1 – active
23	22	N1	Primary heater (N1)	O	0	1	0	integer	0 – inactive, 1 – active
24	23	N2	Secondary heater (N2)	O	0	1	0	integer	0 – inactive, 1 – active
25	24	N2 control	Secondary heater adjustment (N2)	O	0	100	0	integer	Adjustment in %
26	25	Y1 control	Cooler adjustment (CH1)	O	0	100	0	integer	Adjustment in %
27	26	GWC	Ground heat exchanger actuator	O	0	1	0	integer	0 – inactive, 1 – active
28	27	SBP1	Exchanger bypass actuator – air supply (SBP1)	O	0	100	0	integer	Adjustment in %
29	28	SM1	Mixing chamber actuator (SM1)	O	0	100	0	integer	Adjustment in %
30	29	Clean	CLEAN EXCHANGER mode	O	0	1	0	integer	0 – inactive, 1 – active
31	30	Clean_MANUAL	Manual exchanger cleaning	I/O	0	1	0	integer	0 – turn off, 1 – turn on
32	31	Mode_MANUAL	Manual control mode	O	0	1	0	integer	0 – inactive, 1 – active
33	32	Mode_WINDO W	OPEN WINDOWS mode	I/O	0	1	0	integer	0 – inactive, 1 – active
34	33	Mode_OUT	OUT mode	I/O	0	1	0	integer	0 – inactive, 1 – active
35	34	Mode_PARTY	PARTY mode	I/O	0	1	0	integer	0 – inactive, 1 – active
36	35	Mode_OVERPR ES	OVERPRESSURE mode (fireplace)	I/O	0	1	0	integer	0 – inactive, 1 – active
37	36	OVERPRESS_val ue	Overpressure value	I/O	-100	100	-20	integer	Adjustment in %
38	37	SCHEDULER	Operation according to schedule	I/O	0	1	0	integer	0 – off, 1 – on
39	38	-	-	-	-	-	-	integer	
40	39	Temp_USER1	Preset temperature in USER 1 mode	I/O	8	30	20	integer	Unit: °C
41	40	Temp_USER2	Preset temperature in USER 2 mode	I/O	8	30	20	integer	Unit: °C
42	41	Temp_USER3	Preset temperature in USER 3 mode	I/O	8	30	20	integer	Unit: °C



43	42	Temp_USER4	Preset temperature in USER 4 mode	I/O	8	30	20	integer	Unit: °C
44	43	W1	Air supply fan, current expenditure (W1)	O	0	100	50	integer	Adjustment in %
45	44	W2	Extraction fan, current expenditure (W2)	O	0	100	50	integer	Adjustment in %
46	45	W1_EN	Air supply fan operation permission (W1)	O	0	1	1	integer	0 – inactive, 1 – active
47	46	W2_EN	Extraction fan operation permission (W2)	O	0	1	1	integer	0 – inactive, 1 – active
48	47	-	-	-	-	-	-	-	
49	48	Speed_W1_USE R1	Speed of W1 in USER 1 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
50	49	Speed_W1_USE R2	Speed of W1 in USER 2 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
51	50	Speed_W1_USE R3	Speed of W1 in USER 3 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
52	51	Speed_W1_USE R4	Speed of W1 in USER 4 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
53	52	Speed_W1_ECO	Speed of W1 in ECO mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
54	53	-	-	-	-	-	-	-	
55	54	Speed_W2_USE R1	Speed of W2 in USER 1 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
56	55	Speed_W2_USE R2	Speed of W2 in USER 2 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
57	56	Speed_W2_USE R3	Speed of W2 in USER 3 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
58	57	Speed_W2_USE R4	Speed of W2 in USER 4 mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
59	58	Speed_W2_ECO	Speed of W2 in ECO mode	I/O	dyn. (25)	dyn. (100)	50	integer	Adjustment in %
60	59	-	-	-	-	-	-	-	
61	60	DATE_day	Day	I/O	1	31	1	integer	
62	61	DATE_month	Month	I/O	1	12	1	integer	
63	62	DATE_year	Year	I/O	15	99	16	integer	
64	63	TIME_hour	Hour	I/O	0	23	1	integer	
65	64	TIME_minutes	Minute	I/O	0	59	1	integer	
66	65	Stop_time_ECO	Periodic pause time in ECO mode	I/O	1	24	1	integer	Unit: hours
67	66	Work_time_EC O	Airing time in ECO mode	I/O	0	100	10	integer	Unit: minutes
68	67	Filter_time_rem aining	Time remaining to replace filters	O	0	999	1500	integer	Unit: day
69	68	Service_time_re maining	Time remaining to general inspection	O	0	999	90	integer	Unit: day

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70	69	GWC_Enable	GHE operation permission	I/O	0	2	1	integer	0 - closed, 1 - auto, 2 - open
71	70	GWC_Winter	GHE turn on upper threshold – winter	I/O	5	20	8	integer	Unit: °C
72	71	GWC_Summer	GHE turn on lower threshold – summer	I/O	10	30	18	integer	Unit: °C
73	72	SM1_Enable	Mixing chamber activation (SM1)	I/O	0	1	0	integer	0 – inactive, 1 - active
74	73	SM1_Limit	Opening limit of mixing chamber actuator (SM1)	I/O	0	100	100	integer	Unit: %
75	74	BMS_adress	Device address for BMS communication	O	0	256	1	integer	
76	75	-	-	-	-	-	-	-	
77	76	BMS_change_en	BMS settings change	O	0	1	1	integer	0 – turn off, 1 – turn on
78	77	BMS_STOP_en	BMS START_STOP	O	0	1	1	integer	0 – turn off, 1 – turn on
79	78	-	-	-	-	-	-	-	
80	79	UID1	UID - characters 1 and 2	O	12336	23130	-	ASCII	
81	80	UID2	UID - characters 3 and 4	O	12336	23130	-	ASCII	
82	81	UID3	UID - characters 5 and 6	O	12336	23130	-	ASCII	
83	82	UID4	UID - characters 7 and 8	O	12336	23130	-	ASCII	
84	83	UID5	UID - characters 9 and 10	O	12336	23130	-	ASCII	
85	84	UID6	UID - characters 11 and 12	O	12336	23130	-	ASCII	
86	85	UID7	UID - characters 13 and 14	O	12336	23130	-	ASCII	
87	86	UID8	UID - characters 15 and 16	O	12336	23130	-	ASCII	
88	87	UID9	UID - characters 17 and 18	O	12336	23130	-	ASCII	
89	88	UID10	UID - characters 19 and 20	O	12336	23130	-	ASCII	
90	89	UID11	UID - character 21	O	48	90	-	ASCII	Younger byte is a mark, omit older byte
91	90	P1_value	Measured pressure – air supply	O	0	4000	0	integer	Unit: Pa
92	91	P2_value	Measured pressure – exhaust	O	0	4000	0	integer	Unit: Pa
93	92	Flow1_value	Measured flow – air supply	O	0	4000	0	integer	Unit: m3/h
94	93	Flow2_value	Measured flow – exhaust	O	0	4000	0	integer	Unit: m3/h
95	94	P1_setPoint	Preset pressure – air supply	O	0	4000	50	integer	Unit: Pa
96	95	P2_setPoint	Preset pressure – exhaust	O	0	4000	50	integer	Unit: Pa
97	96	Flow1_setPoint	Remote flow – air supply	O	0	4000	50	integer	Unit: m3/h
98	97	Flow2_setPoint	Remote flow – exhaust	O	0	4000	50	integer	Unit: m3/h
99	98	Reg_sett	Control mode	I/O	0	3	0	integer	0 – standard, 1 – constant



									pressure, 2 – constant expenditure
100	99	Pressure_W1_U SER1	Preset pressure – air supply – user 1 mode	I/O	0	4000	50	integer	Unit: Pa
101	100	Pressure_W1_U SER2	Preset pressure – air supply – user 2 mode	I/O	0	4000	50	integer	Unit: Pa
102	101	Pressure_W1_U SER3	Preset pressure – air supply – user 3 mode	I/O	0	4000	50	integer	Unit: Pa
103	102	Pressure_W1_U SER4	Preset pressure – air supply – user 4 mode	I/O	0	4000	50	integer	Unit: Pa
104	103	Pressure_W2_U SER1	Preset pressure – exhaust – user 1 mode	I/O	0	4000	50	integer	Unit: Pa
105	104	Pressure_W2_U SER2	Preset pressure – exhaust – user 2 mode	I/O	0	4000	50	integer	Unit: Pa
106	105	Pressure_W2_U SER3	Preset pressure – exhaust – user 3 mode	I/O	0	4000	50	integer	Unit: Pa
107	106	Pressure_W2_U SER4	Preset pressure – exhaust – user 4 mode	I/O	0	4000	50	integer	Unit: Pa
108	107	Flow_W1_USER 1	Preset flow – air supply – user 1 mode	I/O	0	4000	50	integer	Unit: m3/h
109	108	Flow_W1_USER 2	Preset flow – air supply – user 2 mode	I/O	0	4000	50	integer	Unit: m3/h
110	109	Flow_W1_USER 3	Preset flow – air supply – user 3 mode	I/O	0	4000	50	integer	Unit: m3/h
111	110	Flow_W1_USER 4	Preset flow – air supply – user 4 mode	I/O	0	4000	50	integer	Unit: m3/h
112	111	Flow_W2_USER 1	Preset flow – exhaust – user 1 mode	I/O	0	4000	50	integer	Unit: m3/h
113	112	Flow_W2_USER 2	Preset flow – exhaust – user 2 mode	I/O	0	4000	50	integer	Unit: m3/h
114	113	Flow_W2_USER 3	Preset flow – exhaust – user 3 mode	I/O	0	4000	50	integer	Unit: m3/h
115	114	Flow_W2_USER 4	Preset flow – exhaust – user 4 mode	I/O	0	4000	50	integer	Unit: m3/h
116	115	k_fac_W1	Air supply fan k coefficient	I/O	0	1000	0	float	
117	116	k_fac_W2	Exhaust fan k coefficient	I/O	0	1000	0	float	
118	117	PSA_W1	Air supply fan start level	I/O	dyn. (25)	dyn. (100)	30	integer	Adjustment in %
119	118	PSA_W2	Exhaust fan start level	I/O	dyn. (25)	dyn. (100)	30	integer	Adjustment in %
120	119	maxPres_AIN1	Max. Air supply pressure – analog sensor	I/O	0	4000	100	integer	Unit: Pa
121	120	maxPres_AIN2	Max. Exhaust pressure – analog sensor	I/O	0	4000	100	integer	Unit: Pa



List of BMS alarms									
BMS Index	Modbus address	Variable name	Description	Signal type				Variable type	Comments
					Min.	Max.	Default		
122	200	SAP_AL	SAP alarm	O	0	1	0	integer	0 – inactive, 1 – active
123	201	Service_AL	General inspection required	O	0	1	0	integer	0 – inactive, 1 – active
124	202	Filter_AL	Filter replacement required	O	0	1	0	integer	0 – inactive, 1 – active
125	203	Filter_AL_SUP	Air supply dirty filter – pressure switch action	O	0	1	0	integer	0 – inactive, 1 – active
126	204	Filter_AL_EXH	Exhaust dirty filter – pressure switch action	O	0	1	0	integer	0 – inactive, 1 – active
127	205	Sensor_T2_AL	Sensor T2 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
128	206	Sensor_T3_AL	Sensor T3 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
129	207	Sensor_T4_AL	Sensor T4 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
130	208	Sensor_T5_AL	Sensor T6 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
131	209	Sensor_T6_AL	Sensor T5 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
132	210	Sensor_T1_AL	Sensor T1 malfunction	O	0	1	0	integer	0 – inactive, 1 – active
133	211	-	-	-	-	-	-	-	-
134	212	sup_HT_AL	Air supply high temperature	O	0	1	0	integer	0 – inactive, 1 – active
135	213	sup_LT_AL	Air supply low temperature	O	0	1	0	integer	0 – inactive, 1 – active
136	214	Hex_frost_AL	Frosted exchanger	O	0	1	0	integer	0 – inactive, 1 – active
137	215	N1_HT_temp_AL	Possible primary heater overheat	O	0	1	0	integer	0 – inactive, 1 – active
138	216	N2_HT_temp_AL	Possible secondary heater overheat	O	0	1	0	integer	0 – inactive, 1 – active
139	217	N1_HT_AL	Electric primary heater overheat	O	0	1	0	integer	0 – inactive, 1 – active
140	218	N2_HT_AL	Electric secondary heater overheat	O	0	1	0	integer	0 – inactive, 1 – active
141	219	Frost_AL	Activation of soaking process for secondary heater	O	0	1	0	integer	0 – inactive, 1 – active

Parameter type: O – only Output – read only parameter, I/O – Input/Output – read and modification allowed.



16 INSTALLER MENU - STRUCTURE

The menu is available after entering the service password. Depending on controller configuration and whether it is on or off, some of menu parameters might be unavailable. These are marked with “*”.

Service configuration confirmation

Filter setting
Dirt det. mechanism - supply*
<ul style="list-style-type: none"> None, Time, Pressure switch, Pressure sensor
Dirt det. mechanism - exhaust*
<ul style="list-style-type: none"> None, Time, Pressure switch, Pressure sensor
Signal source selection*
Filter classes parameters*
<ul style="list-style-type: none"> General filters <ul style="list-style-type: none"> ➤ Class of filter ➤ Initial pressure drop ➤ Final pressure drop ➤ Alarm when dirty ➤ AHU emergency mode Medium class (arrangement as above) Fine class (arrangement as above) Filter classes default settings
Detection control*
<ul style="list-style-type: none"> Time control* <ul style="list-style-type: none"> ➤ Days to alarm ➤ Days to emergency mode Detection by pressure drop switch * <ul style="list-style-type: none"> ➤ Logic state - supply ➤ Logic state - extract ➤ Supply air filter used-up alarm ➤ Supply filter lifetime ➤ Emergency mode - supply filter ➤ Alarm when exhaust filter used-up ➤ Extracted air filter lifetime ➤ Emergency mode - extracted air filter AIN higher supply air pressure drop* AIN higher extracted air pressure drop* Pollution test delay* Pollution test set point*
Filter support*
<ul style="list-style-type: none"> Force filter replacement procedure

- Filters replacement by user
- Supply filter worktime reset
- Extracted air filter worktime reset
- Emergency mode - unit turn OFF
- Emergency mode - supply fan*
- Emergency mode - exhaust fan*
- Pollution test periodicity
- Pollution test start day
- Filter test start hour
- Pollution test forcing

Manual control

Supply / Extract control mode

Regulation mode:

- Standard, Constant pressure-drop, CAV

Information

GHE/Mix. chamber/Cooler settings*

GHE support*

- Yes, No

Mixing chamber support*

- Yes, No

Cooler support*

- Yes, No

GHE temp. Sensor*

- Yes, No

Fans settings

Lower set point of supply fan

Higher set point of supply fan

Lower set point of extracted air fan



Higher set point of extracted air fan
Delay of supply fan stop
Delay of exhaust fan stop
Lower external temperature <ul style="list-style-type: none">• Perm. from min. outside temp• Lower external temp• Hyst. of lower external temp
Supply fan start delay
Exhaust fan start delay
Fans control * <ul style="list-style-type: none">• Supply air fan• Exhaust air fan

Heaters settings
Secondary heater type:
<ul style="list-style-type: none">None, Electric (ON / OFF), Electric (0-10V), Water (ON / OFF), Water (0-10V)
Preheater support:
<ul style="list-style-type: none">None, Electric (ON / OFF), Electric (0-10V), Water (ON / OFF), Water (0-10V)
Thermostats of heaters
<ul style="list-style-type: none">Normally opened, Normally closed
Preheater thermostat:
<ul style="list-style-type: none">Normally opened, Normally closed
Secondary heater thermostat:
<ul style="list-style-type: none">Normally opened, Normally closed
Preheater control mode
<ul style="list-style-type: none">Normal, SSR
Secondary heater control mode
<ul style="list-style-type: none">Normal, SSR
Supply fan lower set point @ secondary EH
Supply fan lower set point @ primary EH
Pre-heater except antifreeze
<ul style="list-style-type: none">Turn OFF, ON primary heater, excluding antifreeze procedure
Preheater Turn-ON exc. antifreeze
Preheater Turn-OFF hyst. except antifreeze

Air quality sensors settings*
Analog CO2 sensor*
<ul style="list-style-type: none">• Operation of the CO2 sensor• CO2 normal level• CO2 level hysteresis• CO2 range• Fans set point change
Analog humidity sensor*
<ul style="list-style-type: none">• Operation of the humidity sensor• Humidity normal level• Humidity level hysteresis• Fans set point change
Relative CO2 switch*
<ul style="list-style-type: none">• CO2 switch support• Logic state of switch• Fans set point• Maintaining time
Relative humidity switch*
<ul style="list-style-type: none">• Air quality switch support• Logic state of switch• Fans set point• Alarm duration

Kitchen hood mode settings*
IN1 logic state*
<ul style="list-style-type: none">Normally Opened Normally Closed
IN2 logic state*
<ul style="list-style-type: none">Normally Opened Normally Closed
Supply fan control by IN1 *
Exhaust fan control by IN1 *
Supply fan control by IN2 *
Exhaust fan control by IN2 *

Inspection/blockade settings
Inspection function support
Device blockade support
Inspection counter reset
Days till inspection



Day till blockage
Device unlocking password

Default settings
Default setting panel
Default setting service
Default setting client

Exchanger cleaning*
Manual cleaning start
Stage 1 duration
Stage 2 duration
Cleaning schedule (days)

Exchanger dehydration
Periodical dehydration
Dehydration work time

Modbus settings
Modbus address
Transmission speed
<ul style="list-style-type: none"> 9600, 19200, 115200
Stop bits amount
<ul style="list-style-type: none"> 1 stop bit, 2 stop bits
Parity
<ul style="list-style-type: none"> None, Even, Odd
Modbus activation
<ul style="list-style-type: none"> Yes, No
Edit parameters
<ul style="list-style-type: none"> Yes, No
Recuperator control
<ul style="list-style-type: none"> Yes, No

Touch panel calibration

17 MANUFACTURER MENU - STRUCTURE

The menu is available after entering the service password. Depending on controller configuration and whether it is on or off, some of menu parameters might be unavailable. These are marked with “*”.

Confirm service configuration

Air supply and exhaust control
Pressure air supply/exhaust
AIN1/AIN2 maximum pressure value
Fan k coefficient
Start level

Bypass settings
Bypass support
<ul style="list-style-type: none"> Yes, No

Control mode
<ul style="list-style-type: none"> Smooth, Bistate
Minimum bypass control
Maximum bypass control
Bypass Kp setting
Bypass Ki setting
Bypass Td setting
Actuator full open time

Primary heater
Heater Kp settings



Heater Ki settings
Heater Td settings
Min. control value
Max. control value

Secondary heater
Heater Kp settings
Heater Ki settings
Heater Td settings
Start delay
Actuator full open time

Cooler
Cooler Kp settings
Cooler Ki settings
Cooler Td settings
Mixer full open time

Filters settings
Air supply filter – type:
<ul style="list-style-type: none"> None, Time, Pressure switch, Transducer
Exhaust filter – type:
<ul style="list-style-type: none"> None, Time, Pressure switch, Transducer
Configured by installer
Filters replacement:
<ul style="list-style-type: none"> Installer/User/Configured by installer
Functions available for installer:
<ul style="list-style-type: none"> Filter classes parameters Timed mechanism Detection by pressure switches Pressure difference transducers Dirt test delay Dirt test adjustment
Filter classes parameters:
<ul style="list-style-type: none"> Standard class: <ul style="list-style-type: none"> ➤ Filter class ➤ Initial resistance ➤ Final resistance ➤ Dirt alarm ➤ Central emergency mode Medium class (as above) Accurate class (as above)

Filter classes default settings (yes/no)
--

Exchanger anti-freezing
Exchanger de-freezing control
<ul style="list-style-type: none"> On, Off
Dewpoint use*
<ul style="list-style-type: none"> Yes, No
Dewpoint hysteresis*
Use primary heater
<ul style="list-style-type: none"> Yes, No
De-freezing turn on temp.
De-freezing turn off temp.
Air supply fan velocity
Exhaust fan velocity
Minimum air supply fan velocity
Air supply fan velocity change
<ul style="list-style-type: none"> Yes, No

Air supply temperature protection
Protection against too high temp.
<ul style="list-style-type: none"> No, Alarm and turn off, Turn off secondary heater
Air supply temperature limit value
Operation pause duration
Protection against too low temp.
<ul style="list-style-type: none"> No, Alarm and turn off, Turn off secondary heater
Low supply temp. threshold
Detection time of low temp.

Sensor behind exchanger
<ul style="list-style-type: none"> Yes, No

Erase alarm
<ul style="list-style-type: none"> Yes, No

Analog outputs change
OUT1-OUT4 (0-10V)
<ul style="list-style-type: none"> None, Air supply fan, Exhaust fan, Bypass/rotary exchanger, Cooler,

Secondary heater, Mixing chamber actuator, Primary heater

Control change 0 - 10 V
OUT1...OUT4 (0 - 10 V)
<ul style="list-style-type: none"> Reversed/normal control Minimum voltage value Maximum voltage value

PWM settings*
Primary heater PWM control
<ul style="list-style-type: none"> Normal mode, SSR
Secondary heater PWM control
<ul style="list-style-type: none"> Normal mode, SSR

Exchanger cleaning
Exchanger cleaning support

Mixing chamber settings
Mixing chamber Kp
Mixing chamber Ki
Mixing chamber Td
Min. mixing chamber control
Max. mixing chamber control

Exchanger type
<ul style="list-style-type: none"> Cross-flow, Rotary

Setting relay output
Relay 1-6

Default settings
Default setting panel
Default setting service
Default setting client
Counters erase

Access passwords change
Installer Password
Service password

Recuperator operation signal - mode
<ul style="list-style-type: none"> None, Fans, Mode 1, Mode 2, Mode 3, Mode 4, Pause mode, Party mode, Airing mode, Out mode, Leading sensor, Primary heater thermostat, Secondary heater thermostat

Dewpoint settings
Dewpoint
<ul style="list-style-type: none"> On, Off

18 MENU - UNLOCK THE DEVICE

Menu available only after entering a special password.

Device blockage support
Device blockage



19 DESCRIPTION OF THE INSTALLER PARAMETERS

Parameter	Description
Confirm service configuration	After changing service settings a proper controller configuration must be confirmed to allow device to operate, p.21.
Filters settings	Settings related to anti-dirt filters. If manufacturer allows installer a menu will appear, otherwise all below settings remain on manufacturer's side.
<ul style="list-style-type: none"> Air supply filter – type 	Setting parameter according to which filters quality will be checked. Available options: <i>None, Time, Pressure switch, Transducer.</i>
<ul style="list-style-type: none"> Exhaust filter – type 	Setting parameter according to which filters quality will be checked. Available options: <i>None, Time, Pressure switch, Transducer.</i>
<ul style="list-style-type: none"> Filter classes parameters <ul style="list-style-type: none"> * Standard class * Medium class * Accurate class * Classes default settings (restore default parameters) 	Filters settings with division to accuracy classes. It is possible to set additional parameters in each class: <ul style="list-style-type: none"> * Filter class * Initial resistance (resistance value of clean filter in Pa) * Final resistance (maximum value of dirty filter in Pa) * Dirt alarm (dirt value that starts the alarm in %) * Central emergency mode (dirt value that starts emergency mode in %)
<ul style="list-style-type: none"> Detection mechanism (when choosing Time) 	Timed mechanism: <ul style="list-style-type: none"> *Days to alarm (filter work days starting the alarm) *Days to emergency mode (filter work days starting emergency mode)
<ul style="list-style-type: none"> Detection mechanism (when choosing Pressure switch) 	Detection with pressure switches setting: Pressure switch <ul style="list-style-type: none"> * logical state air supply filter (Normally open/Normally closed) * logical state exhaust filter (Normally open/Normally closed) * Exhaust filter lifetime (separate settings for air supply and exhaust in days) * Turning on emergency mode (separate settings for air supply and exhaust in %) *Dirt test delay (in minutes, parameter allows to set delay providing time to change throttles settings) *Dirt test adjustment (in V, parameter allows setting voltage controlling fans during tests)
<ul style="list-style-type: none"> Detection mechanism (when choosing Transducer) 	<ul style="list-style-type: none"> * Override filters replacement procedure (yes/no, immediate override filters replacement procedure). * Filters replacement by user (yes/no, permission for filters replacement procedure by user). * Air supply filter work time reset (yes/no,).
<ul style="list-style-type: none"> Filters support 	<ul style="list-style-type: none"> * Override filters replacement procedure (yes/no, immediate override filters replacement procedure). * Filters replacement by user (yes/no, permission for filters replacement procedure by user). * Air supply filter work time reset (yes/no,) * Exhaust filter work time reset (yes/no,)



	<p>* Emergency mode – turning off central (yes/no, central turn off override in case of emergency mode)</p> <p>* Emergency mode – air supply fan (setting demanded air supply fan velocity during emergency mode in %)</p> <p>* Emergency mode – exhaust fan (setting demanded exhaust fan velocity during emergency mode in %)</p> <p>* Dirt test frequency (period between following dirt test, in days min. 1 – max. 7)</p> <p>* Day of dirt test (day of the week settings to perform first dirt test Mon, Tue, Wed, Thu, Fr, Sat, Sun)</p> <p>* Starting hour of dirt test (setting starting hour of dirt test, range 1-23h)</p> <p>* Dirt test override (yes/no, allowing immediate start of dirt test)</p>
Manual control	Manual control allows manual setting of individual relay outputs. Attention! Use this menu with caution and turn on outputs knowingly to avoid damaging the recuperator.
Air supply and exhaust control	Setting control mode for fans: air supply and exhaust.
<ul style="list-style-type: none"> Control mode 	<p>Selection of smooth air supply and exhaust control:</p> <ul style="list-style-type: none"> <i>Standard</i> – no automatic fans velocity control. Fans velocity change is possible only by changing active operation modes or its settings. <i>Constant pressure</i> – fans velocity control to maintain constant pressure in channels: air supply and exhaust. Differential pressure sensors required. <i>Constant flow</i> – fans velocity control to maintain constant flow in channels: air supply and exhaust. Differential pressure sensors required.
IN1/IN2 inputs settings	Settings corresponding to IN1/IN2 digital inputs.
<ul style="list-style-type: none"> IN1/IN2 inputs operation mode 	Changing operation mode of IN1/IN2 digital inputs.
<ul style="list-style-type: none"> IN1, IN2 logical state 	Logical state related to detection of IN1 and IN2 expenditure. Available state: <i>Normally open</i> or <i>Normally closed</i> .
<ul style="list-style-type: none"> Hood mode support 	<p>Settings related to expenditure demand of fans in constant control mode.</p> <ul style="list-style-type: none"> <i>Air supply fan control from IN1, IN2</i> – setting air supply fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure. <i>Exhaust fan control from IN1, IN2</i> – setting exhaust fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure. <i>Air supply pressure from IN1 IN2</i> - setting pressure for air supply fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure. <i>Exhaust pressure from IN1 IN2</i> - setting pressure for exhaust fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure. <i>Air supply flow from IN1, IN2</i> - setting flow for air supply fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure. <i>Exhaust flow from IN1, IN2</i> - setting flow for exhaust fan velocity change for signal from IN1 or IN2. Value above 0 increase fan expenditure, value below 0 decrease fan expenditure.
<ul style="list-style-type: none"> Air quality sensor 	<p>Settings related to support of digital air quality sensor.</p> <ul style="list-style-type: none"> Sensor logical state – logical state of digital air quality sensor. Fans velocity – fans velocity after digital air quality sensor signal occurs.



	<ul style="list-style-type: none"> Alarm maintenance time – alarm maintenance time for bistate digital air quality sensor.
GHE/mixing chamber/cooler settings	On or off settings of individual recuperator inputs or outputs adjustment.
<ul style="list-style-type: none"> GHE support 	GHE control module turning on or off. If GHE is not available in the system it has to be turned on to avoid disturbance in control algorithms work.
<ul style="list-style-type: none"> Mixing chamber support 	Mixing chamber turning on or off.
<ul style="list-style-type: none"> Cooler support 	Turning on or off cooler in recuperator.
<ul style="list-style-type: none"> GHE sensor 	Additional GHE sensor turning on or off.
Heaters	Settings related to primary and secondary heaters.
<ul style="list-style-type: none"> Secondary heater type 	Selection of supported secondary heater.
<ul style="list-style-type: none"> Primary heater type 	Selection of supported electric primary heater.
<ul style="list-style-type: none"> Primary heater thermostat 	Setting thermostat logical state during controlling primary heater using thermostat.
<ul style="list-style-type: none"> Secondary heater thermostat 	Setting thermostat logical state during controlling secondary heater using thermostat.
<ul style="list-style-type: none"> Minimum air supply fan flow 	Minimum air supply fan flow, which allows secondary electric heater to operate.
Analog air quality sensor	Settings related to the support of analog air quality sensors.
<ul style="list-style-type: none"> Air quality sensor support 	Turning on selected analog air quality sensor. Available settings: CO ₂ sensor or humidity sensor.
<ul style="list-style-type: none"> Humidity sensor detection level 	Preset nominal value of relative air humidity in room.
<ul style="list-style-type: none"> Humidity sensor detection hysteresis 	Hysteresis restricting allowed humidity range in room.
<ul style="list-style-type: none"> CO₂ detection level 	Preset normal value of CO ₂ concentration in room.
<ul style="list-style-type: none"> CO₂ detection hysteresis 	Hysteresis restricting allowed CO ₂ range in room.
<ul style="list-style-type: none"> CO₂ sensor range 	Measurement range of installed analog CO ₂ sensor.
<ul style="list-style-type: none"> Fans velocity change 	Analog air quality sensor fans velocity change. If CO ₂ concentration or humidity are too low – velocity will decrease; if too high – velocity will increase.
Fans settings	Menu contains fans settings available for installer, where it is possible to set minimum and maximum fans adjustments and fans stop delay after electrical heaters operation.
<ul style="list-style-type: none"> Min. and Max. control of supply fan 	Minimum and maximum control that can be set for air supply fan. Setting should be adjusted to fan power.
<ul style="list-style-type: none"> Min. and Max. control of extraction fan 	Minimum and maximum control which can be set for exhaust fan. Setting should be adjusted on fan power.
<ul style="list-style-type: none"> Stop delay of air supply/exhaust fan 	Delay of air supply and exhaust fan stop after stopping electric heater.
<ul style="list-style-type: none"> Min. outside temp. 	Minimal outside temperature, below which operation will not be permitted. Below the threshold set in <i>Perm. from min. outside temp.</i> there will be no permission for recuperator to work. In addition in <i>Min. outside temp.</i> parameter the temperature value below which work of recuperator will not be permitted is set, including difference from this temperature in <i>Hyst. of min. outside temp.</i> The external temperature is measured by a sensor on the inlet of an intake.



• Start delay	System start delay after switching to <i>Work</i> mode, from <i>Off</i> mode, pending for throttle to open.
Inspection/blockade settings	Settings related to turning on/off general inspection support and recuperator operation blockage.
• Inspection function support	Turns on/off notification about necessity of periodic inspection.
• Device blockage support	Turn on or off work blockage function of recuperator.
• Inspection counter reset	Reset inspection counter for periodic inspection and start counting time until next inspection from the beginning.
• Amount of days till inspection	Setting amount of days until notification about necessity of periodic inspection is displayed.
• Amount of days till blockage	Setting amount of days after which device operation will be blocked.
• Device password unlocking	Setting a password by installer to unlock device. Device blockade is turned on by setting parameter <i>Device blockade</i> to <i>On</i> . The parameter is available after entering a special password in the menu Service settings .
Default settings	This menu allows restoring default settings for panel, service and client. Setting parameter <i>Restore default settings Panel</i> or <i>Restore default settings service</i> or <i>Restore default settings client</i> to <i>YES</i> deletes all changes made in panel settings by service or client and restores default settings (factory settings).
Exchanger cleaning	Setting related to cleaning of the exchanger.
• Manual cleaning start	Outside temperature below which fans velocity will be decreased or increased.
• Stage 1 duration	Step 1 duration of cleaning, where fan W1 stops and W2 works with 100%.
• Stage 2 duration	Step 2 duration of cleaning, where fan W2 stops and W1 works with 100%.
• Cleaning schedule (days)	Setting period of days when exchanger will be cleaned.
Exchanger dehydration	Settings related to exchanger dehydration function. Dehydration of the exchanger is done to drain off water from the exchanger by stopping air supply and exhaust fans, so water could easily filter down.
• Dehydration periods	Setting by how many hours exchanger dehydration function should start. Setting to "0" disables the function.
• Dehydration work time	Duration of exchanger dehydration process. During this procedure fans will be stopped.
Modbus settings	Settings related to Modbus communication. Parameters to be set: <i>Modbus address</i> and preferred <i>Transmission speed</i> , (9600, 19200, 115200), <i>Stop bits amount</i> and <i>Parity</i> .
• Modbus address	Settings related to Modbus address.
• Transmission speed	Transmission speed for Modbus communication.
• Stop bits amount	Setting related to number of stop bits.
• Parity	Setting related to parity.
• Modbus activation	Enable and disable the use of the Modbus protocol.
• Parameters edit	Allows to edit parameters using Modbus protocol.
• Recuperator control	Allows to control recuperator using Modbus protocol.



20 DESCRIPTION OF THE MANUFACTURER PARAMETERS

Parameter	Description
Confirm producer configuration	After changing service settings a proper controller configuration must be confirmed to allow device to operate, p.21.
Air supply and exhaust control	The menu contains settings defining, how to control air supply or exhaust fans using pressure sensors.
<ul style="list-style-type: none"> Pressure air supply/exhaust 	Pressure selection for air supply/exhaust fan. Available settings: <i>Internal sensor</i> installed on module board, <i>Analog sensor on AIN1/AIN2</i> , <i>Modbus sensor</i>
<ul style="list-style-type: none"> Fan K coefficient 	K coefficient value of air supply/exhaust fan, for constant flow control algorithm.
<ul style="list-style-type: none"> AIN1, AIN2 max. pressure value 	The maximum pressure value at AIN1 and AIN2 inputs for the analog sensor. Pressure corresponding to 10 V for the connected sensor.
<ul style="list-style-type: none"> Start level 	Initial speed set right after starting algorithm calculating preset air supply/exhaust fan adjustment.
Bypass settings	Bypass settings related to smooth bypass throttle control and bypass2 throttle control.
<ul style="list-style-type: none"> Bypass support 	Option to turn on bypass support in device.
<ul style="list-style-type: none"> Control mode 	Setting the bypass throttle control mode: <i>Bistate</i> - digital or analog.
<ul style="list-style-type: none"> Minimum bypass control 	Setting minimum control for bypass throttle with PID control.
<ul style="list-style-type: none"> Maximum control 	Setting maximum control for bypass throttle with PID control.
<ul style="list-style-type: none"> Kp settings 	Setting amplification of the PID algorithm for bypass control.
<ul style="list-style-type: none"> Ki settings 	Setting integration of the PID algorithm for bypass control.
<ul style="list-style-type: none"> Td settings 	Setting differentiation of the PID algorithm for bypass control.
<ul style="list-style-type: none"> Actuator full open time 	Time to full open of mixer actuator.
Primary heater	Primary heater – manufacturer settings.
<ul style="list-style-type: none"> Heater Kp settings 	Setting amplification of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Heater Ki settings 	Setting integration of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Heater Td settings 	Setting differentiation of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Min. control value 	Setting minimum control value.
<ul style="list-style-type: none"> Max. control value 	Setting maximum control value.
Secondary heater	Secondary heater – manufacturer settings.
<ul style="list-style-type: none"> Heater Kp settings 	Setting amplification of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Heater Ki settings 	Setting integration of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Heater Td settings 	Setting differentiation of the PID algorithm for water and electric heater.
<ul style="list-style-type: none"> Start delay 	Delay of the secondary heater start after air supply fan start
<ul style="list-style-type: none"> Actuator full open time 	Time to full open of mixer actuator.
Cooler	Settings related to cooler manufacturer settings.
<ul style="list-style-type: none"> Cooler Kp setting 	Setting amplification of the PID algorithm for cooler.
<ul style="list-style-type: none"> Cooler Ki setting 	Setting integration of the PID algorithm for cooler.
<ul style="list-style-type: none"> Cooler Td setting 	Setting differentiation of the PID algorithm for cooler.
<ul style="list-style-type: none"> Actuator full open time 	Time to full open of mixer actuator.
<ul style="list-style-type: none"> Cooler blockade time 	Time through which cooler will not start after closing bypass.
Exchanger anti-freezing	Settings related to exchanger anti-freezing mechanism.



• Exchanger de-freezing support	Turning on and off exchanger de-freezing function. It is recommended to turn this function on when there is a risk of frosting or exchanger is iced.
• Using primary heater	Turning on or off de-freezing mechanism using primary heater.
• Using dewpoint	Using calculated dewpoint temperature to start de-freezing.
• Dewpoint hysteresis	Dewpoint hysteresis specifying de-freezing turn off temperature.
• De-freezing turn on temp.	Extractor temperature below which de-freezing turns on.
• De-freezing turn off temp	Extractor temperature above which de-freezing turns off.
• Min. air supply fan velocity	Setting air supply fan velocity during exchanger de-freezing.
• Air supply fan velocity change	Changing air supply fan velocity during exchanger de-freezing.
Filters settings	Manufacturer settings related to filters.
• Air supply filter – type	Setting parameter according to which filters quality will be checked. Available options: <i>None, Time, Pressure switch, Transducer.</i>
• Exhaust filter – type	Setting parameter according to which filters quality will be checked. Available options: <i>None, Time, Pressure switch, Transducer.</i>
• Configured by installer	Parameter allowing setting access level to filters replacement function. Available settings: <i>Installer/User/Configured by installer.</i>
• Functions available for installer	Settings available for installer: <ul style="list-style-type: none"> • Filter classes parameters • Timed mechanism • Detection by pressure switches • Pressure difference transducers • Dirt test delay • Dirt test adjustment
• Filter classes parameters <ul style="list-style-type: none"> ➢ Standard class ➢ Medium class ➢ Accurate class • Classes default settings	Filters settings with division to accuracy classes. It is possible to set additional parameters in each class: <ul style="list-style-type: none"> * Filter class * Initial resistance (resistance value of clean filter in Pa) * Final resistance (maximum value of dirty filter in Pa) * Dirt alarm (dirt value that starts the alarm in %) * Central emergency mode (dirt value that starts emergency mode in %)
• Filter replacement by installer	Setting enabling or disabling filter replacement and deletion of filter work time by installer.
Supply temperature protection	Settings related to protection against too high or too low air supply temperature.
• Protection against too high temp.	Turns on/off protection mechanism against too high air supply temperature.
• Limit value of the air supply temp.	Limit value of the air supply temperature above which recuperator will be turned off for preset time.
• Operation pause time	Recuperator operation pause time after exceeding maximum air supply temperature.
• Protection against too low temp.	Turns on/off protection mechanism against too low air supply temperature.
• Low air supply temp. threshold	Setting low air supply temp. threshold.
• Detection time of low temp.	Detection time of too low air supply temperature.
Sensor behind exchanger	Turns on/off support of the sensor behind exchanger.



Alarms erase	Function allowing erase of registered alarms.
Analog outputs change	The possibility of configuring analog voltage outputs OUT1..OUT4 (0-10 V) to support selected ventilation system devices.
Control change 0 – 10 V	Menu allows control change (normal 0 – 10 V or reversed 0 – 10 V) on analog outputs.
Output 1...4	Control mode setting 0 – 10 V for output 1...4, normal or reversed.
Min./Max. voltage value output 1...4	Setting min./max. value on analog output 1...4.
PWM settings	Settings related to PWM operation speed.
• Primary heater PWM control	Setting PWM operation speed for primary heater. <i>Normal mode</i> : f=6 kHz, SSR: f=0.1 Hz.
• Secondary heater PWM control	Setting PWM operation speed for secondary heater. <i>Normal mode</i> : f=6 kHz, SSR: f=0.1 Hz.
Exchanger cleaning	Setting related to exchanger cleaning.
• Exchanger cleaning support	Turns on/off support of the exchanger cleaning mechanism.
Mixing chamber settings	Settings for the mixing chamber throttle.
• Mixing chamber Kp	Setting integration of the PID algorithm for mixing chamber control.
• Mixing chamber Ki	Setting amplification of the PID algorithm for mixing chamber control.
• Mixing chamber Td	Setting differentiation of the PID algorithm for mixing chamber control.
• Minimum control of mixing chamber	Setting minimum control for mixing chamber throttle below which control algorithm will not go.
• Maximum control of mixing chamber	Setting maximum control for mixing chamber throttle.
Exchanger type	Setting the type of used exchanger: cross-flow or rotary. Selection changes automation scheme on the main display and amends operation scheme of automation system under installed exchanger.
Relay outputs settings	Allows to change relay outputs settings to work under different connections configuration.
Default settings	The menu allows to restore default settings for <i>Service</i> , <i>Client</i> and <i>Manufacturer</i> settings. Parameter <i>Counter erase</i> can erase service counters.
Access passwords change	Change of service and manufacturer menu access passwords.
Recuperator operation signal – mode	Changes function under state of relay output WORK.



21 OUTPUTS CONFIGURATION AND CONFIRMATION OF CONFIGURATION

The controller allows configuration of active functions on relay outputs and analog outputs.



Before making the electric connection of outputs, make sure that their configuration is correct.

Additionally, the installer or manufacturer must confirm the correctness of outputs configuration. Without confirmation, the following alarm is activated: *Recuperator settings error, possible settings deletion*, and the recuperator will not work. After applying installer and manufacturer settings, confirm settings correctness by choosing *Yes* in the *Confirm service/manufacturer configuration* parameter of the controller to allow its operation.

21.1 OUTPUTS CONFIGURATION FOR FAN CONVECTOR

Fan convector is a device with functionality of both cooler and secondary heater. Controller has software modules installed, which allow to control such devices. To turn on fan convector support go to *Manufacturer menu*. Under sub-menu *Analog outputs change* and change any function on digital output to *Fan convector*. Such modification will delete settings of outputs 0 – 10 V, that are connected with cooler and secondary heater control, and will assign settings of abovementioned devices to fan convector. From sub-menu *Relay outputs settings*, it is possible to define additional signals controlling fan convector: signal permitting its operation – *Fan convector operation* – and signal selecting fan convector operation mode – *Fan convector heating/cooling*.



Operation permission signals and fan convector mode selection signals must be mandatorily declared if they are required by device manufacturer.

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To properly configure fan convector function settings in service menu must be also amended. In sub-menu *GHE/Mixer chamber/Cooler settings* choose *Cooler support* parameter and set it to *Yes*. Then, in sub-menu *Heaters* change *Secondary heater type* parameter to *Analog water* or *Analog electric*. Keep in mind, that functions protecting secondary heater remain active and depending on the selected heater type the controller will act differently after thermostat output is activated. In case of secondary water heater soaking process will start. In case of electric heater an operation blockade of secondary heater will activate. Decision of which heater should be used is made by person configuring the system.



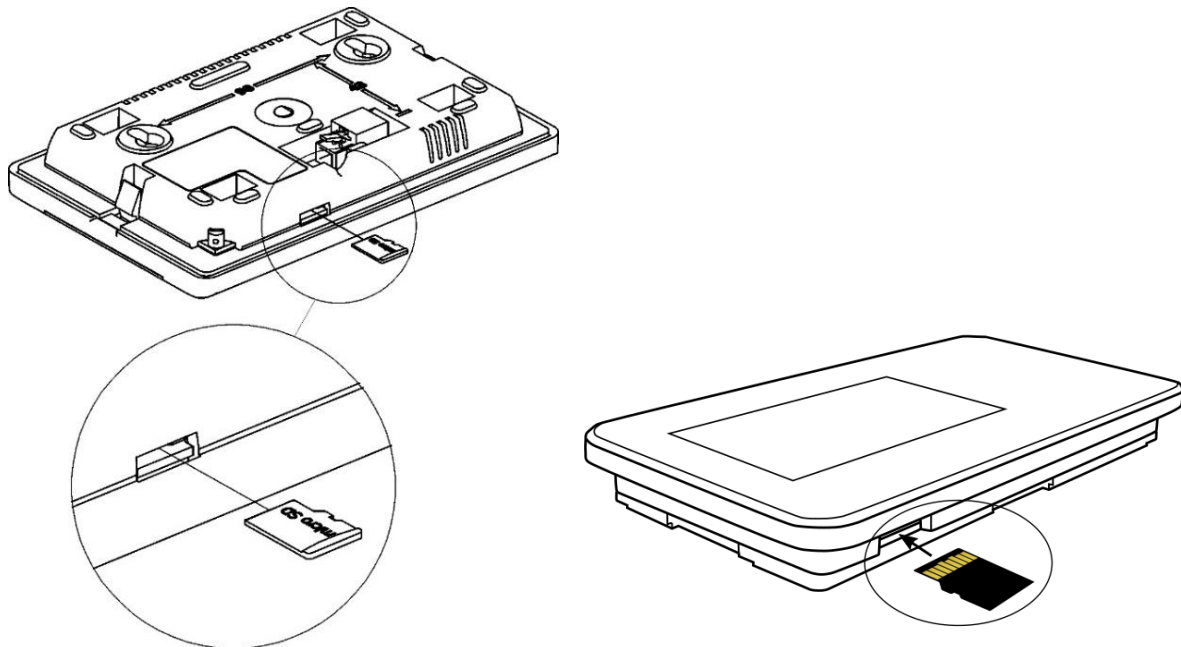
Incorrectly defined settings may cause fan convector malfunction or lower heating comfort in ventilated rooms.

Fan convector function does not have its own settings, when cooling is needed the controller cooler settings are used, while heating is needed the declared secondary heater settings of controller are used. Controllers settings can be amended in relevant sub-menus in *Manufacturer menu*.



22 SOFTWARE UPDATE

Software update can be performed using only microSDHC memory card, inserted into the socket in control panel housing.



Before starting controller software update all peripheral devices operating with the central must be disconnected from electric power supply.

In order to make software update the controller's power supply must be disconnected and control panel with the display detached from mounting cover, then memory card inserted into the socket shown in above figure.

The memory card should contain new software in *.pfc format, two files: panel program file and controller module program file. New software should be placed directly on memory card with no folders or sub-folders. Next, the panel should be attached to the cover and power supply connected.

Enter into menu:

Menu → **General settings** → **Software update** and install new software, first in main controller module, secondly in control panel.

23 FILTERS SUPPORT

Filters support menu allows central manufacturer defining to which parameters, configuration actions and filters support installer will have access.

To control filters with differential pressure transducers only optional transducers can be used, which are installed directly on controller's board.



Manufacturer configures:

- detection method (time, pressure switch, differential pressure transducer),
- operation period parameters, pressure drops and individual filter classes marks,
- digital inputs selection for pressure switches in manufacturer menu: **Inputs/outputs settings** → **Inputs configuration** → **Digital inputs change**,
- worn out alarm levels for individual filter classes,
- testing procedures parameters and their starting periods, (e.g. delay time and tests adjustment parameters, day and hour of test to start), dirt test adjustment has identical value in Volts for both fans,
- ventilation central reaction (turn off, adjustment) to excessive filters dirtying,
- whether filters are replaced by user or installer, whether installer defines who has access to replacement function,
- to which elements of filters system installer can have access.

24 OTHER FUNCTIONS

24.1 UNLOCK THE DEVICE

In case of blocking the controller's work, e.g. by unauthorized activation, enter to the menu:

Menu → **Service settings**

enter a special password and unlock the device.

24.2 POWER SUPPLY OUTAGE

In case of a power supply outage, the controller recovers to the operation state before power outage.

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25 PARTS OR SUBASSEMBLIES REPLACEMENT

25.1 MAINS FUSE REPLACEMENT

Use 230 VAC mains fuses, antisurge fuses, made of porcelain 5 mm x 20 mm. Output circuit fuses should be selected depending on the load. Standard current for the fuse is 6.3 A. A smaller fuse is allowed if the total load on the circuits is lower.

25.2 CONTROL PANEL REPLACEMENT

When replacing control panel make sure that its software is compatible with software in controller's module.

Changes record:



The manufacturer reserves a right for making improvements and modifications of the devices.



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Assembly dimensions of the MIDI module

