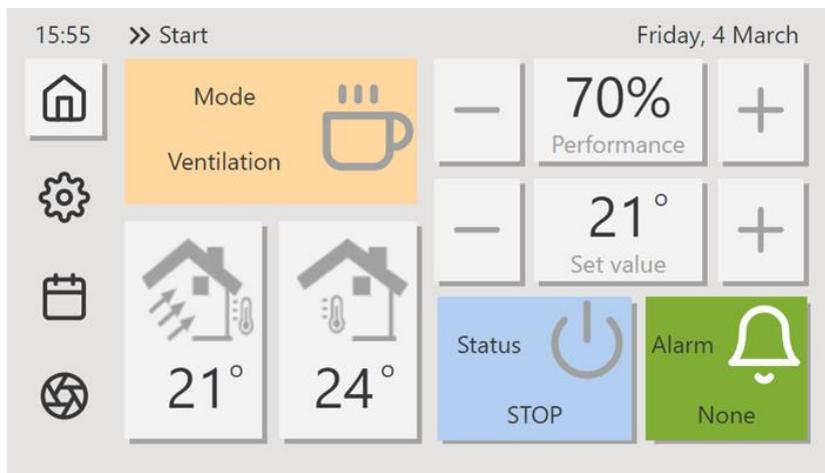


CONTROL AUTOMATION STW-6 MAXI



INSTRUCTION MANUAL

Panel version: 114

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1 Safety requirements

1.1 General safety requirements



Device may be installed only by person having suitable certificates. Before performing any action it is necessary to acquaint with following installation instruction. The device may only be installed in enclosure which ensures that there is no access to parts that could cause risk to health or life.

The controller can not be used in conditions of water condensate occurrence and exposed to water action. Protection against dust and water access should be ensured.

The controller is designed to operate in enclosure. The controller enclosure must prevent access to hazardous parts and ensure air exchange in the enclosure.

Value of the programmable parameters must be selected for given type of installation, taking into consideration all operating conditions thereof. Mistaken parameter selection can lead to emergency state. Programmed parameter modification should only be carried out by authorised person acquainted with Instruction Manual.

Device programming does not provide high degree of protection against installation malfunction; this should be provided by using external, controller-independent safeguards.

Additional elements securing against controller's failure or errors in programming consequences thereof should be used. The controller provides the following procedures: shutting down the heater at overheating, protecting the water heaters against freezing, shutting down the fans when alarm conditions occur; however, the elements used must have their own protection independent of the controller.

Fuse protection is provided in the mains controller power output circuits. Value of the fuses must be selected according to connected load.

The electrical installation in which the controller is operated should be protected by fuse selected appropriately according to the loads involved.

The device must be utilized in accordance with intended use thereof and within range of operating parameters for which it was designed. Otherwise, Manufacturer is not liable for consequences resulting from such use.

In any event controller construction modification is not allowed to be performed. It is forbidden to operate device that is defective or has been repaired by unauthorised service centre.

230V mains cables should be routed such that they do not come into contact with the cables of low-voltage sub-assemblies. The cables should not come into contact with surfaces with temperature exceeding their nominal operating temperature. Access to the controller by persons not acquainted with the contents of present instruction manual, in particular in case of children, should be prevented.

1.2 WEEE 2012/19/EU Directive

The purchased product has been designed and manufactured of materials and components with highest quality that are subject of recycling and can be reused. Product meets requirements of Directive 2012/19/UE of European Parliament and Council from 4th of July 2012 on wasted electric

and electronic equipment (WEEE), according to which it is marked with symbol of crossed-out wheeled bin to indicate that it is subject to selective collection. Obligations after termination of product's life: the packaging and the product at the end of its useful life should be disposed in suitable recycling company. Do not dispose the product together with normal waste. Do not burn the product. By complying with the above obligations for the controlled disposal of wasted electrical and electronic equipment, damaging the environment and hazards to human health will be avoided.



1.3 Information on documentation

Instruction Manual constitutes supplement to documentation of the mechanical ventilation system with heat recovery function. User should be acquainted with entire Instruction Manual. We do not accept any liability for damages caused by failure to follow Instruction Manual. This Instruction Manual should be carefully stored.

2 GENERAL PART

STW-6 maxi controller communication with the external system which enables control and monitoring of the device, occurs via ModBus RTU protocol. Moreover, it cooperates with the internet module. The STW-6 maxi controller is designed to control recuperator with the heat exchanger. Based on the values read out from the sensors, it recovers heat from the ventilated rooms. Controller's function is to optimally control the fans (supply and exhaust ones). It enables manual control, and schedule setting to determine when and with what parameters the system should operate as well.

It is also responsible for controlling such devices as cooler, heater, heating/cooling unit, bypass and ground heat exchanger. The controller's analogue and digital inputs enable the external sensors and control signals to be connected.

The controller indicates and saves alarm conditions ensuring appropriate system response. It creates records of total operating time of individual components in counters and calculates the running recuperator operating efficiency.

STW-6 system of ventilation controlling consists of three mutually cooperating devices:

1. The controller to which all sensors and devices operating in the air handling unit are connected, such as the fans, actuator, differential pressure presostats, temperature sensors, etc.
2. The operator's panel with liquid-cristal display by means of which user is programming and supervising ventilation operation.
3. The internet module which may serve as additional operator's panel.

2.1 Controller's serial number, programming version

Controller's serial number may be read in following places:

1. Sticker on controller module (laterally from right side).
2. From internet browser or application.
3. From operator's panel (SETTINGS → REGISTERING → SERIAL NUMBER)

3 Controller operation by means of PS-D6 panel

3.1 General information

The 4.3" touch-panel serves for complete service of the STW6 air handling unit controller. It is possible to read out from panel's level all most important parameters, mode change, and settings, performing of service and configuring activities of the controller. Casing is available in two colour versions: white and black and is adapted to surface installing.

3.2 Home page screen

Once switching of the power supply and panel connection to the controller the home page will appear on the screen thereof. It shows the most important parameters and allows to set easily operation setting of the air handling unit.



Fig. 1 Main screen

ICON	NAME	DESCRIPTION
	Main screen	Transition to main screen
	Settings	Transition to settings
	Time schedule	Transition to time schedules
	The air handling unit	Transition to visualization
	Operation mode	Transition to operation modes
	Air intake temperature	Air intake temperature readout
	Panel temperature	Panel temperature readout
	Capacity	The air handling unit set capacity (regulation by means of - and +)
	Set temperature	The air handling unit set temperature (regulation by means of - and +)
	Status	Switching the status
	Alarms	Transition to messages Green color - no alarm Orange color - alert Red color - alarm
	Time and date	Setting possibility in Timer

3.3 The air handling unit preview

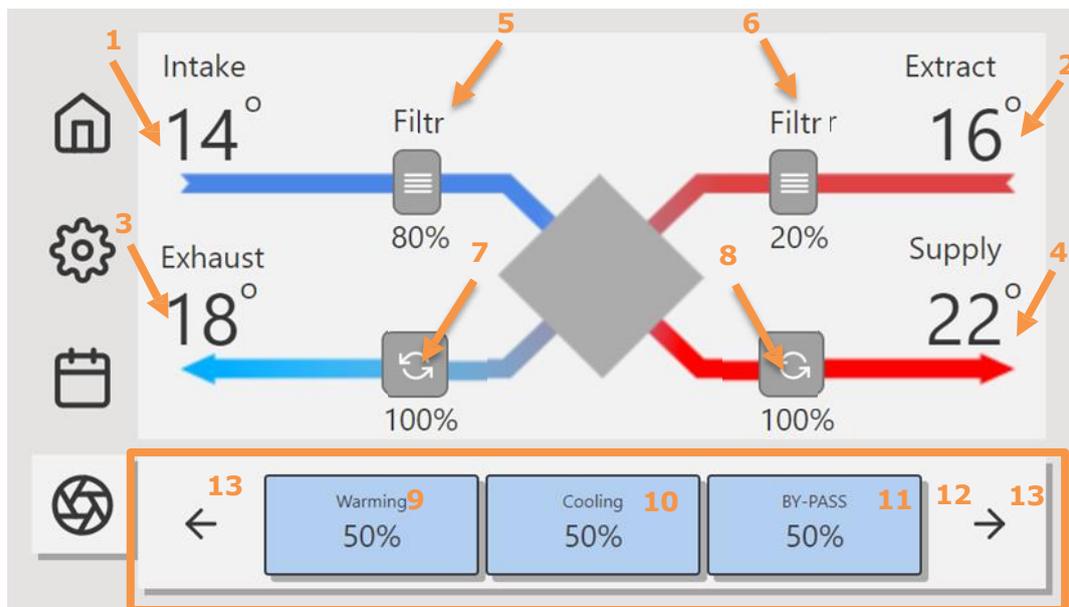


Fig. 2 The air handling unit preview window

REFERENCE NUMBER	NAME
1	Air intake temperature
2	Exhaust air temperature
3	Launch temperature
4	Air supply temperature
5	Air intake filter
6	Exhaust air filter
7	Launch fan capacity
8	Air supply fan capacity
9	Heating
10	Cooling
11	By-Pass
12	Heater
12	Cooler
12	Throttles
12	Set fan capacity
12	Heating/Cooling
12	Recirculation
12	Initial electric heater
12	Echanger efficiency
13*	Current control status displaying

13* – Depending on the controller’s configuration and the additional equipment installed, on the main screen control information is displayed. E.g. when the air handling unit is equipped with heater control function, the suitable control value in relation to the installed heater is displayed. If the controller has no such function, information on the heater will not be displayed.

3.4 Screen saver



Fig. 3 Screen saver

Time, date, air intake temperature and panel temperature are displayed on the screen saver. Setting "0 seconds" disables the screen saver.

3.5 Navigating around the panel

The panel allows to go to the home screen at any time with using Home Screen icon. We navigate using the arrows.

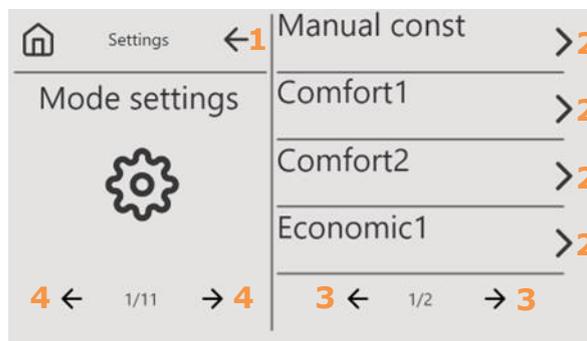


Fig. 4 Navigation panel

ICON	NAME	DESCRIPTION
	Home Page screen	Transition to home page screen
1	Function key	Return to previous menu
2	Function key	Transition to sub-menu/parameter changes
3	Function keys	Navigating around menu options
4	Function keys	Navigating around setting options

3.6 Parameter value change (of option)

Both when changing the parameter value and when selecting options, changes are made using the keys for decreasing and increasing parameter value.

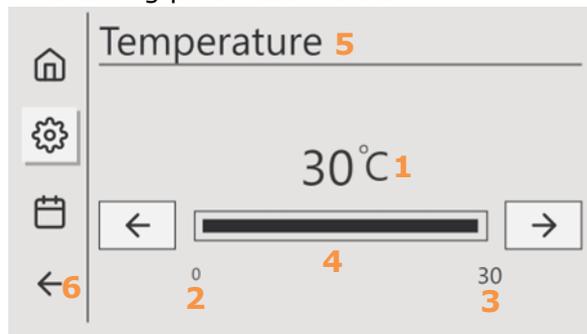


Fig. 5 Exemplary view of parameter value change

ICON/REFERENCE NUMBER	NAME	DESCRIPTION
←	Function key	Parameter value decreasing
→	Function key	Parameter value increasing
1	Parameter value / Option	Set parameter value / Selected option
2	Range (minimum)	Minimum range value
3	Range (maximum)	Maximum range value
4	Progress bar	Parameter value visualization in relation to range
5	Parameter name	-
6	Return	Return to previous view

4 User's mode settings

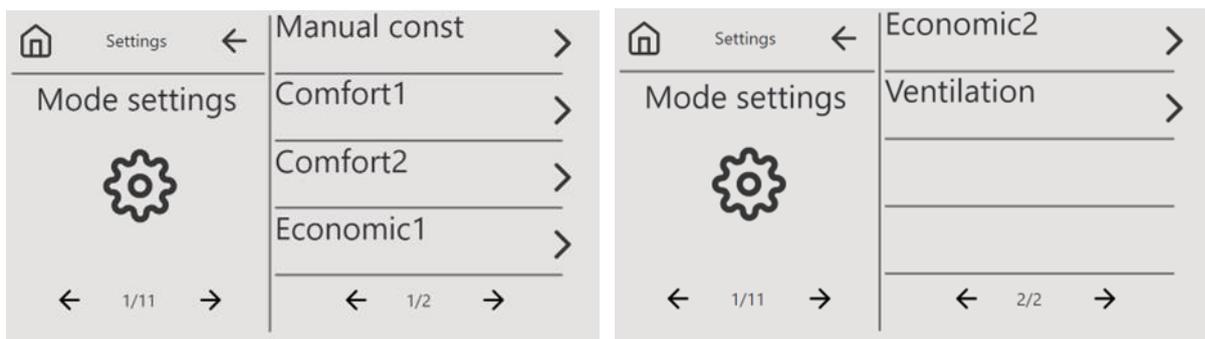


Fig. 6 Mode settings

User was provided with 6 operation modes of the air handling unit, for each of which 2 parameters can be defined. The exception is **Ventilation** – possibility of capacity setting (only the capacity in % is displayed on home page screen, with possibility to change the setting). User's modes are independent of **Schedule**.

PARAMETER NAME	DESCRIPTION	RANGE
SET TEMPERATURE	Set temperature of the air handling unit	15 ... 35 [°C]
SET CAPACITY	Set capacity of the air handling unit	5 ... 100 [%]

5 Operation mode

Operation of the air handling unit can be controlled through the defined operating modes of the air handling unit (User's Mode Settings), the schedule modes (Schedule) and Capacity Mode. There are 2 additional modes available from this level which are dependent on **Manual Fixed Mode** and **Schedule Mode**.

Time Mode is controlling operation of the air handling unit with using setting from Schedule.

Temporal Mode is controlling operation of the air handling unit with using settings from Schedule – for non-defined setting periods, settings are overwritten with using of **Manual Fixed Mode**.

Capacity Mode – depending on arrangement, more information in item 16.3

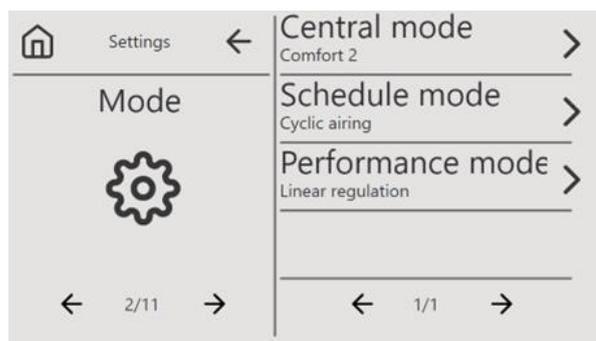


Fig. 7 Operation Mode

6 Status of the air handling unit

From status view of the unit we have access to status of the unit and status thereof.

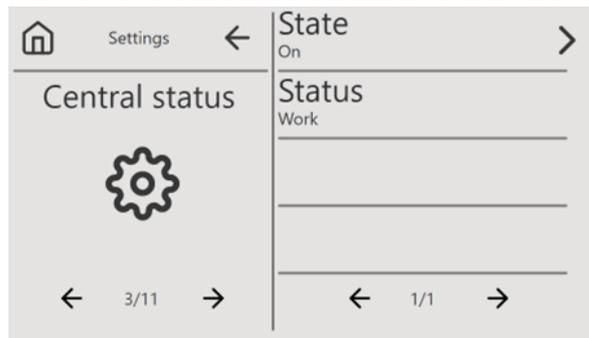


Fig. 8 Status of the air handling unit

PARAMETER NAME	OPTIONS
CONDITION	Off, On
STATUS	Inicialization, Throttle Opening

7 Leading sensor

As the leading sensor we can select the panel temperature sensor, air supply temperature sensor, or exhaust air temperature sensor.

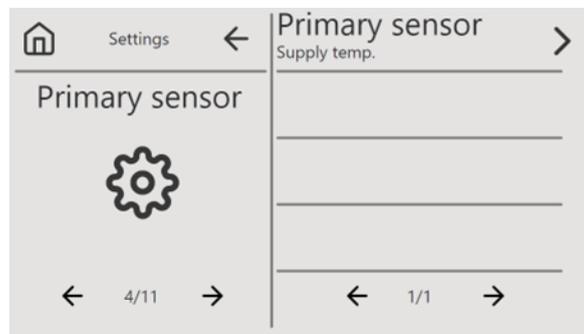


Fig. 9 Leading sensor

8 User's settings

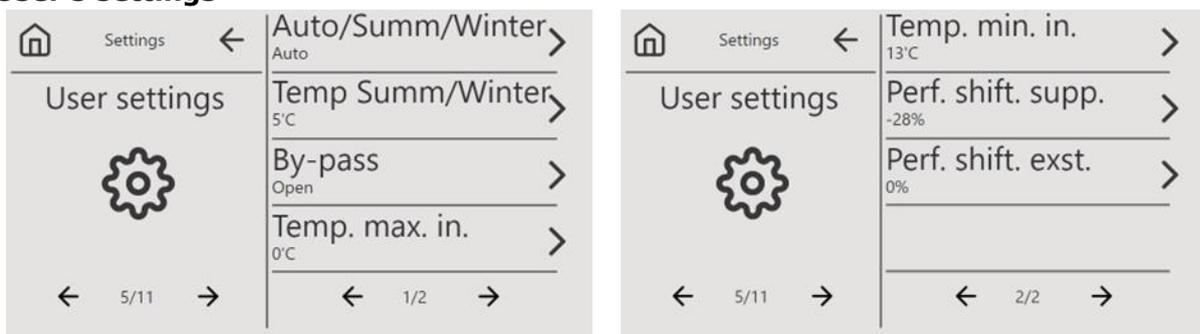


Fig. 10 User's settings

User's settings allow by-pass operation to be automated depending on season of the year. Automatic mode allows season of the year to be detected by means of air intake temperature.

User can determine temperature limit (Temperature Summer/Winter) on which changeover to **Winter** or **Summer** mode depends. If **air intake temperature** is lower than **Temperature Limit**, **Winter** mode is switched on. Otherwise, mode is switched to **Summer**.

CONDITION	MODE
AIR INTAKE TEMPERATURE < TEMP. SUMMER/WINTER	Winter
AIR INTAKE TEMPERATURE > TEMP. SUMMER/WINTER	Summer

Winter mode causes permanent by-pass closing. **Summer** mode can cause the by-pass to open for chill or heat recovery. User can manually set Winter or Summer mode.

It is also possible to specify minimum and maximum supply air temperature. The air handling unit will be aiming to achieve values determined by range depending on the demand. For the supply and exhaust air, capacity offset in relation to set capacity may be determined.

9 Panel settings



Fig. 11 Panel settings

PARAMETER NAME	DESCRIPTION	RANGE
SCREEN SAVER	Time after which the screen saver will appear	0 ... 60 [s] stroke every 10 s
SCREEN BRIGHTNESS	Screen brightness during saver displaying	0 ... 100 [%] stroke every 1%
OPERATION BRIGHTNESS	Screen brightness	10 ... 100 [%] stroke every 10%
TOUCH SIGNAL	Key press sound	ON / OFF
ALARM SIGNAL	Alarm sound	ON / OFF

10 Recuperator registration

From this level, the recuperator can be registered with using activation code. Then, with using the arrow of **Recuperator status** one should go to Keyboard where activation code may be entered and confirmed. In case of entering correct code, Recuperator Status should change from "Unregistered" into "Registered". It is not possible to enter code again. After entering the Recuperator Status tab, the keypad will be displayed and after while it will return to the previous window.

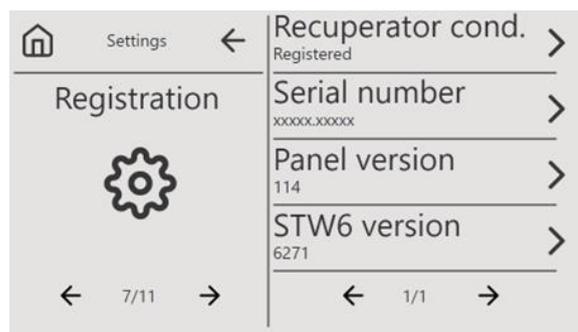


Fig. 12 Recuperator registration

From this level, it is also possible to view the air handling unit serial number, the panel and controller programming versions.

To obtain activation code, contact with the air handling unit Supplier

11 Timer

For controllers with internet module, the panel automatically downloads the time from device with internet access. For controllers without internet module, the time and date must be set manually. The time and date are displayed on the Home page screen.



Fig. 13 Timer settings

12 Messages



Fig. 14 Messages

Messages are divided into 2 groups: alarms and alerts. The appearance of **alert** will not cause the air handling unit to stop, whereas **alarm** will cause the air handling unit to stop until the problem is resolved.

Alert "Register Recuperator" will be displayed until activation code is entered, see item 10. For detailed list of alarms and alerts, see item 24.

13 Schedule



Fig. 15 Schedule

Schedule allows temperature and capacity of the air handling unit to be set depending on the time of day. The schedules "All week", "Monday-Friday", "Saturday-Sunday" allow the day to be divided into 4 **Entries**. Entry defines operating time range and the set temperature and capacity for given range. Example of settings for **Entry1**:

PARAMETER NAME	VALUE
ENTRY1-FROM HOUR	5
ENTRY1-FROM MIN.	30
ENTRY1-TILL HOUR	10
ENTRY1-TILL MIN.	30
ENTRY1-SET TEMPERATURE	27 °C
ENTRY1-SET CAPACITY	100%

This means that if schedule with such entry defined will be selected, the air handling unit will operate from 5.30 a.m. to 10.30 a.m. with 100% efficiency and at desired temperature of 27 °C.

14 Keypad

Keypad allows activation code to be entered. Code should be entered with using the numeric keypad and then confirmed with key . When correct cod is entered, we will be transited to previous view.

Return to previous view occur after pressing .

Code cancellation will occur after pressing .

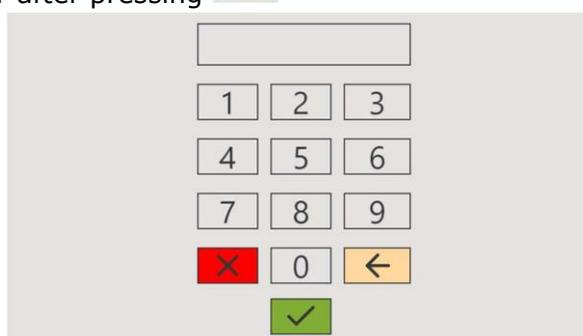


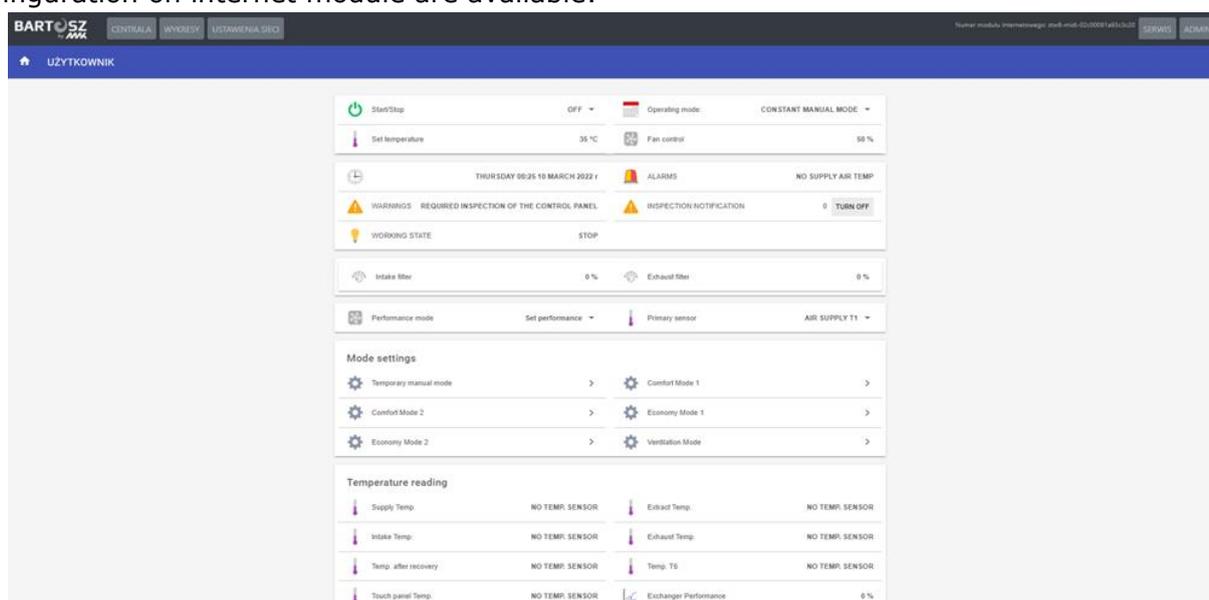
Fig. 16 Keypad

15 Controller's operation by internet module

15.1 Internet module

It brings possibility to supervise and control operation of the air handling unit through internet. It can be additional User's panel.

On website www.bartoszwentylacja.com.pl instructing films of first connection and configuration on internet module are available.



15.2 Logging:

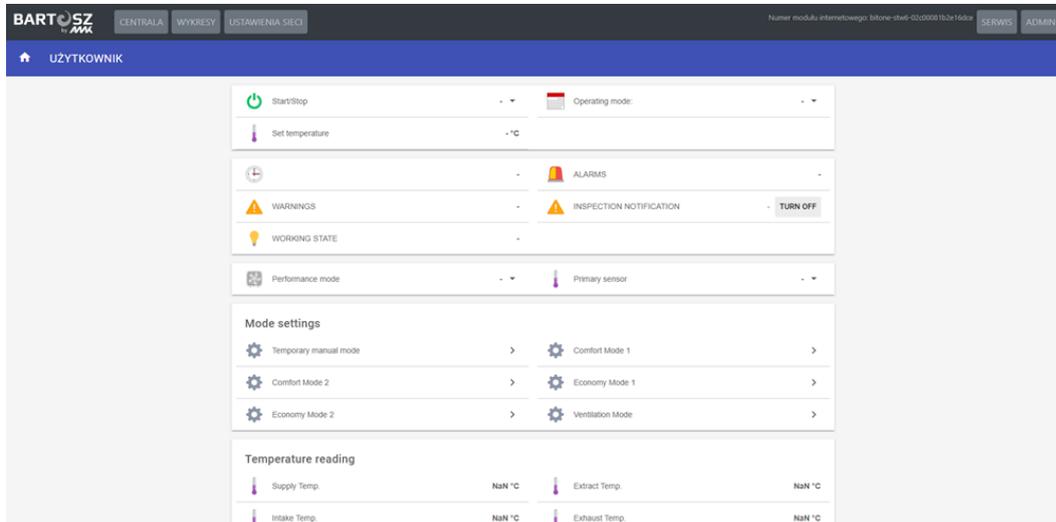
Connection through internet browser:

a) Local connection:

The computer should be connected to the internet module which is connected to the controller, by means of cable of patchcord type. Then, in internet browser address **169.254.0.1** should be entered (website refreshing may be necessary).

User's name: user

Password: given on controller



b) Remote connection:

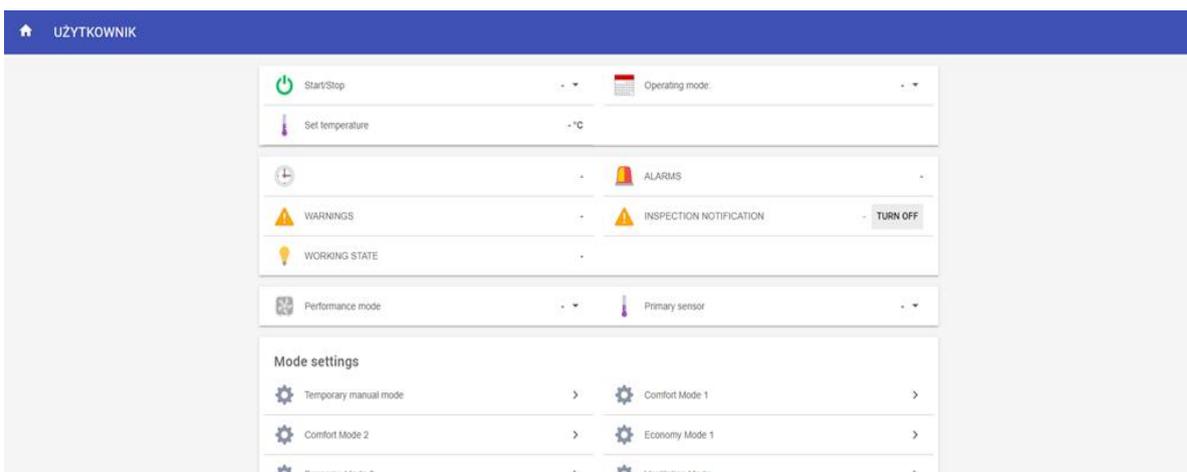
After connection to internet, address should be entered in the browser box:

<https://XXX.stw6.bartosz.com.pl/>

* XXX – unique device serial number (given on the name plate, 10 digits)

User's name: user

Password: given on the controller



15.3 Connection through OpenHAB application

To utilize the mobile app, download the OpenHAB app from the App Store (iOS system) or Play Store (Android system) and make sure whether the internet module is connected to the power

supply.

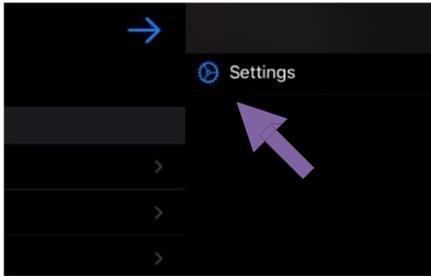


Application in App Store

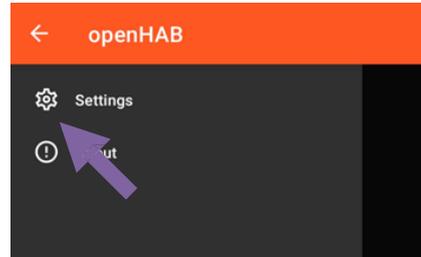


Application in Play Store

The next step after downloading application is to log into the system with using login and password provided. After launching application, go to section of settings.

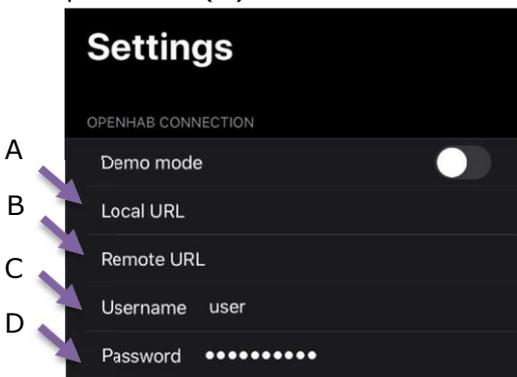


iOS System

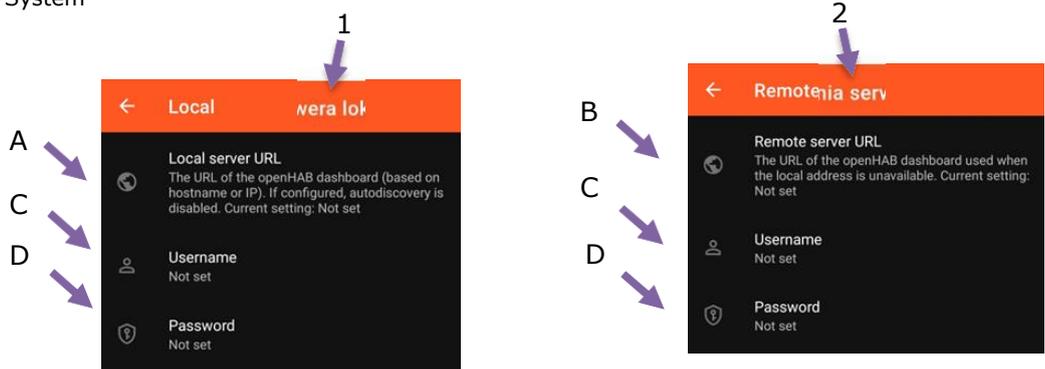
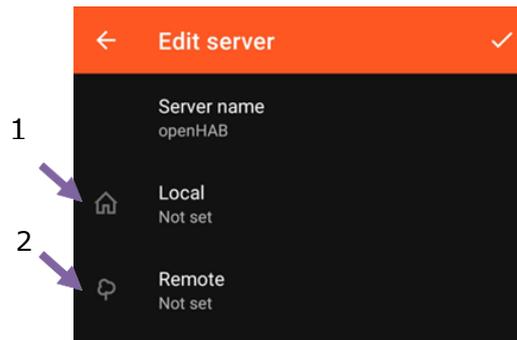


Android System

In section of settings, local server settings (1) and the remote server settings (2) should be entered subsequently. Connection parameters are local address (A), remote address (B), user's name (C) and password (D).



iOS System



Android System

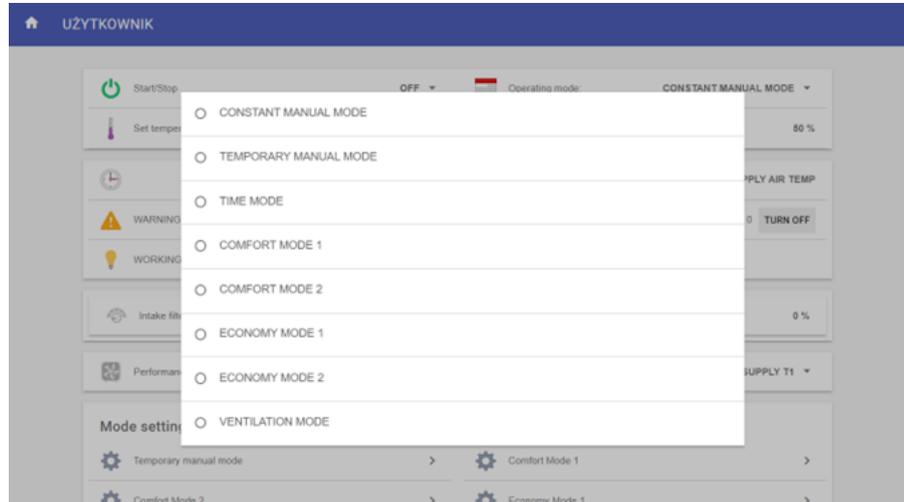
After logging into the system, prepared view "UNIT" should be selected.

15.4 Instruction manual of control panel from User's level

1. Current date and hour should be set entering in "Timer - entry". After setting of arrow in the left upper corner should be pressed.

Hour	8	Minute	27
Day of the week	Thursday	Day	10
Month	March	Year	22

2. Selecting "OPERATING MODE", mode in which the air handling unit is to operate may be selected.



3. Schedule

By activating time programmes, the air handling unit will be operated according to the time programme. On the tab PROGRAMME SELECTION, programme in which the air handling unit is to operate is selected. Whereas, by entering the individual time programme, the settings and at what time the ventilation should be switched on and off are selected.

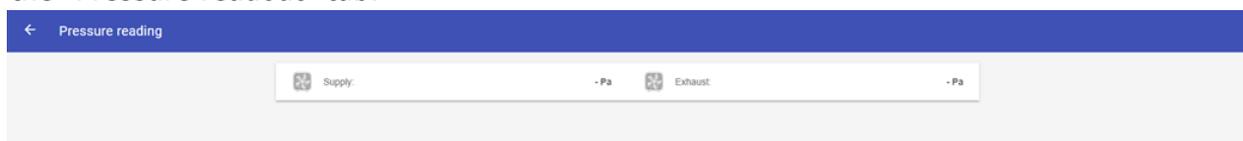
Mode selection	User program time mode
Whole week	Monday - Friday
Saturday - Sunday	Cyclic ventilation
User	

4. Temperature adjustment - is located in tab "User's Settings".

Auto/Summer/Winter	Summer	BY-PASS	Open
Temp. Summer/Winter	28 °C	Maximum supply air temperature	35
Minimum supply air temperature	20	Shift of air supply Performance	- %
Shift of air exhaust Performance	- %	Language selection:	ENGLISH

5. Pressure readout

If the air handling unit is equipped with pressure sensors, current system pressure can be read out in the "Pressure readout" tab.



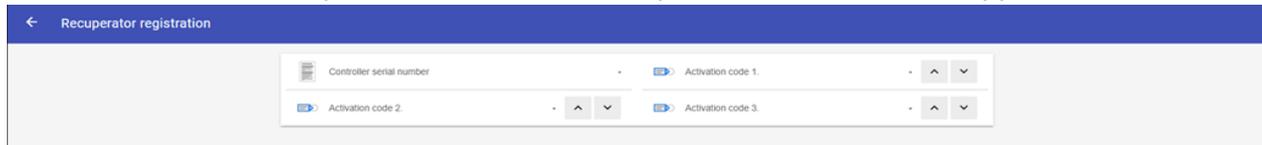
6. Flow rate readout

If the air handling unit is equipped with flow rate sensors, current system flow rate can be read out in "Flow rate readout" tab.



7. Recuperator registration

To register the air handling unit, it is necessary to enter "Recuperator registration", then enter activation code, for example, 07-02-07, and then press arrow in the left upper corner.

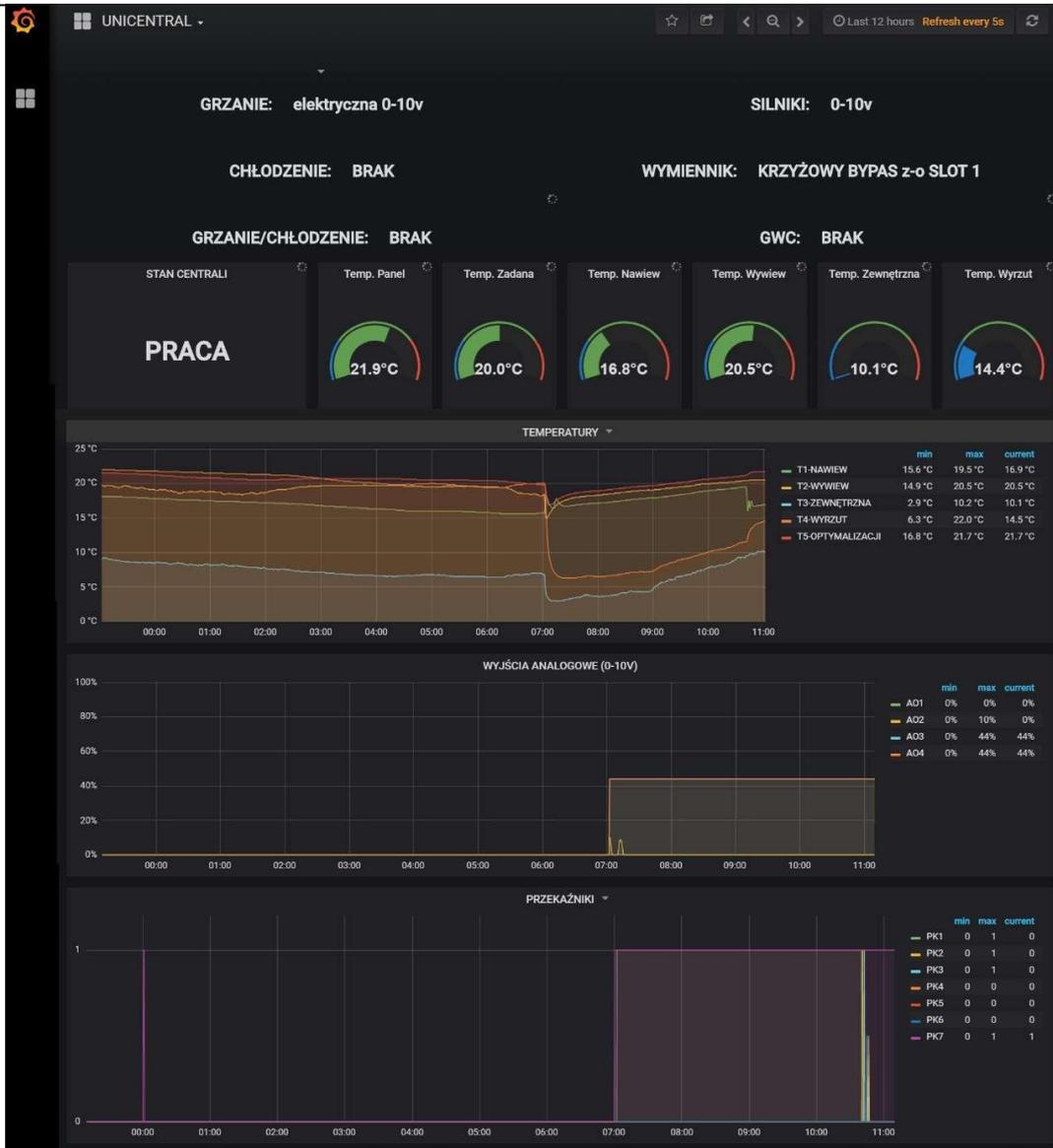


8. Message Inspection

Manufacturer of the air handling unit determines the necessary frequency of the air handling unit inspection. The air handling unit inspection is concluded with inspection protocol. If the air handling unit requires to be technically inspected, "1" will appear at item "MESSAGE INSPECTION". The inspection message can be deleted by pressing "OFF". After pressing "OFF", "0" will appear.

9. The air handling unit operating monitoring including data archiving

With using of internet browser, by entering "DIAGRAMS" tab in the control panel, it is possible to monitor operation of the air handling unit, trends of selected variables and the list of alarms up to 2 years back.



10. List of alarms and alerts



Alarms occurring in real time are marked in red. From the right side, alarms in time space are marked. Critical alarm stops the air handling unit operation. Alerts occurring in real-time are marked in orange.

16 The air handling unit operating modes

16.1 Manual operating modes

Continuous manual operating mode

In this mode, user enters the fan capacity and set air supply temperature for the rooms or the room (in interior). The set temperature will be adjusted provided that any control devices (e.g. heater, cooler, by-pass) are connected to the air handling unit. Once set values have been entered, the air handling unit should be switched on with using "ON" command. The ventilation will be operated with these settings continuously until user changes thereof or switches off the air handling unit.

Temporal manual operating mode

In this operating mode, user enters the fan capacity and the air supply set temperature for the rooms or the room (in interior). The set temperature will be adjusted provided that any control devices (e.g. heater, cooler, by-pass) are connected to the air handling unit. Once the set values have been entered, the air handling unit should be switched on with using "ON" command. The ventilation will be operated with these settings until first change of settings appears in the time programme (schedule) of the time mode and at this moment the ventilation will be switched from temporary mode into **time mode**.

Modes Comfort 1, Comfort 2

Operating principle is the same as in "Continuous manual mode". Operating parameters for these modes (i.e. set temperature and fan capacity) must be defined earlier in "Mode settings".

Economic 1, Economic 2

In economic mode, the air handling unit is aiming to the set temperature by adjusting the by-pass actuator. The heater and cooler do not operate.

Ventilation Mode

In this mode, user enters the fan capacity. The by-pass is opened. Ventilation will be running with these settings continuously until user changes thereof or switch off the air handling unit.

16.2 Time programmes

"Whole week" - This programme consists of four time entries which are implemented each day throughout the week. Single time entry consists of the following elements: hour of start / hour of termination; capacity with which the ventilation is operating; set temperature of the supply air to the rooms or in the room (in interior). Entry is inactive if the set fan capacity is equal 0%.

"Monday-Friday" - This programme consists of four time entries which are implemented every Monday to Friday. Single time entry consists of the following elements: hour of start - hour of termination; capacity with which ventilation is operating; the set temperature of the supply air to the room or in the room (in interior). Entry is inactive if the set fan capacity is equal 0%.

"Saturday-Sunday" - This programme consists of four time entries which are implemented on Saturday and Sunday. Single time entry consists of the following elements: hour of start / hour of termination; capacity with which ventilation is operating; the set temperature of the supply air to the rooms or in the room (in interior). Entry is inactive if the set fan capacity of the fans is equal 0%.

"Periodical aeration" (available from browser level) - This programme consists of two time entries which are implemented alternately without interruption. Single time entry consists of the following elements: number of hours when given entry is active and capacity with which ventilation is operating. Temperature control is disabled.

Time mode User's programme (available from browser level) - This programme consists of ten time entries which are implemented on any weekday. Single time entry consists of the following elements: hour of start / hour of termination; capacity with which ventilation is operating; set temperature of the supply air to the rooms or in the room (in interior) and weekdays on which the time entry will be implemented. If recirculation throttle is present in the system, it is additionally possible to program opening time thereof. This is only possible in the user's programme. The entry is inactive until it is enabled it with "On" command.

16.3 Capacity mode

- **"Set capacity"**, it is fan operating capacity which was set for operating of given "Operating mode".
- **"Constant flow rate control"**, the controller is supervising that the set amount of air flows through the air handling unit [m^3/h] - the value [m^3/h] is entered by the manufacturer of the air handling unit. If the User sets, for example, 50% of capacity, the air handling unit will be achieving 50% of the factory set value [m^3/h].
- **"Constant pressure control"**, the controller is supervising that there is constant set pressure [Pa] in the air handling unit - [Pa] value is entered by the air handling unit manufacturer. If User sets, for example, 50% of capacity, the air handling unit will be achieving 50% of the factory set [Pa] value.
- **"Linear controlling from sensors 0-10V"** - operation of the air handling unit is controlled on the basis of indications from 0-10V sensors, e.g. the air quality sensor. Detailed parameters can be set by Admin or Serviceman.

17 Leading sensor

Temperature controlling sensor is selected as leading sensor. Supply air sensor was factory set as leading sensor. When there are no panel, leading sensor is automatically switched into the room exhaust air temperature sensor. Whereas, in case of damaged exhaust air temperature sensor, the leading sensor is switched into the supply air temperature sensor. The outdoor temperature sensor is involved in determining whether it is winter or summer (whether to heat or cool); if it is faulty, winter is set.

18 Temperature adjustment

User having additional devices responsible for temperature controlling, such as heater, cooler or by-pass, may switch them on or off from the controlling algorithm via Auto/Summer/Winter settings.

1. In mode Winter, cooler is disabled. By-pass is closed.
2. In mode Summer, heater is disabled. By-pass is controlled automatically.
3. In mode Auto, it is set automatically from mode Summer into mode Winter and from mode Winter into mode Summer. Transition temperature is set by user.
4. By-pass setting. Open/Close/Auto
5. Maximum and minimum of supply air temperature: e.g., in case of temperature control setting from exhaust air temperature, the supply air temperature is aiming to achieve the set exhaust air temperature as quickly as possible, i.e. it supplies air with the maximum or minimum permissible temperature.
6. Supply and exhaust air capacity transfer. It is fan capacity transfer on supply air separately from exhaust air 0 - x%.

19 Method of equipment controlling

19.1 Throttles

If the air handling unit is equipped with throttles, 3-minute time is set for the throttles to open each time the unit is switched on (before the fans start).

19.2 Heater

1. Water heater:

If the air handling unit is equipped with water heater, when starting the air handling unit in winter, "heater warming-up" time is set (valve opened to 100% and the circulation pump is put into operation. Factory set time is 30 seconds. This time can be changed from "admin" level. The water heater is used to heat supply air to the rooms. The heating power is regulated by means of actuator with mixing valve. The pump activates and the valve opens to 100% when the controller detects "winter". Controlling only works when the fans are running. "Anti-freeze" alarm (physically anti-freeze thermostat is located behind the heater) causes ventilation stopping and opening the heater at 100% of output. After ceasing the alarm, ventilation returns to normal operation. The activation is signalled by means of message "FREEZING ALARM".

2. Electric heater:

Electric heater serves to heat air supplied to the rooms. Heating power is controlled via analogue output or on/off with using relay output.

19.3 Cooler

1. Ice water unit

The air handling unit is equipped with ice water unit. It is controlled by means of chill activation signal (relay output) and controlling with mixing valve actuator (0-10V or in 3-point manner).

2. Freon cooler

Activated by means of relay output. This function is adapted against to switch on freon units whose task is to chill air supplied to the rooms with using the cooler.

19.4 Heat pump

Heat pump controlling: controlling via defined two relay outputs and a 0-10V analogue output for seamless controlling. The first relay means start (permission to operate), the second relay means heating/cooling (high state means cooling, low state means heating).

19.5 Heat exchanger

- Heat exchanger by-pass controlling. Heat exchanger by-pass operates first of all as cooling function of air supplied to rooms in situations when heat recovery is too high or, additionally as heating function, if suitable temperature prevails outside the building (i.e., temperature is higher than set temperature).

* By-pass operating:

Temperature	By-pass actuator position
$T_{out} < \text{set for transition into mode Winter or manually set into mode Winter}$	Closed
$T_{out} < T_{exhaust} < T_{set}$	Heat recovery/ controlled closing
$T_{out} > T_{exhaust} > T_{set}$	Chill recovery/ controlled closing
$T_{out} < T_{exhaust} > T_{set}$	Controlled opening

* Set temperature (T_{set}) - it may be controlled from:

- Supply air temperature
- Exhaust air temperature
- Panel temperature

* In case of lack or panel leading sensor failure, controlling is automatically switched into exhaust air temperature controlling. Whereas, in case of lack or exhaust air temperature failure, controlling is automatically switched into exhaust air temperature controlling.

* By-pass is closed at disabled ventilation.

* Rotary heat exchanger. When ventilation is disabled, the rotor of rotary exchanger is disabled.

BY-PASS has possibility to operate in three operating modes:

- Auto – it is operating automatically according to algorithm from the table above
- Close – permanently closed

- Open – permanently opened

NOTICE! By-pass opening at sub-zero temperatures threatens condensate to freeze in the exchanger. Such situations should be avoided and be aware of it, as it brings risk of damaging the exchanger and voiding the warranty.

19.6 Ground Heat Exchanger (GWC function)

1. Air intake

Controlling of air intake actuator is implemented on an "on-off" basis. If the relay is on, GWC source is selected. If the relay is off, the outdoor air intake is selected directly. GWC function is set automatically. The controller selects the outdoor air intake at the start of fan operation on: "Test time" to check the current temperature. Based on outdoor temperature, GWC, supplied, of the room and that set, it decides on the most preferable air source depending on whether it should heat or cool. The controller, during ventilation operation, every time period set: "Minutes of GWC operation to test" is testing through the time: "Minutes of the air intake/glycol test". In case of alarm temperature exceeding below the "Lower GWC operating temperature" or above the "Upper GWC operating temperature", the outdoor air intake is automatically selected for the ground bed resting time for the time of "GWC operating minutes to test".

2. Glycol

Control algorithm is identical to that of the "Air intake" position, whereas it is implemented by enabling the circulation pump.

- Common setting parameters:
 - * Test minutes air intake/glycol
 - * GWC upper operating temperature
 - * GWC lower operating temperature
 - * Test minutes air intake/glycol
 - * GWC Operation minutes to test
 - * Lift shifting at GWC

19.7 Recirculation

1. On/off controlled recirculation

- Recirculation control is implemented on "on-off" basis, with using the relay. Circulation mode can be selected from the service or admin level in tab Settings->Recirculation:
 1. Recirculation is On – recirculation enabled permanently
 2. Recirculation is Off - recirculation disabled permanently
 3. Recirculation is Auto - recirculation operates in automatic mode
- Parameters from "Recirculation" menu are responsible for automatic operation: "Minimum supply air temperature", "Minimum outdoor temperature", "Minimum humidity", "Maximum humidity", "Forced capacity". When recirculation is activated, the fan capacity is increased by parameter "Forced capacity".
- Activating hysteresis for humidity measurement is 2%, 1% each down and up from parameter value "Minimum humidity" and "Maximum humidity" with delay of 10 seconds. Recirculation activation from the temperature condition occurs with delay of 10 minutes when measurement falls below value set in parameters "Minimum supply air temperature" and "Minimum outdoor temperature". The recirculation deactivation hysteresis is 3 degrees upwards with delay of 30 minutes. The conditions activating recirculation constitute logical sum in automatic operation "Recirculation auto".

2. Seamlessly controlled recirculation

- Throttles controlled by 0-10V analogue signal. In case when recirculation has not been configured, at the air handling unit disabled, the throttles are closed, and opening occurs when the air handling unit is enabled. In case when recirculation is configured, the throttles, when the air handling unit is disabled, are closed. When the air handling unit is started up, throttle opening process does not occur. Possible opening occurs at recirculation closing. (When the air handling unit is disabled, recirculation is 100%). The throttles operate

inversely in relation to recirculation. There is possibility of separate configuration of 0-10 outputs for recirculation, air intake and launch throttles. Detailed recirculation parameters can be set from Admin or Serviceman level.

20 System

System settings are entered when the air handling unit is put into operation for the first time or when the ventilation system is rebuilt. Manufacturer provides pre-configured programme for specific ventilation system as specified by Customer. During operation, User enters system setting corrections improving exclusively the quality of use and control.

20.1 Timer

Timer function allows the real-time timer according to which the time programme is implemented to be set. Timer setting should be checked after long power failures and after time change from winter to summer time and from summer to winter time. Timer without power supply is maintained for minimum of 12 months and should not change time.

NOTICE!!!

AUTOMATION IS SECURED

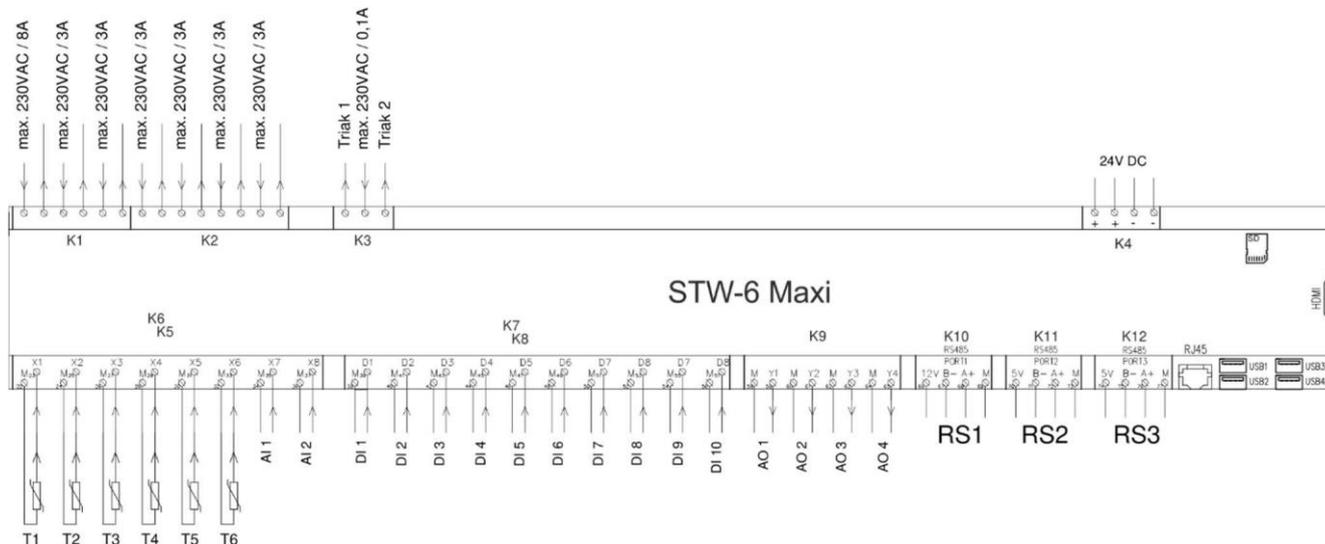
Operating time from code entering – 500 hours

21 Installation, connection and service settings

21.1 Controller's technical data

Version	STW-6 Maxi
Supplying	24V DC 50Hz
Communication	3x RS485 RS1 – panel PS-D6 RS2 – extension modules, panel PS-T6 RS3 – system service BMS
Inputs	6 inputs of temperature measurement (measurement accuracy within range of -35–60°C for outdoor sensor, 0-60°C for remaining: +/- 2°C, within range of 0-25°C is +/- 1°C)
	2 analogue inputs of voltage measurement from sensors (0-10V)
	10 digital inputs
Outputs	4 analogue voltage outputs (0-10V)
	7 relay outputs (1x8A, 6x3A)
	1 output 12V, 2 outputs 5V
Power consumption	With operator's panel maximum 9.5W
Power carrying capacity	maximum 1kW
Operation temperature	-10°C ~ +40°C
Application	OpenHAB 2
Level IP	IP20
Dimensions	width: 212 x height: 89 x depth: 63 (mm)

21.2 Exemplary controller's electric scheme



Controller's scheme with embedded internet module

Analogue inputs:

- T1 – supply air temperature sensor;
- T2 – exhaust air temperature sensor;
- T3 – outdoor air temperature sensor (air intake)/GWC;
- T4 – exhaust air temperature sensor (launch);
- T5 – air temperature sensor behind UOC;
- T6 – air temperature sensor behind NEW;
- AI1 – RH sensor;

Analogue outputs:

- AO1 – supply air fan control;
- AO2 – exhaust air fan control;
- AO3 – heater control;
- AO4 – cooler control;

Relay outputs:

- PK1 – start NE / of circulation pump NW;
- PK2 – ON by-pass actuator UOC (by-pass);

- AI2 - VOC / CO₂ sensor;
- Digital inputs:
- DI1 - alarm SAP (fire alarm);
- DI2 -supply air filter presostat;
- DI3 -exhaust air filter presostat;
- DI4 - supply air fan failure;
- DI5 - exhaust air fan failure;
- DI6 -forcing of Comfort1 mode;
- DI7 - free
- DI8 - water heater frosts;
- DI9 - confirmation of supply air throttle actuator;
- DI10 - confirmation of exhaust air throttle actuator;
- Power supply:
- + - cable +24VDC;
- - cable GND;
- PK3 - OFF UOC by-pass actuator (by-pass);
- PK4 - ON 3-way NW / ON PC valve actuator;
- PK5 - OFF 3-way NW / heating / cooling PC valve actuator;
- PK6 - operation;
- PK7 - operation, throttle, air intake/launch;
- Triak outputs:
- TK1 - free (max 230VAC/30VAC);
- IN - triak power supply;
- TK2 - free (max 230VAC/30VAC);
- Transmission channels:
- RS1 - panel PS-D6;
- RS2 - panel PS-T6, extension module;
- RS3 - BMS;
- RJ45 - web
- USB - Wi-Fi module

21.1 PS-D6 and PS-T6 panel installing and connection

The control panel type of PS-D6 is designed for indoor wall mounting. The panel cannot be used in condensation conditions and must be protected against water. PS-D6 panel should be installed at height enabling comfortable operation.

To reduce temperature measurement interference by the panel, places lighted by the sun, with poor air circulation, close to heating devices, directly next to doors and windows should be avoided (minimum 200 mm from the edge of the door as standard).

To protect the panel against scratches, protective film is placed on the screen. Once the installation work is completed, the film should be carefully taken off from the panel screen.

Recommended cable for connection to the controller terminals LiYCY 4x0.5mm². To connect the cable, unscrew the screw at the bottom and remove the rear part of the housing.

Notice! From the panel side, we recommend installing the cable without the sleeve ends.

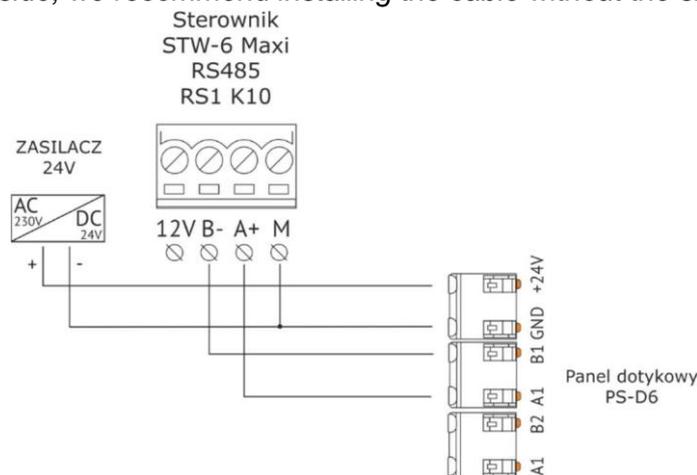


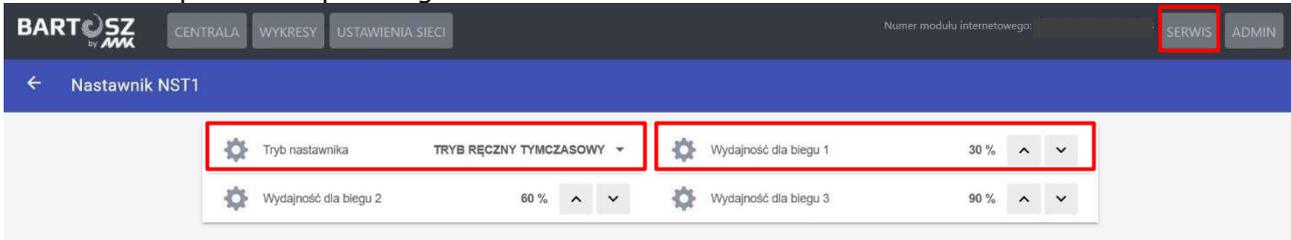
Fig. 17 PS-D6 connection including controller

PS-T6 panel

PS-T6 control panel enables following parameters to be controlled:

- ON / OFF of the air handling unit;
- value change of set temperature;

- operating mode change / fan gears (1 gear-30%, 2 gear-60%, 3 gear-90% - possibility to change percentage points through application or website → Installer's module - "Service" tab);
- any setting change (capacity, temperature, start/stop) by means of the panel in the air handling unit operating in TIMER MODE causes automatic change of its operating mode into FIXED MANUAL MODE (default mode) or TIMER MANUAL MODE (variant selection possibility through application or website → Installer's module - "Service" tab). Return to TIMER MODE is only possible by reactivating thereof (PS-D6 panel/application/website). Detailed descriptions of operating modes are available in the "STW-6 User's Instruction Manual".



SCREEN	FUNCTION
ON OFF □□□□ □□□□	The air handling unit ON / OFF
	The air handling unit operating mode / fan gears
18° □□□□	Value of set temperature
	Alert – it does not cause the air handling unit to stop
	Alarm – it stops the air handling unit operation

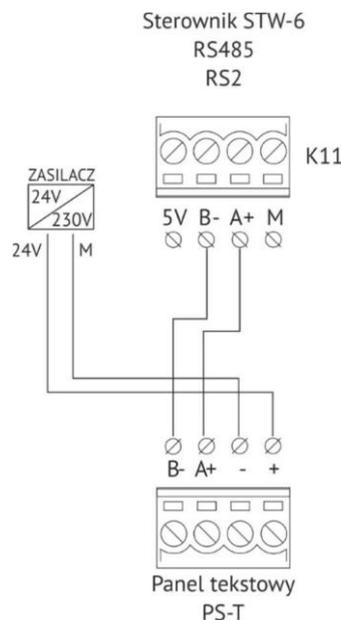


Fig. 18 PS-T6 connection including controller

21.2 Service mode

Access to service mode is possible after entering Installator's password. To enter to service menu, it is advised to go through tab 11 Service and click the "arrow" .

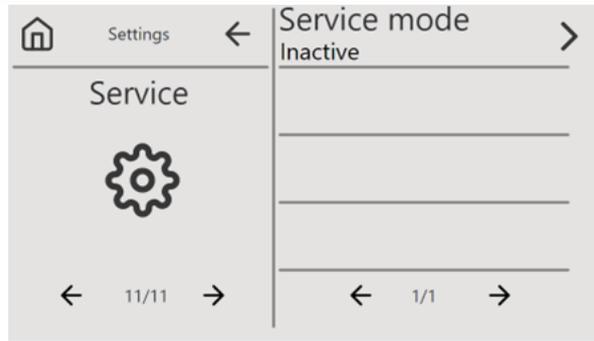


Fig.19 Screen; Service mode

Once clicking, the window with numerical keypad will appear enabling code to be entered.

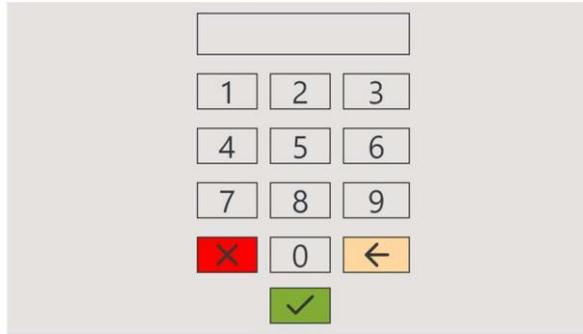


Fig. 20 Window to enter the access code

If the access code entered is correct, the screen with the first tab of service menu will appear.

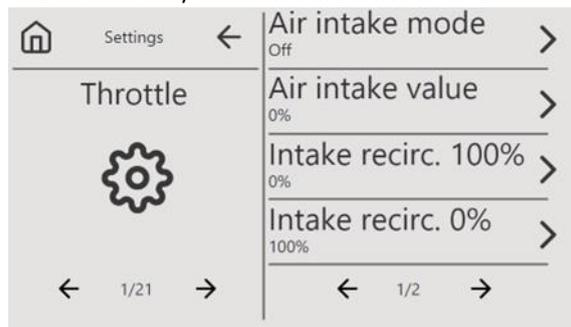
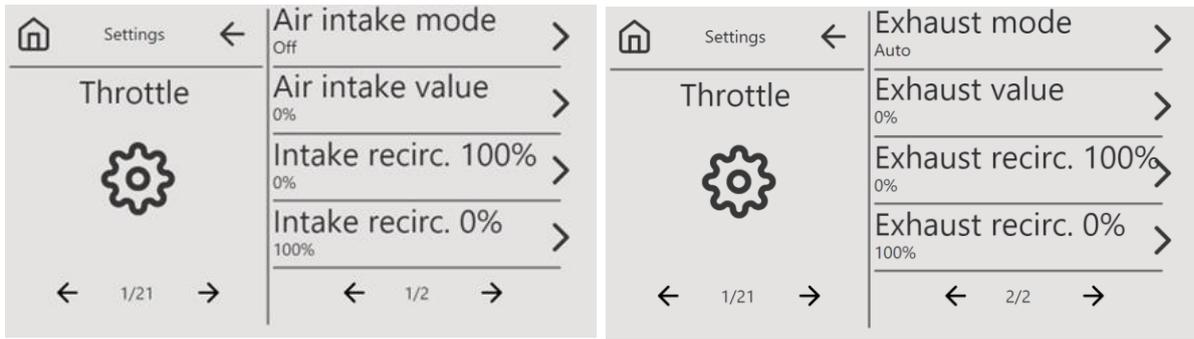


Fig. 21 First screen of service menu

Service menu consists of 21 tabs. To move to the next card, click the icon with the "→" symbol (arrow). After entering the service menu, the "service mode" is automatically activated what gives possibility to manually adjust the analogue and digital outputs. For correct operating of the system in automatic mode, it is necessary to exit the service mode by exiting to the user panel. Descriptions of the individual components can be found later in this instruction manual.

NOTICE! To disable the service mode, go to tab 21 Panel Reset and press Reset. Black screen will appear on the panel and the panel will be restarted.

THROTTLES



Rys. 22 Screen; throttles

Settings are selected when the throttles are controlled seamlessly with using 0-10V signal. Air intake mode/launch mode - AUTO/OFF/ON/HAND - setting option of air intake/launch throttle control selection.

- **Auto** – throttles are controlled automatically depending on the air handling unit configured
- **OFF** – throttle closed – 0%
- **ON** – throttle opened – 100%
- **HAND** – possibility of manual controlling of throttle opening degree - 0-100%

Set air intake value/ Set launch value– set value of throttle 0-100%, manual setting level of throttle opening. Active parameter at **HAND** mode configuration.

Recirculation air intake 100% / Recirculation launch 100% - level of recirculation for air intake /launch 100%, level of recirculation below which throttle set value will be 100%.

Recirculation air intake 0% / Recirculation launch 0% - level of recirculation for air intake/launch 0%, level of recirculation below which throttle set value will be 0%.

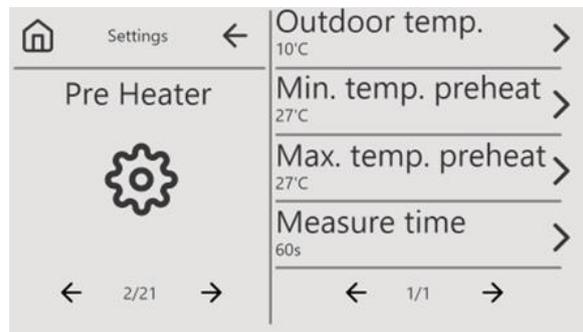


Fig. 23 Initial electric heater setting screen

INITIAL ELECTRIC HEATER

- **MINIMUM TEMP. PRE HEATER** – minimum temperature required behind initial heater. Heater is enabled below this value.
- **MAXIMUM TEMP. PRE HEATER** – maximum temperature required behind initial heater. Heater is disabled above this value.
- **MEASUREMENT TIME** – interval at which measurement expressed in seconds will be carried out.

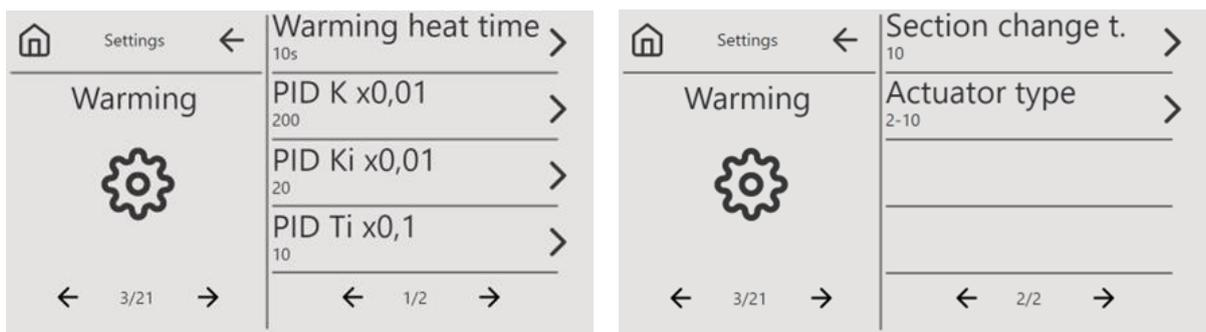


Fig. 24 Heating parameter setting screen

MAIN HEATER (SECONDARY)

- HEATER’S HEATING TIME – in case if water heater is configured, it is time through which pump is operating and valve is opened in 100%.
- PID K – amplification coefficient of controller PI proportional member.
- PID Ki – amplification coefficient of controller PI integral action member.
- PID Ti x0.1s – time of integral action of controller PI integrating member.
- SECTION CHANGE TIME – change interval for multi-section heaters.
- ACTUATOR 0-10 / 2-10 – controlling signal selection for actuator.

COOLING

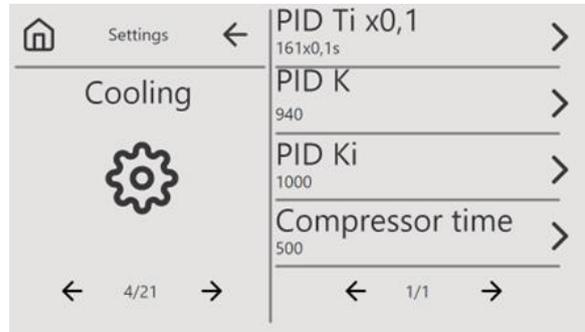
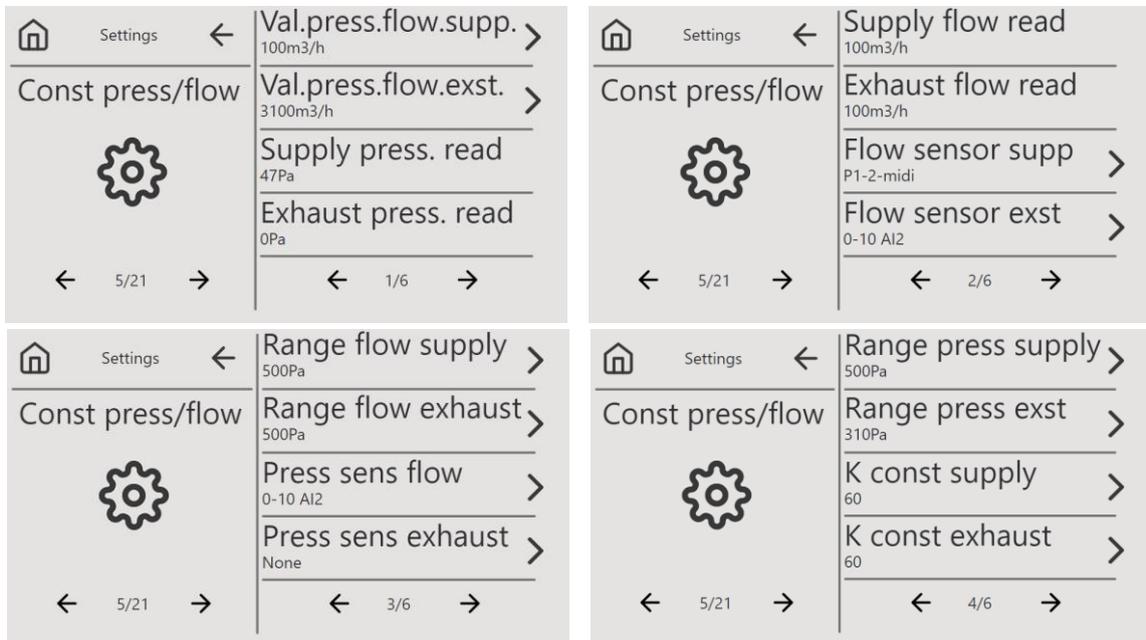


Fig. 25 Cooling parameter setting screen

- PID K – amplification coefficient of controller PI proportional member.
- PID Ki – amplification coefficient of controller PI integral action member.
- PID Ti x0.1s – time of integral action of controller PI integrating member.
- COMPRESSOR OPERATING TIME – minimum time in which the compressor is operating. Value is set in seconds and may be adjusted at every 1s step.

CONSTANT FLOW RATE / PRESSURE



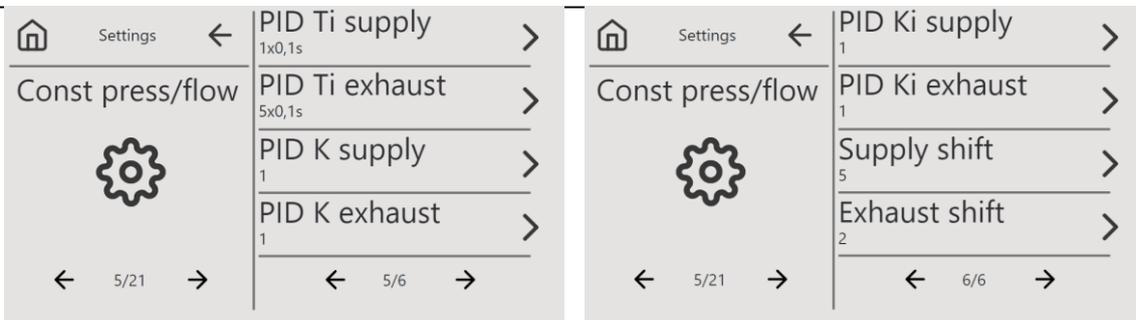


Fig. 26 Constant flow rate/constant pressure setting screens

- SET FLOW RATE/SUPPLY/EXHAUST AIR PRESSURE – set target flow rate value (m³/h) / pressure (Pa). Parameter set at step of 50. Efficiency mode is selected in tab 2 of main menu.
- CONSTANT K OF SUPPLY/EXHAUST AIR – constant K of supply/exhaust air controller.
- PID Ti OF SUPPLY/EXHAUST AIR x0.1s – time of integrating of constant flow rate / constant pressure controller PI integrating portion.
- PID K OF SUPPLY/EXHAUST AIR – proportional member of controller PI constant flow rate / constant pressure.
- PID Ki SUPPLY/EXHAUST AIR – proportional member of integrating controller PI portion of constant flow rate / constant pressure.
- SUPPLY/EXHAUST AIR SHIFT – additional percentage value of overdriving within range of set values.
- FLOW RATE/PRESSURE RANGE OF SUPPLY/EXHAUST AIR – minimum/maximum value of flow rate/pressure within frame of which supply/exhaust air settings may be set in User’s settings.

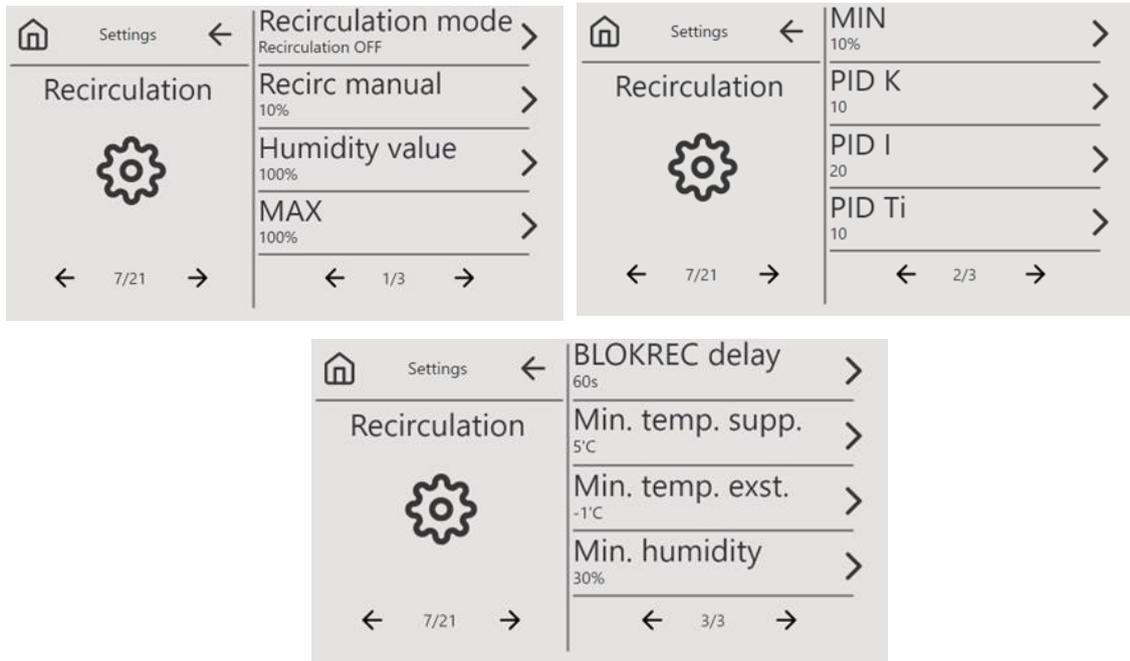
GROUND HEAT EXCHANGER (GWC)



Fig. 27 Screens of ground heat exchanger setting parameters

- UPPER GWC OPERATING TEMPERATURE – temperature above which GWC function will be active.
- LOWER OPERATING GWC TEMPERATURE – temperature below which GWC function will be active.
- MINUTES OF AIR INTAKE TEST – time measured from the air handling unit start after which checking of outdoor and GWC temperatures will occur.
- OPERATION MINUTES BEFORE TEST – time interval at which (with the air handling unit operation) outdoor and GWC temperatures are checked.
- GWC EXTRACTOR SHIFTING – value of exhaust capacity decreasing to compensate additional resistance at supply air when GWC is operating.

RECIRCULATION



RECIRCULATION MODE:

Fig. 28 Recirculation parameter setting screens ON / OFF / AUTO – it operates in accordance with defined parameters

- MINIMUM SUPPLY AIR TEMPERATURE - below this temperature recirculation is activated
- MINIMUM OUTDOOR TEMPERATURE – below this temperature recirculation is activated
- MINIMUM MOISTURE - below this moisture (relative), recirculation is activated
- MAXIMUM MOISTURE – above this moisture (relative), recirculation is activated
- FORCED CAPACITY – value (within range 0-100%) by which fan capacity will be increased, when moisture is too high
- MINIMUM / MAXIMUM RECIRCULATION – minimum and maximum level of recirculation established within range of 0-100% with step every 10%.

LINEAR CONTROLLING

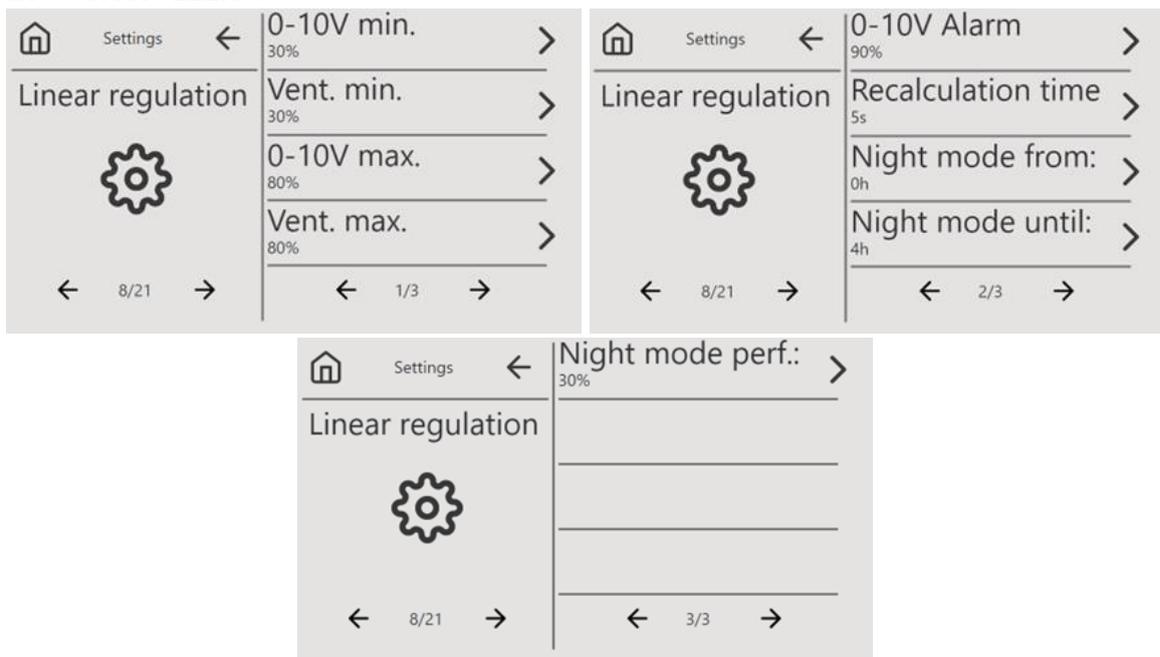


Fig. 29 Linear controlling parameter setting screens

Function utilized with using of 0-10V of sensor (for moisture, CO₂)

0-10V min – Minimum measurement value expressed in % in relation to whole sensor measurement range

Vent. min – Minimum ventilation capacity for measurement "0-10V min"

0-10V max – Maximum measurement value expressed in % in relation to whole sensor measurement range

Vent. max – Maximum ventilation capacity for measurement "0-10V max"

0-10V Alarm – Value above which ventilation goes to 100% capacity.

Calculation time – calculation time expressed in seconds

Night mode from – hour of night decreasing starting

Night mode to – hour of night decreasing termination

Night mode capacity – capacity setting for device to operate in night mode

OPTIMIZATION

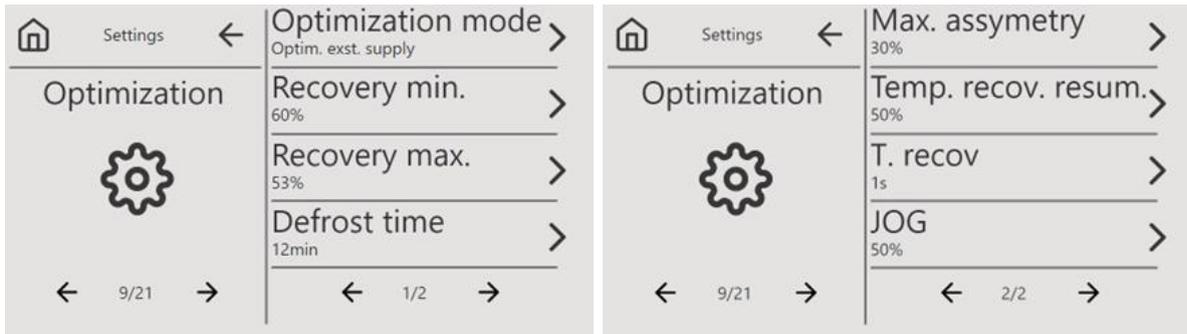


Fig. 30 Recovery optimization setting screen

Recovery may be optimized against **exhaust air and supply air** or only against **supply air**. Optimization may be also deactivated.

- MIN/MAX RECOVERY – adjustable within range of 20~95% with 1% step. Below minimum level, the offset between supply and exhaust air is set to the MAX ASSYMETRY level. Above maximum level, supply air and exhaust air operate in 1:1 proportion.
- EXCHANGER DEFROSTING TIME – adjustable within range of 0~99 minutes with step of 1 min. Parameter setting for 0, enables defrosting to be deactivated. Parameter establishes minimum defrosting time when outdoor temperature falls below 0°C and below minimum set exchanger capacity.
- TEMPERATURE RECOVERY % FROM AIR EXHAUST – adjustable within range of 1~20°C with step of 1°C. Based on supply air readouts it decides when defrosting procedure is terminated.
- MAX ASYMMETRY – adjustable within range of 0~100% with step of 10%. Parameter set in relation to maximum value that determines maximum asymmetry between supply air fan efficiency and the exhaust air fan efficiency during recovery optimisation mode. The exhaust operates at maximum efficiency.
- TEMPERATURE RECOVERY – adjustable within range of 10~100 seconds with step of 1 s. Determine at what time intervals the current capacity is checked and recalculated and the values on the outputs are set.
- JOG – ROTOR WINTER CAPACITY – inverter power function enabling master frequency in relation to nominal power within 0~100% to be set.

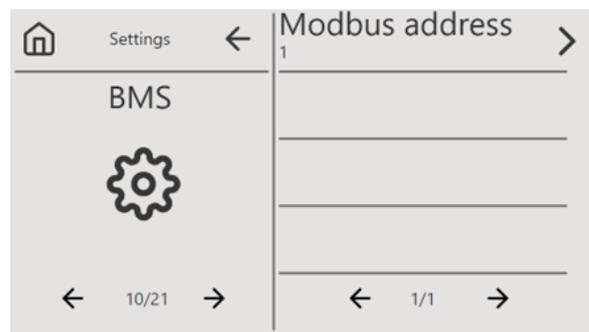


Fig. 31 Address setting screen in BMS System

It enables BMS address to be set. Transmission parameters are: bitrate-19200, data_bytes-8, parity-N(none), stop_bytes-1.

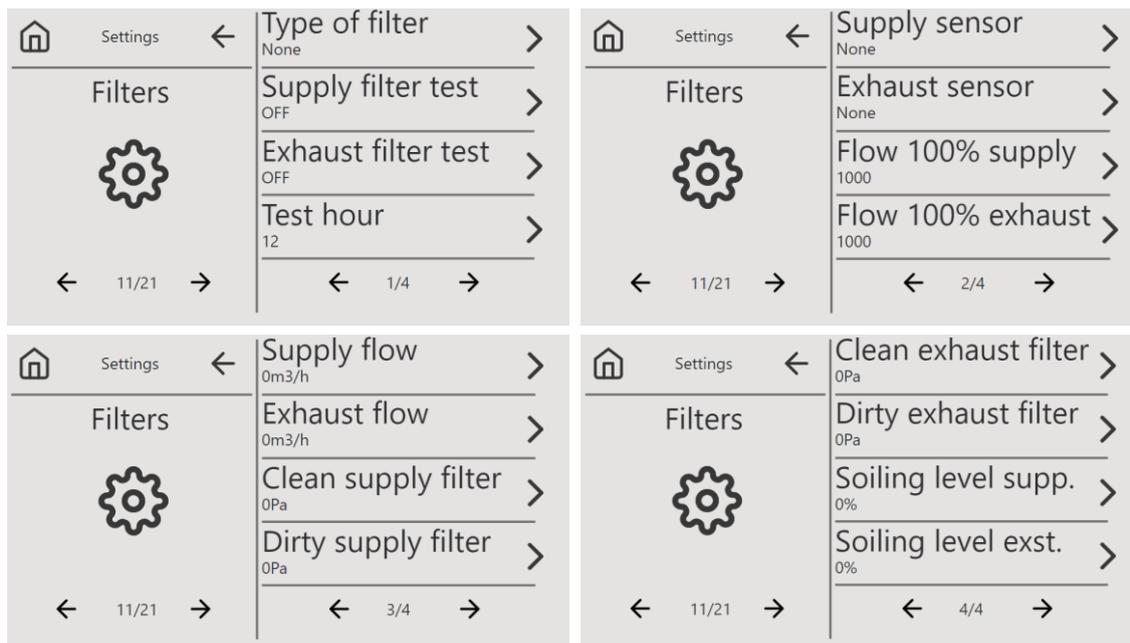


Fig. 32 Air filter parameter setting screens

Filter type – No filter, Presostats, FILTERS SOILING 0-100%

Supply air filter test - OFF/ON – supply air filter test forcing

Exhaust Air filter test – OFF/ON – exhaust air filter test forcing

Test hour– hour at which test will be carried out

Supply air sensor – selection of connected sensor for supply air filter

Exhaust air sensor – selection of connected sensor for exhaust air filter

- Flow rate at 100% supply air/exhaust air capacity – flow rate value within range of 0 – 20 000 m³/h
- Supply air filter flow rate – flow rate value within range of 0 – 10 000 m³/h
- Exhaust air filter flow rate – flow rate value within range of 0 – 10 000 m³/h
- Supply air filter soiling level – filter level within range of 0 – 1 000 Pa
- Exhaust air filter soiling level – filter level within range of 0 – 1 000 Pa
- Level of clean supply air filter – filter level within range of 0 – 1 000 Pa
- Level of clean exhaust air filter – filter level within range of 0 – 1 000 Pa

FANS

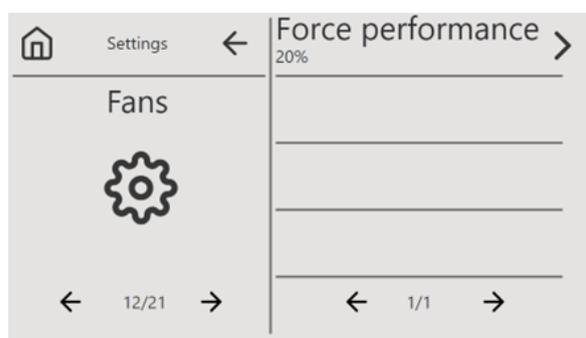


Fig. 33 Fan setting screen

Capacity forcing - parameter used for heating and cooling devices. In case of given device enabling, ventilation accelerates to the capacity set in this parameter, provided that ventilation was operating at lower capacity. This parameter protects against low airflow through devices

which are at risk of overheating or freezing.

AIR QUALITY

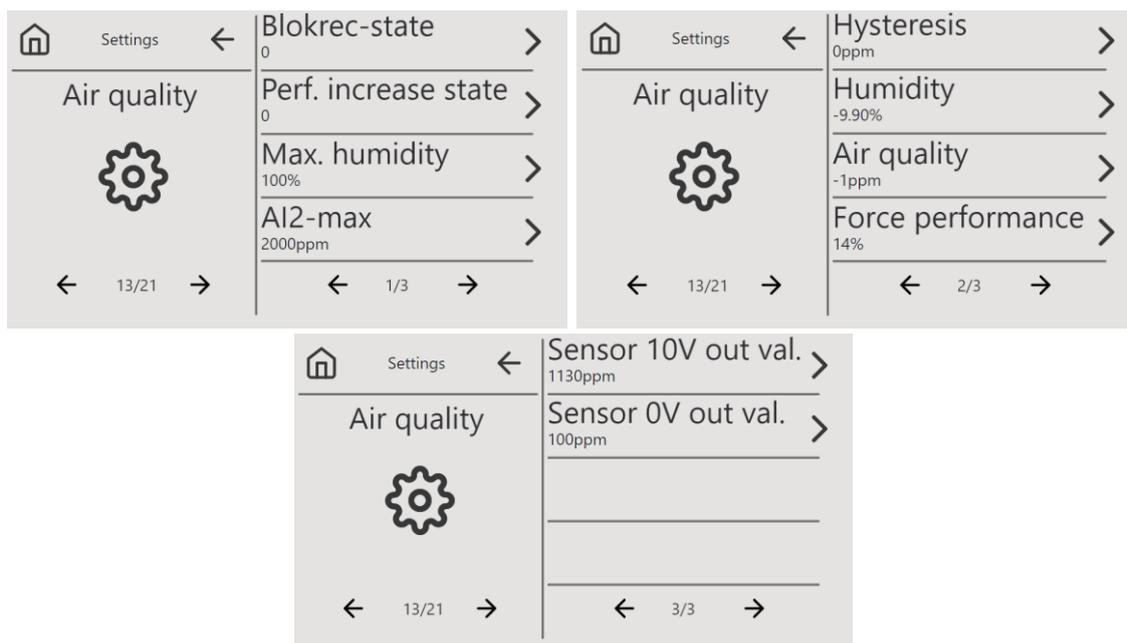


Fig. 34 Air quality setting screens

Status – Blokrec / Status-normal capacity – information on operation status marked as 0 - non-active, 1 – active, at active function during recirculation

Maximum humidity – setting maximum level for humidity

AI2-max – setting maximum level for CO₂

Hysteresis – setting for CO₂

Humidity – parameter readout

Air quality – parameter readout

Capacity forced – capacity increasing when exceeding set level at air quality

Sensor value 10V out – maximum value for CO₂ sensor

Sensor value 0V out – minimum value for CO₂ sensor

HEATING / COOLING



Fig. 35 Setting screens Heating/Cooling

Heating Kp – amplification coefficient of controller PI proportional member.

Heating Ki – amplification coefficient of controller PI integrating member.

Heating Ti – integrating duration of controller PI integrating member.

Cooling Kp – amplification coefficient of controller PI proportional member.

Cooling Ki – amplification coefficient of controller PI integrating member.

Cooling Ti – integrating duration controller PI integrating member.

Minimum temperature PC – minimum temperature till which heat pump operates

Heat source – AUTO/HEATER STANDARD/HEAT PUMP

NST1

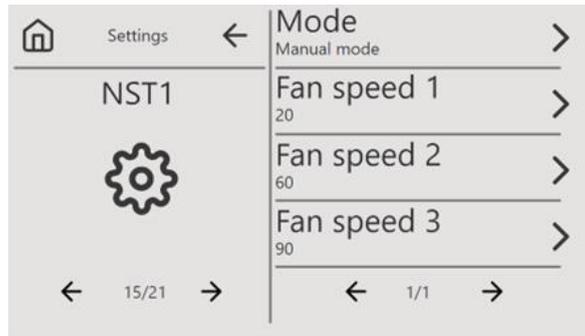


Fig. 36 NST1 display setting screen

Settings for PS-T6 panel.

Mode – settings for two modes Manual mode/Manual mode temporal

Capacity gear 1 – capacity setting for first threshold

Capacity gear 2 – capacity setting for second threshold

Capacity gear 3 – capacity setting for third threshold

AIR EXCHANGER

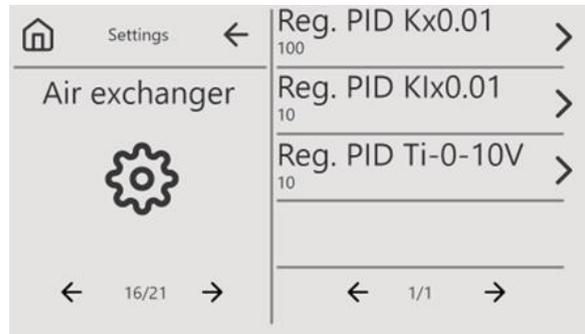


Fig. 37 Air exchanger setting screen

PID parameter setting for by-pass controlling.

DRAINING

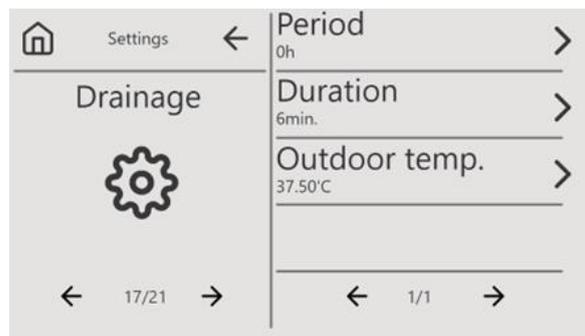


Fig. 38 Draining setting screen

Period – time interval expressed in hours, between subsequent draining performing. Setting 0 indicates OFF.

Duration – for how long the air handling unit will be disabled, the message displayed.

Outdoor temperature – temperature for draining allowing below which function will be activated. Factory setting 10°C.

SUPPLY AIR CRITICAL TEMPERATURE

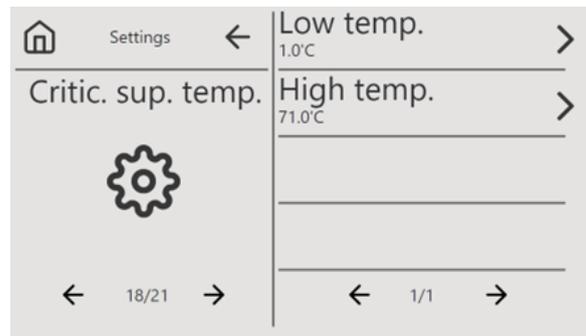


Fig. 39 Critical supply air temperature setting screen

This function enables parameters of low and high supply air temperature parameters to be set. Below and above set ranges appropriate message will be displayed.

Low temperature – factory setting 5°C

High temperature – factory setting 45°C

SERVICE MODE

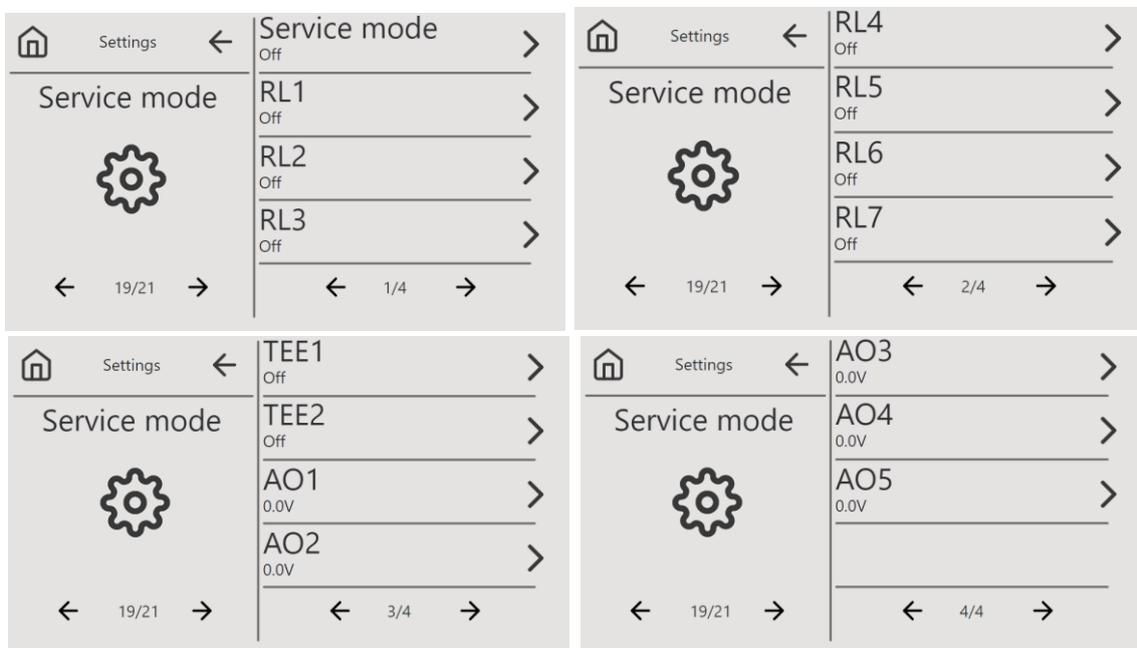


Fig.40 Service mode setting screens

In this place, there is possibility to set manually values of analogue outputs AO1 – AO5 within range 0 – 10V (AO5 occurs only in STW-6 midi).

In this tab relays PK1-PK7 may be activated.

PK1 – start NE / of circulation pump NW

PK2 – by-pass opening

PK3 – by-pass closing

PK4 – ON of 3-way valve actuator NW / ON PC

PK5 – OFF of 3-way valve actuator NW / heating / colling PC

PK6 – free

PK7 – operation

TK1 and TK2 – free

CALIBRATION OF TEMPERATURE SENSORS

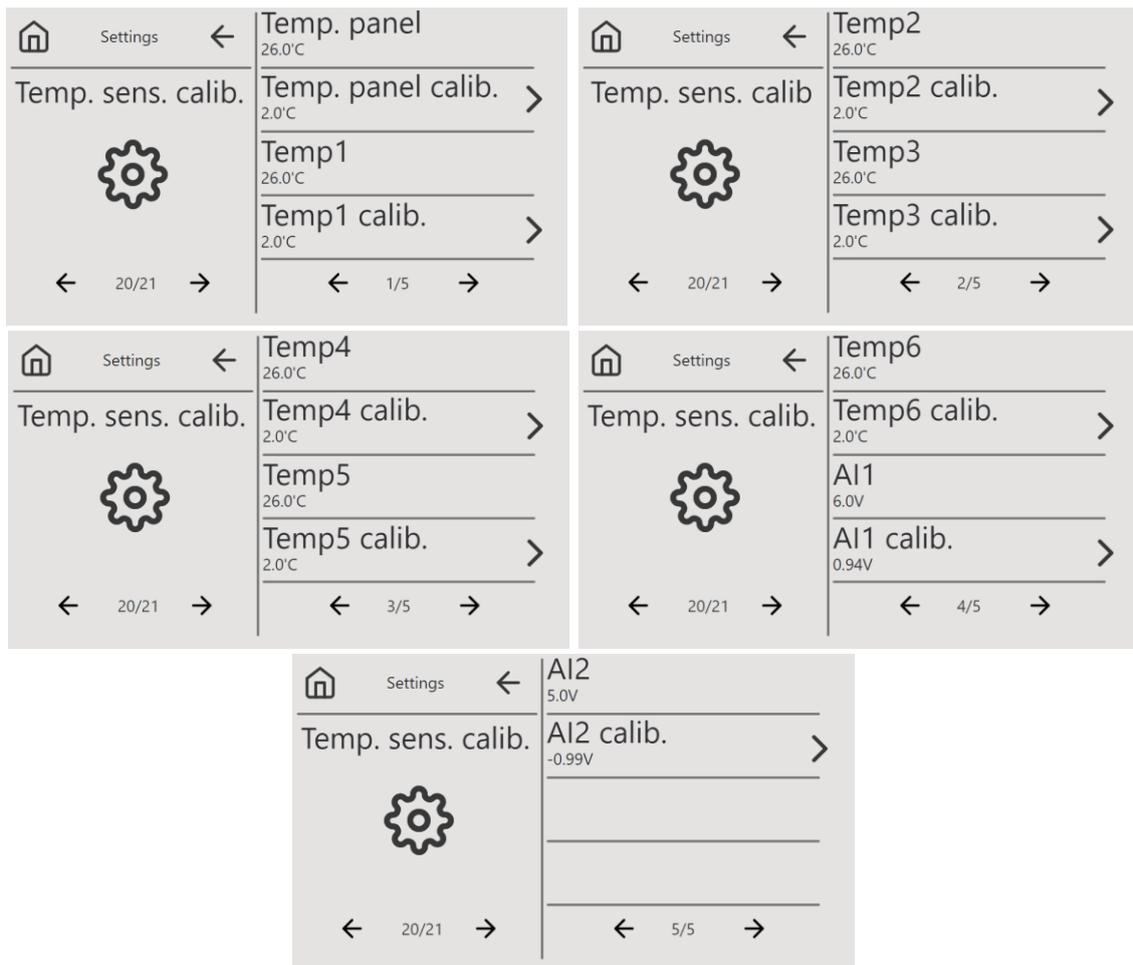


Fig. 41 Sensor calibration screens

Tab Calibration of temperature sensors enables temperature sensors and analogue inputs to be calibrated. Sensor names read from the controller's electrical scheme, e.g.:

- Temp1 - readout of current supply air temperature
- Temp1 calib. - current temperature setting according to the reference thermometer

PANEL RESET

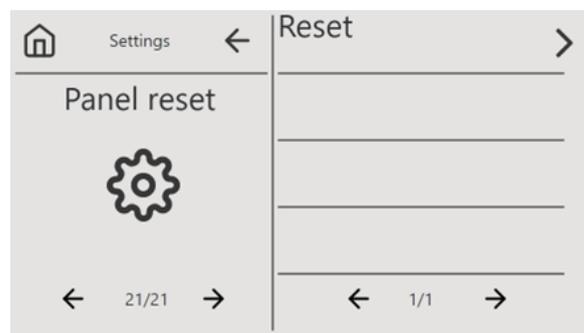


Fig. 42 Panel reset

To disable service mode, key ">" next to the word Reset should be pressed. After a while, black screen will appear, the panel will restart, the company logo will be displayed and then the main screen. Service mode will be deactivated.

22 Programming updating

Programming may be updated by yourself with using USB C port on right side of the

panel. There is adapter for USB A into USB C in the box with due to which updating with using Pendrive with the most common input - USB A is possible to be carried out.

To update panel programming:

1. Programming should be downloaded on Pendrive. Pendrive should only contain files with programming.
2. Disconnect power supply from panel.
3. With using the adapter, Pendrive should be connected to the panel.
4. Power supply of the panel should be switched on. Updating will start automatically.
5. After programming uploading, starting screen will be displayed. USB memory may be disconnected.
6. Uploaded programming correctness can be checked in settings → tab 7 Registration. In order to obtain the latest programming version, please contact with Manufacturer.

23 Installation and service of the controller

23.1 Operating conditions

Controller should not be exposed to direct weather conditions (rain, sunlight) and vibrations more intensive than typically during transportation. Controller should not be used in water vapour condensation occurrence and protected against water. Storing and transport temperature should not exceed range of -15...+50°C. Controller should be installed in dry residential room.

23.2 Cleaning and maintenance

Cleaning and maintenance of control panel screen external surface:

- Device should be cleaned with soft, dry cloth.
- It is not allowed to clean device with using flammable substance (e.g., benzene or solvent) nor humid cloth. It may cause problems with device.
- It is not allowed to scratch the screen using nails or sharp objects. It may cause device scratching or failure.
- It is not allowed to clean device by spraying thereof with water. If water get into device, it may cause fire, electrocution or device damage.
- It is not allowed to use damaged power supply cable, power supply plug or loosened electric socket. Failure to follow this recommendation brings risk of electrocution or fire.

24 Troubleshooting/messages

If the air handling unit during 30 min. detects the same message 5 times, it will be necessary to disable manually the air handling unit from application or panel levels.

Alerts which do not cause the air handling unit operation to be stopped.

Alert/Alarm	Possible reason	Solution method
Alert "Supply air filter chocked"	Soiled supply air filter.	<ul style="list-style-type: none"> ➤ Replace supply air filter. ➤ Check presostat settings and possibly correct them.
Alert "Exhaust air filter chocked"	Soiled exhaust air filter.	<ul style="list-style-type: none"> ➤ Replace exhaust air filter. ➤ Check presostat settings and possibly correct them.
Alert: <ul style="list-style-type: none"> • "No outdoor temperature" • "No exhaust air temperature" 	Damaged sensor or no sensor.	➤ Replace or install sensor.
	Damaged cable or cable short-circuited.	➤ Check or replace cable.
	Short-circuit on bolted joint in the controller or loosened bolted clamps.	➤ Check correctness of cable connection to controller's bolted clamps.
Alert "Enabled service mode"	Enabled service mode in service menu.	➤ Disable service mode.
Alert "No pressure sensor"	Sensor damaged or no sensor.	➤ Replace or install sensor.
	Damaged or short-circuited cable.	➤ Check or replace cable.

	Short-circuit on bolted joint in the controller or loosened bolted clamps.	➤ Check correctness of cable connection to controller's bolted clamps.
	It may appear in situation when capacity mode is selected from pressure sensors. Capacity mode will be then be transferred into operation mode settings "CONSTANT MANUAL MODE".	➤ Change capacity mode into SET CAPACITY.
Alert "Register recuperator"	Recuperator is not registered.	➤ Register recuperator in "Recuperator register" tab entering activation code obtained from Seller.
Alert "The air handling unit inspection is required"	Information message on recommended periodical inspection of filters and the air handling unit operation correctness.	➤ Perform the air handling unit inspection, call serviceman. IMPORTANT! Inspection performing is necessary for correct operation of the recuperator and for maintaining the warranty conditions.
Alert "No panel temperature"	Sensor damaged.	➤ Contact with service department.
	Damaged or short-circuited cable.	➤ Check or replace cable.
	Short-circuit on bolted joint in the controller or loosened bolted clamps.	➤ Check correctness of cable connection to controller's bolted clamps.
Alert "Winter mode"	Exchanger efficiency is smaller than that set as minimum and outdoor temperature is below zero. The set fan asymmetry is maximum. There occurs exchanger defrosting.	➤ Checking correctness of temperature sensor indications, possible sensor calibration. ➤ Providing initial electric heater.
	Leak of the system.	➤ System tightness checking.
Alert "The air handling unit blocked"	Activation code has not been entered during 500 h.	➤ Enter activation code obtained from Seller.
Alert "Recovery optimization"	Recuperator operation in recovery optimization mode. Exchanger efficiency smaller than that set as maximum.	➤ If recuperator is not able to exit recovery optimization mode, temperature sensor indication correctness should be checked, possible sensor calibration.
Alert "Exchanger draining"	Exchanger draining process. Air intake temperature below 10°C.	➤ Wait till exchanger draining process is completed.
Alarm "No supply air temperature"	Damaged sensor or no sensor.	➤ Replace or install sensor.
	Damaged or short-circuited cable.	➤ Check or replace cable.
	Short-circuit on bolted joint in the controller or loosened bolted clamps.	➤ Check correctness of cable connection to controller's bolted clamps.
		➤ After alarm has been cleared, it is necessary to restart controller's voltage.
"Frosting" alarm	The water heater protection function (anti-freeze thermostat) was activated. Temperature dropped below that set on the thermostat. Ventilation stopping and opening the water heater at 100% power. The exchanger "anti-freeze" protection operates when the operation of the air handling unit is stopped, e.g. at the moment when the air handling unit is blocked.	➤ Checking temperature readout from operator's panel. If alarm is ceased, the air handling unit is possible to put into operation after pressing ON/OFF on the panel.

	No process heat in the heater.	➤ Check inflow and supplying agent parameters.
	Damaged actuator with valve, pump.	➤ Check circulation pump, actuator and valve operations.
	Damaged cable.	➤ Check or replace the cable.
	Damaged controller or bolted joint slided out.	➤ Check connection correctness and bolted joint.

"Fire" Alarm	The air handling unit detected fire	<ul style="list-style-type: none"> ➤ Restarting the air handling unit without removing the cause of the alarm is prohibited. ➤ After alarm clearing, restarting of the air handling unit through controller voltage resetting.
Alarm: <ul style="list-style-type: none"> • "No confirmation of Supply air operation" • "No confirmation of exhaust air operation" 	No confirmation of supply air/exhaust air fan operation.	➤ Check correctness of cable connection to controller bolted joints.
	Signal not provided.	➤ Provide signal.
	Damaged cable.	➤ Check and replace the cable.
	Damaged fan. Fan motor overheating.	<ul style="list-style-type: none"> ➤ Replace the fan. ➤ Check overheating reason.
		➤ After alarm reason clearing the air handling unit restarting after pressing ON/OFF icon on the panel.
Alarm "No 2-10V sensor"	Damaged sensor or no sensor.	➤ Replace or install the sensor.
	Damaged or short-circuited cable.	➤ Check or replace the cable.
	Short-circuit on bolted joint in the controller or loosened bolted clamps.	➤ Check correctness of cable connection to controller bolted joints.
	Damaged element supplying sensor.	➤ Check or replace power supply unit.
	Set capacity mode „linear controlling of the sensors from 0-10“	➤ In case of sensor lack, change capacity mode.
Alarm "Critically high supply air temperature"	Too high supply air temperature alarm (above +45°C). Message displayed, the air handling unit operation is not stopped.	<ul style="list-style-type: none"> ➤ Appropriate system adjusting. ➤ Process heat temperature decreasing.
	Damaged heater.	➤ Heater checking or replacement.
	Damaged sensor of supply air temperature.	➤ Sensor checking or replacement.
Alarm "Critically low supply air temperature"	Too low supply air temperature alarm (below +5°C). Message displayed, the air handling unit operation is not stopped.	➤ Appropriate system adjusting.
	Damaged cooler.	➤ Cooler checking or replacement.
	Damaged supply air temperature sensor.	➤ Sensor checking or replacement.
	By-pass actuator opened.	➤ Checking of throttle operation correctness and User's settings.
Alarm "Winter mode ineffective"	Activated winter mode did not cause exchanger defrosting, 3 cycles of the attempt to defrost the actuator have passed.	<ul style="list-style-type: none"> ➤ Checking the flow uniformity. ➤ Checking settings and temperature sensors. ➤ Initial heater addition.

25 Modbus register table

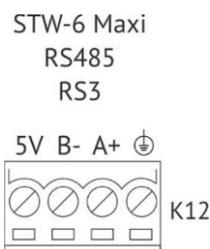


Fig. 43 Connection scheme of STW-6 maxi controller to BMS system

Modbus register table may be downloaded from website www.bartoszwentylacja.com.pl → tab "Download" → "Instructions and programmes".



Attachment no 1

Long-lasting AC/DC load capacity of insulated copper cables permanently installed in rooms at temperatures <25°C

Nominal cross section	Single-conductor cables DY, LY, LgY etc.				Multi-conductor cables YDY, YDYp, Dył, YDYł etc.			
	Cables laid in insulation pipes or in common insulation shield				Cables laid individually, directly on the plaster or inside the plaster			
	1 each	2 each	3 each	4 each	2- conductor	3- conductor	4- conductor	5- and 6- conductor
mm ²	I [A]	I [A]	I [A]	I [A]	I [A]	I [A]	I [A]	I [A]
0.35	8	7	6	5	10	9	8	7
0.5	10	9	8	7	12	11	10	9
0.75	13	11	10	9	16	14	13	11
1	15	13	12	10	19	17	15	13

In DC electrical circuits where the energy receiver is resistance, electrical power can be determined from the formula: $P=U*I$, where: P is power, U is electrical voltage and I is electrical current amperage

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