

User manual

CB and PT-B series

Air handling unit controller



Color 3,5" capacitive touchscreen panel

Intuitive user interface

BMS Modbus protocol

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1. Installation requirements

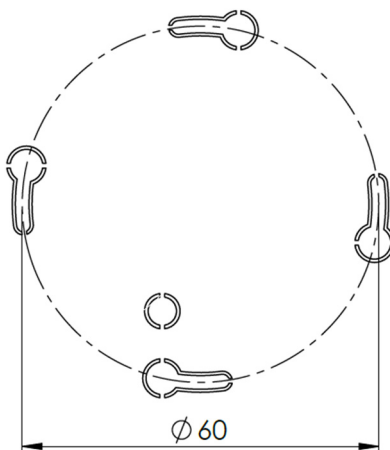
Room conditions, where control panel is installed, must ensure environmental requirements:

- ambient temperature: 0 °C ... 40 °C;
- relative humidity: 20 % ... 80 %, non-condensing;
- protection against vertical dripping water;
- no excessive vibrations.

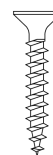
The control panel can be mounted on a flush mounting box or in any other place screwing two-four holes on the fastening surface. Alternative mounting option is attaching control panel to magnetic surface (for example air handling unit metallic case) without screwing using integrated magnets on the back of the panel.

Control panel cable connection is provided through a hole in the back or bottom side, depending on installation requirements. The length of the cable for connecting the panel with the controller may not exceed 150 m.

Panel mounting diagram showed below. Connection cable is within flush mounting box circle.

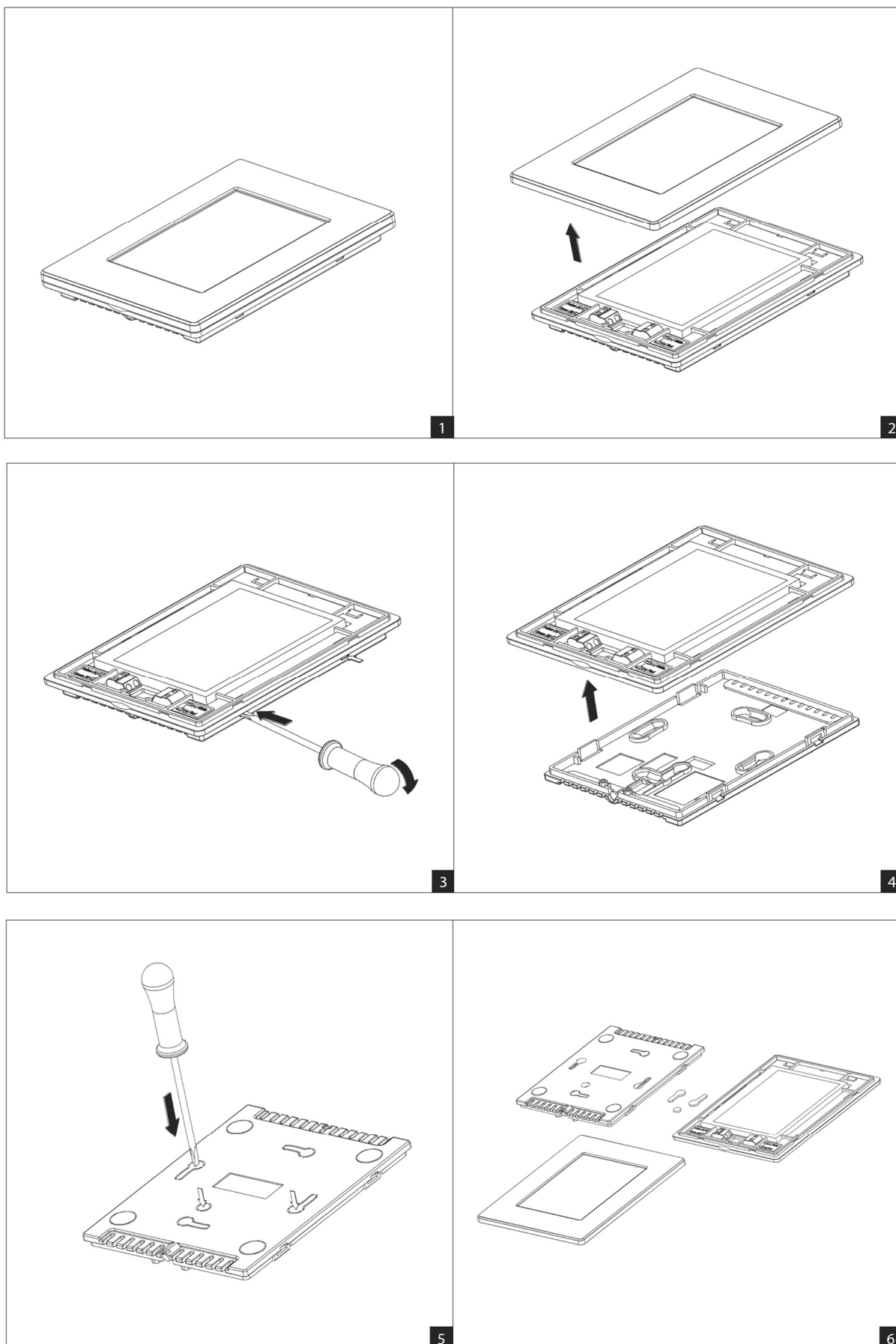


Screws used for control panel mounting on a flush mounting box or surface must be 2,0..3,0mm diameter and be flat head type. Failure to observe this requirement can cause permanent control panel failure that is not covered by warranty.

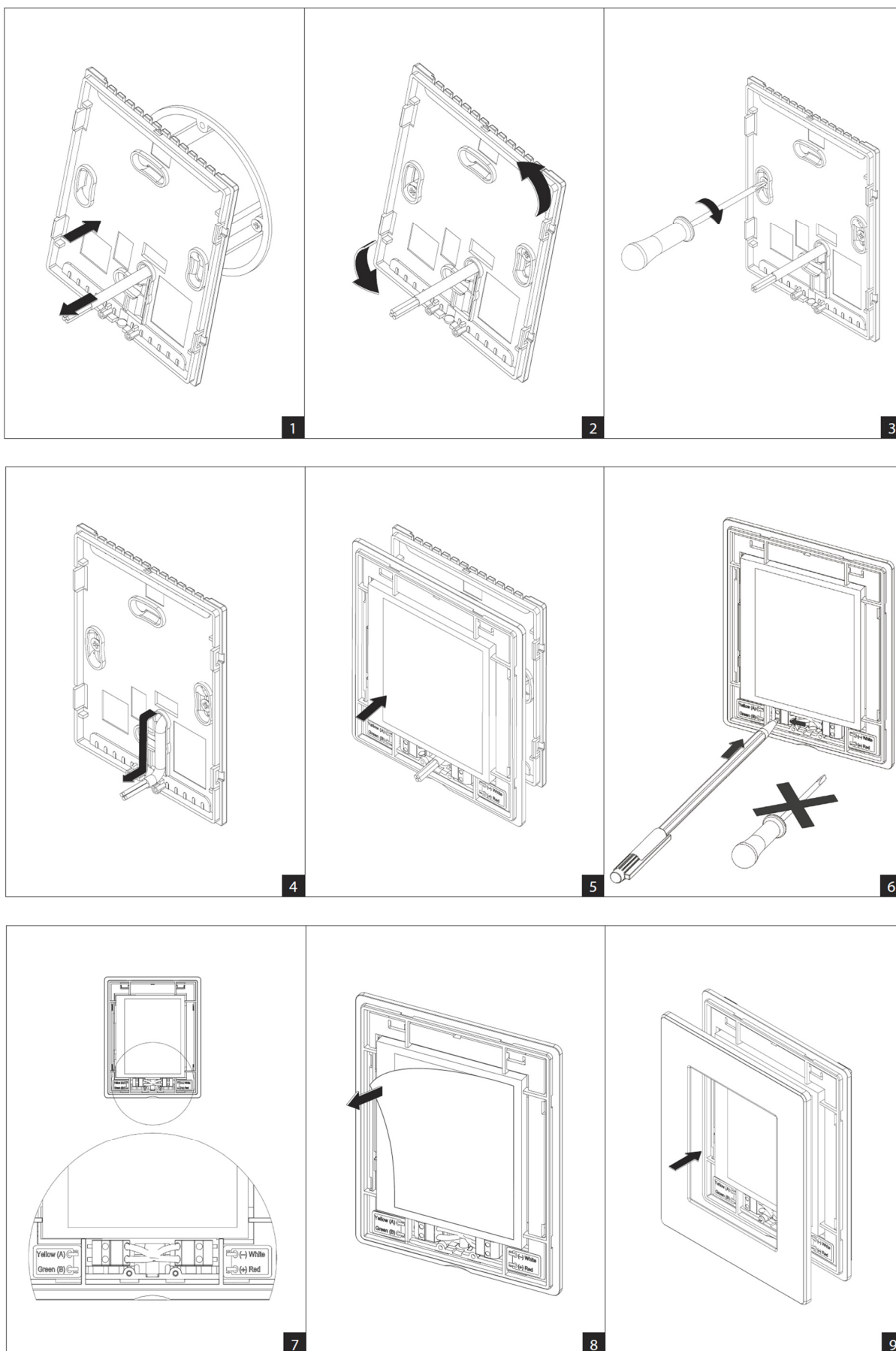


It is recommended to lay control panel cable separately from power cables in a distance no less than 20 cm.

2. Panel disassembly



3. Panel installation



4. Operating functions

4.1. Unit control

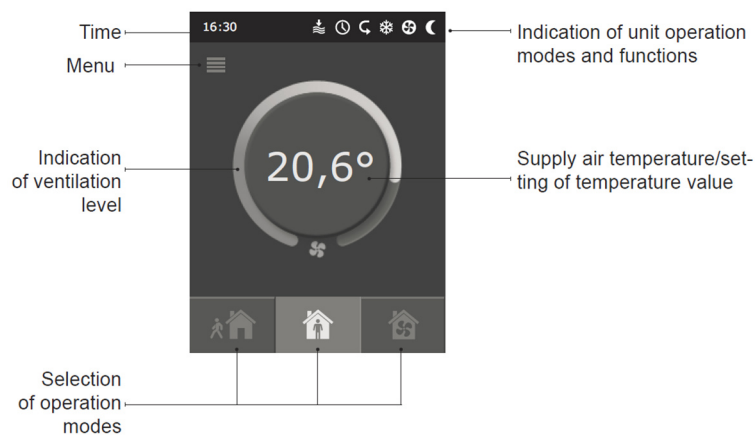
Control system ensures control of the physical processes that are taking place inside the air handling unit.

Control system consists of:

- controller module;
- temperature sensors and control panel, which can be installed in the convenient place for the user.



4.2. Control panel indication



Explanation of the displayed symbols:

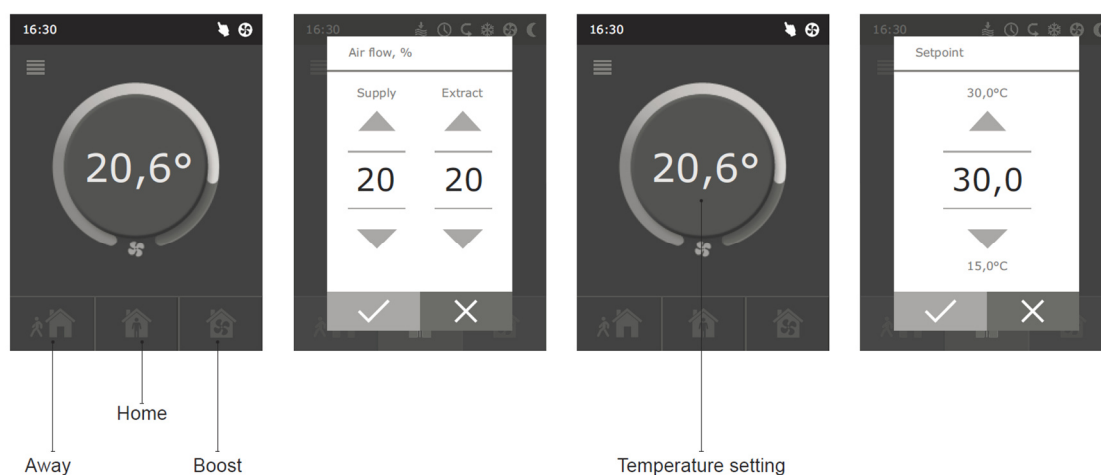
	Setpoint sliding (the value increases)		Air heater operation
	Setpoint sliding (the value decreases)		Air cooler operation
	Supply air		Weekly operation mode
	Extract air		„Override“ mode
	Fan operation		Alarm signal
	Energy recovery operation		

4.3. Operation modes selection

Three operation modes are possible, one of them user can directly select from control panel main window:

- Away;
- Home;
- Boost.

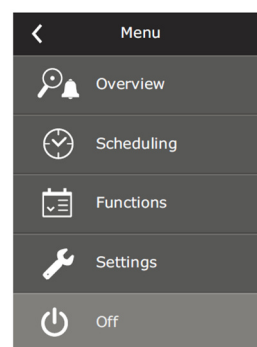
The mode is selected by tapping one of modes buttons located in the main window. The corresponding button becomes black, when the selected mode is activated. The user can set ventilation intensity separately for supply and extract air in each operation mode. Ventilation intensity mode window is opened by pressing and holding one of modes buttons. The supply air temperature is set by tapping round button in the center of main window.



4.4. Menu

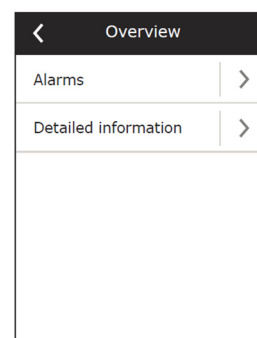
Menu of panel consists of the five points:

- Overview;
- Scheduling;
- Functions;
- Settings;
- On/Off.



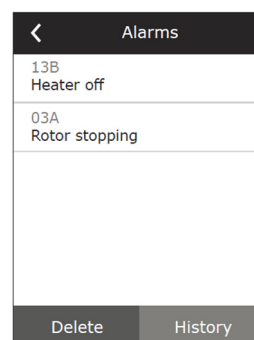
4.4.1. Overview

All information, relating to the operation and alarms of the unit, is detailed in overview menu.



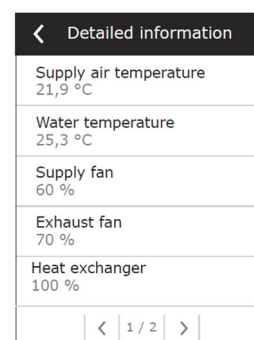
4.4.1.1. Alarms

This menu displays the notification of existing faults. After failure elimination (see chapter 5), messages are deleted by selecting “Delete”. By clicking on „History“ can be viewed up to 50 registered alarms.



4.4.1.2. Detailed information

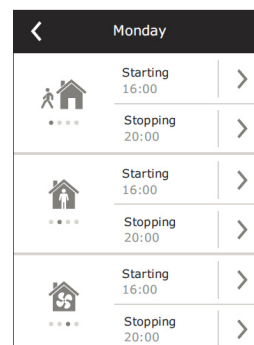
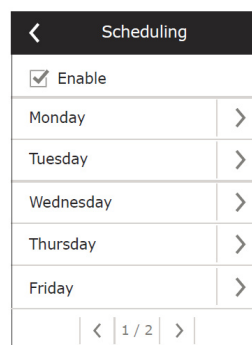
All temperature sensor readings, functioning of separate air handling unit elements and other detailed information is available in this menu.



4.4.2. Scheduling

Menu for planning of the air handling unit operation according to the weekly program.

Three events can be set up for every week day. One of three modes can be assigned to each event. Every event has a timing, when the selected mode should be active. The timing is set by tapping “Start” and “Stop”. When the mode “Standby” is selected, the fans are stopped and the unit is inactive until the next event.



Example:

Monday:

07:30 – 11:00 Away mode is active

11:30 – 16:00 Home mode is active

16:00 – 17:00 Boost mode is active

The rest of the day the unit operates in Standby mode.

Every event start and end time is set from 0:00 to 24:00 h. The events should be set consistently from the first one at the top of the window.

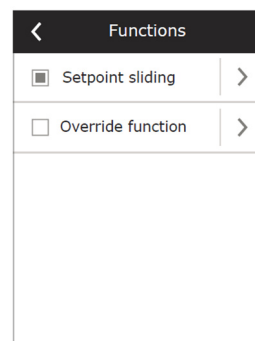
4.4.3. Functions

In this menu item, the user can activate and set additional unit functions:

- Setpoint sliding;
- Override function.

☐ blank box: function is not activated

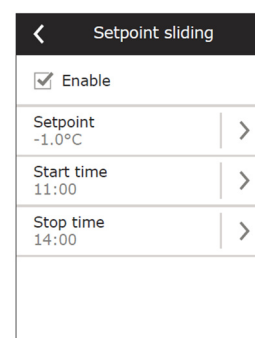
☒ grey box: function is activated



4.4.3.1. Setpoint sliding

The temperature setting point can be shifted from -9 °C to +9 °C from the temperature set value at user-specified time period. Event start and end time is set from 0:00 to 24:00 h.

When setpoint sliding is active according to set time period, the setpoint sliding icon will be displayed in the main window (see chapter 4.2).

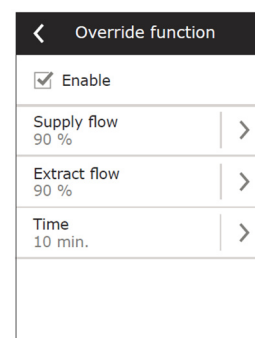


4.4.3.2. Override function

Override function is intended for remote air handling unit control by an additional external device. After the activation of this function the current mode of operation will be ignored and the unit will operate at set intensities. Intensities can be set from 20 to 100 % interval.

The function can be activated in two ways:

- **By the external control device** - Interconnecting (short-circuiting) the controller's Override function contacts. Unit will operate in the selected Override mode and after disconnection it will return to the previous operation mode. Activation by external device has the highest priority and will force the unit to start even from stopped mode.
- **By control panel or Modbus protocol** – in this case there is no need for additional connections to external control devices, the function is activated from the control panel or Modbus protocol, and the unit will operate in the chosen Override mode until the internal timer is active (user-defined from 1 to 90 minutes). When this function is active, the intensities of the supplied air and separately for the extracted air fans can be adjusted via control panel or any time via Modbus registers.



When Override function is activated, the mode selection buttons in the main window are inactive. The corresponding icon appears in notification bar (see chapter 4.2).



Typical applications of the Override function:

- **Maintenance of CO₂ quantity or VOC air quality in room** – by adding an additional CO₂ or VOC sensor (with relay output), the main user-set ventilation rate at lower air quality will be switched to the maximum or other preset intensity until the room is ventilated, then unit will return to the previously mode.
- **Maintenance of relative humidity in the room** – after contacting the external relative humidity sensor (with output relay), automatically switching to maximum or other preset ventilation intensity will maintain the humidity level, desired by the user.
- **Ventilation on demand** – when the motion sensor is connected to the control contacts, ventilation will be adjusted according to demand, i.e. if people are indoors, ventilation will be carried out according to the set Override intensity and if there is nobody in the room – the unit will operate according to main user-set intensity, for example, the minimum.
- **Ventilation with additional air extraction** – connection of additional extracting device, for example, a kitchen hood or other extraction device without a separate fan, is intended, thus the air extraction is carried out by the unit itself. After the activation of the function the supply and extract air fans start operating at maximum or other preset intensity.
- **Negative pressure compensation** – intended for systems where air extraction can be carried out in a separate air extraction fan. Supply fan then should be preset to higher intensity than extract fan and after activation of the function, negative pressure in the room compensation can be achieved.

4.4.4. Settings

This menu is for air handling unit and the user parameters setting. The user can switch the menu languages, change the screen saver, panel lock, touch sound, season, time and date.

For the air handling unit operating in most economical mode, summer and winter seasons have been provided:

- **Summer** - heater operation is blocked but allowed cooler operation;
- **Winter** - cooler operation is unavailable but allowed heater operation.

Settings	
Language English	>
Screen saver On	>
Panel lock Off	>
Touch sound Click	>
Season Winter	>
Time / Date	>

Time and date is required for air handling unit operation planning.

4.4.5. Unit switching on or off

This menu item is intended for the air handling unit switching on/off.



After switching the unit off, it will not operate according to weekly program.

Menu	
Overview	
Scheduling	
Functions	
Settings	
Off	

5. Troubleshooting

Message	Protection tripping description	Possible Failure Cause	Failure Elimination
3A Rotor stopping	When there is no signal from the rotor's rotation sensor, if the "Winter" season is set, the unit will stop operating in 2 min.	The belt is broken, failure of the rotor motor or rotor sensor.	Check rotor drive and rotation sensor condition.
4A Electric heater overheating	Unit with electric heater has emergency protection from overheating, which can be activated in case of the heater failure. Unit operation is terminated.	Electric heater overheating protection is on.	Restore emergency overheating protection after electric heater overheating cause has been eliminated.
9A B1 sensor failure	When temperature exceeds the maximum permitted limits: -30 °C...+75 °C, the unit stops operating immediately.	Supply air temperature sensor is not connected or broken down.	It is necessary to check sensor connections or change the sensor.
15A Fire alarm	A fire signal has been received from the fire signalization system of the building.	Fire in the premises.	Delete alarm message and restart the unit when the fire signal disappears.
19A Low supply air temperature	If the supply air temperature falls below the permitted value: +5 °C, unit will stop operating with 10 min. delay.	Malfunction of the heat exchanger and/or heater.	Check temperature and season settings. Check the heat exchanger and heater operation.
20A Supply air overheating	If the supply air temperature is above the permitted value: +45 °C, unit will stop operating with 10 min. delay.	Malfunction of the heat exchanger and/or heater.	Check temperature and season settings. Check the heat exchanger and heater operation.
27A Return water low temperature	In the unit with water heater, when the water temperature falls below the permitted value of +10°C, the unit will stop operating.	Failure of the hot water preparation and supply function in the heating system.	Check circulation pump and heating system condition, heating valve actuator performance.
28A Frost possibility	In the unit with plate heat exchanger, if the freezing protection of the heat exchanger is activated and is not restored, the unit will stop operating.	Temperature of the air passing through plate heat exchanger, dropped lower allowable level.	Check by-pass damper condition and actuator performance. It is recommended to decrease ventilation level.
11B Rotor stopping	When there is no signal from the rotor's rotation sensor, if the "Summer" season is set, the warning message appears in 2 min. on the control panel. The unit operation is not terminated.	The belt is broken, failure of the rotor motor or rotor sensor.	Check rotor drive and rotation sensor condition.
13B Heater off	Unit with electric heater has protection from overheating, which can be activated if the heater blow-cooling is insufficient. Unit operation is not terminated.	Heater is disconnected due to low air flow.	When heater cools down, protection restores automatically. It is recommended to increase ventilation intensity level.
14B Service time	Depending on the intensity of unit operation, at a certain time a periodic inspection message appears on the control panel.	—	After disconnecting the unit from power supply, it is necessary to carry out periodic inspection of the unit, i.e. to check the air filter clogging and the condition of the heat exchanger, the heater and fans.

6. Technical data

Control panel data

Material	ABS plastic
Protection class	IP30
Dimensions	113x90x13 mm
Display	Color 3,5" capacitive touchscreen
Ambient operating temp.	0..+40°C
Storage temperature	-30..+70°C
Ambient humidity	0..90%RH, non-condensing

Control panel electrical data

Supply voltage	24Vdc
Power consumption	<1W
Connectors	0,2..0,75 mm ² wire