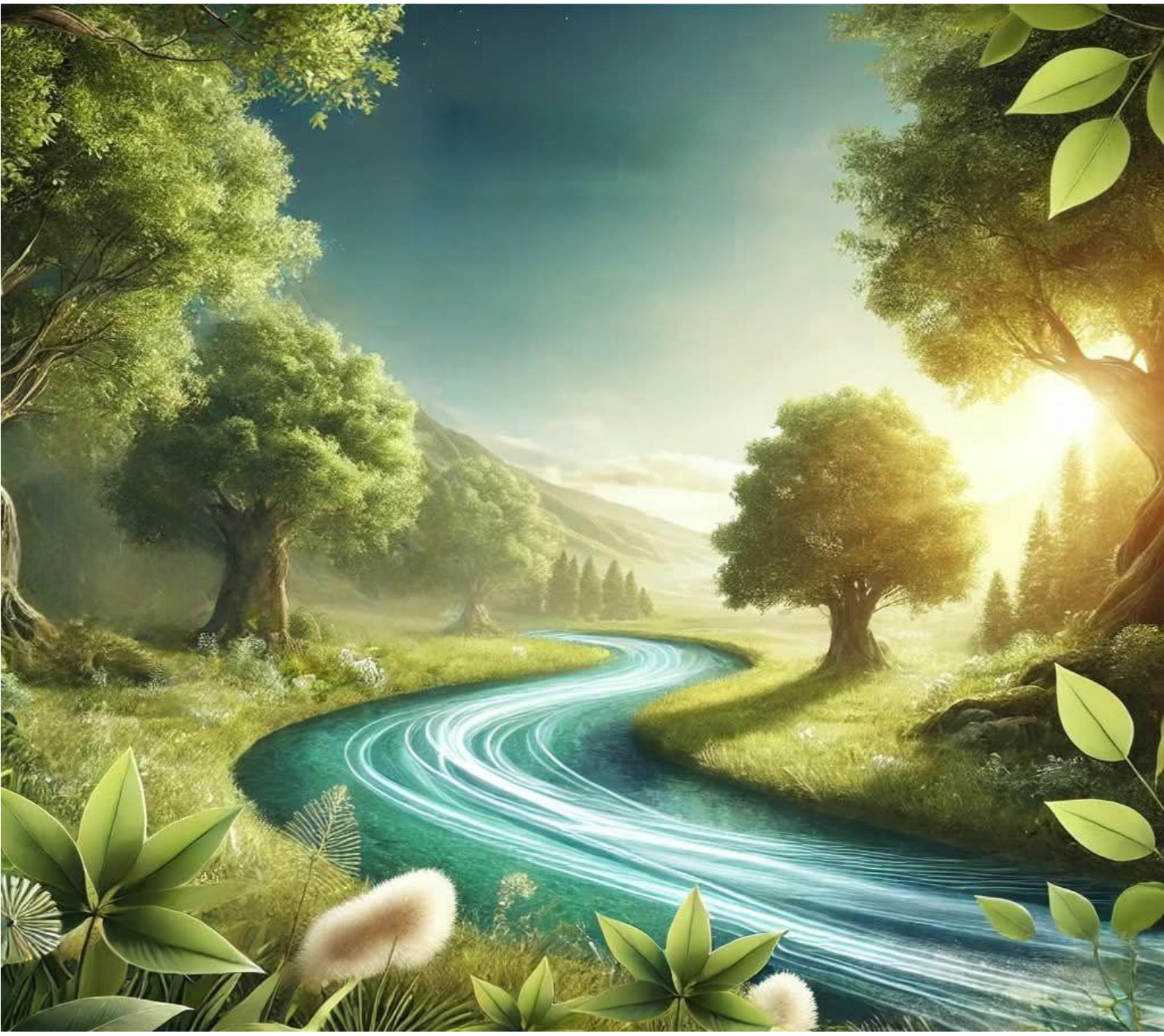
# User manual and Installation Guide



# Wave AHU-200-700

# 1 Content

## 2 Safety

- The device must not be misused.
- Failure to comply with the manual or improper connection of the module may cause malfunction of the module or interruption of its operation.
- Start-up of the device and its connection should be carried out only by a person who has read the present manual.
- Before performing any operations on the controller: wiring, installing the device, etc., read the manufacturer's instructions and recommendations, absolutely disconnect the mains supply and make sure that the terminals and electrical wires are not live.
- After the controller has been switched off, dangerous voltage may occur at its terminals. The controller is not a substitute for a circuit breaker for the associated modules.
- Installation of the controller should be carried out by a qualified person with the appropriate authorisation, in accordance with the technical documentation and the regulations in force in this area. Incorrect wiring can cause damage to the device.
- The controller must not be operated in conditions of condensation and if exposed to water. Protection against dust and water must be provided.
- The controller is designed for building in. The installation of the controller must prevent access to hazardous parts.
- Additional protection against controller failure or programming errors must be provided.
- In the power output circuits of the controller, fuse protection is provided. The value of the fuses must be adapted to the connected load.
- The electrical installation in which the controller operates must be protected by a fuse selected according to the load.
- The appliance must be used for its intended purpose and within the operating parameters for which it was designed. Otherwise, the manufacturer shall not be held liable in any way whatsoever for the consequences thereof.
- Under no circumstances must modifications be made to the structure of the controller. It is forbidden to operate a device that is faulty or has been repaired by an unauthorised service.
- The cables should not come into contact with surfaces with a temperature exceeding their nominal operating temperature.
- It is necessary to prevent access to the controller by persons not familiar with the contents of this manual and, in particular, by children.

## 3 Documentation

The manual is complementary to the documentation of the mechanical ventilation system with heat recovery function. The user should read the entire manual. We accept no liability for damage caused by failure to observe the instructions. Store this manual carefully.

## 4 Symbols used

The following symbol is used in this manual:

- the symbol indicates that the information relates to the performance characteristics of the controller.

- symbol indicates important information on which damage to the device or malfunctions may depend.

## 5 Declaration of conformity

The product complies with the requirements of **Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment** and is not a source of harmful interference in radio communications to the operation of other equipment, in a residential area, provided the product is installed and used correctly 5 in accordance with the requirements of this manual.

The full text of the declaration of conformity is available on the module manufacturer's website.

## 6 WEEE Directive 2012/19/EU

The product has been designed, manufactured using materials of the highest quality and components that are recyclable and can be reused. The product complies with the requirements of **Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)**, according to which it is marked with the symbol of a crossed-out wheeled bin to indicate that it is subject to separate collection.

Obligations at the end of the product's useful life: dispose of the packaging and the product at the end of its useful life at a competent recycling company, do not dispose of the product with normal waste, do not burn the product.

By complying with the above obligations for the controlled disposal of waste electrical and electronic equipment, harmful effects on the environment and risks to human health are avoided.

## 7 Storage and transport conditions

The module must not be exposed to direct atmospheric conditions, i.e. rain and sunlight, and vibrations greater than typical during transport by road.
The product complies with the requirements of **Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment** and is not a source of harmful interference in radio communications to the operation of other

equipment, in a residential area, provided the product is installed and used correctly 5 in accordance with the requirements of this manual.
The full text of the declaration of conformity is available on the module manufacturer's website.

## 8 General information

The controller manages a mechanical ventilation unit equipped with a rotary heat exchanger. It performs the function of heat recovery from ventilated rooms on the basis of sensor readings and has a balanced ventilation function. The controller smoothly controls the operation of supply and exhaust fans ensuring high efficiency of heat recovery and air exchange in the rooms based on preset schedules or in manual control. It controls the heaters, the cooler in a fluid manner to ensure the highest possible comfort and precision in controlling the supply air temperature. It controls the bypass and cooperates with the ground heat exchanger. It has a function of operating filters and detecting the necessity to replace them. It cooperates with the Internet module. Digital and analogue inputs enable the connection of external control signals from the control panel, air quality and humidity sensors and other automation systems. The controller signals and records alarm conditions, ensuring that the system reacts in adequate manner. It records the total operating time of individual components in counters. It enables communication via Modbus RTU protocol, which can be controlled or monitored from an external building management system. An additional function of the controller is, among other things, anti-freeze protection.

## 9 Installation of the controller

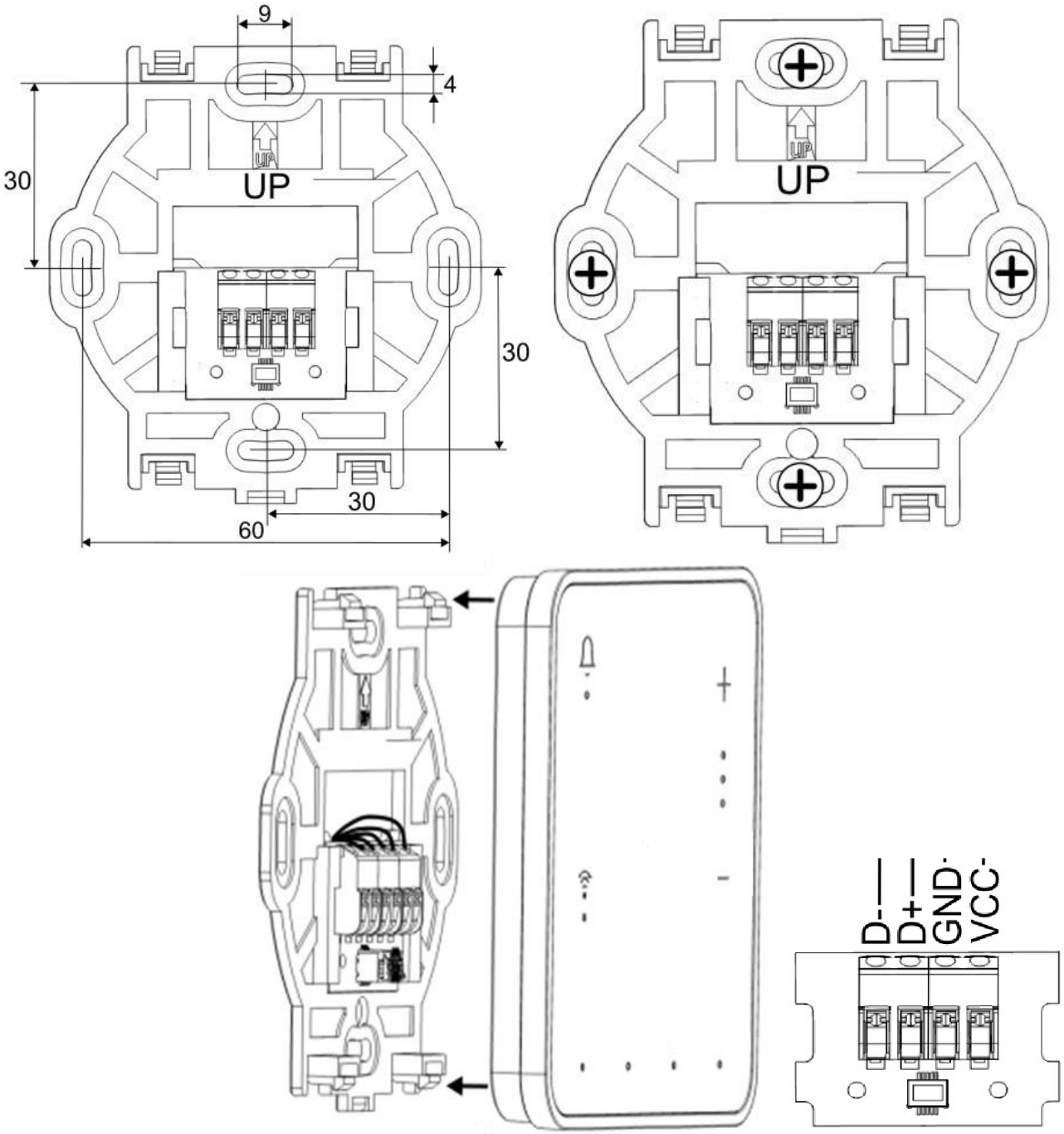
It must be installed by the manufacturer of the finished product in accordance with the applicable standards and regulations and the guidelines specified in the controller documentation. The manufacturer of the controller shall not be liable for any damage caused by failure to observe the applicable regulations and this manual.

## 10 Installation of the control panel SCP V1

The SCP V1 control panel is designed for wall mounting, only in a dry room. The panel shall not be used in condensation conditions and shall be protected from the effects of water.

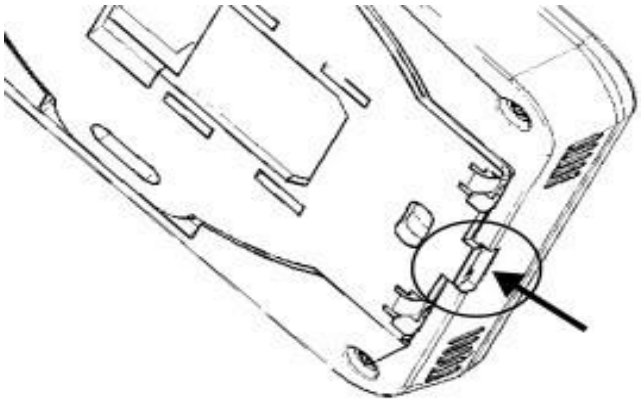
Installation of the panel should be executed in conformity with the guidelines below.

Detach the mounting frame from the rear housing of the panel. The frame is fixed to the panel housing by clips. A flat screwdriver can be used to detach the frame. Connect the wires of the transmission cable that connects the panel to the controller to the panel self-clamp. The cable connecting the panel to the controller must be recessed into the wall. The cable connecting the panel to the controller must not be run together with the building's mains cables. The cable should also not be positioned close to equipment emitting strong electromagnetic fields. Drill holes in the wall and fix the mounting frame at the desired point on the wall with screws, keeping it in the correct position (UP). Then fix the panel to the mounting frame using the clips.




When power supply of the controller is on, the LEDs of the , , , buttons on the panel turn on in sequence, which indicates that the software is loading. The loading lasts approx. 10 sec. If it takes much longer, check the correct connection of the D+, D- wires of the transmission cable connecting the panel with the controller.

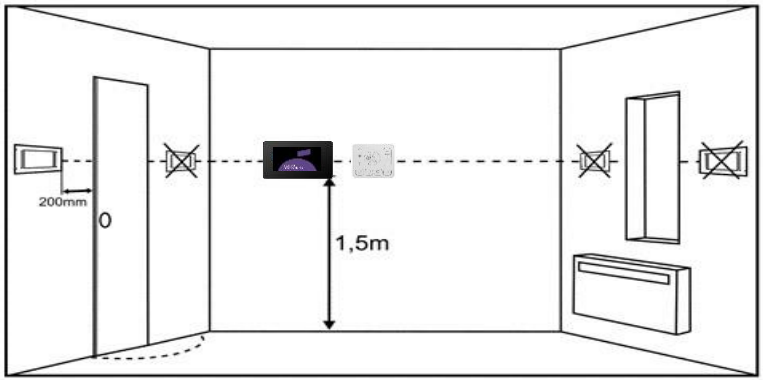
**Dismantling the panel**



To detach the panel from the mounting surface, insert a flat object such as a screwdriver into the indicated slot of the mounting frame. This opens the clips of the mounting frame and allows the panel to be detached.

## 11 Installation of the control panel ecoTOUCH T5 RT (Optional)

The ecoTOUCH T5 RT control panel is designed to be mounted on a wall or placed on a flat surface, only in a dry room. The panel shall not be used in condensation conditions and shall be protected from the effects of water. The panel should be installed at a height that allows comfortable operation, typically 1.5 m above the floor.



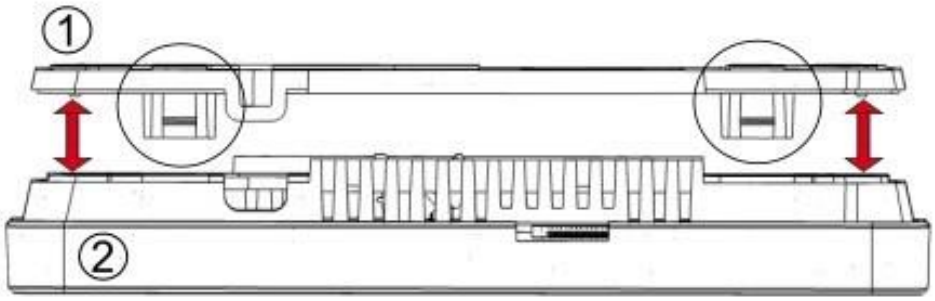

In order to reduce interference of temperature measurement by the panel, it is necessary to avoid places with strong sunlight, poor air circulation, close to heating devices, directly next to doors and windows (typically at least 200 mm from the edge of the door).

The panel should be installed by a qualified installer.

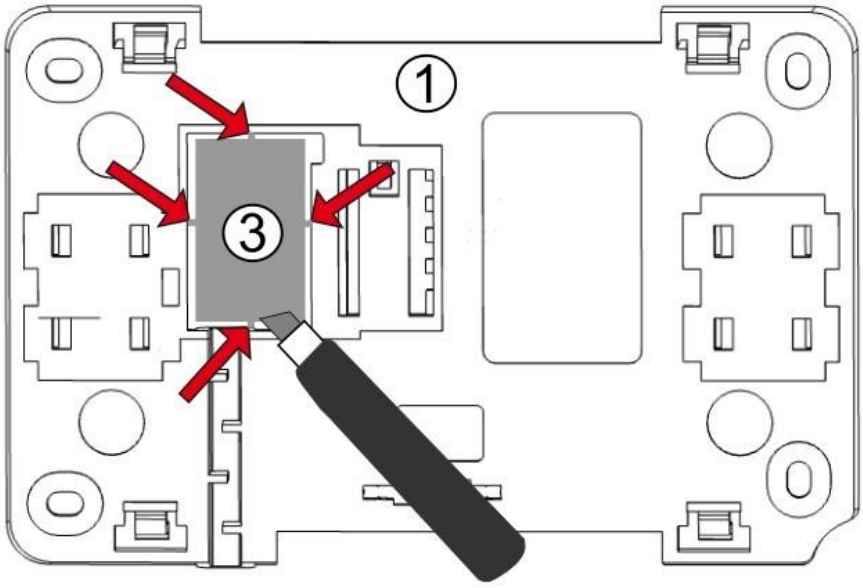
When choosing the wire connecting the panel with the controller, the rule of thumb should be applied so that the resistance of one conductor in the cable is not greater than 8 Ω and the total length of the cable is not greater than 100 m. As the length of the cable increases, its cross-section should be increased.

Installation of the panel should be executed in conformity with the guidelines below.

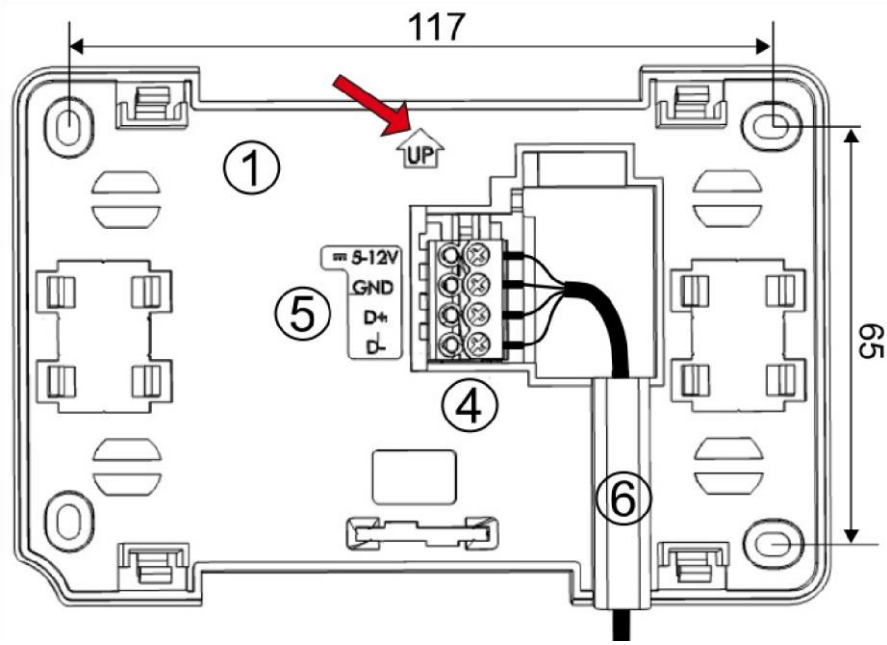
Detach the mounting frame (1) from the rear housing of the panel (2). The frame is fixed to the panel housing by clips. A flat screwdriver can be used to detach the frame.

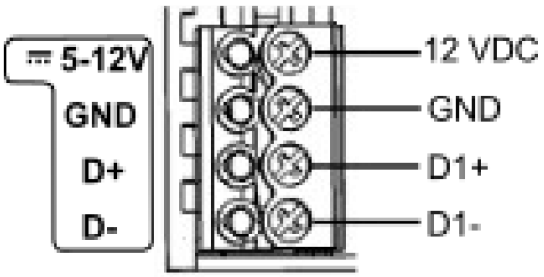



Cut out the housing (3) of the screw terminal hole in four points with a sharp tool.




Connect the wires of the transmission cable connecting the panel with the controller to the screw terminal (4) as described (5). The cable connecting the panel with the controller may be recessed in the wall or may run along the wall surface, in which case the cable must additionally be placed in the cable channel (6) of the mounting frame. The cable connecting the panel to the controller must not be run together with the building's mains cables. The cable should also not be positioned close to equipment emitting strong electromagnetic fields.




Drill holes in the wall and fix the mounting frame at the desired point on the wall with screws, keeping it in the correct position (UP). Then fix the panel to the mounting frame using the clips.

## 12 Adding an installation to your Ensy Cloud account

Setting up a connection to a Wi-Fi network requires the Ensy Cloud mobile app for Android or iOS to be installed.

The mobile app can be downloaded from Google Play or App Store using the QR code below.

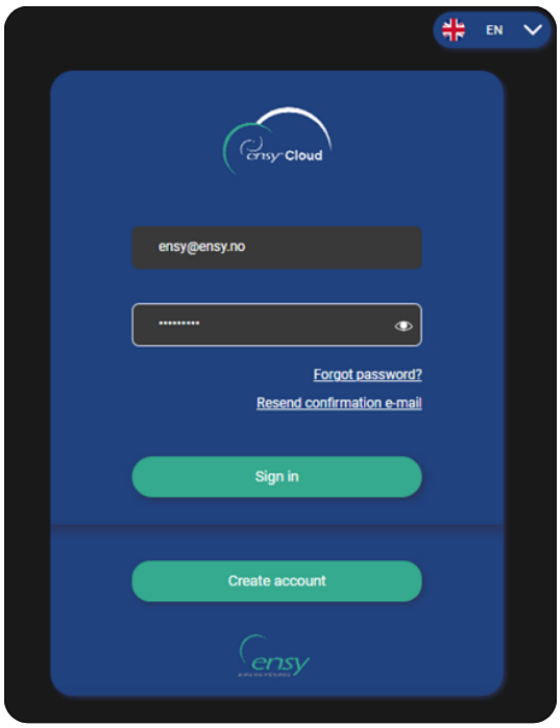
iOS

Android

A proper connection to a Wi-Fi network enables full online operation and configuration of the recuperation unit via the web service or the Ensy Cloud mobile application.

Module configuration:

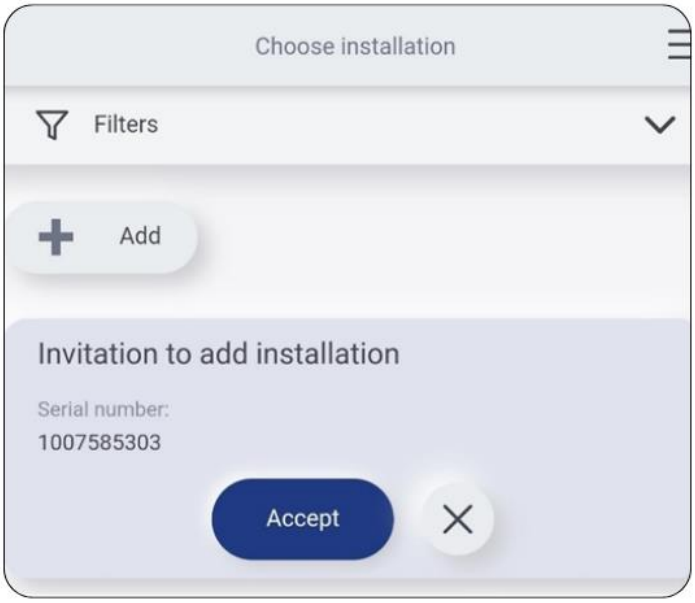
1. When the module is powered on, by default it is in BT mode, which is indicated by a rapid flashing of the LED under the connection icon . Otherwise hold down the power button for 5 sec to enable the module's BT mode.
2. After downloading and installing the Ensy Cloud mobile application, enable it on your mobile device.
3. Log in to your user account. If there is no active account, please create one.



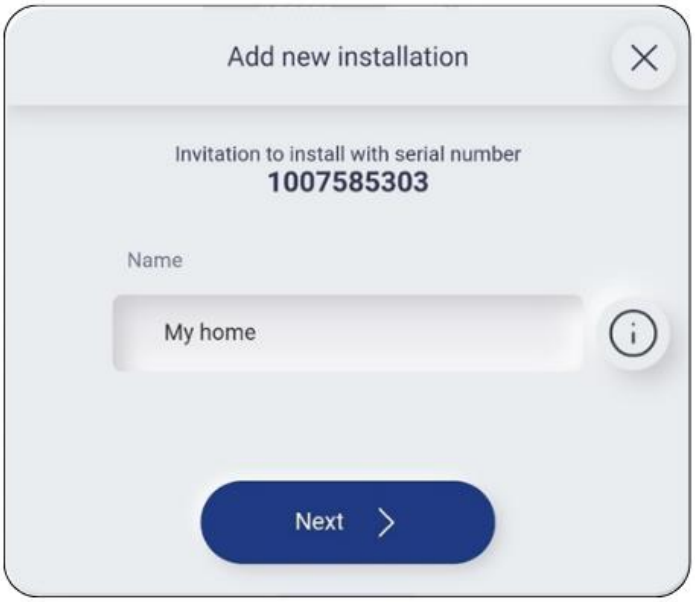
### 12.1 User invited by the installer.

If the user has been invited by the installer, he/she will see an invitation to accept after logging in.

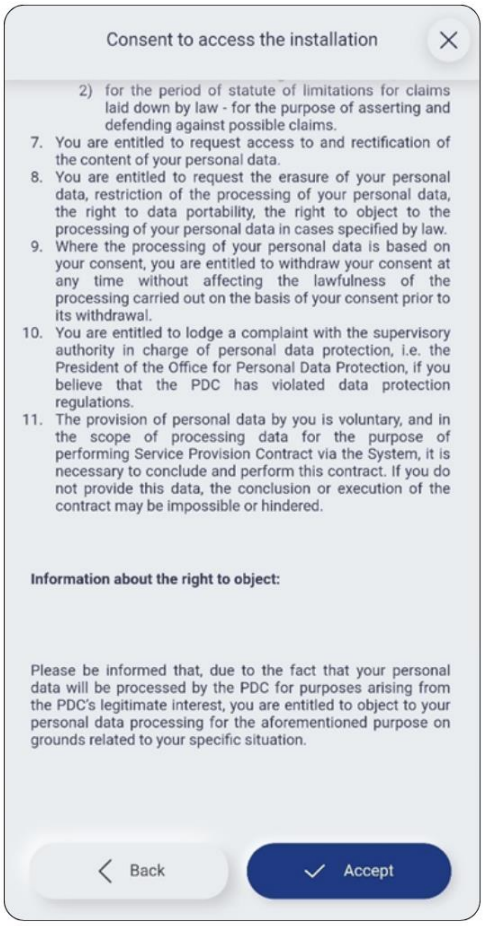
1. Accept the invitation.



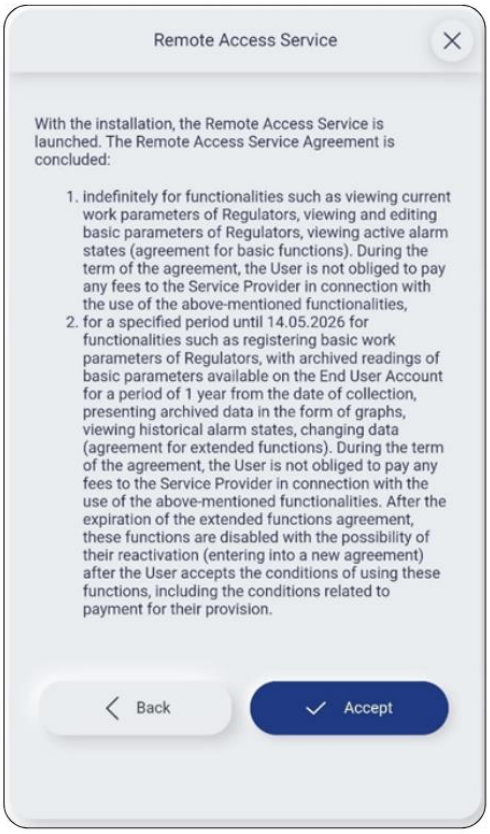

2. Give a name to your installation.



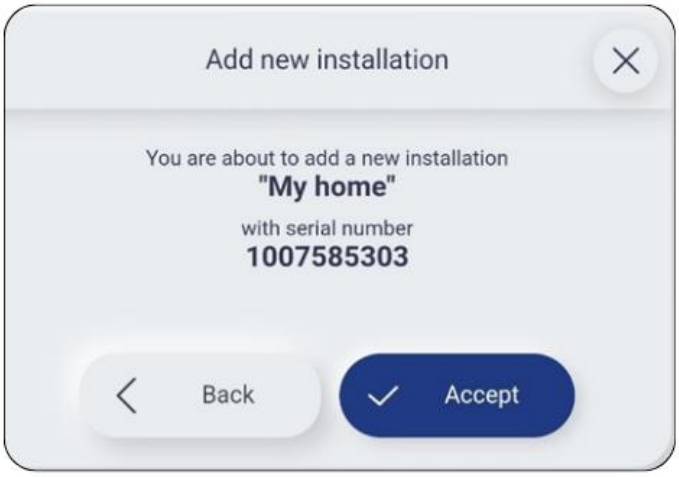
3. Acceptance of marketing consents (those mandatories are marked with an asterisk).



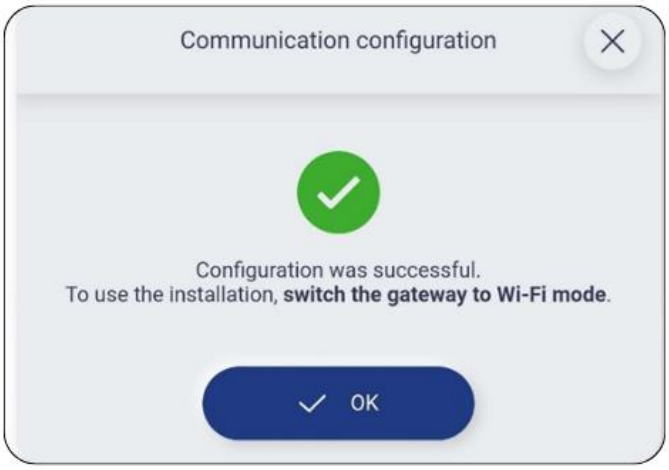

4. Acceptance of remote access service.



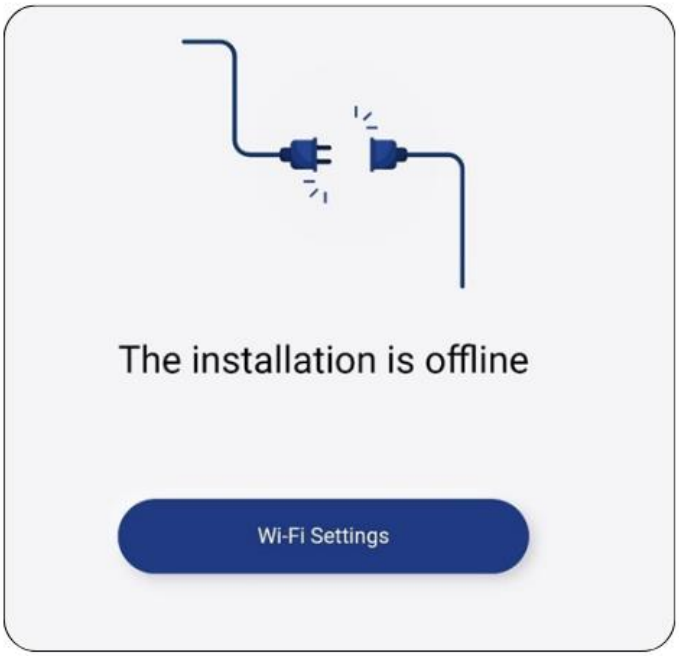
5. Confirmation of the addition of the new installation.



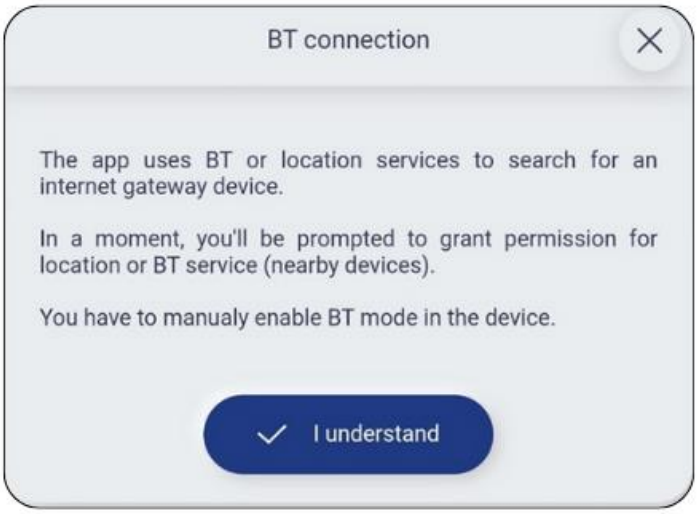

6. Enter the recently added installation.




7. Configure connection

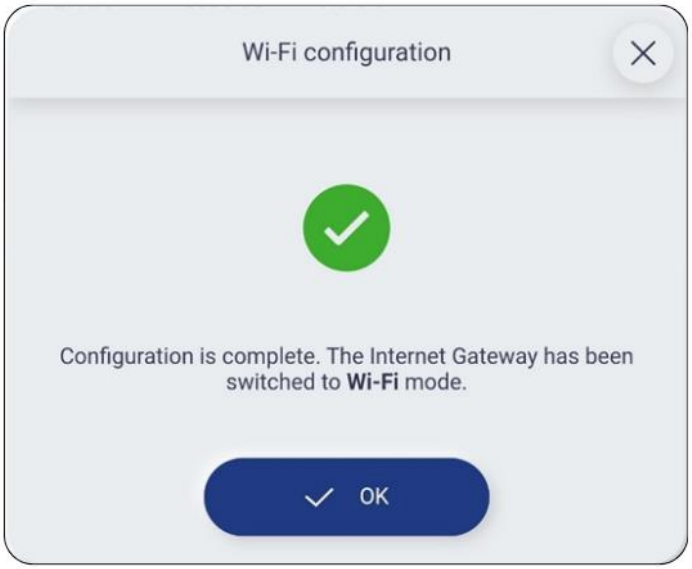


9. Follow the instructions in the app.



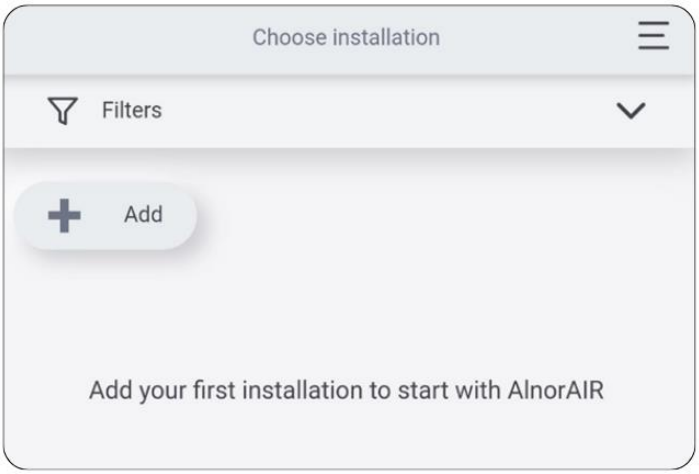

10. Configure the Wi-Fi network according to your home settings.

11. Once the network data has been entered correctly, the module automatically switches to Wi-Fi mode. To repeat the process, switch the module back to BY mode by holding down the ON/OFF button for 5 sec.

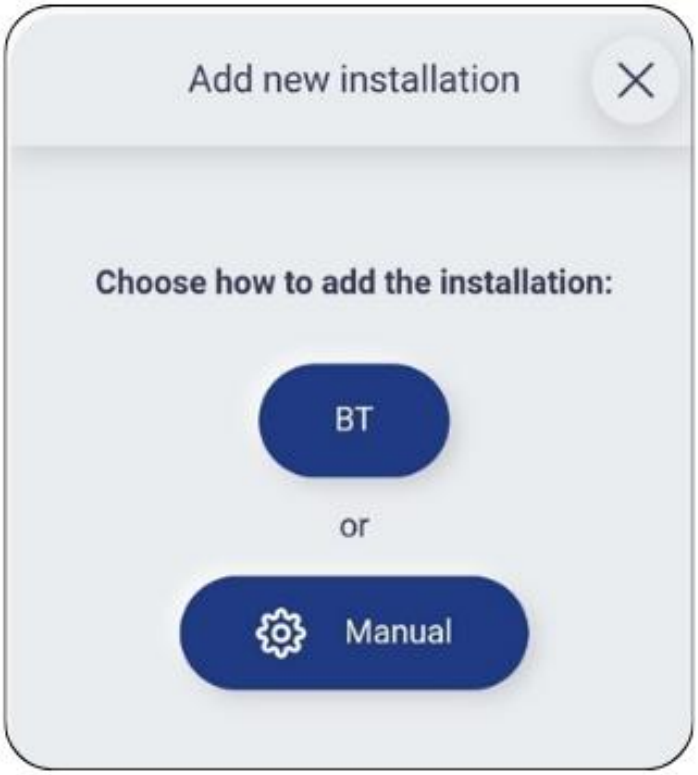



### 12.2 User not invited by the installer.

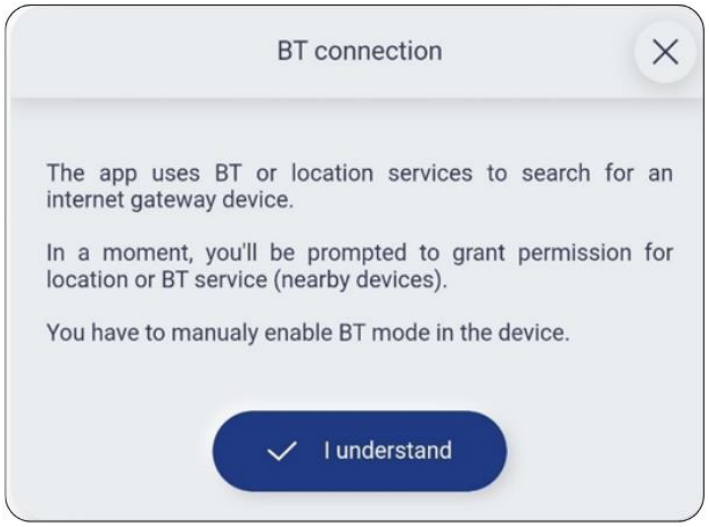
1. If the user has not been invited by the installer and has a correctly performed installation, the user can add “manually” such an installation.



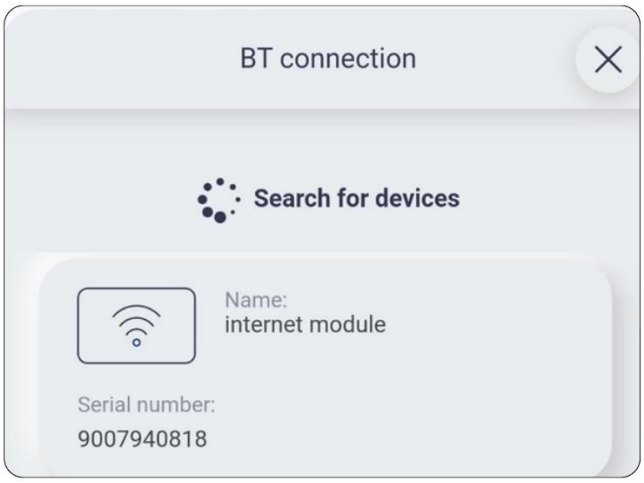
2. Select the method of adding the “BT”.



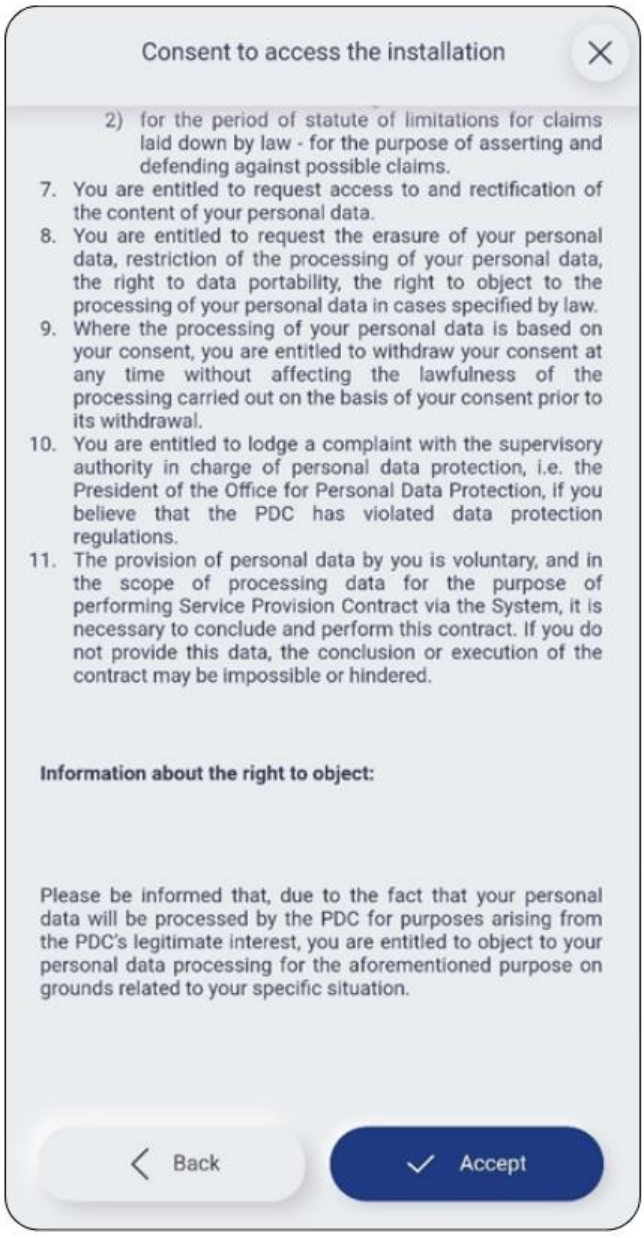

3. Follow the instructions in the app.



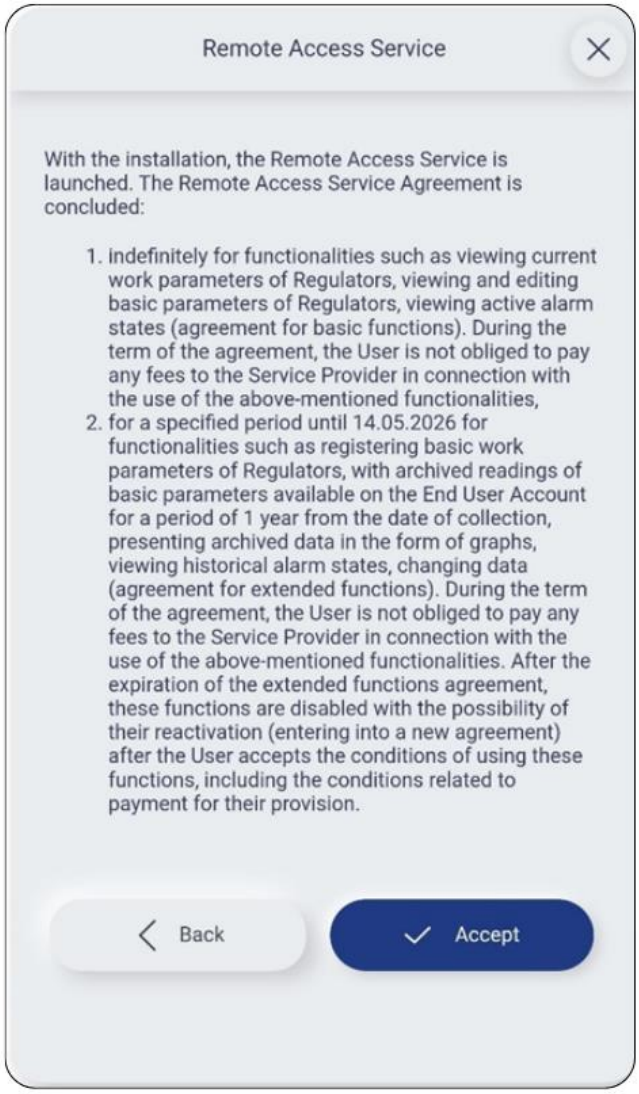
4. Search from the list by FN number (factory number read from the module nameplate e.g. 1006194719) and select the communication module you wish to configure.



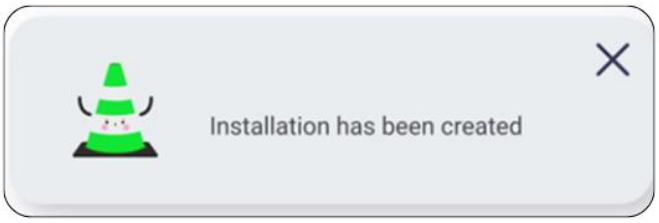

5. Acceptance of marketing consents (those mandatories are marked with an asterisk).



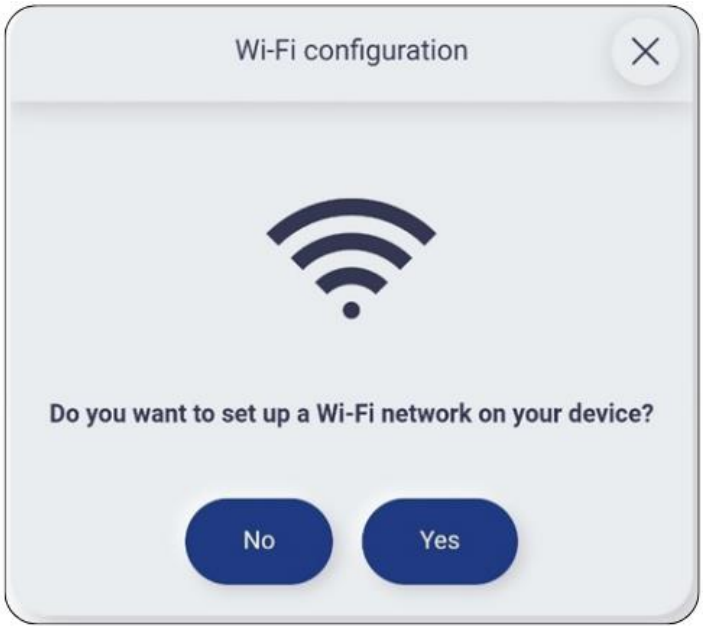
6. Acceptance of remote access service.



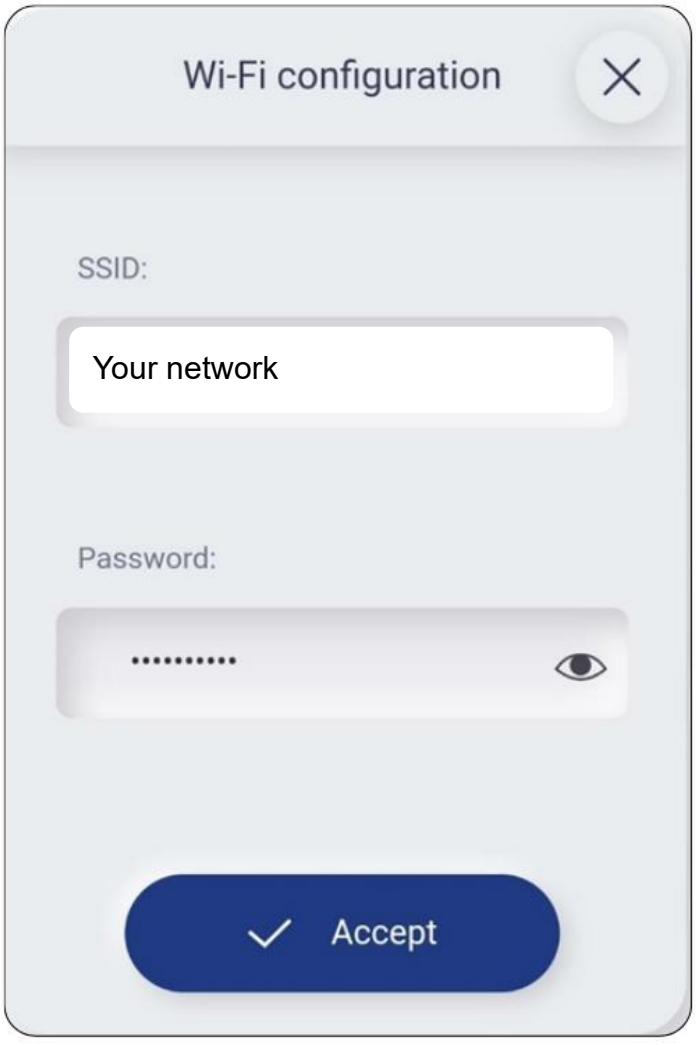

7. Confirmation of the addition of the new installation.



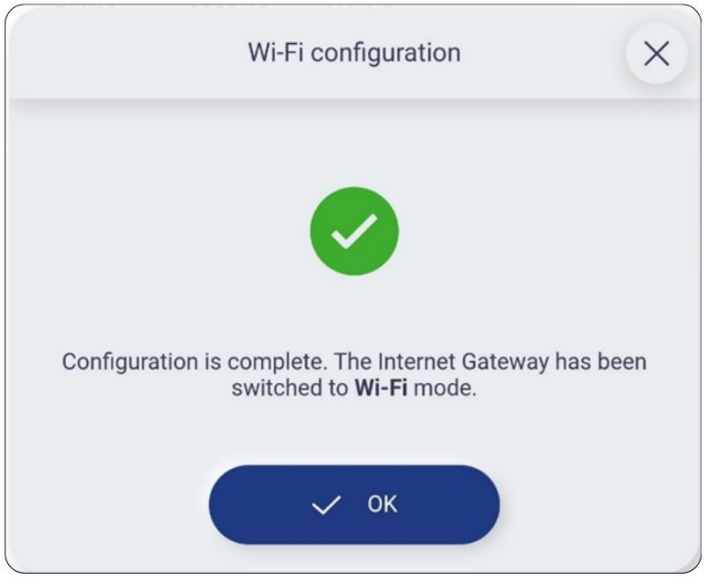
8. Wi-Fi configuration question.




9. Wi-Fi data configuration.



10. Once the network data has been entered correctly, the module automatically switches to Wi-Fi mode.

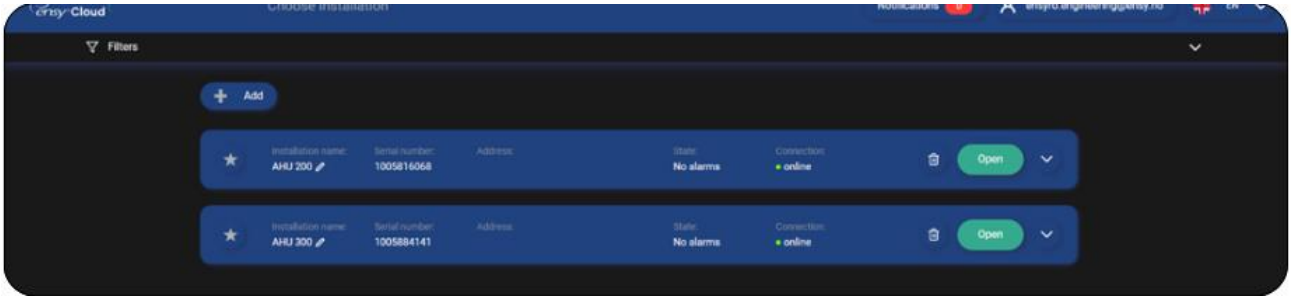



## 13 Description of WWW service functions

Full configuration and operation of the air handling unit from the **https://account.ensy.no/** website. Most of the functions described below can also be found in the mobile application.

### List of installations

Presents a list of installations assigned to an account. Each installation has its own unique serial number. From the installation list it is possible to read the status of the network connection and whether an alarm is currently active. Using the **Select** button, the user is taken to the **Main Screen** of the selected installation.



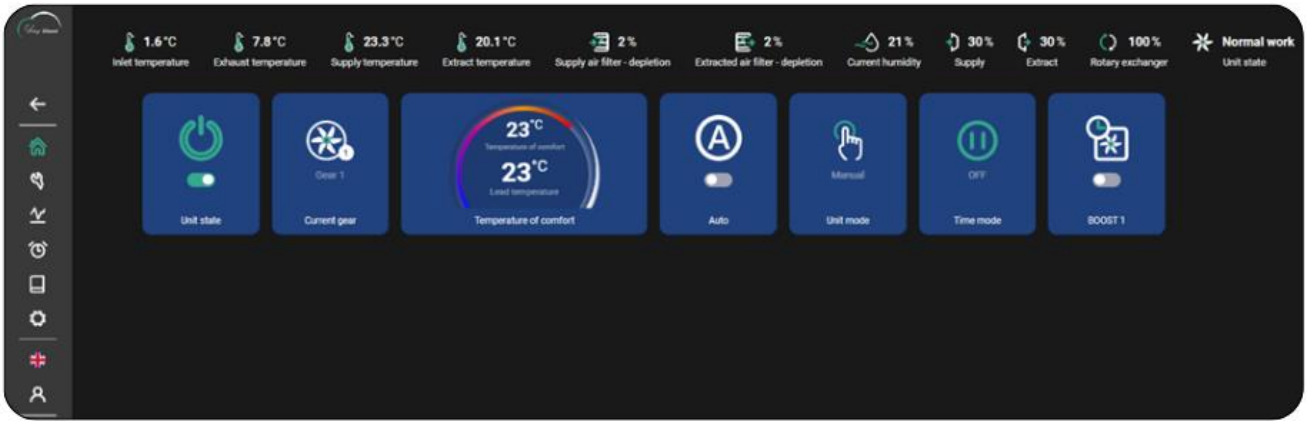

### Main screen

The main screen consists of three main elements:

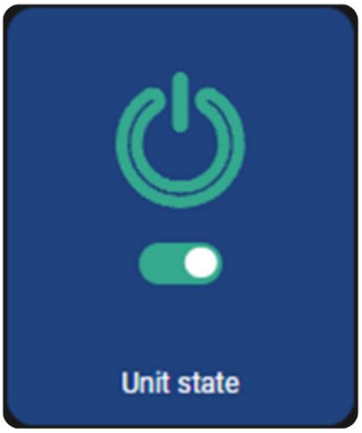
The **information bar** located at the top of the screen. The information bar contains basic information about the operating parameters of the unit air, such as temperatures, filter contamination status, air quality and the operating status of the unit.

The **central part** of the screen containing tiles for quickly changing the operating parameters of the unit.

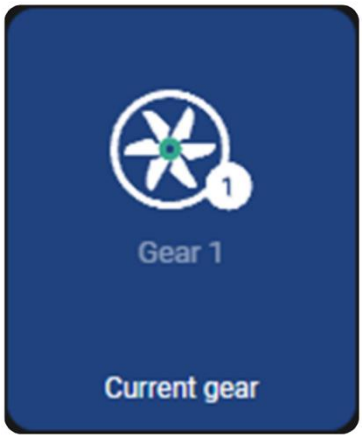
The **drop-down navigation menu** on the left-hand side of the screen.



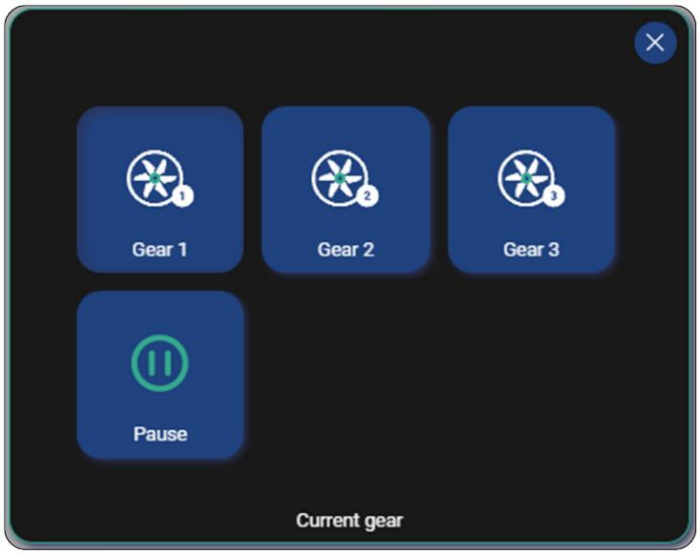

**Status of the control panel -** Enables the unit to be switched on/off.




**Current running mode tile** - Allows to change the operating mode of the unit air.




When pressed, it develops the current running mode selection screen, which allows to change the main operation mode, which is gears 1 (minimum), gear 2 (normal), gear 3 (maximum) and consequently the ventilation intensity and to stop the unit air operation.



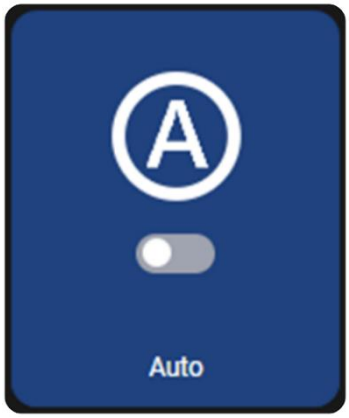

**Comfort temperature tile**

Allows to edit the set temperature visible in the upper part of the tile and the temperature reading from the leading sensor in the lower part of the tile.


When the cursor is positioned over the tile, it will change its appearance to allow the values to be edited. It is possible to edit the comfort temperature using the “+” and “-” signs. The modification must be confirmed using the purple button in the bottom right corner of the tile.

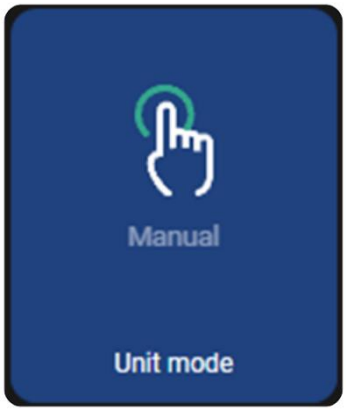
### Auto tile

Enables the Auto operating mode, which consists of operating the air handling unit in a mode that automatically adjusts the air exchange rate in relation to the parameters from the CO2 and RH air quality sensors.

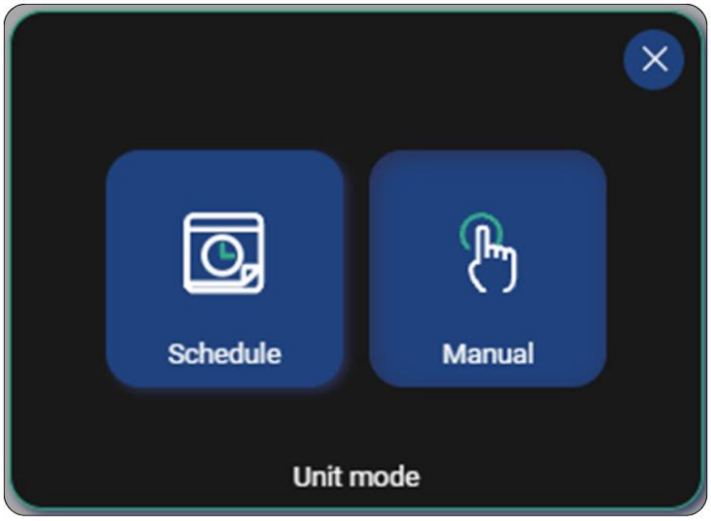



### Mode of the control panel tile

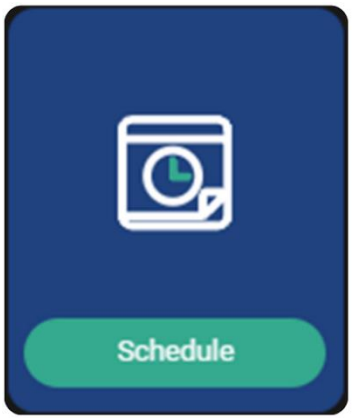
Enables changing the operation mode of the unit.



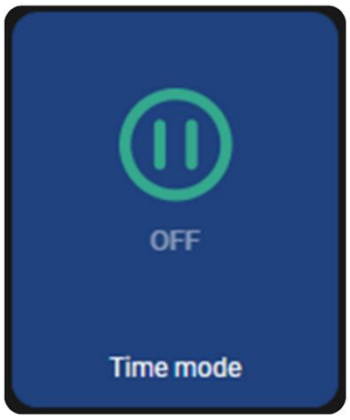

When pressed, it develops the operating mode selection screen.



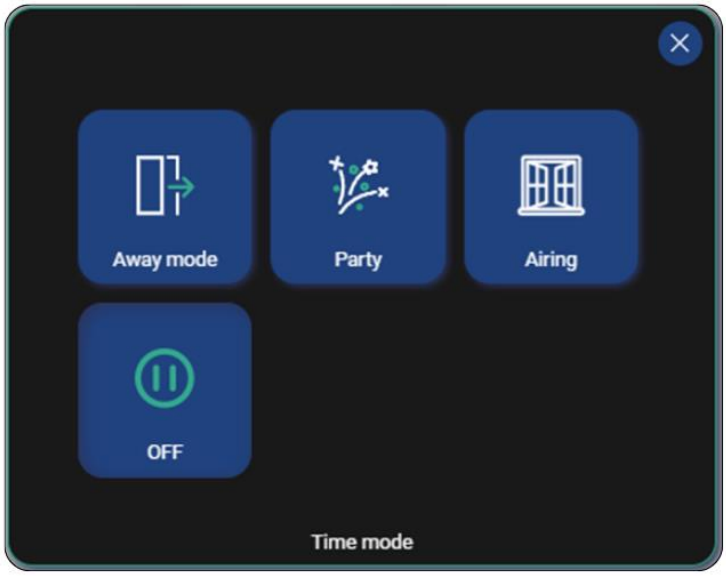
You can choose between **Manual** and **Schedule**. When the Schedule mode is selected, a navigation tile will appear on the main screen directing the user to the schedule edit screen. The schedule edit screen will be shown later in this manual.




**Time mode**




It enables the activation of a timed mode forcing a temporary change in fan control according to the settings of the mode. When pressed, it develops the time mode selection screen.

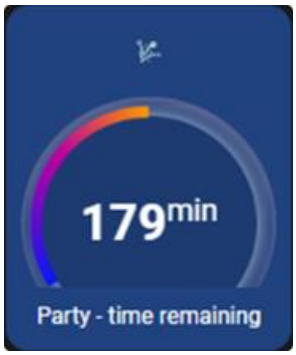


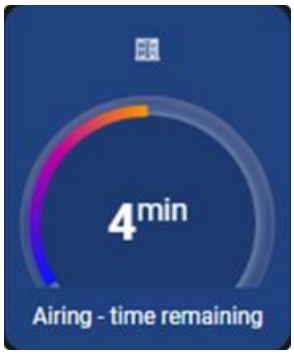

**Away mode –** Stops the operation of the unit, this mode can be used when the user leaves the room. The settings of this mode allow you to specify the duration.

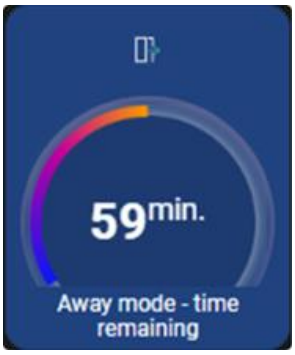
**Party -** Increases the fan output, this mode can be used when there are more people in the room. The settings of this mode allow to specify the air supply fan output, the exhaust fan output and the duration in hours.

**Airing –** Amends exhaust fan adjustment, while turning off air supply fan, this mode can be applied for fast air exchange in the room.

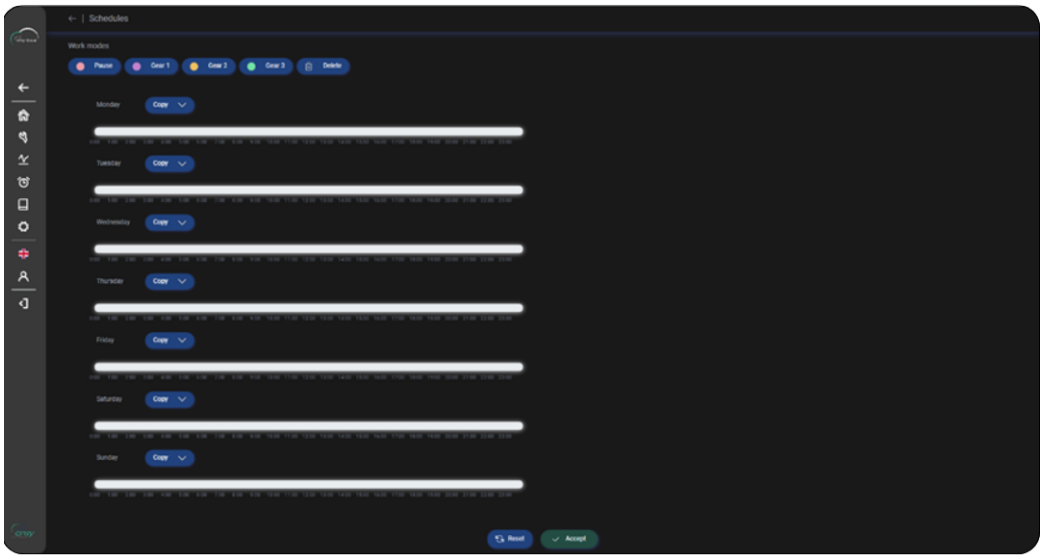
When a given time mode is activated, a tile indicating the remaining duration will appear.



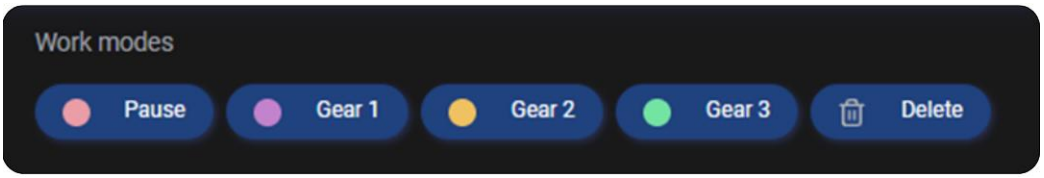




### Schedule settings screen

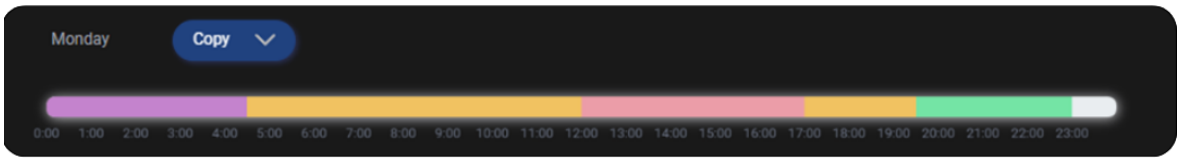


At the top of the screen, there is a selection of **Operation Mode.**

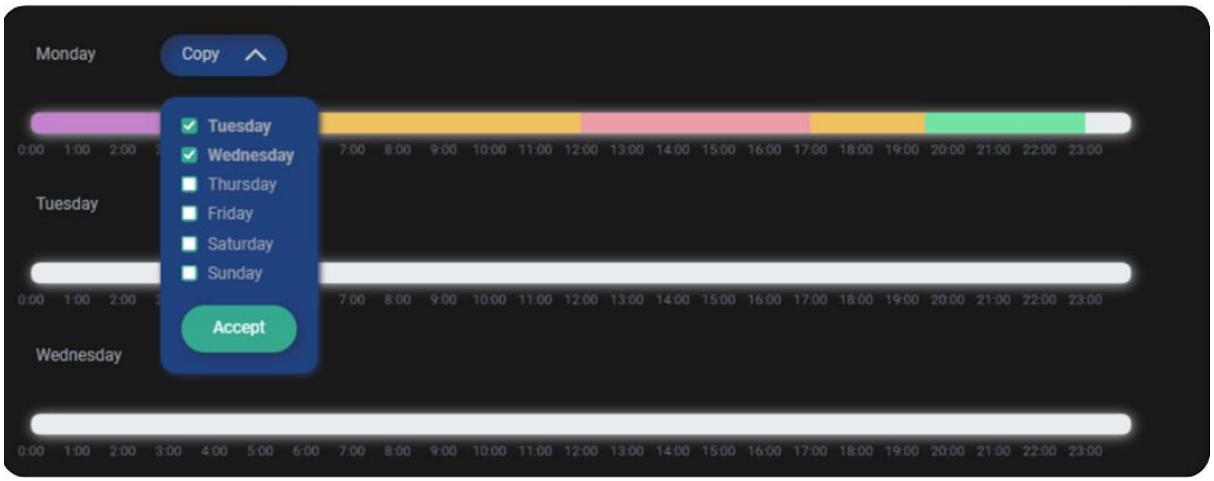



The central part of the screen shows the days for which the operating schedule can be set. To set the schedule, first select the Operation Mode you want to choose.

Then set the time interval for the selected day. Up to five intervals can be set in a single day.

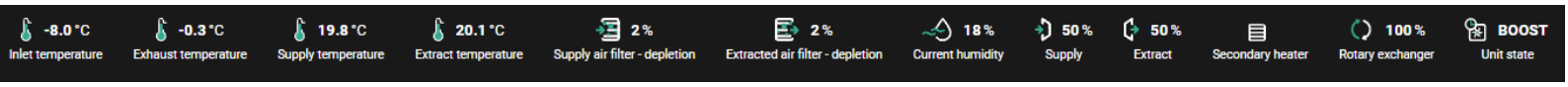



To copy the settings of a day, press the **Copy** button, then select the days to which you want to copy the settings in the drop-down menu and confirm.




To confirm the changes, press the **Confirm** button at the bottom of the page.

## 13.1 Information bar

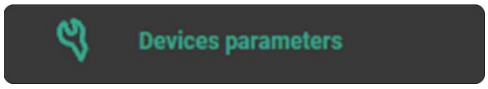



- **Temperature icons** - contain information about the temperatures on the individual channels of the unit air.
- **Filter - air supply** – shows the percentage dirtiness of the supply air filter.
- **Filter - exhaust** – shows the percentage dirtiness of the exhaust filter.
- **Air supply/exhaust icon** - shows the current power of the supply or exhaust fan or the readout of the air flow rate.
- **Current running mode** - shows the currently selected running mode of the unit air
- **Alarm active** - indicates the occurrence of an alarm
- **Humidity** – humidity of the room as read by the defined sensor.
- **CO2** – carbon dioxide concentration in the room as read by the defined sensor.

**Operating status icons:**

- **Normal operation** - the unit air in accordance with the settings of the user, controls the ventilation operation aiming at a comfort temperature in the room.
- **Heating operation** - in spite of the low outdoor air temperature, the unit air strives to maintain the room temperature by using the heat recovery in the exchanger first. Then it selects the source with the highest air temperature and, depending on the conditions, activates the optional secondary heater.
- **Cooling operation** - in spite of the high outdoor air temperature, the unit air strives to maintain the room temperature by using the cooling recovery in the exchanger first.
- **Pause** - the unit air stops the operation of the unit, only the protective functions operate.
- **Secondary heater** - Indicates heater activity in ON/OFF mode.
- **Ventilation** - the ventilation function is activated during the control panel operation.
- **Filter contamination test** - Filter contamination test in progress.
- **Anti-freeze** - the unit air, changing the fan speed or operating the secondary heater, prevents the exchanger from freezing.
- **Start delay** - the unit is started up; the fans start delay is in progress.
- **Heat recovery** - The leading temperature is lower than the comfort temperature, the unit air aims at the comfort temperature by means of heat recovery.
- **Cold recovery** - The leading temperature is higher than the comfort temperature, the unit air aims at the comfort temperature by means of cold recovery.

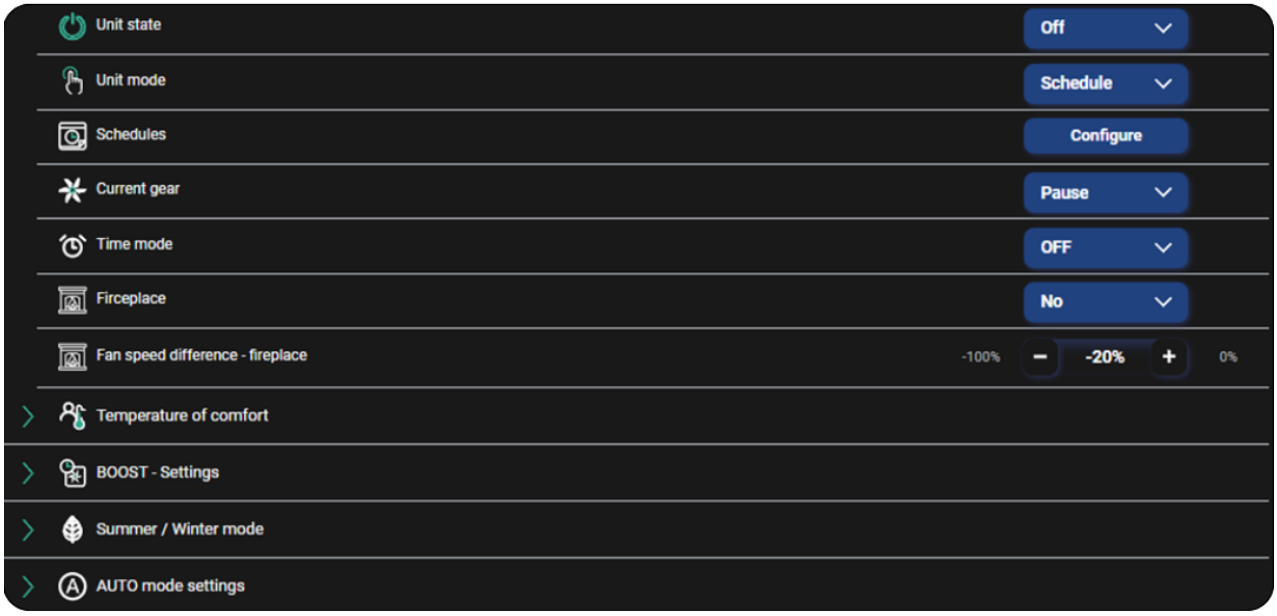
## 13.2 Installer accessible device parameters:




**Parameters marked with * are optional!**

It contains full information about the unit, the User menu and access to advanced settings including service settings. Among other things, depending on the software version, it includes:

- **Work mode**




- **Unit state** - Allows to set OFF/ON the unit.


- **Unit mode** - Allows to set the mode of unit “Schedule/Manual”.


- **Schedules** - Configure open the “Schedule settings screen”.


- **Current gear** - Allows to set the unit fans gear.

- **Time mode** - Allows to set the unit mode: Away, Party, Airing.


- **Fireplace** - possibility to activate the Fireplace mode - the idea is to create an overpressure in the ventilation by means of a differential control of the air supply/exhaust fans to prevent smoke backflow into the room from a burning fireplace and to provide oxygen for the combustion process.


- **The exhaust fan control** - will depend on the supply fan speed and the speed difference set in this parameter.


- **Temperature of comfort** - Possibility to read or set the target temperature.


- **BOOST settings (COOKER HOOD)** - It allows the user to set the air supply fan and exhaust fan control during the active mode.


- **Summer / Winter mode** - Seasonal mode settings; This parameter allows the user to select the mode: Auto, Winter, Summer or Ventilation
    - **Winter mode activation** - The parameter for defining the activation temperature of the winter mode in seasonal auto mode.
    - **Summer mode activation hysteresis** - The parameter for defining the activation hysteresis of the summer mode in seasonal auto mode.

- **AUTO mode settings** – possibility to enable automatic operation mode with respect to air sensor quality parameters.
    - **Normal humidity level** - This parameter allows to define the humidity level accepted as normal for the control algorithm.
    - **Hysteresis humidity level** - This parameter allows to define the range of air humidity treated as normal.


➢ **Time modes settings**


- **Away mode** - Parameter for specifying the duration of the away time mode. The time is set in hours.


- **Airing:**
    - **Set extract fan control** - The parameter for specifying extract fan control during the function: Airing
    - **Airing mode time duration** - The parameter to specify the Airing function duration.


- **Party:**
    - **Party mode time duration** - Parameter for specifying the duration of the party time mode. The time is set in hours.

➢ **Heat recovery**

- **Exchanger control** - The parameter to select the speed of the exchanger. Available options: Minimum speed, Maximum speed, Auto.

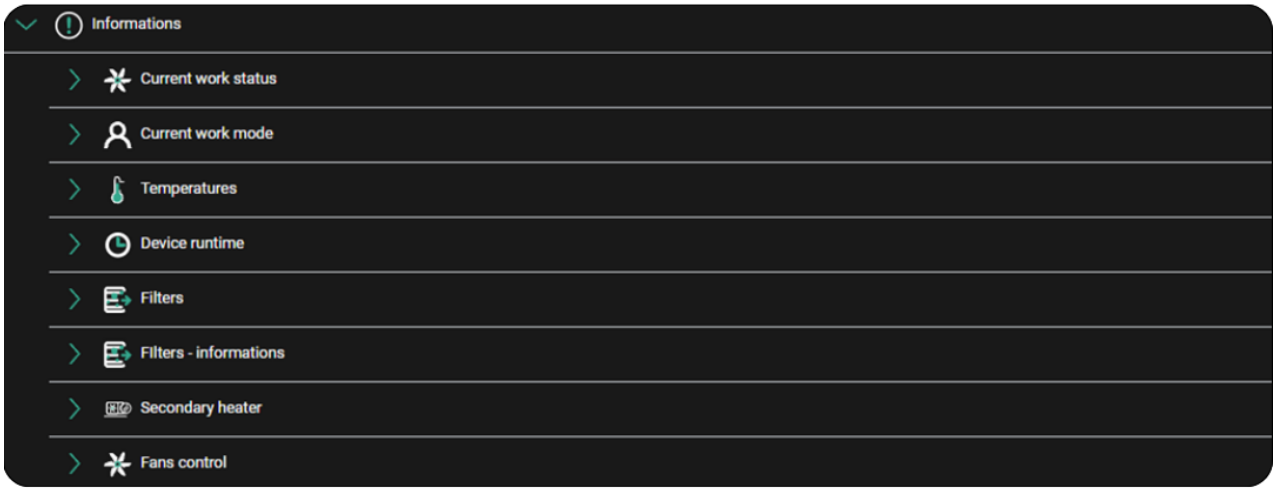

➢ **Filters**

- **Start filter change procedure** - Menu containing parameters for the filter replacement procedure.


➢ **Additional equipment authorisation**

- **Second heater** – permission to work; This parameter allows the user to authorise the operation of the secondary heater.

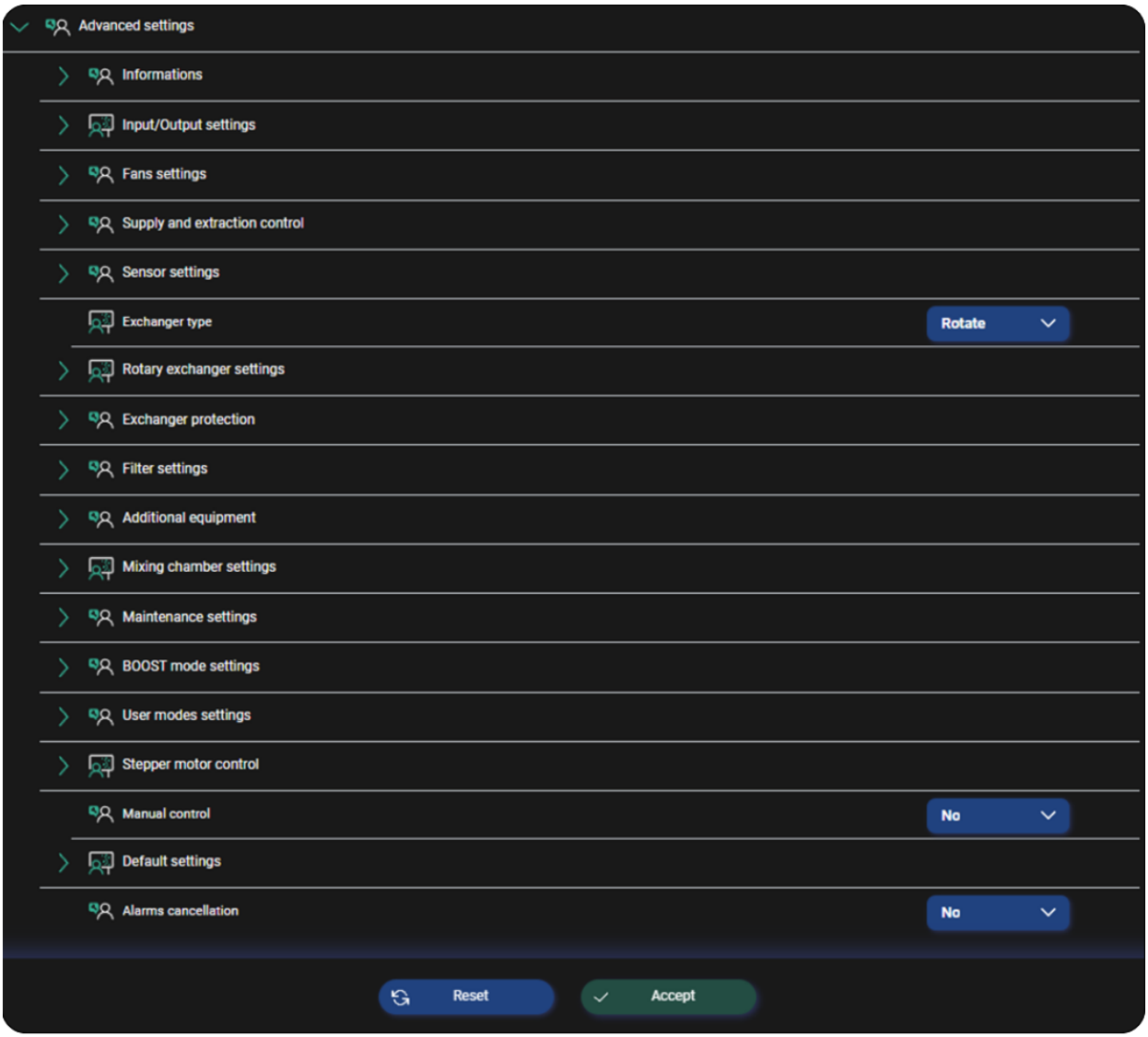

➢ **information's** - Menu containing information parameters such as current operating status, temperatures or filter operating time.



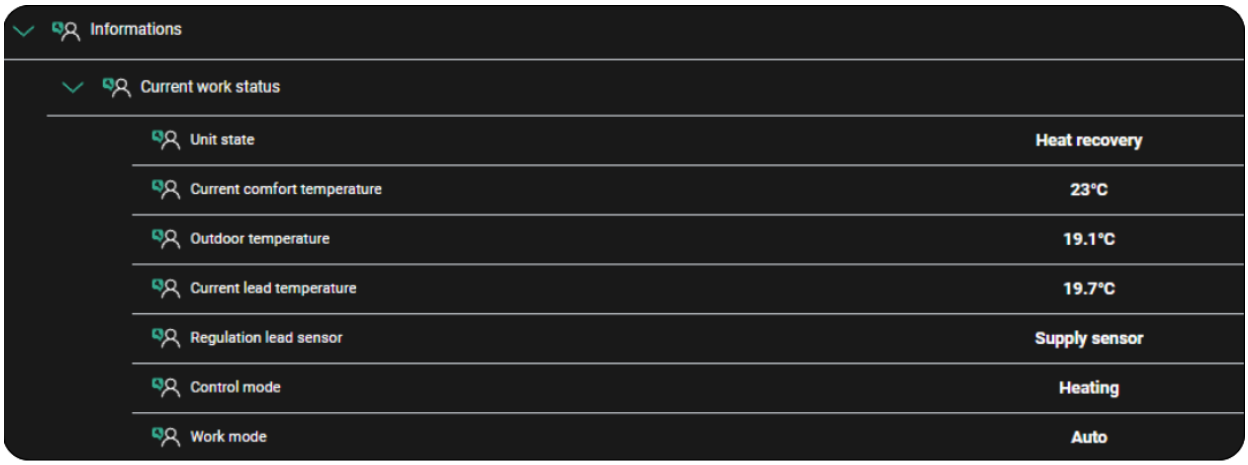
➢ **Advanced settings - The level of access to parameters is restricted based on the level of the account used by the currently.**

**Icon - indicates parameters to which the installer and the manufacturer have access.**

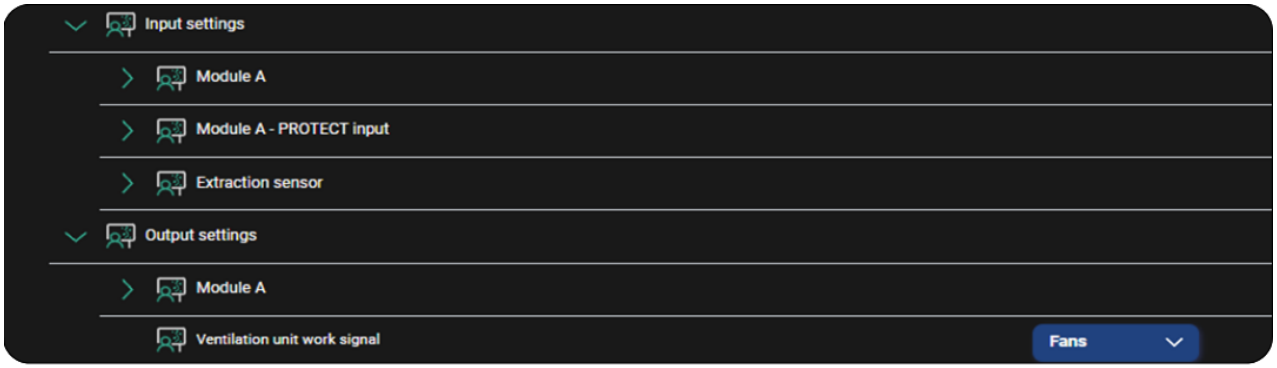
**Icon - indicates parameters to which only the manufacturer has access.**




- **Information's** – Allows to read information about all unit parameters.



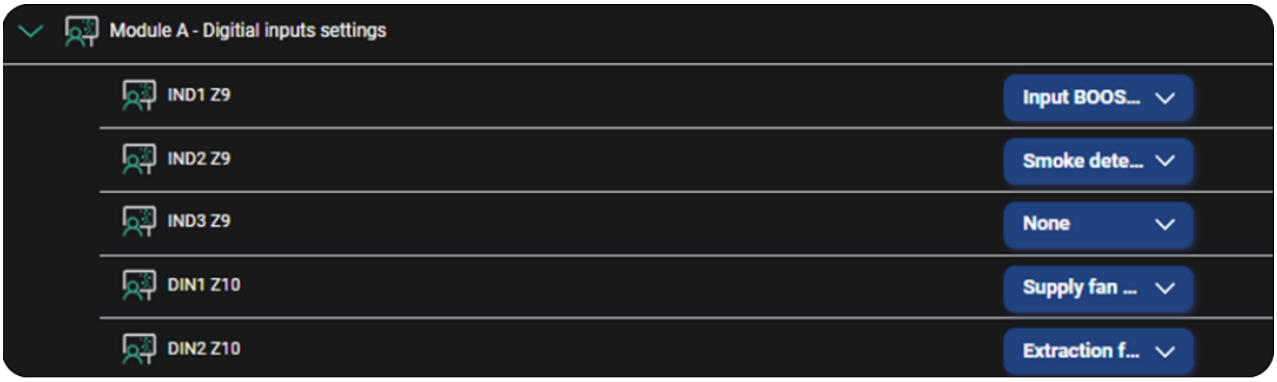
- **Input/Output settings** - The menu contains parameters allowing the declaration of the functions carried out on the inputs and outputs of the controller.




- **Input settings** - Submenu containing parameters allowing the declaration of functions performed on the inputs of the controller.
  - ***Module A*** - Submenu containing parameters of the inputs located on module A

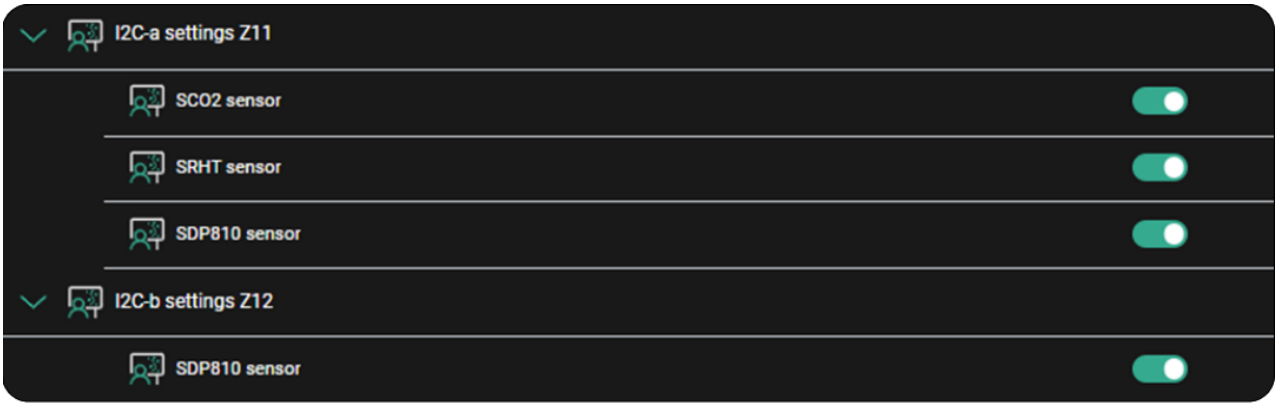
- ***Analog inputs settings.*** Submenu containing parameters allowing the declaration of functions performed on the analogue inputs (capable of processing voltages in the range 0 - 10 V) of the controller. Possible inputs: AI1 Z9, AI2 Z9. Selectable functions: None, Humidity sensor, *CO2 sensor, Air supply pressure sensor, Extraction pressure sensor, Air supply filter detection, Extraction filter detection.


- ***Digital inputs settings*** - Submenu containing parameters allowing the declaration of functions performed on the binary inputs of the controller. Possible inputs: IND1 Z9, IND2 Z9, IND3 Z9, DIN1 Z10, DIN2 Z10. **Selectable functions on the IND inputs:** None, Input BOOST1 (COOKER HOOD), Alarm control panel, FAS- fire alarm system, Input BOOST2, Supply filter, Extraction filter, *Smoke detector. **Selectable functions on the DIN inputs:** None, Air supply fan control, Extraction fan control, Rotary exchanger tachometer.

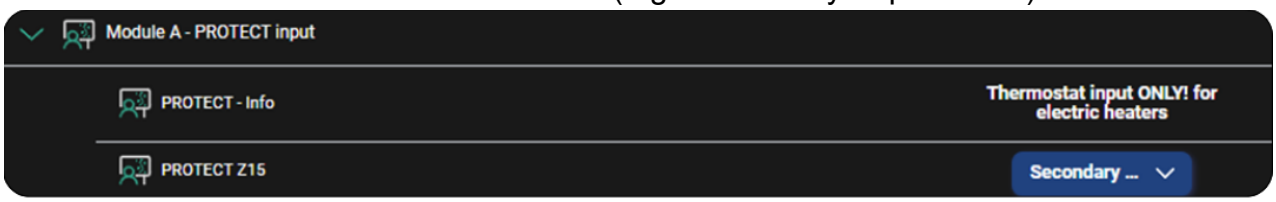



- ***Changing the built-in inputs*** - Submenu containing parameters allowing the declaration of functions performed on the I2C-A, I2C-B inputs. It is possible to enable:

**I2C-a settings Z11:** *SCO2 sensor, SRHT sensor, *SDP810 sensor and **I2C-b settings Z12:** *SDO810 sensor.




- **Module A – PROTECT input** - Allows to read what type of protection you can install and to select for which heater to work (e.g.: secondary or preheater).



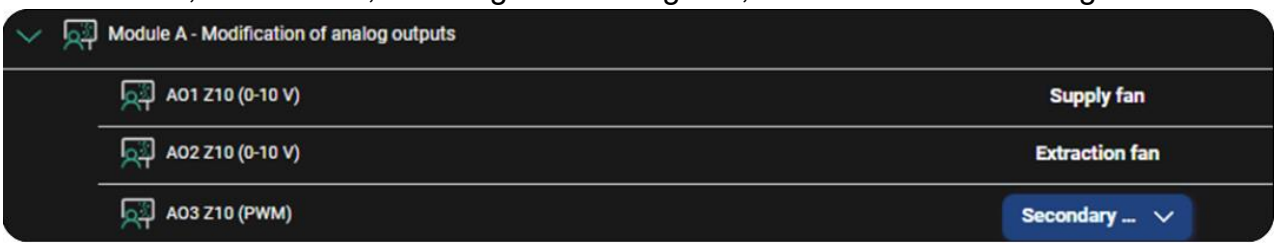

- **Extraction sensor** – Allows to select and activate which sensor to read the extract air temperature.


- **Output settings** – Submenu containing parameters allowing the declaration of functions performed on the outputs of the controller.
  - ***Module A*** - Submenu containing parameters of the inputs located on module A.

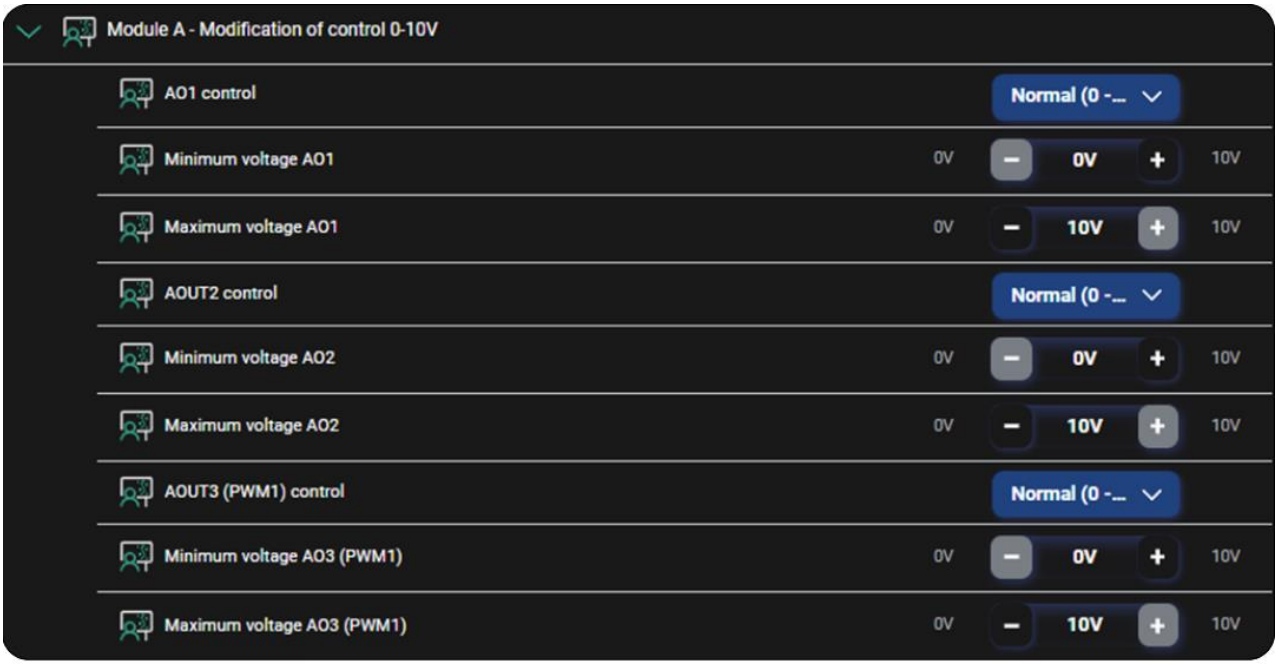
- ***Relay output modification*** - Submenu containing parameters allowing the declaration of functions performed on the relay outputs (both 230 V~ and potential-free) of the controller. Possible outputs: REL1 Z5, REL2 Z14. It is possible to choose the following: None, *Bypass, *Ground heat exchanger, *Air recirculation, Rotary exchanger, *Zone damper.


- ***Modification of analog outputs*** - Submenu containing parameters allowing the declaration of functions performed on the analogue 0-10 V outputs of the controller.

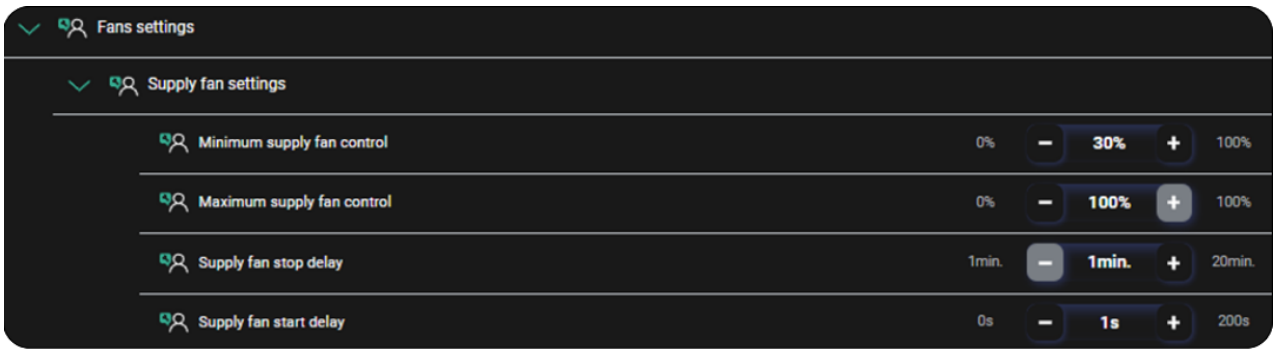
Possible outputs: AO1 Z10 (0-10V), AO Z10 (0-10V), AO3 Z10 (PWM). **For the first two outputs the settings are default and cannot be changed:** AO1 for supply fan and AO2 for extraction fan. **For the third output it is possible to choose the following (AO3):** None, Secondary heater, Bypass/Rotary exchanger, *Cooler, *Mixing chamber actuator, *Pre-heater, *Heating and cooling unit, *Ducted air conditioning fan.




- ***Modification of control 0-10V*** - Submenu containing parameters allowing the configuration of the operation mode of the analogue outputs. This option allows to define: Output mode (normal or inverted 0 - 10 V), Minimum voltage exposed, Maximum voltage exposed.




- **Fans settings** - The menu contains the fan settings available to the installer, where minimum and maximum fan control values are set, as well as the delay for stopping the fans after electric heater operation.
  - **Supply fan settings** - Submenu containing air supply fan settings.
- ***Minimum supply fan control*** - The minimum control that can be set in the air supply fan used. The setting should be selected according to the fan power.
- ***Maximum supply fan control*** - The maximum control that can be set in the air supply fan used. The setting should be selected according to the fan power.
- ***Supply fan stop delay*** - Delayed stop of the air supply fan after switching to *Off* mode from *Run* mode while waiting for the throttles to open.
- ***Supply fan start delay*** - Delayed start of the air supply fan after switching to *Run* mode from *Off* mode while waiting for the throttles to open.




- **Exhaust fan settings** - Submenu containing exhaust fan settings.

- ***Minimum extraction fan control*** - The minimum control that can be set in the exhaust fan used. The setting should be selected according to the fan power.
- ***Maximum extraction fan control*** - The maximum control that can be set in the exhaust fan used. The setting should be selected according to the fan power.
- ***Extraction fan stop delay*** - Delayed stop of the air extraction fan after switching to *Off* mode from *Run* mode while waiting for the throttles to open.
- ***Extraction fan start delay*** - Delayed start of the air extraction fan after switching to *Run* mode from *Off* mode while waiting for the throttles to open.


- **Minimum outdoor temperature** - The submenu contains settings related to the mechanism for permitting operation from the minimum temperature.

- ***Outside temperature permit*** - This parameter allows to enable/disable the mechanism to allow operation from the minimum outside temperature. Below the set threshold, the fans will be stopped and the throttles closed.
- ***Minimum outdoor temperature*** - This parameter allows you to specify the minimum outdoor temperature below which the unit will be disabled.
- ***Minimum outdoor temperature hysteresis*** - This parameter allows the outdoor temperature hysteresis to be set. Exceeding it will allow the unit to resume operation.


- **Fans operation control** - This submenu contains settings related to the fan operation monitoring function.

- ***Fan operation monitor*** - This parameter allows to enable the fan operation monitoring function.

- ***Work mode*** - It allows the selection of the fan operation monitoring mode. It is possible to choose the following: Pressure switch, Tachometer.
- ***Supply fan test time duration*** - The time for which a binary input will be monitored for a change of state. Delay in triggering the alarm response associated with the fan stop.
- ***Extraction fan test time duration*** - The time for which a binary input will be monitored for a change of state. Delay in triggering the alarm response associated with the fan stop.
- ***Supply fan alarm acknowledgement*** - Parameter for confirmation of the air supply fan outage alarm.
- ***Extraction fan alarm acknowledgement*** - Parameter for confirmation of the extraction fan outage alarm.
- ***Confirmation of triple triggering of the alarm of no supply/exhaust operation*** - Parameter for confirmation of the alarm relating to the triple failure to confirm the operation of the fans.


- **Supply and extraction control** - Setting the control mode for the air supply and exhaust fans.
  - **Type of regulation** – Selection of the fluid control option for air supply and exhaust: ***Standard*** – no automatic fan speed control. The fans control can only be changed by changing the active operating modes or their settings. ***Constant pressure*** – fan speed control to maintain constant pressure in air supply and exhaust ducts. Differential pressure sensors are required. ***Constant flow*** – fan speed control to maintain constant flow in supply and extract ducts. Differential pressure sensors are required.

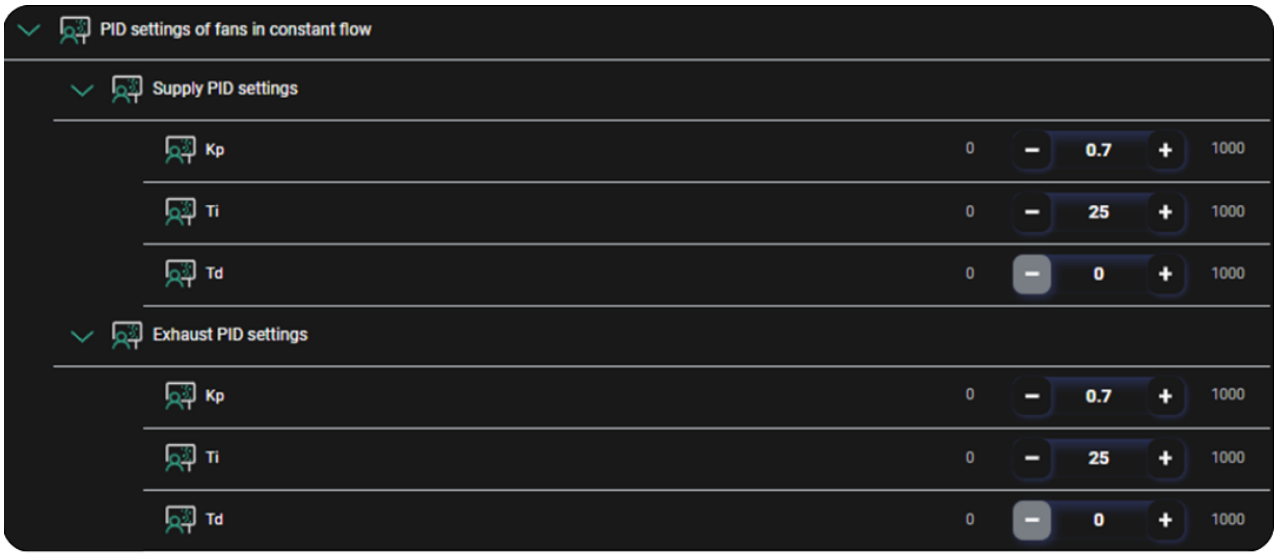

  - **Supply control** - Submenu containing parameters for the implementation of the Fixed pressure or Constant flows for the air supply duct.
- ***Start level*** - The output minimum fan control from which the control calculation for Fixed pressure and Constant flows will start.

- **Extraction control** - Submenu containing parameters for the implementation of the Fixed pressure or Constant flows for the exhaust duct.

- ***Start level*** - The output minimum fan control from which the control calculation for Fixed pressure and Constant flows will start.


- **PID settings of fans in constant flow** - This menu allows you to make adjustments to the PID parameters of fan control in “Fixed flow” mode. The parameters allow changes to be made to the PID control separately for:

- ***Supply PID settings (Kp, Ti, Td coefficients available)***
- ***Exhaust PID settings (Kp, Ti, Td coefficients available)***

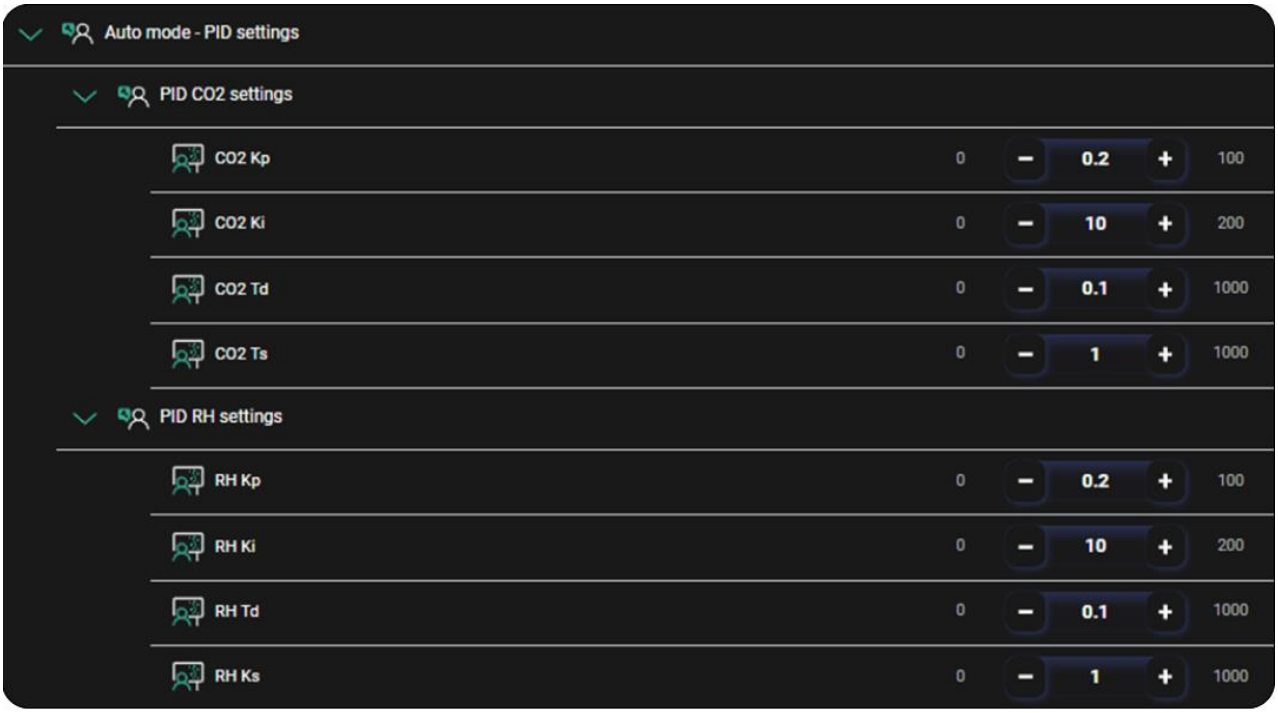



- **Sensor settings** - The menu contains settings related to temperature sensors, Auto mode settings and threshold air quality sensors.
  - **Regulation lead sensor** - Selection of the sensor responsible for regulation of the comfort temperature (Supply sensor, Panel T5, Exhaust sensor i2C, SCP panel).
  - **I2C sensor correction** - This submenu allows the correction of the CO2 or humidity readings.

- ***SCO2 sensor PPM correction*** - Correction of PPM of SCO2 sensor in the range of -100 to 100 ppm.
- ***SCO2/SRHT sensor humidity correction*** - Correction of the humidity of the SCO2/SRHT sensor in the range -10 to 10 %.

- **Auto mode settings** - Fan control mode settings according to the air quality sensor readings.

- ***Auto mode – PID settings*** - This menu allows you to make adjustments to the PID parameters of fan control. The parameters allow changes to be made to the PID control separately for: **PID CO2 settings** (Kp, Ki, Td, Ts coefficients available) and **PID RH settings** (Kp, Ki, Td, Ts coefficients available).




- ****CO2 sensor*** - Submenu containing settings related to the operation of the CO2 sensor.

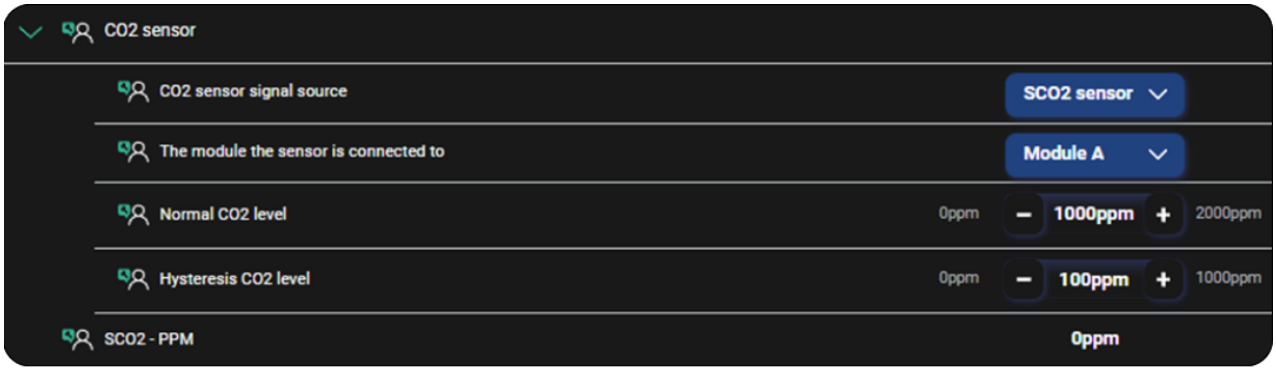
❖ **CO2 sensor signal source** - This parameter allows the selection of the signal source of the CO2 sensor. The selection enables/disables operation and initial configuration. It is possible to choose the following: None, Analogue sensor, SCO2 sensor.

❖ **Normal CO2 level** - This parameter allows to define the range of CO2 concentrations in the air treated as normal.

❖ **Hysteresis CO2 level** - This parameter allows to define the range of CO2 concentrations in the air treated as normal.

❖ **CO2 sensor range** - This parameter allows you to specify the measurement range of the connected sensor.

❖ **SCO2 PPM** - Overview of the CO2 reading in PPM after correct sensor configuration.



- ***Humidity sensor*** - Submenu containing settings related to the operation of the humidity sensor.

❖ **Humidity sensor signal source** - This parameter allows the selection of the signal source of the humidity sensor. The selection enables/disables operation and initial configuration. It is possible to choose the following: None, Analogue sensor, SRHT sensor, SCO2 sensor, SCP panel.

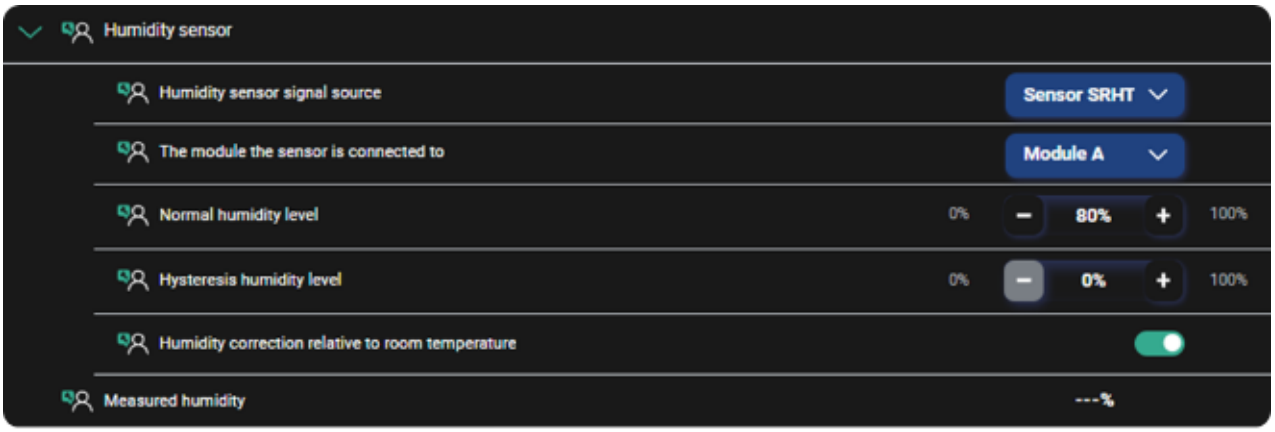
❖ **The module the sensor is connected to** - This parameter allows the selection of the module to which the sensor is connected.

❖ **Normal humidity level** - This parameter allows to define the humidity level accepted as normal for the control algorithm.

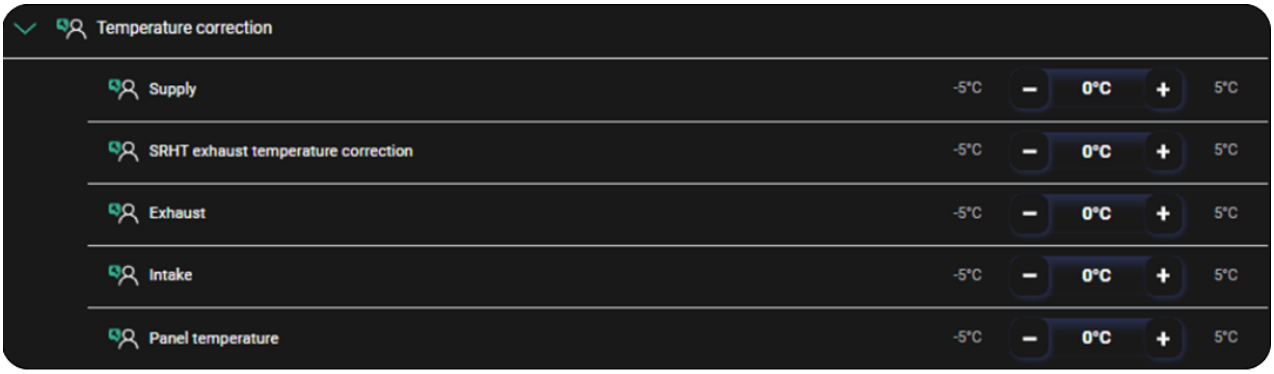
❖ **Hysteresis humidity level** - This parameter allows to define the range of air humidity treated as normal.

❖ **Humidity correction relative to room temperature** - Enables/disables an additional algorithm for correcting the reading of the indoor sensor in relation to the room temperature reading.

❖ **Measured humidity** - Overview of humidity reading in percentage after correct sensor configuration.




- ***Temperature correction*** - The submenu allows to enter a correction of the read value from the temperature sensors.




- ****Smoke detector*** - Submenu containing settings related to the operation of the smoke sensor.

❖ **Extract fan operation during active sensor signal** – This parameter allows the selection of enable/disable of the extraction fan operation after smoke detection.

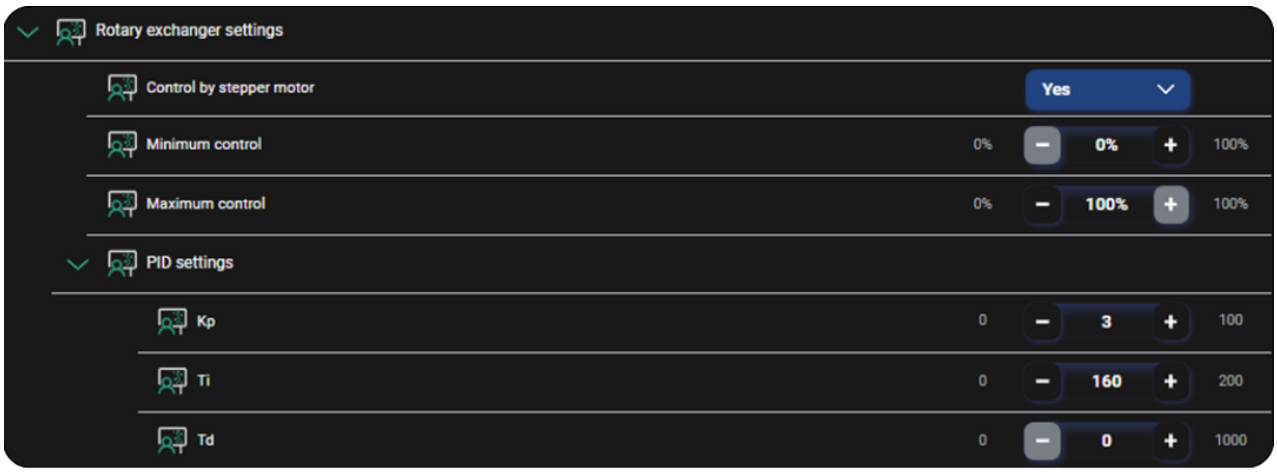
❖ **Extract fan speed** - This parameter allows you to specify the speed of the extract fan that will be set when a signal from the smoke detector sensor is detected.

- ❖ **Smoke detector work state** – This parameter allows to read the state of the smoke detector “OFF/ON”.
- ❖ **Digital input logic state** - The parameter to specify the setting of the logical state of a digital input: *NO* (normally open) or *NC* (normally closed).


- **Exchanger type** - Selection of the type of exchanger used: Countercurrent or rotary. The selection changes the automatics scheme displayed on the main screen and changes the automation scheme under the given type of the installed exchanger.


- **Rotary exchanger settings** - This menu contains parameters related to the algorithm controlling the rotary exchanger motor.
  - **Control by stepper motor** - This parameter enables or disables the exchanger motor control algorithm.
  - **Minimum control** - Setting of the minimum control for the rotary exchanger with fluid control.
  - **Maximum control** - Setting of the maximum control for the rotary exchanger with fluid control.
  - **PID settings** - This menu allows you to make adjustments to the PID parameters of rotary control:

- ***Kp setpoint*** - Setting of the PID algorithm Override Controlling for the rotary exchanger motor control.
- ***Ti setpoint*** - Setting of the PID algorithm integration for the rotary exchanger motor control.
- ***Td setpoint*** - Setting of the PID algorithm differentiation for the rotary exchanger motor control.

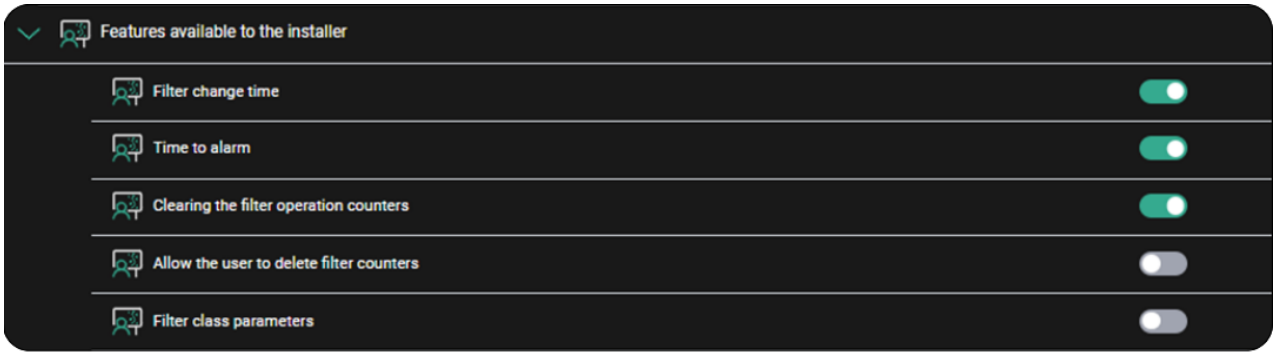


- **Exchanger protection** - Menu containing submenus related to exchanger protection functions.
  - **Overheat protection** - Activation or deactivation of the air supply over-temperature protection mechanism. It is possible to choose the following: No, Alarm and switch off unit air, Switch off secondary heater.
  - **Supply temperature limit** - Limit value of the air supply temperature above which the unit will be switched off for a certain period.
  - **Down time** - The down time of the unit after exceeding the maximum air supply temperature.
  - **Low temperature protection** - Activation or deactivation of the air supply under-temperature protection mechanism. It is possible to choose the following: No, Alarm and switch off supply air fan, Switch on secondary heater.
  - **Low supply temperature threshold** - Setting of the threshold for too low air supply temperature.
  - **Low temperature detection time** - The interruption time of the air supply fan after exceeding the minimum air supply temperature.


- **Filter settings** - Settings related to filters.
  - **Dirty filter detection mechanism** - This parameter allows you to set the method for monitoring filter contamination. It is possible to choose the following: None, Time Pressure switch, Converter.
  - **The installer configures** - This parameter allows to set installer access to the filter configuration function.
  - **Filter change** - This parameter allows to set the level of access to the filter replacement function. It is possible to choose the following: Installer/ User/ Installer configures.

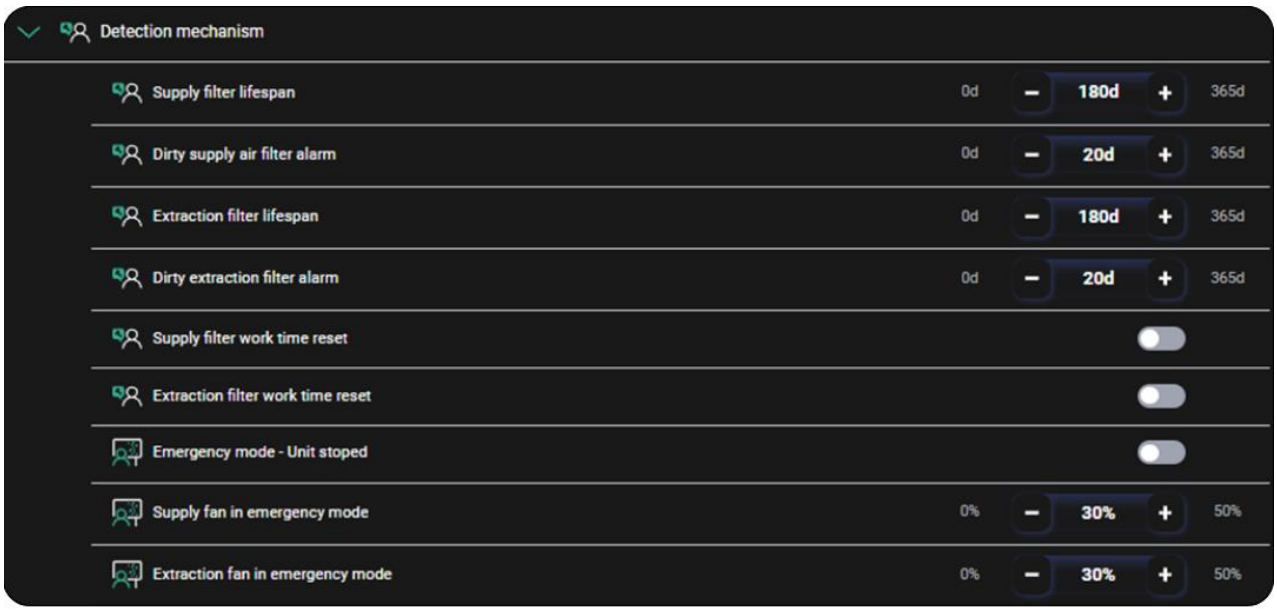
- **Features available to the installer** - Submenu containing settings related to making configuration functions available to the installer.

- ***Filter change time*** - This parameter allows the installer to be granted access to the menu containing the settings for the “Filter change time”.
- ***Time to alarm*** - This parameter allows the installer to be granted access to the menu containing the settings for the “Time to alarm”.
- ***Clearing the filter operation counters*** - This parameter allows the installer to be granted access to the menu containing the settings for the “Clearing the filter operation counters”.
- ***Allow the user to delete filter counters*** - This parameter allows the installer to be granted access to the menu containing the settings for the “Allow the user to delete filter counters”.
- ***Filter class parameters*** - This parameter allows the installer to be granted access to the menu containing the definitions of the filter classes.



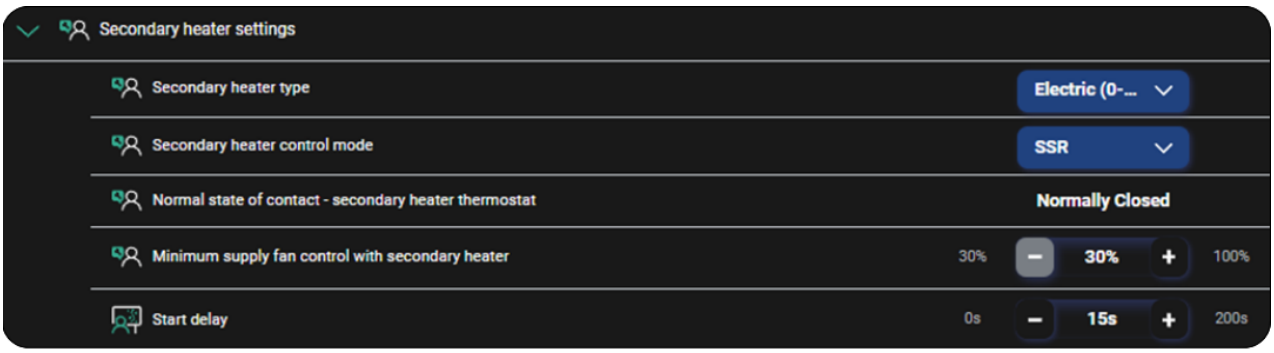

- **Detection mechanism** - Submenu containing settings related to the contaminated filter detection mechanisms.

- ***Supply filter lifespan*** - This parameter allows you to set the number of operating days of the air supply filter as declared by the manufacturer.
- ***Dirty supply air filter alarm*** - This parameter allows to set the contamination threshold above which an alarm will be displayed.
- ***Extraction filter lifespan*** - This parameter allows you to set the number of operating days of the exhaust filter as declared by the manufacturer.
- ***Dirty extraction filter alarm*** - This parameter allows to set the contamination threshold above which an alarm will be displayed.
- ***Supply filter work time reset*** - This parameter allows to reset the operating time counter of the air supply filter.
- ***Extraction filter work time reset*** - This parameter allows to reset the operating time counter of the exhaust filter.
- ***Emergency mode – Unit stopped*** - The parameter determines the shutdown of the unit in the event of an emergency mode.
- ***Supply fan in emergency mode*** - This parameter allows to set the air supply fan control value during the emergency mode (available if the unit stop with the above parameter is not defined).
- ***Extraction fan in emergency mode*** - This parameter allows to set the exhaust fan control value during the emergency mode (available if the unit stop with the above parameter is not defined).

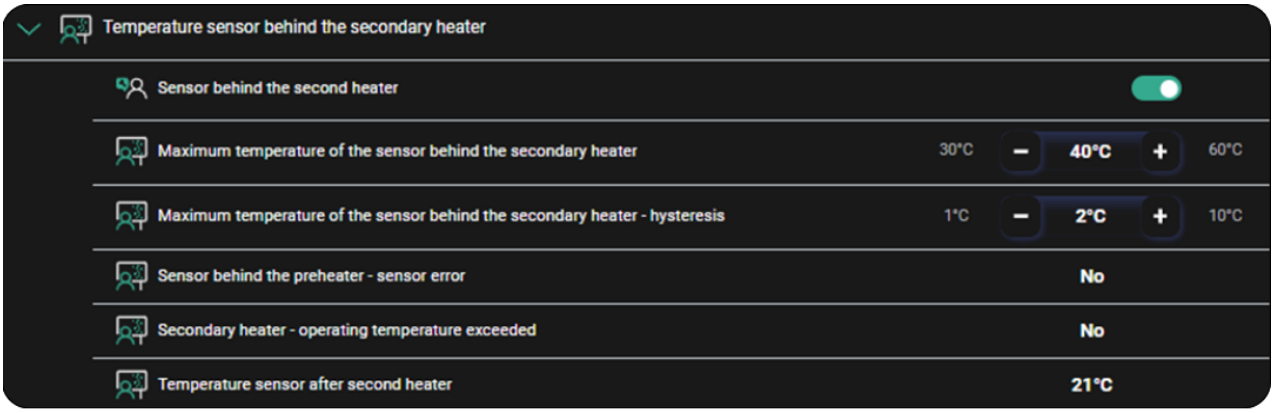



  - **Filter support enable** – Submenu containing settings related to the operation of the filters.
- ***Filter change by the user*** – This parameter allows to make the filter replacement procedure available to the end user.
- ***Start filter change procedure*** – The parameter allows the filter replacement procedure to be started.


- **Additional equipment** - Menu comprising submenus for operating additional devices.
  - ***Cooler** - Parameters related to the operation of the Cooler.
  - **Secondary heater settings** - Parameters related to the operation of the secondary heater.
- ***Secondary heater type*** - Selection of the type of secondary heater to be operated. It is possible to choose the following: None, Electric ON/OFF, Electric 0100%, Water ON/OFF, Water 0-100%.
- ***Secondary heater control mode*** - This parameter allows the type of secondary heater control to be set. Normal mode f = 6 kHz; mode SSR f = 0.1 Hz.
- ***Normal state of contact – secondary heater thermostat*** - This parameter allows to read the normal state of the binary input for detecting the signal from the secondary heater thermostat (electric or water).
- ***Minimum supply fan control with secondary heater*** - This parameter allows to set the minimum air supply fan control above which the secondary heater can be activated.
- ***Start delay*** - Start delay of the secondary heater after the air supply fan starts.

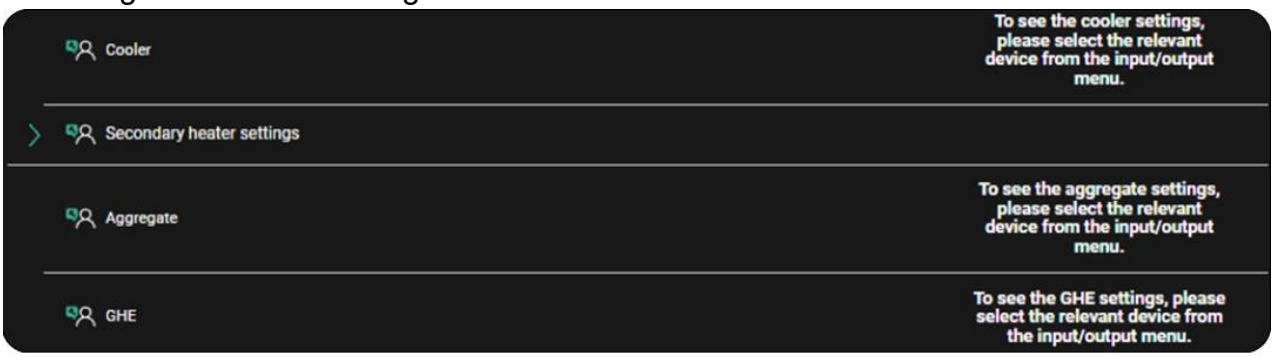



- ***Temperature sensor behind the secondary heater*** - Submenu containing settings related to the operation of the sensor behind the heater.
- ❖ **Sensor behind the second heater** - This parameter enables operation of the additional sensor.
- ❖ **Maximum temperature of the sensor behind the secondary heater** - Parameter to set the maximum heating temperature of the secondary heater.
- ❖ **Maximum temperature of the sensor behind the secondary heater – hysteresis** - This parameter allows the max. temp. of the sensor behind heater hysteresis to be set. Exceeding it will allow the unit to resume operation.
- ❖ **Sensor behind the preheater - sensor error** – The parameter allows reading if the sensor has an error.
- ❖ **Secondary heater - operating temperature exceeded** – The parameter allows reading if the operating temperature is exceeded.
- ❖ **Temperature sensor after second heater** – The parameter allows reading the sensor temperature value.




- ***PID settings for the secondary heater*** - Submenu containing parameters for adjusting the operation of the PID algorithm.
- ❖ **Kp setpoint** - Setting the PID algorithm Override Controlling for the water and electric heater.
- ❖ **Ti setpoint** - Setting the PID algorithm integration for the water and electric heater.
- ❖ **Td setpoint** - Setting the PID algorithm differentiation for water and electric heater.

- ***Aggregate** - Parameters related to the operation of the Aggregate.
- ***GHE** - The menu contains parameters for editing the parameters relating to the ground heat exchanger.




- **Mixing chamber settings** - This menu contains parameters related to the operation of the mixing chamber.
  - **Kp setpoint** - Setting of the PID algorithm integration for mixing chamber control.
  - **Ti setpoint** - Setting of the PID algorithm Override Controlling for mixing chamber control.
  - **Td setpoint** - Setting of the PID algorithm differentiation for mixing chamber control.
  - **Min. control of mixing chamber** - Setting of the minimum control for the mixer chamber throttle below which the control algorithm will not be performed.
  - **Max. control of mixing chamber** - Setting of the maximum control for the mixer chamber throttle below which the control algorithm will not be performed.


- **Maintenance settings** - This menu contains parameters related to the operation of the maintenance.
  - **Maintenance function enabled** – This parameter enables or disables the maintenance function algorithm.
  - **Maintenance counter reset** – This parameter allows to reset the number of days until the maintenance time arrives.
  - **Number if days to maintenance** - This parameter allows to set the number of operating days of the unit as declared by the manufacturer, until the next maintenance.

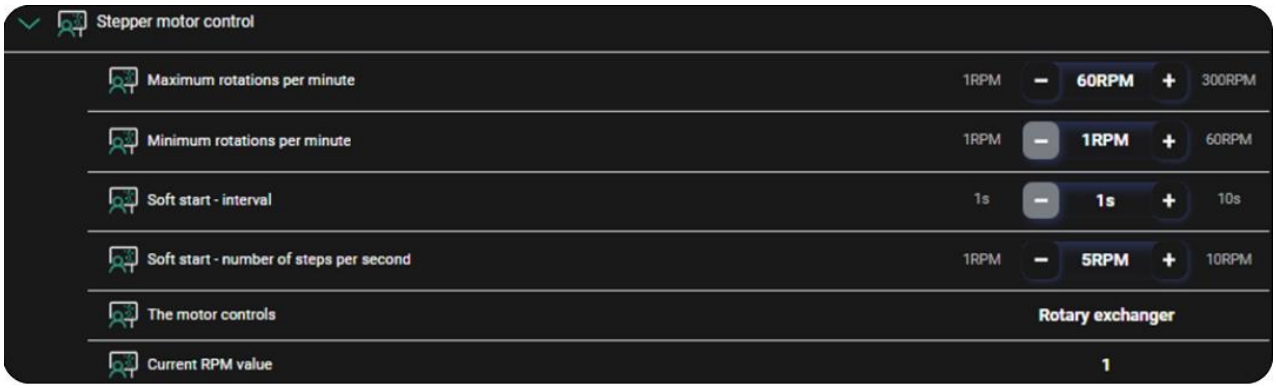
- **BOOST mode settings (COOKER HOOD)** - This menu contains parameters related to the operation of the BOOST mode.
  - **BOOST operation mode** – This parameter enables or disables the BOOST mode control algorithm. It is possible to choose the following: Close-means a permanent ON/OFF switch; Signal-means a momentary switch (you press and release).
  - **Hood – change of fan control** – This parameter allows to choose the following: “Add”-you add the entered value to the current fan control; “Set”-you set what the fan control value should be.
  - **BOOST 1 Logic state** – The parameter to specify the setting of the logical state of a digital input: *NO* (normally open) or *NC* (normally closed).
  - **Settings for the fan control BOOST 1** – Submenu containing settings related to the supply fan control and extraction fan control in boost mode.
- ***Supply fan control from BOOST 1*** – This parameter allows to set the supply fan operating percentage during BOOST 1 mode.
- ***Extraction fan control from BOOST 1*** - This parameter allows to set the extraction fan operating percentage during BOOST 1 mode.


- **User modes settings** - Menu containing parameters for setting the fan running modes and their control during time modes.
  - **User modes** - Submenu containing parameter settings for air supply and exhaust fan control for each of the time modes. It is possible to make the changes to the following: Gear 1 (Minimum), Gear 2 (Normal), Gear 3 (Maximum).

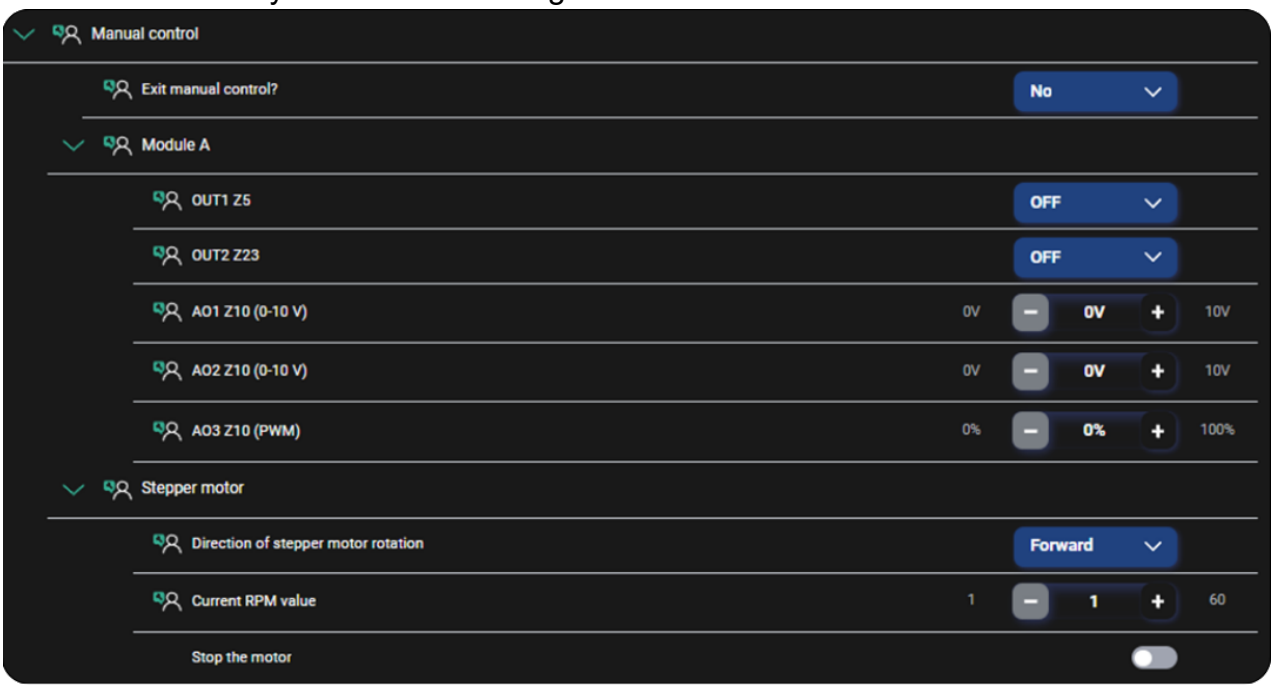
- **Time modes settings** - Submenu containing settings for air supply and exhaust fan control during the **Party mode**.


- **Comfort temperature range settings** - Submenu containing settings for the minimum and maximum comfort temperature range for the setting on home page.


- **Stepper motor control** - The menu contains settings for step motor operation.
  - **Maximum rotations per minute** – The parameter allows to set the maximum number of rotations of the stepper motor per minute (e.g.: 60 rpm).
  - **Minimum rotations per minute** - The parameter allows to set the minimum number of rotations of the stepper motor per minute (e.g.: 10 rpm).
  - **Soft start – interval** - The parameter allows to set the time between motor steps at startup.
  - **Soft start – number of steps per second** – The parameter allows to set the number of steps per second at motor startup.
  - **The motor controls** – The parameter allows to read the device driven by the stepper motor.
  - **Current RPM value** – The parameter allows to read the real-time value of the stepper motor's rotation per minute.



- **Manual control** - Manual control allows the manual setting of individual relay outputs. **Attention:** Use this menu with caution and switch the outputs on consciously so as not to damage the unit.

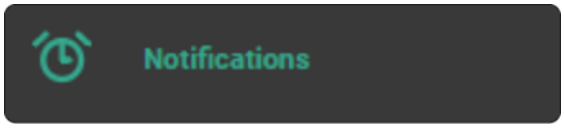



- **Default settings** - This menu contains parameters allowing to restore default settings of the unit. It is possible to choose the following: Yes or No.

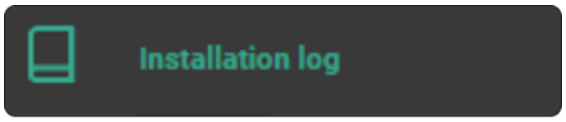

- **Alarm cancellation** - The parameter allows to clear the list of historical alarms. It is possible to choose the following: Yes or No.

### 13.3 Diagrams
Information on air parameters and the operation of the unit over a given time interval.

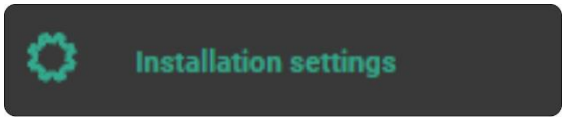

### 13.4 Notifications
History of messages and alarms.



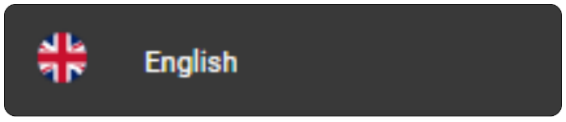

### 13.5 Installation log
Tab for installers/service technicians and manufacturers (only available for accounts with higher rights) where they can keep records of e.g. service Override Controls.




### 13.6 Installation settings
View of parameters of currently operated devices, user contact details, service rights and software updates.

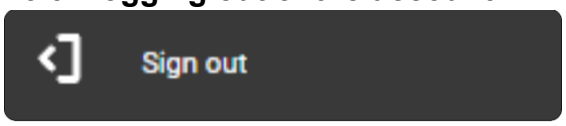



### 13.7 Language settings
Allows the language of the installation to be changed.




### 13.8 User and account data settings
User and account data settings.

### 13.9 Logging out of the account



### 13.10 Controller operation

The controller is operated via:

- SCP V1 control panel with integrated BT/Wi-Fi module.
- *ecoTOUCH T5 RT control panel with touchscreen and temperature sensor and built-in BT/Wi-Fi module.
- Ensy Cloud mobile app.

## 14 Operation via SCP V1 control panel

The basic operation of the controller is done by touching the selected function button of the SCP V1 panel. Button symbols and LED indications mean:

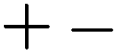
 - indication of switching off (LED of the button off) or switching on (LED of the button lights up for 5 sec.) operation of the unit. The operation of the switched-on unit is also indicated by LEDs e.g. selected fan gear, switched on automatic mode, schedule mode, manual mode.

The button is also used to change the operation mode of the panel between BT and Wi-Fi. Changing is done by holding the button down for approx. 5s.

 - switching on (LED of the button on) the mode of the unit according to the set time schedule. The air handling unit switches to time schedule mode. If the time schedule is not set or not enabled, the button LED flashes. When schedule mode is active, the LED for manual mode is off and vice versa.

 - switching on (LED of the button on) the operation of the unit to the automatic mode in relation to the parameters from CO2 and RH air quality sensors.

 - switching on (LED of the button on) the operation of the unit in manual mode, which enables setting the gear/force of the fan.

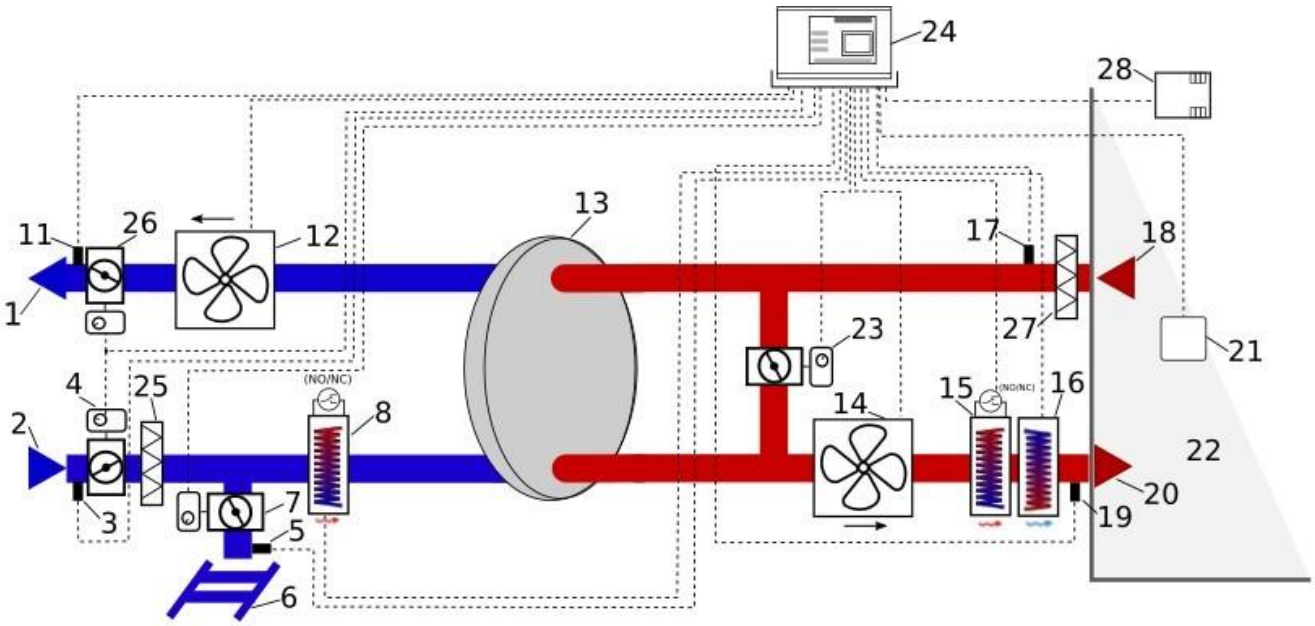
 - increase or decrease the gear/force of the fan. The function works only when the manual operation mode is on.

 - indication of active events from the air handling unit.

 - active connection to the web service or via BT. Rapid flashing of the LED indicates BT mode. Wi-Fi mode can be indicated by no LED light - indicates no connection to Wi-Fi network, slow LED flashing - indicates connection to Wi-Fi but no internet connection to the server, continuous LED light - indicates active connection to Wi-Fi and server.

## 15 Automation scheme

**The following example diagrams are not a substitute for the ventilation system installation project.**
**They are for illustrative purposes only!**




Ventilation scheme with a rotary exchanger and secondary cooler with freon or water, and primary and secondary electric heaters.

Description: 1 - air outlet, 2 - air intake, 3 - air intake / outdoor temperature sensor, 4 - intake throttle actuator, 5 - GHE temperature sensor, 6 - GHE, 7 - GHE throttle actuator, 8 - electrical or water pre-heater with thermostat, 9 - bypass throttle actuator, 10 - bypass, 11 - exhaust temperature sensor, 12 - exhaust fan, 13 - cross-flow, counter flow or rotary exchanger, 14 - air supply fan, 15 - electrical or water secondary heater with thermostat, 16 - freon or water secondary cooler with thermostat, 17 - extract (room) temperature sensor, 18 - extractor, 19 - supply air temperature sensor, 20 - air supply, 21 control panel, 22 - ventilated room, 23 - mixer chamber throttle actuator, 24 - built-in controller module, 25 - intake filter, 26 exhaust throttle actuator, 27 - extractor filter, 28 - air quality sensor.

### 15.1 General principle of operation of the rotary exchanger controller.

When the controller is enabled, the air supply and exhaust throttles are opened by actuators and the air supply and exhaust fans are activated. Depending on the cooling or heating demand and the fulfilment of the specified temperature and time conditions, the controller automatically calculates the appropriate rotary heat exchanger motor control, starts the freon Cooler or the secondary heater (electric or water), or switches on the heating/cooling unit and controls it according to the current demand. Antifreeze protection is not normally used with this type of exchanger.

# 16 Technical data

## 16.1 Main module

| | |
|---|---|
| Power supply | 230 VAC, 50 Hz |
| Current drawn | 0.04 A[1] |
| Rated current | Maximum: 6 (6) A<br>REL1: 3 (3) A<br>REL2: 3 (3) A<br>OUT1-230 V: 6 (6) A<br>OUT2-230 V: 6 (6) A<br>OUT3-230 V: 6 (6) A |
| Ambient temp. during operation | 0...50ºC |
| Storage temperature | -25...+60ºC |
| Relative humidity | 5…85%, non-condensing |
| CT14 sensor measuring range / accuracy | -40...+60ºC / ±2ºC |
| Screw terminals, mains | Cable section: 0, 5.2.5 mm$^2$, tightening 0.4 Nm, isolation 7...8 mm |
| Screw terminals, signal | Cable section: 0.25 mm... 1.5 mm$^2$, tightening 0.2 Nm, isolation 7 mm |
| Dimensions | 150x100x34 mm (including 9 mm spacing) |
| Standard | EN 60730-2-9, EN 60730-1 |
| Software class | A according to EN 60730-1 |
| Protection grade | For incorporation into Class I devices |
| Degree of contamination | 2 degrees, according to EN 60730-1 |
| Controller operating type | 1.B, according to EN 60730-1 |
| Installation | Built-in |
| Surge voltage | 2500 V |
| Protection grade | IP 00 |

[1] This is the current drawn by the controller itself. The total current consumption depends on the devices connected to the controller.

## 16.2 Control panel SCP V1

| | |
|---|---|
| Panel power supply | 5...12 VDC - directly from the controller socket or an external power supply. |
| Power consumption | Typically 0.24W, max. 1.7W |
| Transmission | - RS485 with controller,<br>2.4 GHz WIFI according to the IEEE 802.11 B/G/N standard with econetcloud.eu server,<br>- BT v4.2 LE with mobile app |
| Operating conditions | 0...40ºC, 5...85 %RH (non-condensing), closed low-dust rooms |
| Terminals | Self-clamping connector. Conductor cross-section<br>0.25...1.5 $mm^2$ |
| Protection grade | IP 20 |
| Storage temperature | 0…65ºC |
| Temperature measurement range / Accuracy | 5…35ºC / ±0,5ºC |
| Temperature hysteresis | 0.2…5ºC |
| Dimensions | 80 x 80x 10 mm |
| Installation | Wall mounted |

**Control panel ecoTOUCH T5 RT**

| | |
|---|---|
| Panel power supply | 5...12 VDC - directly from the controller socket or an external power supply. |
| Current drawn (at 12 V supply voltage) | 0.15 A |
| Transmission with the controller | RS485 (Modbus RTU protocol)<br>2.4 GHz WIFI according to the IEEE 802.11 B/G/N standard with econetcloud.eu server,<br>- BT v4.2 LE with mobile app |
| Display | Colour, graphic 800x480 p., with touch panel |
| Protection grade | IP 20 |
| Operating temperature | 0..50ºC |
| Storage temperature | 0..65ºC |
| Relative humidity | 5…85%, non-condensing |
| Temperature measurement range | 0..50ºC |
| Temperature regulation range | 5..35ºC |
| Hysteresis | 0.2.5ºC |
| Screw terminals | Cable section: 0.15 mm... 1.5 $mm^2$, tightening 0.23 Nm, isolation 7 mm |

| | |
|---|---|
| Panel dimensions | 148 x 97 x 23 mm |
| Standards | EN 60730-2-9, EN 60730-1 |
| Installation | Wall mounted or standing alone |

## 17 Air filters

**Prior to the first start-up of the unit, the condition of the filters must be checked. The unit must not be operated when they are considerably contaminated or without the filters installed!**

The mechanism for monitoring the filters' contamination status should be selected in co-operation between the installer and the manufacturer's assistance. The controller manufacturer offers three mechanisms for detecting filter contamination: based on a timer mechanism, based on readings from external pressure switches and based on readings from differential pressure transducers.

Depending on the unit manufacturer's settings, the installation service can access settings related to contamination detection mechanisms, filter class parameters, definition of contamination conditions and activation of the alarm mode from a dedicated menu.

The connection and configuration of the pressure switches and/or differential pressure transducers must be carried out in accordance with the recommendations of their manufacturers and those of the unit manufacturer.

**The system should not operate for an extended period of time with contaminated filters, as this may damage the fan motors.**

**The filters should be replaced or cleaned in accordance with the unit manufacturer's recommendations.**

**On the air intake side, it is recommended to use a throttle with spring return to cut off the air inflow when the controller is switched off.**

# 18 Alarms and prompts

**Emergency operation is only permitted under user supervision until service arrives and the fault is rectified. If user supervision is not possible, the controller should be disconnected from the power supply.**

| Alarm | Possible cause | Effect of alarm | Display |
|---|---|---|---|
| Supply air temperature sensor defective. | Sensor damaged, incorrectly connected or not configured. | Alarm signal, ALARM output active, disabling the panel operation. | Continuously since the cause was noted. |
| Temperature sensor behind the exchanger defective. | | | |
| Ejector temperature sensor defective. | | | |
| Intake temperature sensor defective. | | | |
| Exhaust temperature sensor defective. | | | |
| GHE temperature sensor defective. | | | |
| Leading temperature sensor defective. | Leading regulation sensor damaged, incorrectly connected or not configured. | Alarm signal, ALARM output active, disabling the panel operation. | Continuously since the cause was noted. |
| SAP alarm - the control panel has been stopped due to an external signal. | Signal from fire panel active. | Alarm signal, ALARM output active, SAP operation procedure. | Continuously since the cause was noted. |
| Periodic Override Control is approaching. | Periodic Override Control is approaching - contact manufacturer's assistance. | Alarm signal. | Less than 3 days until general Override Control due date. |
| General Override Control by manufacturer service department required. | General Override Control required - contact manufacturer's assistance. | Alarm signal, ALARM output active. | Until new Override Control is entered by installer. |
| The air supply temperature to the room was noted to be too high. | The air supply temperature to the room was noted to be too high. | Alarm signal, ALARM output active, excessive temperature protection procedure. | Continuously since the cause was noted. |
| The air supply temperature was noted to be too low. | The air supply temperature to the room was noted to be too low. | Alarm signal, ALARM output active, low temperature protection procedure. | Continuously since the cause was noted. |
| Water preheater thermostat active. Warming-up procedure. | A signal from the water pre-heater thermostat has been noted - the warm-up procedure has started. | Alarm signal, ALARM output active, warming-up procedure. | Continuously since the cause was noted. |
| Secondary water heater thermostat active. Warming-up procedure. | Low temperature or signal from the secondary water heater thermostat noted - Warming-up procedure started. | Alarm signal, ALARM output active, warming-up procedure. | Continuously since the cause was noted. |
| Possible overheating of the preheater. | The electric pre-heater thermostat is reported to have been activated. It may require resetting. | Alarm signal, ALARM output active, electric heater alarm procedure. | Continuously since the cause was noted. |
| Primary electric heater overheating - 3x thermostat activation | High temperature of the primary electric heater - 3x thermostat activation. Air flow is too low, the heater thermostat may need to confirm the alarm. | Alarm signal, ALARM output active, electric heater cyclic alarm procedure. | Continuously since the cause was noted. |
| Possible overheating of the secondary heater. | The electric secondary heater thermostat is reported to have been activated. It may require resetting. | Alarm signal, ALARM output active, electric heater alarm procedure. | Continuously since the cause was noted. |
| Secondary electric heater overheating - 3x thermostat activation | High temperature of the secondary electric heater - 3x thermostat activation. Air flow is too low, the heater thermostat may need to confirm the alarm. | Alarm signal, ALARM output active, electric heater cyclic alarm procedure. | Continuously since the cause was noted. |
| Heater thermostat activation | The electric heater thermostat is reported to have been activated. It may require resetting. | Alarm signal, ALARM output active, electric heater alarm procedure. | Continuously since the cause was noted. |
| Triple activation of the heater thermostat - confirmation required | High temperature of the electric heater - 3x thermostat activation. Air flow is too low, the heater thermostat may need to confirm the alarm. | Alarm signal, electric heater cyclic alarm procedure. | Continuously since the cause was noted. |
| Installation setting error. Possible deletion of settings | Deletion or non-confirmation of settings in the service menu. | Alarm signal, ALARM output active, disabling the panel operation. | Continuously since the cause was noted. |
| Error in control panel manufacturer's settings. Possible deletion of settings | Deletion or non-confirmation of settings in the manufacturer menu. | Alarm signal, ALARM output active, disabling the panel operation. | Continuously since the cause was noted. |

| | | | |
|---|---|---|---|
| Unauthorised start-up - device blocked | Unauthorised attempt to start up the unit. Contact the installation service to remove the lock. | Alarm signal, disabling and locking the panel operation. | Continuously since the cause was noted. |
| No communication with the controller | Possible damage to the transmission cable connecting the panel to the controller. | Alarm signal control panel continues to operate. | Continuously since the cause was noted. |
| Communication error from pressure / flow sensor for air supply | Communication error between the controller and the built-in sensor for the supply duct. Possible damage or incorrect connection of the sensor. | Alarm signal, ALARM output active, control panel continues to operate. | Continuously since the cause was noted. |
| Communication error from pressure / flow sensor for exhaust | Communication error between the controller and the built-in sensor for the exhaust duct. Possible damage or incorrect connection of the sensor. | Alarm signal, ALARM output active, control panel continues to operate. | Continuously since the cause was noted. |
| Air supply filter replacement deadline is approaching | Filter replacement deadline is approaching - Depending on the settings of the unit, purchase filters or contact the service. | Alarm signal. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| Exhaust filter replacement deadline is approaching | Filter replacement deadline is approaching - Depending on the settings of the unit, purchase filters or contact the service. | Alarm signal. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| Air supply filter contamination. Switch off the unit and replace the filter | Possible contamination of the filter on the air supply duct. Switch off the unit and replace the filter. | Alarm signal, ALARM output active. | Continuously since the cause was noted. Once the alarm has been accepted, the filter replacement procedure proceeds. |
| Exhaust filter contamination. Switch off the unit and replace the filter | Possible contamination of the filter on the exhaust duct. Switch off the unit and replace the filter. | Alarm signal, ALARM output active. | Continuously since the cause was noted. Once the alarm has been accepted, the filter replacement procedure proceeds. |
| Air supply filter contamination. Call the assistance | Possible contamination of the filter on the air supply duct. Call the assistance to change the air filters. | Alarm signal, ALARM output active. | Continuously since the cause was noted. |
| Exhaust filter contamination. Call the assistance | Possible contamination of the filter on the air supply duct. Call the assistance to change the air filters. | Alarm signal, ALARM output active. | Continuously since the cause was noted. |
| Filter replacement procedure | Filter replacement procedure is active, causing the unit to stop operating. | Alarm signal, disabling the panel operation. | Continuously since the cause was noted. |
| Emergency mode - exhausted filters | The contamination of one of the filters has exceeded the alarm condition. It must be replaced immediately. | Alarm signal, ALARM output active, filter contamination alarm procedure. | Continuously since the cause was noted. |
| No air supply fan operation confirmation | No air supply fan operating signal. Possible mechanical damage. | Alarm signal, disabling the panel operation. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| No air supply fan operation confirmation - Call the assistance | Possible mechanical damage to air supply fan. Switch off the control panel and contact the installation service. | Alarm signal, disabling the panel operation. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| No exhaust fan operation confirmation | No signal from the exhaust fan. Possible mechanical damage. | Alarm signal, exit disabling the panel operation. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| No exhaust fan operation confirmation - Call the assistance | No signal from the exhaust fan. Possible mechanical damage. Switch off the control panel and contact the installation service. | Alarm signal, ALARM output active, disabling the panel operation. | Continuously after the cause is noted, ceasing when the alarm is accepted. |
| Filter contamination test Do not switch the unit off | The procedure for testing the condition of the filters is active. Do not switch off the unit until the procedure has been completed. | Alarm signal. | Continuously since the cause was noted. |
| Humidity sensor error | No humidity level reading from the sensor. Possible fault. Check the correct connection and configuration of the humidity sensor | Alarm signal | Continuously since the cause was noted. |
| CO2 sensor error | No humidity level reading from the CO2 level. Possible fault. Check the correct connection and configuration of the humidity sensor | Alarm signal | Continuously since the cause was noted. |
| Multiplexer - communication error | No communication with multiplexer module. Possible failure, check correct connection. | Alarm signal | Continuously since the cause was noted. |
| Fixed flow - pressure sensor fault | No pressure reading. Possible sensor fault. Check correct connection and configuration of Constant flow. Control panel limited to minimum flow rate. | Alarm signal, Control panel limited to minimum flow rate. | Continuously since the cause was noted. |
| No humidity level reading - no connection to panel | No humidity level reading from sensor in SCP panel due to lack of communication between panel and controller. | Alarm signal | Continuously since the cause was noted. |
| Error of the leading temperature sensor (SCP panel) - caused by a lack of communication with the panel. | Lack of temperature reading from the sensor in the SCP panel caused by a lack of communication between the panel and the controller. | Alarm signal, disabling the panel operation. | Continuously since the cause was noted. |

| | | | |
|---|---|---|---|
| Auto mode - error of the air quality sensors | Error of one of the air quality sensors during the active auto mode, control of the air handling unit limited to a minimum. | Alarm signal. Restriction of the air handling unit control to a minimum. | Continuously since the cause was noted. |

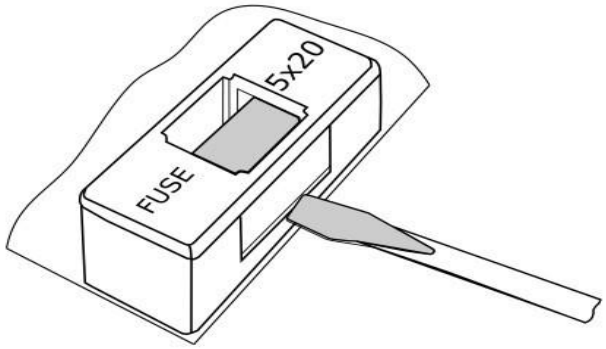
### 19 Parts or components replacement

When ordering spare parts and components, it is important to provide the necessary information from their nameplates. In the case of a controller, it is important to know its serial number. If you do not know the serial number, please indicate the model, controller structure and year of manufacture.

## Main fuse replacement

**Before replacing the fuse, the electrical supply to the controller must be disconnected.**

The fuses of the output circuits should be selected according to the load present. The standard current for the main F1 fuse is 6.3 A - use a 250 VAC, delayed, porcelain fi 5 mm x 20 mm mains fuse. It is acceptable to use a smaller F1 fuse if the total load on the circuits is lower.




F1 fuse replacement.

To remove the F1 fuse, lift the fuse housing with a flathead screwdriver and slide the fuse out.

### 19.1 Room panel replacement

If it is necessary to replace solely the room panel, check the compatibility of the new panel's software with that of the controller module. Compatibility is maintained if the first program number in the panel and module are the same.

**The software versions of the panel and the controller module can be read from the dedicated parameters located in the Software versions parameter of the Information menu.**

**The incompatibility of the controller module software and the panel software may cause unpredictable errors. The manufacturer is not responsible for failures caused using incompatible programmes by the end customer.**

### 19.2 Software update of the controller and SCP_V panel
**Software exchange is possible via the ecoNEXT mobile application.**

To perform a software update of the controller and panel, select the upper symbol  in the mobile application for advanced settings and enter the software update password. In the local memory of the mobile device the new software should already be saved in file format *.pfi for the module and *.bin for the SCP panel. After entering the update menu, select and add the update file from the mobile device memory first for the main controller module and confirm the start of the update, then do the same for the panel file and the other devices connected to the controller module.

Once the software update file upload process is complete, the mobile app disables the wireless connection to the controller.

Tip: before adding an update file, the mobile app must be authorised to access the file explorer in the Android configuration. The mobile app allows files to be added from the local memory of the mobile device, but also allows files to be added directly from the cloud, such as Google Drive (internet connection required).

Once a correct software update file has been selected and its compatibility has been checked, it is added to the list of available update files. All files are stored in the application's local data. If the list of available files contains outdated or no longer needed update files, there is the option to delete files with which you can remove the selected update files.

## Saving/reading the configuration

It is also possible to save/load the controller's parameter configuration into the memory of the mobile device after entering the password for the manufacturer's or installer's parameter level.

**After the update, it is necessary to restore service settings and check them. If any problem occurs, it is recommended to restore the default settings and, after a prolonged power failure, to enter the current configuration.**

**The incompatibility of the controller software and the panel software may cause unpredictable errors. The manufacturer is not responsible for failures caused using incompatible programmes by the end customer.**

## 19.3 AHU wall mounted

(Pictures shows AHU wall mounted)

To open the front hatch you will find a handle for the quarter turn latches.

To open the locks, turn the handle toward the center of the unit.

Left latch

Right latch

To close, after putting the hatch back on place, turn the latches the opposite way. You may use some pressure towards the hatch to close it.

Be careful that the door can "be stuck" in the sealing on the hatch.
For easier loosening of the hatch, release it first in one corner at the top.

To operate this product people should have the necessary skills, or under the supervision of a qualified person.
Children should be told not to play with the appliance.

Before any access into the electrical connections boxes, power must be disconnected by pulling out the plug from the socket.

It is only allowed for authorized persons to enter into the electrical connection boxes. The position of the connection boxes may be different from model to model.

If any electrical components are damaged, they must be replaced by the manufacturer, dealer or a qualified person in order to avoid dangerous situations.


### 19.3.1 Replacing the filter.

The filters should be replaced every 6. 9. or 12. months.

Should be extracted without use of any tools.

*To guarantee optimal properties of the ventilation unit, use the original filters from EnSy. The use of spurious filters will limit the warranty on the product.*

**Ensy art number for filter set is:**
011460850-2
SET FILTRE ENSY AHU 200 + 300 B. F7: 120x280x94

011460862-2
SET FILTRE ENSY AHU 350 BV/BH + 400 BV/BH. F7: 165x370x94

011460876-2
SET FILTRE ENSY AHU 700 BV/1- BH/1. F7: 165x479x94

### 19.3.2 Cleaning the fans.

This must be done by a qualified person.

Before removing fans the main power must be disconnected by pulling out the main supply plug from the socket, or fans to be programmed to position "**AV**" or "**OFF**"

Disconnect the 3-pole plugs.

Depending on the AHU model the fans can be pulled out of the ventilation unit with or without the need for any tools.
If tools are necessary, uncrew the stopper brackets that hold the fans in position.
**NOTE! Remember to put the stoppers back after work is done.**
Clean with mild soap and water

### 19.3.3 Maintenance and cleaning of rotary heat exchanger.

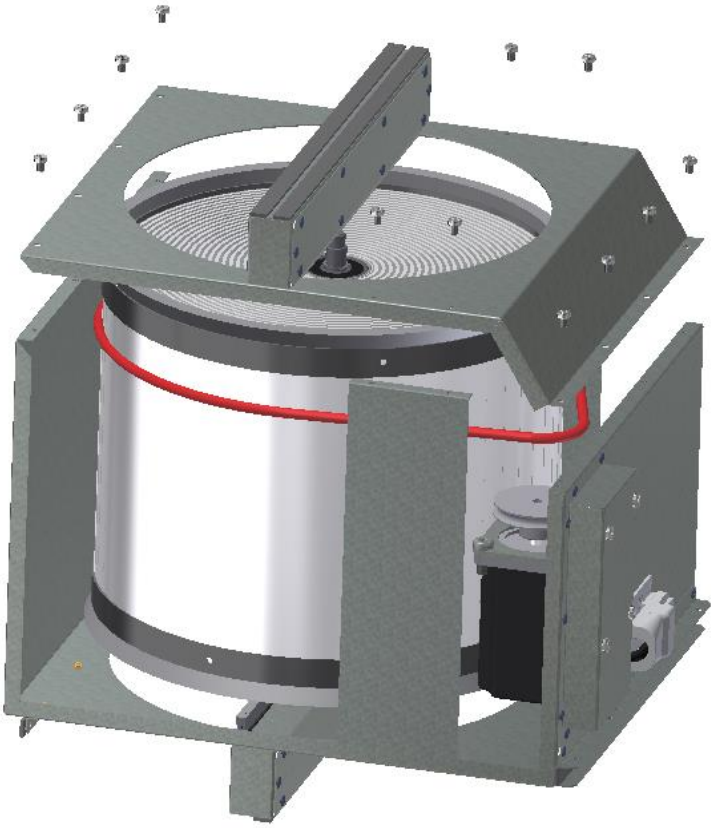
This must be done by a qualified person.

Disconnect the 5-pole plug.

Can be pulled out of the ventilation unit without the need for any tools.

Rotor exchanger can easily be removed for cleaning, depending of AAHU model by unscrewing the 12 or 14 screws that holds it together.

Clean parts with mild soap and water.



Do not expose the rotor motor or connector to moisture/water.

The exchanger you also can clean with mild soap and water. Do not use ammonia containing detergent, as this will prey on and discolor aluminum in the rotary heat exchanger. Flush with hand shower and blow gently with compressed air.

Ensure that the screws are tightened sufficiently so that they do not come loose during operation.

Preferably use a screwdriver to tight the screws. If use of electrical screwdriver, make sure that you use low torque to prevent destroying the threads in the sheet metal parts.

To make sure that the drive belt can adjust itself into correct position you must rotate manually the exchanger some turns.

Then insert back into the ventilation unit. Be sure that rotor exchanger is properly inserted in all the guides inside the unit. If not, this can lead to vibration in the system and internal air leakage in the unit.

## 19.4 AHU 200 KV/KH

(Pictures shows AHU-200 KV SLIM)

Be careful that the door can "be stuck" in the sealing on the hatch.
For easier loosening of the hatch, release it first in one corner at the top.

To operate this product people should have necessary skills, or under the supervision of a qualified person.

Children should be told not to play with the appliance.

If you are going into the unit then first you have to remove any kitchen furniture front door, if so is mounted on front of unit.

On these pictures, you can see the ventilation unit with white coated cooker hood.
There are also variants with hoods in brushed stainless steel.

To open the front hatch you first have to untighten those 4 screws you find in each corner of the unit.

When hatch is mounted back on the unit, try to use almost same torque on all 4 screws.

Then put the kitchen furniture front door back on place.

Before any access into the electrical connections boxes, power must be disconnected by pulling out the plug from the socket.

Only authorized persons is allowed to enter into the electrical connection boxes. If any electrical components are damaged, they must be replaced by the manufacturer, dealer or a qualified person in order to avoid dangerous situations.

### 19.4.1 Replacing the filters.

The filters should be replaced every 6. 9. or 12. months.

Should be extracted without use of any tools.

*To guarantee optimal properties of the ventilation unit, use the original filters from EnSy. The use of spurious filters will limit the warranty on the product.*

**Ensy art number for filter set is:**
011460850-2
SET FILTRE ENSY AHU 200 + 300 B. F7: 120x280x94

### 19.4.2 Cleaning the fans.

This must be done by a qualified person.

Before removing fans the main power must be disconnected by pulling out the main supply plug from the socket, or fans to be programmed to position "**AV**" or "**OFF**"

Disconnect the 3-pole plugs.

Depending on the AHU model the fans can be pulled out of the ventilation unit with or without the need for any tools.
If tools are necessary, uncrew the stopper brackets that hold the fans in position.
**NOTE! Remember to put the stoppers back after work is done.**

Clean with mild soap and water

### 19.4.3 Maintenance and cleaning of the rotary heat exchanger.

This must be done by a qualified person.

Disconnect the 5-pole plug.

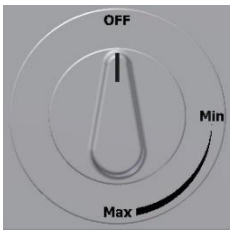
Can be pulled out of the ventilation unit without the need for any tools.

**NOTE!** To not scratch the cooker hood so you should cover this before you pull out the rotary heat exchanger.

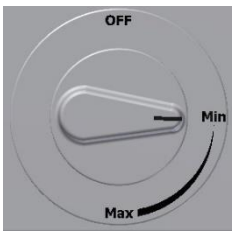
## 19.5 Operation of kitchen hood

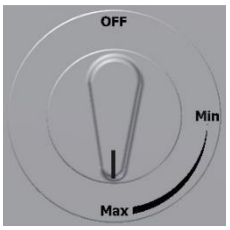
ON / OFF switch, for down lights.

Using the damper in a kitchen hood.




The switch has a spring retraction and will not work until it has passed "Min"




No function

Opens damper.

Timer activated

Max time on timer

60 min

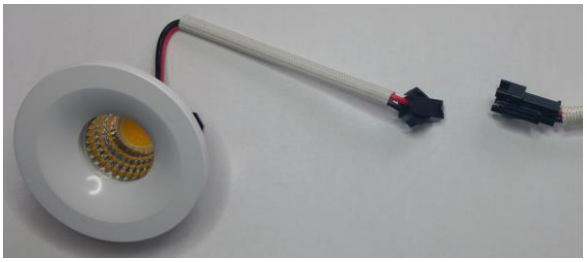
## 19.5.1 Replacing the LED and transformer on the cooker hood

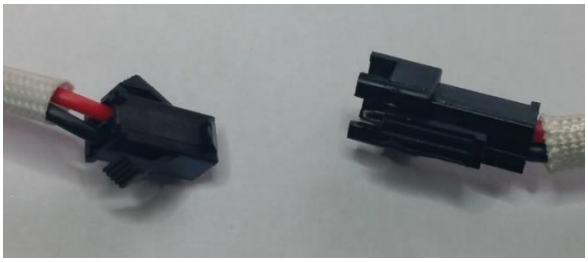
Turn off the power before replacing the down light.

If the light is not working then you must replace the entire light socket and transformer. To replace the user must first remove the four blanking plugs and then loosen four screws to release the entire cover.

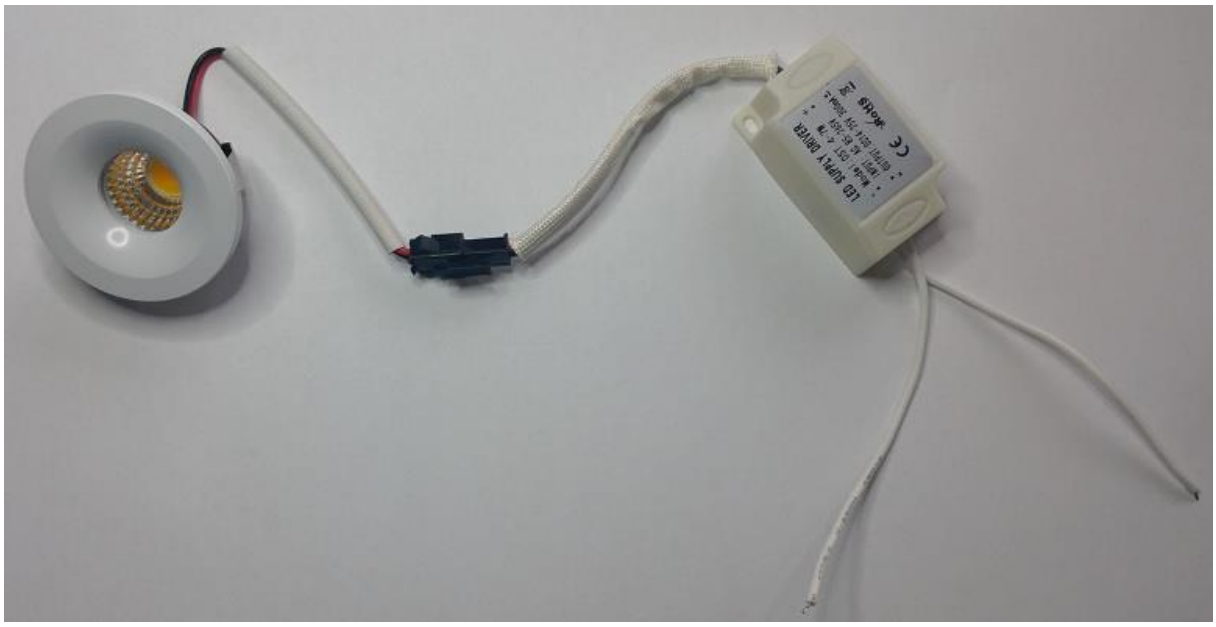
Compress the spring with fingers to more easily sliding light socket out through cover.

The plugs that are between light and transformer can be pulled apart.





**If faulty light then both downlight and transformer replaced with new parts.**



## Original LED light that is inserted from factory


**Ensy art no:**

**260455-2 Down Light LED 5W with white socket and transformer**

**260456-2 Down light LED 5W with black socket and transformer**

### 19.5.2 Replacement or washing the filter from the kitchen hood.

Release from the frame by pushing the lock to the middle of the filter and tilted down. The filter can be washed in soapy water. Must be completely dry before it is mounted in place again. If the filter material is damaged it must be ordered new original.

**(Ensy art no: 270081-2)**

## 19.6 AHU ceiling mounted

(Pictures show AHU ceiling model)

To open the front hatch, you will find a handle for the quarter turn latches.

To open the locks, turn the key toward the center of the unit.

Left latch

Right latch

To operate this product people should have the necessary skills, or under the supervision of a qualified person.

Children should be told not to play with the appliance.



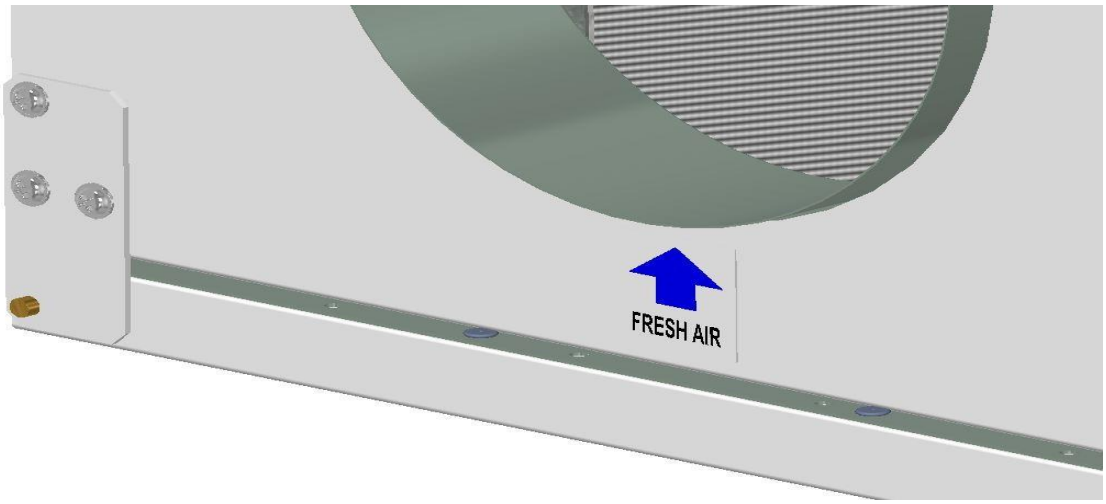
Before any access into the electrical connection's boxes, power must be disconnected by pulling out the plug from the socket.

It is only allowed for authorized persons to enter into the electrical connection boxes.

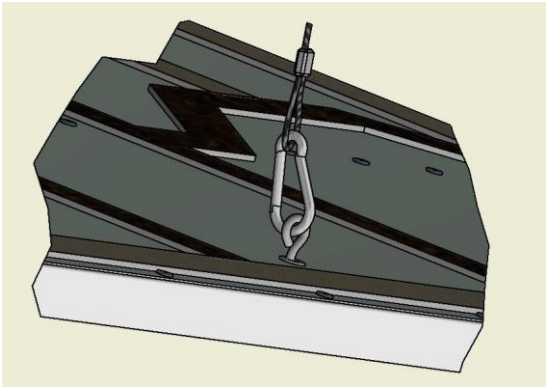
(Sketch shows AHU-300/400 HH)

If any electrical components are damaged, they must be replaced by the manufacturer, dealer or a qualified person in order to avoid dangerous situations.

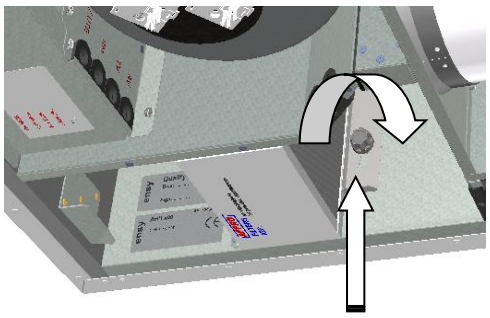
The hatch has two hinges that holds it permanently to the housing. If the unit is placed high under a ceiling, then is mandatory to get help from another person to take down the hatch. It can be done by unscrewing 1 pcs of screw from the front hatch on one side and slide off from the other.




The safety wire can be removed from inside of the front hatch so that the hatch can be opened or removed. The safety wire must be reinstalled before the hatch closes.



To close, after putting the hatch back on place, turn the latches the opposite way. You may use some pressure towards the hatch to close it.

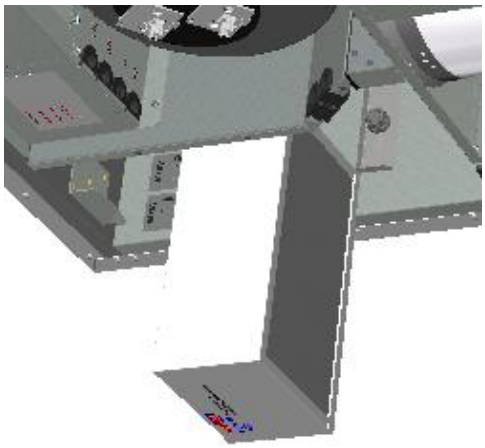


### 19.6.1 Replacing the filter.

The filters should be replaced every 6. 9. or 12 months.

Or by the alarm from the pressure sensor*.

Before the filters can be removed, you have to unscrew 2 screws for each locking bracket a little bit. Push the bracket away from you to release the filters.

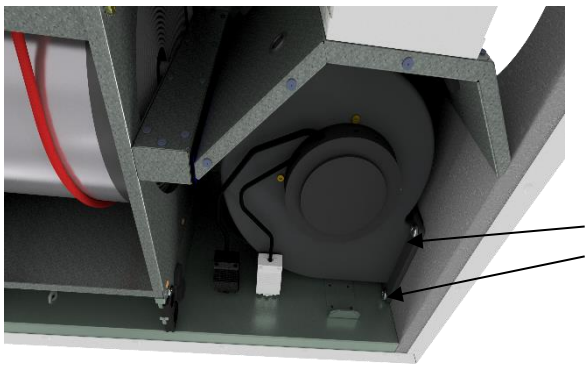


Should than be extracted without use of any tools.

*To guarantee optimal properties of the ventilation unit, use the original filters from EnSy. The use of spurious filters will limit the warranty on the product*

**Ensy art number for filter set is:**
011460860-2
FILTERSETT ENSY AHU 300 Himling. F7: 140x240x94.
011460864-2
FILTERSETT ENSY AHU 400 Himling. F7: 247x285x94

To insert a new filter you then first have to push the bracket away from yourself. Then put the filter in place and then pull the bracket against yourself and tighten the skrews on the bracket.

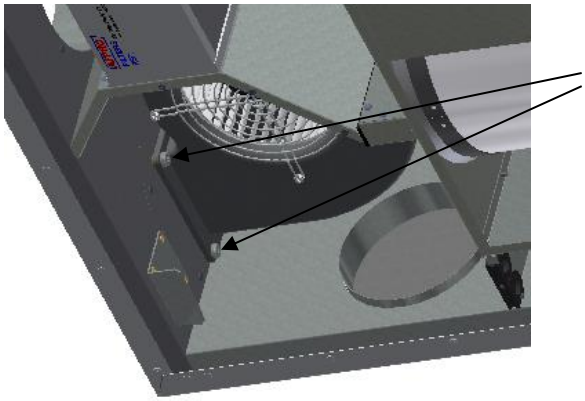


### 19.6.2 Cleaning the fans.

This must be done by a qualified person.

Before removing fans, the main power must be disconnected by pulling out the main supply plug from the socket, or fans to be programmed to position "**AV**" or "**OFF**"

Disconnect the 3-pole plugs.



Before you are able to remove the fans you first have to unscrew two screws for each fan that holds the fan in the correct position.

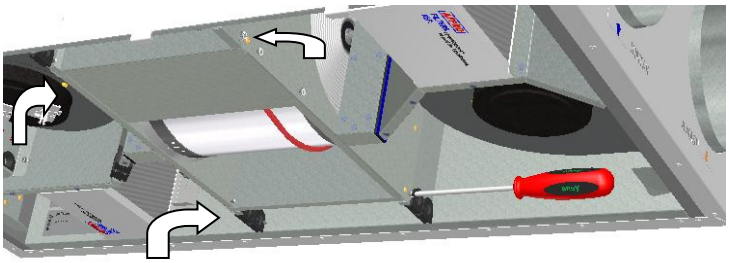
The fans can then be pulled out of the ventilation unit with the need for any tools.
When the fan is placed back into the unit, then make sure the screws are tightened so that there is no danger that they loosen during operation. Clean with mild soap and water.

### 19.6.3 Maintenance and cleaning of rotary heat exchanger

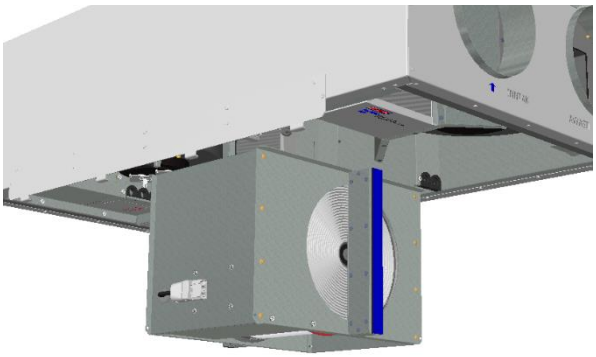
This must be done by a qualified person.

If the unit is placed high under a ceiling, then it might be an advantage to get help from another person to hold the rotor exchanger in correct position untill all four “safety” screws are loosen.

Disconnect the 5-poled plug , and then unscrew those four “safety” screws that are holding the rotor exchanger in place.

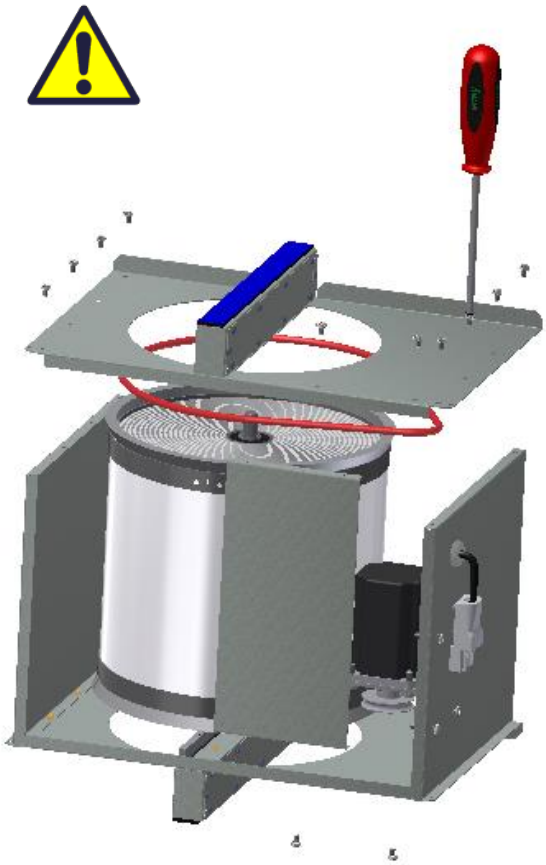


(Sketch shows AHU-300 HH, but the principle is the same for AHU-300 HV and AHU-400 HH/HV)



Can be pulled out of the ventilation unit without the need for any tools.
Rotor exchanger can easily be removed for cleaning by unscrewing 12 screws that hold it together.

Clean parts with mild soap and water.



Do not expose the rotor motor or connector to moisture/water.

The exchanger you also can clean with mild soap and water. Do not use ammonia-containing detergent, as this will prey on and discolor aluminum in rotary heat exchanger. Flushed with hand shower and blow gently clean with compressed air.

Ensure that all 12 screws are tightened sufficiently so that they do not come loose during operation.
Preferably use a screwdriver to tight the screws. If use of electrical screwdriver, make sure that you use low torque to prevent destroying the threads in the sheet metal parts.

To make sure that the drive belt can adjust itself into the correct position you must rotate manually the exchanger some turns. Then insert back into the ventilation unit. Be sure that the rotor exchanger is properly inserted in all the guides inside the unit. If not, this can lead to vibration in the system and internal air leakage in the unit. Make sure that all four “safety” screws are tightened so that there is no danger that they loosen during operation.

# 20 Mounting instructions.

## 20.1 Table of Contents



### 20.1.1 General

This guide is made to provide installation and user instructions regarding the correct installation of Ensy AHU.

Ensy AHU is designed for heat recovery with air volumes from 200 $m^3$ / h of up to 700 $m^3$ / h. The energy from the exhaust air is transferred to supply air through the rotary heat exchanger where the air streams pass each other without making contact.

The unit has a built in-heater for supplementary heating of supply air. Humidity sensor for forced ventilation is integrated into ventilation unit.

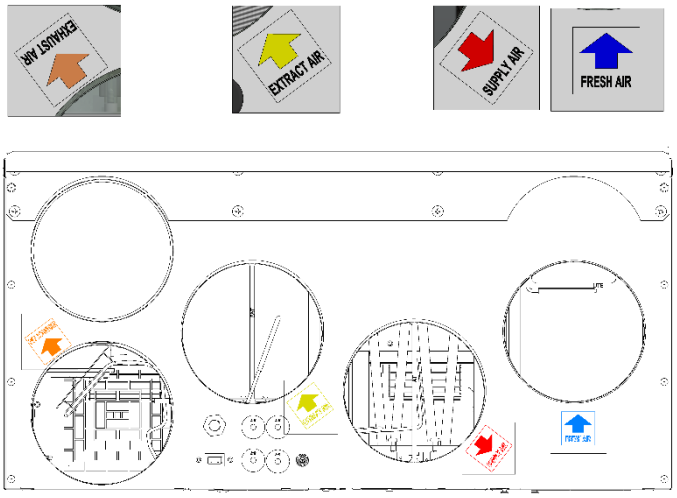
The unit can also connect additional equipment cooker hood over the stove, pulse switch for controlling the forced ventilation, for example, wet rooms or bathrooms, sensor for carbon management and switch management away / home function. Controls of these options are integrated into Ensy AHU.

Ensy AHU is supplied in painted finish, tested and ready for operation. Installation, commissioning and tuning must be performed by authorized personnel.

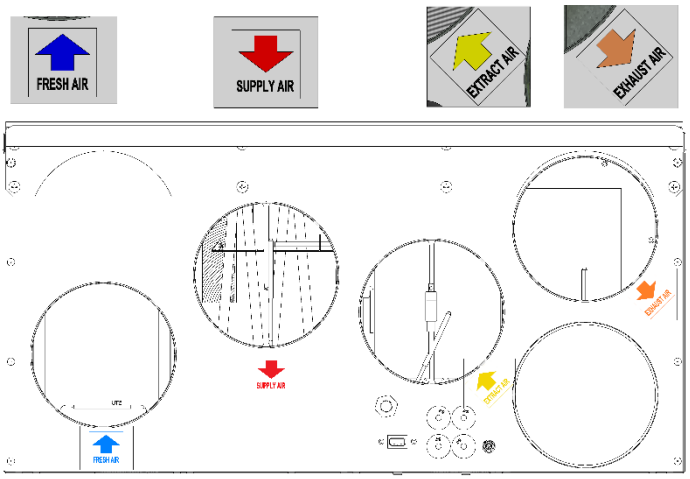
### 20.1.2 Mounting

Together with the unit is delivered the following equipment:
1. Suspension bracket and stoppers
2. Wall Bracket with vibration dampening gasket
3. Self-adhesive vibration damping
4. Accessories bag containing the necessary screws
5. 1 pcs. plug for connecting the cooker hood.
6. Control panel

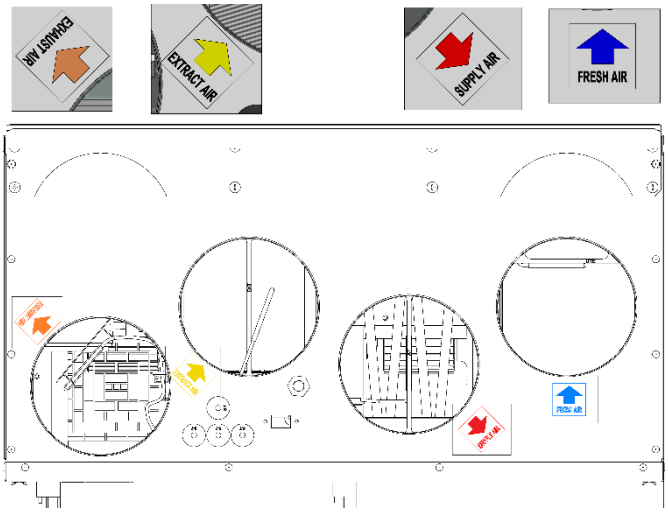
First, select how the unit should be mounted so that the piping system should be as easy as possible.



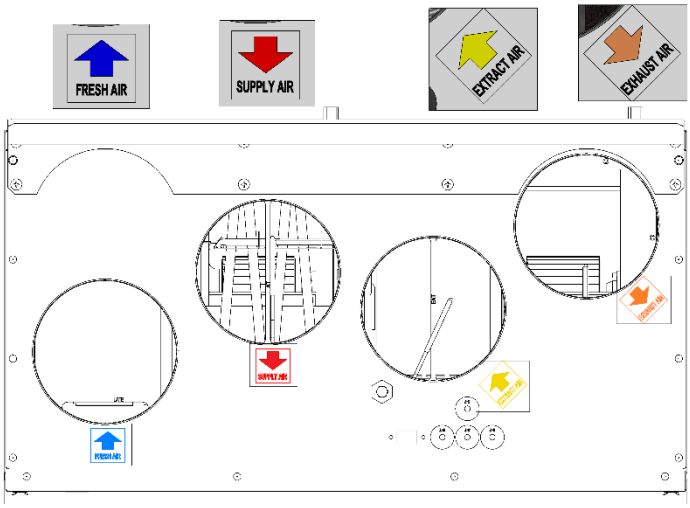

(Sketch over shows AHU-200 H/300 BH)



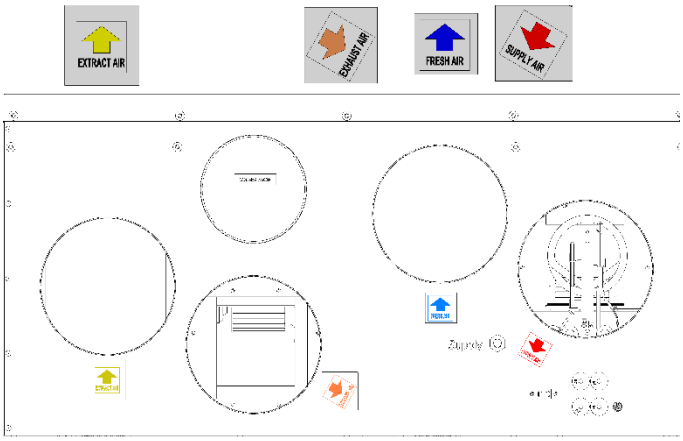

(Sketch over shows AHU-200 V/300 BV)



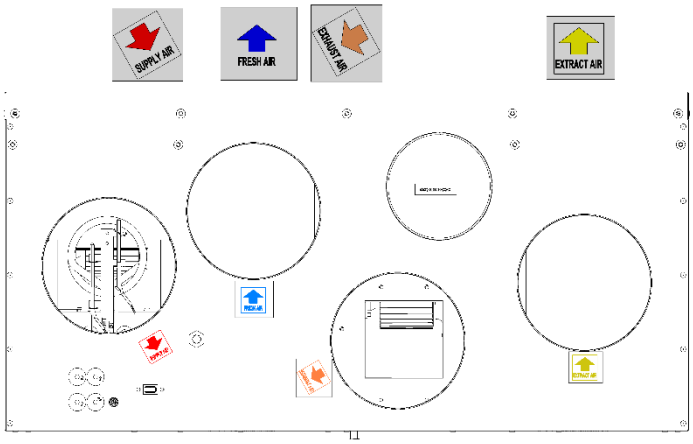

(Sketch over shows AHU-200 KH)



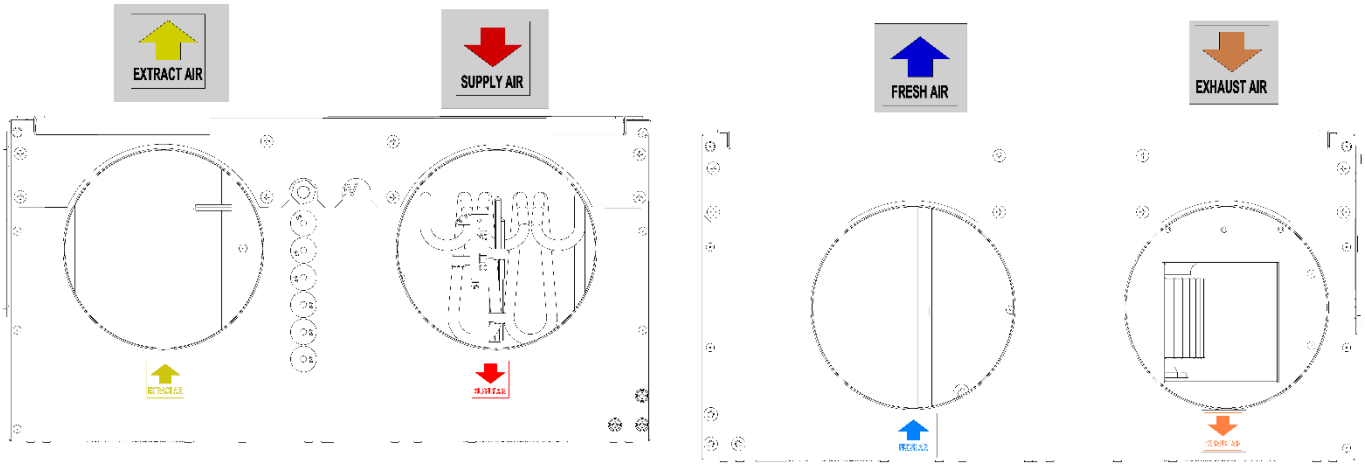

(Sketch over shows AHU-200 KV)



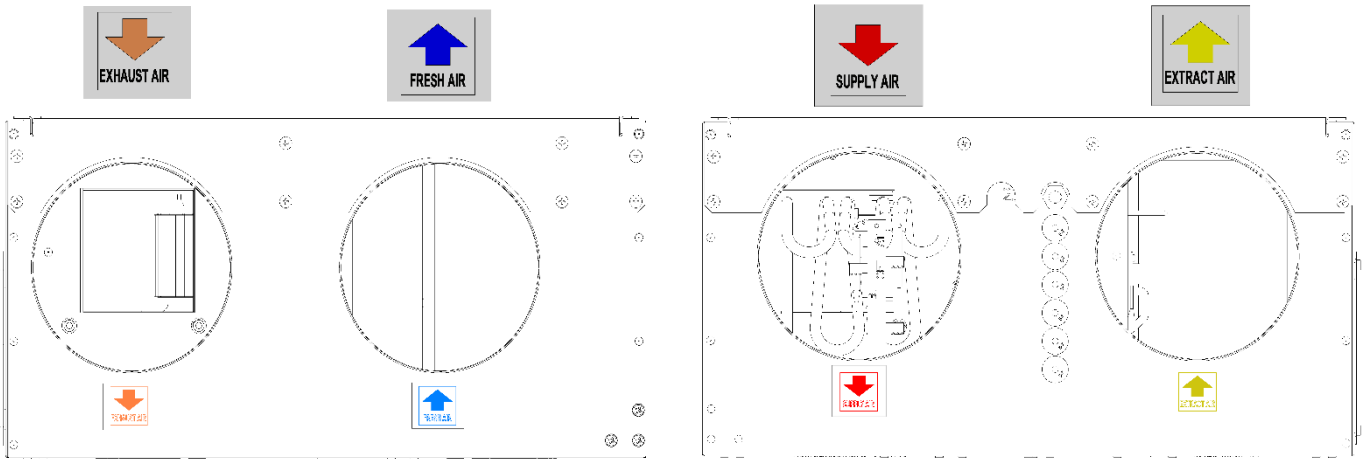

(Sketch over shows AHU-350/400/700 KH)




(Sketch over shows AHU-350/400/700 KV)




(Sketch over shows AHU-300/400 HH)




(Sketch over shows AHU-300/400 HV)

| | English | Norwegian |
|---|---|---|
| SUPPLY AIR | Supply Air | Tillluft |
| FRESH AIR | Fresh Air | Friskluft |
| EXHAUST AIR | Exhaust Air | Avtrekk |
| EXTRACT AIR | Extract air | Avkast |

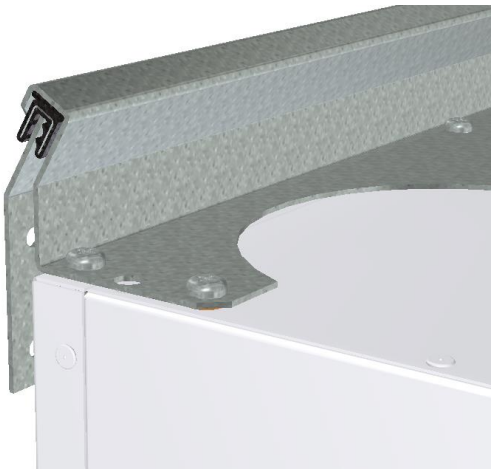
### 20.1.2.1 Brackets and vibration gasket wall mounted

Suspension bracket screwed on top of the unit as shown.

Use 8 pcs M5 x 16mm, supplied with the unit.

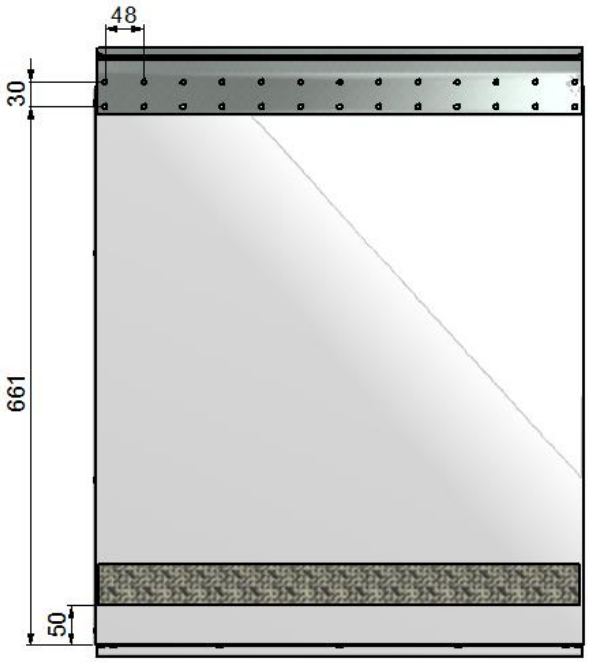
(Sketch over show AHU-200 V, but applies to all wall mounted units)

Mount the wall bracket with vibration gasket.



Make sure that the edge protection gasket is placed on the wall bracket.

Be sure that the vibration gasket is intact.




Glue vibration gasket to the back of the unit, see illustration. Approx. 50mm from the bottom of the unit.

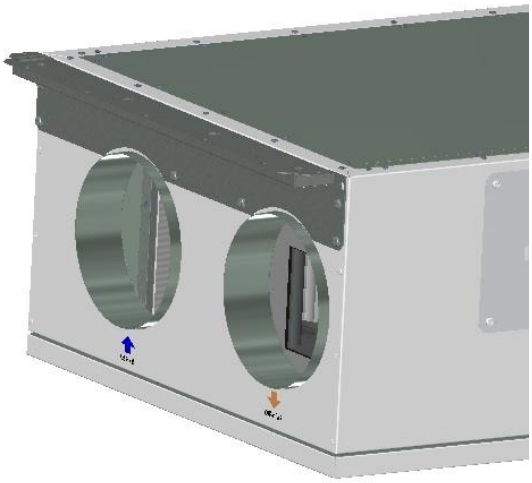
Lift the unit in place and ensure that there is no direct contact between unit and building construction.

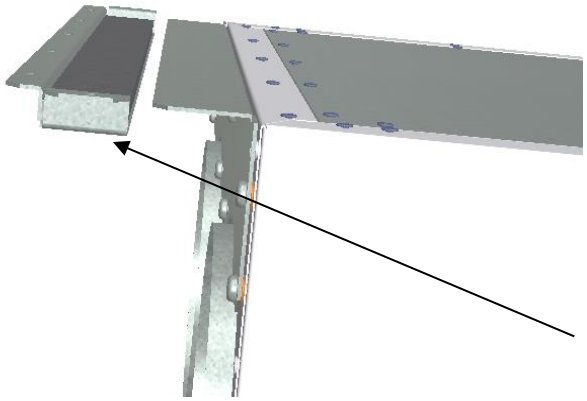
## Brackets and vibration gasket ceiling mounted

Make sure that the gasket is placed on both brackets.

Suspension brackets screwed on the unit as shown on both ends of the unit.

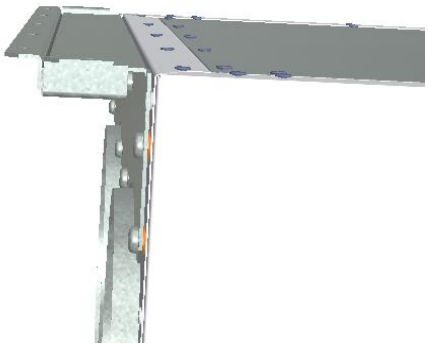
Use 8 pcs M5 x 16mm, supplied with the unit.





Attach one of the ceiling brackets in the correct position in the roof.

Use 7 pcs wood screws 5 x 40mm, supplied with the unit, for each bracket.



Then lift the unit and place the bracket on the unit between the gasket and roof.

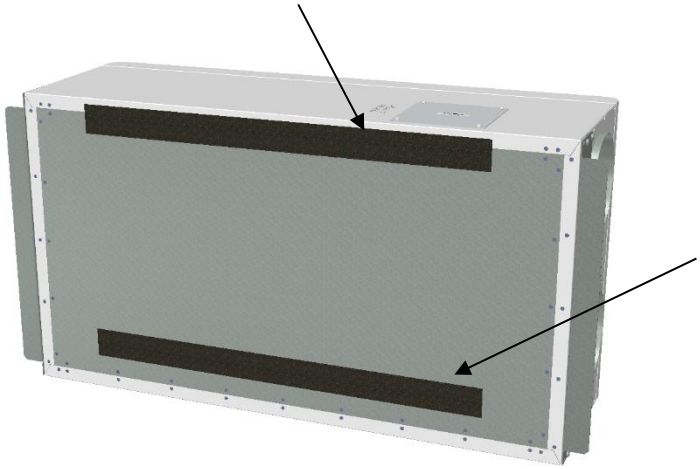
Then lift up the unit in the correct position and make sure there is no contact between parts on the unit and building construction.

Then the second bracket can be placed at the other end of the unit.

**Alternative placement on wall**

The unit can also be placed on a wall. You then need the use of a separate wall bracket. This does not follow the unit and has to be ordered separate. (Ensy Art no: 01008045-2)

To avoid vibration from the unit towards building constructions it here is important that there are placed 5 mm vibration damper on the back of the unit.

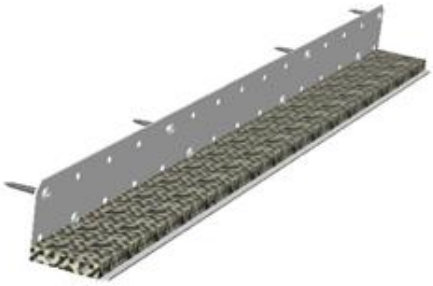


Two vibration gaskets screws for the extra bracket follow the extra bracket.

One of the gaskets is placed in top of the unit.

The other one you place approx. 60 mm from the button of the unit so that id do not will come in contact with the wall bracket.

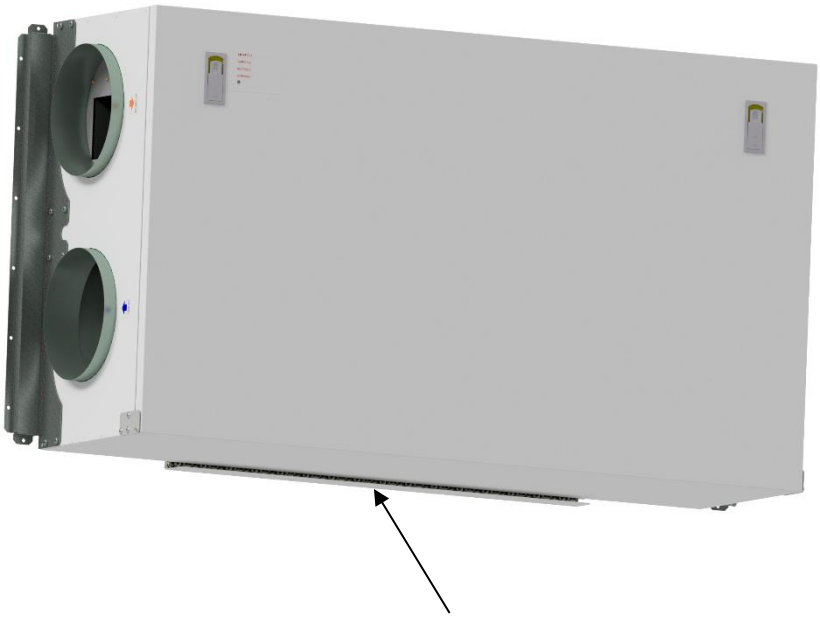
Then first put those two brackets in each end of the unit as shown on page 16.



Then the wall bracket, with 10 mm gasket, is screwed to the wall where it is wanted.

Use 8 pcs wood screws 5 x 40mm.

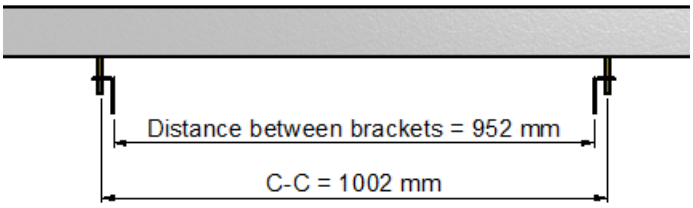
Then you can lift the unit and place it on the wall bracket. Then you use brackets that follow the unit, one in each end. Use 7 pcs wood screws 5 x 40mm, supplied with the unit, for each bracket.



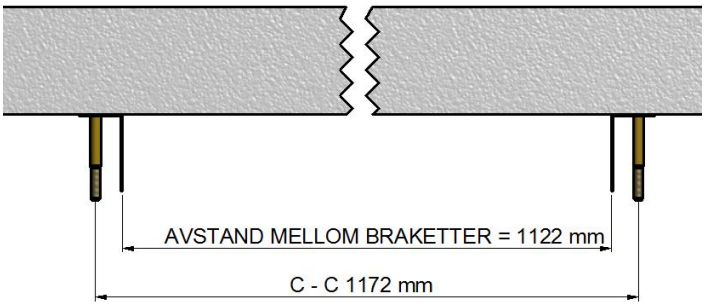
**Wall bracket**

**Placement under concrete ceiling**

If the unit is to be mounted directly into concrete ceiling where there may be uneven or not level than it may be easiest to use expansion bolts fastened into the ceiling. That way, you can adjust with the nuts so that the unit is in level.




If so, then use the suspension brackets as jigs for the bolts so that the distance between brackets will be correct.




Use correct drill for use for the M10 mm expansion bolts.

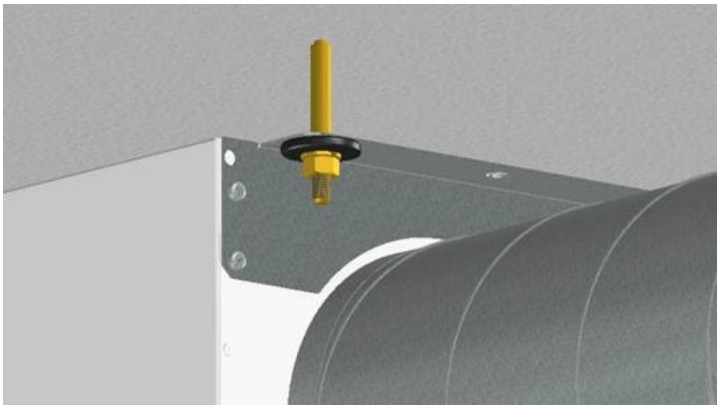
If so, then use the suspension brackets as the bolts so that the distance between brackets will be correct.

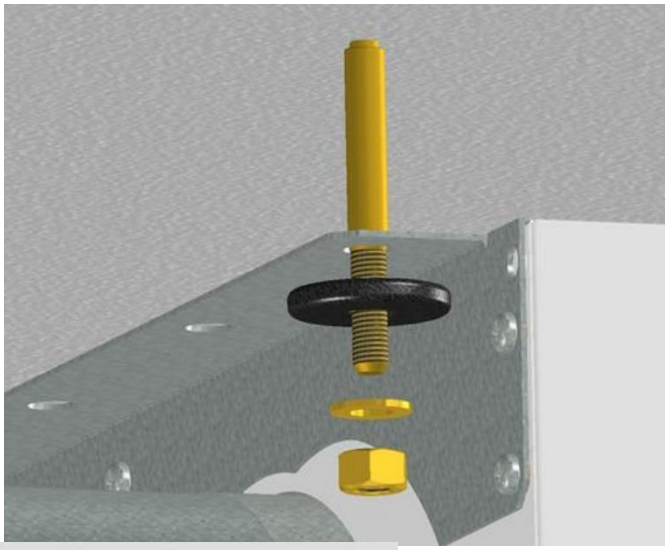
Use correct drill for use of M10 mm expansion bolts.

(On top dim. for AHU 300H and under

dim for AHU 400H)

Make sure the bolt is turned so hard that it cannot loosen. The bolts are available in different lengths so select someone suitable for this purpose. Lift the unit into position. Use a rubber cushioning, 4-6 mm thick, between washers and mounting brackets.





### 19.1.2.2. Mounting of cooker hood

**If kitchen exhaust hood is to be used together with the unit**

If kitchen exhaust hood is to be connected into the top of the unit, you must remove the end cap in the top that is marked “COOKER HOOD”

(Sketch shows AHU-200 V)

### 20.1.2.3 Duct cover

If you want to use a duct cover to hide the pipes you will need the distance of 296 mm from the roof and down to the top of unit.

The duct cover has to be ordered separately from supplier.

(Art: 0100107-2) DUCT COVER AHU-200 V/H_KV/KH, WHITE COATED (ACCESSORIES)

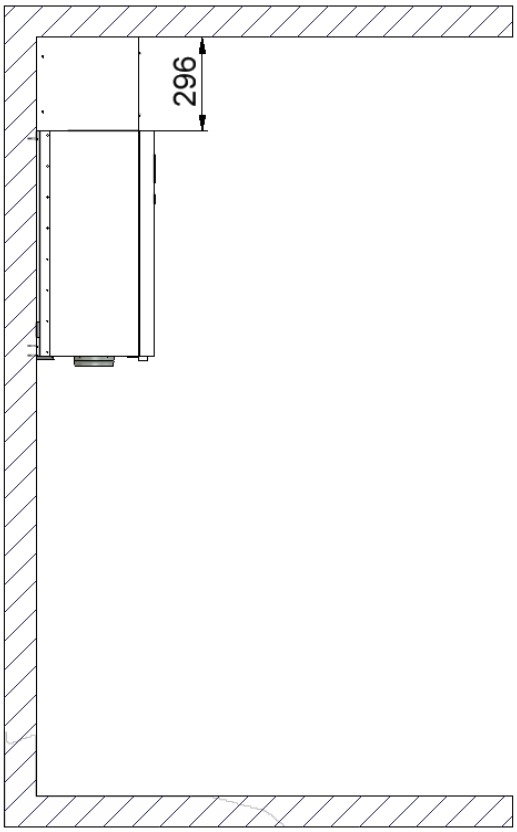
(Art: 0100207-2) DUCT COVER AHU-300 BV/BH, WHITE COATED (ACCESSORIES)

(Art: 0100307-2) DUCT COVER AHU-400 BV/BH, WHITE COATED (ACCESSORIES)

(Art: 0100407-2) DUCT COVER AHU-350 BV/BH, WHITE COATED (ACCESSORIES)

(Art: 0100507-2) DUCT COVER AHU-700 BV/BH, WHITE COATED (ACCESSORIES)

The instruction how to mount this duct cover you will find together with the duct cover.




**20.1.2.4 Dimensions**

| Model | Length [mm] | Width [mm] | Depth [mm] | Duct size [mm] | Cooker Hood [mm] |
|---|---|---|---|---|---|
| AHU 200B | 699 | 598 | 347 | 125 | 125 |
| AHU 200K | 748 | 600 | 326/481* | 125 | 125 |
| AHU 300B | 715 | 700 | 362 | 125 | 125 |
| AHU 300H | 972/1066** | 520 | 290 | 160 | 125 |
| AHU 350B | 715 | 755 | 452 | 160 | 125 |
| AHU 400B | 715 | 825 | 452 | 160 | 125 |
| AHU 400H | 1162/1240** | 653 | 343 | 200 | 125 |
| AHU 700B | 790 | 1004 | 570 | 200 | 125 |

*Dimensions with and without cooker hood
**Dimensions with and without mounting brackets
***More dimensions can be found on each unit on www.ensy.no

### 20.1.3 Connections

**Connections of sensors / external functions**

Plugs for connecting external sensors you find in the accessories bag supplied with the unit.

**Duct connections**

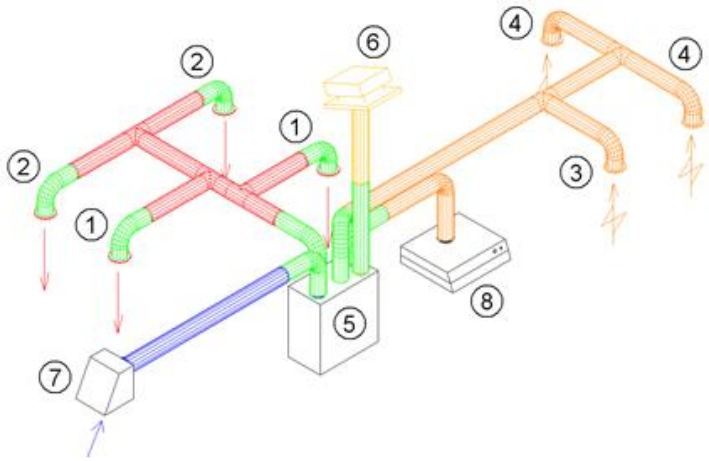
The unit is mounted preferably in for example laundry room, storage room, utility room, etc. Air duct from cooker hood can be connected to separate "bypass channel" in the top of the unit, marked “Cooker hood”.

The choice of placement must be taken into account that the unit requires periodic maintenance. Be sure that it is possible to open / remove the unit inspection hatch, and that there is sufficient room to remove the main components. If the unit is mounted on the lightweight wall construction to the living room, for example bedroom / living room, recommended wall insulated / constructed so that the risk of sound transmission avoided.

Fresh air intake is to be placed primarily on the building's north and east and at a good distance from the exhaust openings for ventilation, central vacuum, Hoods and Vents, sewer vent, chimney or other contaminated source such as dust / exhaust from traffic etc. The return of the exhaust air should always be in good distance from fresh air intakes, close windows, etc

**Sketch for piping when mounting the cooker hood to the top of the unit.**

1. Supply air bedroom
2. Supply air living area
3. Extract kitchen
4. Extract bathroom / utility room
5. Ventilation unit
6. Roof cowl/ exhaust air
7. Fresh air / outdoor air inlet
8. Cooker hood




Instead of separate roof cowl for exhaust air and wall grid for fresh air there also can be used combi grids with inlet and outlet air are in the same box.
Air to and from the unit will be led through the ducts. Best durability and capabilities for cleaning will be achieved by using ducts in galvanized steel.
Short customizations (à 1 m length) with a flexible aluminum - ducts can be used for piping between the unit and roof cowl / wall grid.
In order to achieve effective, low energy consumption and proper airflow, the duct system designed with low air speeds and low pressure drop.

## Sound reduction

To avoid disturbing noise from blowers in living area installation of sound-absorber (silencer) in the duct for supply and extract air recommended. (Length = 0.9 meters each section)

To prevent sound transmission between rooms via the duct system, and reduce any noise that occurs in the duct system, is also is recommended a silencer in front of each supply diffuser in the living area.

**Flexible ducts.**

Flexible ducts can be used for adjustments between the unit and roof cowl / fresh air inlet. Alternatively, the flexible silencers used (remember requirements for outdoor sound level).

**Condensation/isolation**

Isolation is necessary to safeguard thermal-, sonic- and fire considerations at the plant. Most often it is a combination of these are due to isolate.

Reasons for thermal insulation of ventilation ducts are:

- obtain good heat economy by limiting heat loss
- achieve a specific outlet temperature of the ventilation air.
- preventing condensation on either the inside or outside of the duct.

Heating costs reduced by preventing the heat supplied in ventilation air can be transferred to unheated surroundings.

If the ducts are positioned in a cold environment, such as in an attic, where the temperature is significantly lower than the ventilation air, there is a risk of condensation inside the ducts. This can be prevented by isolating the channel exterior. It can also be used insulation tubes (100 mm mineral wool) with plastic diffusion barrier pulled over the ducts. The same applies to insulation of pipings between the unit and diffusors, bringing the cooled air up to the rooms.

In areas with extremely low winter temperatures, additional insulation must be used. Total insulation thickness must be at least 100 mm.

# Warranty:

Ensy AHU unit has a warranty period according to the European directive 1999/44 CE, from the date of sale. For the warranty to be valid, the following documents received with the unit must be retained:

**- Warranty and User manual for Ensy® AHU-unit**

**- Service reports, you can download from: http://ensy.no/en/service-and-maintenance/form-to-report-errors/**

**Both documents need to be complete and with all correct data.**

Sale date: _____

**The company has installed this unit:** **Contact:**

_____ _____

Phone: E-mail:

_____ _____

## Notes:

**Ensy AS**

Mohagasvingen 1

N-2770 JAREN

http://www.ensy.no