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Supersedes	

Operating Manual
D-EOMAH03402-25_00EN

COMPACT L AIR HANDLING UNIT

ALB

Original Instructions

Table of Contents

1 ABOUT THIS DOCUMENT

1.1. Notice

MicroTech 4	from Daikin Applied Europe	
Before starting	This document refers to the following components: POL688, POL 955, POL 822, POL895, POL871	
Application range	Microtech 4	Controller
Users	Users of this document are intended to be:	
	- AHU users	
	- Sales staff	
Conventions	MicroTech 4 further in this document and when proper will be referred to as “MicroTech”	

2 SAFETY INFORMATION

Observe all safety directions and comply with the corresponding general safety regulations in order to preventpersonal injury and damage to property.

- Safety devices may not be removed, bypassed or taken out of operation.
- Apparatus and system components may only be used in a technically fault-free state. Faults that canaffect safety must be rectified immediately.
- Observe the required safety instructions against excessively high contact voltages.
- The plant may not be in operation if the standard safety devices are out of operation or if their effectsare influenced in some other way.
- All handling that affects the prescribed disconnection of the protective extra-low voltage (AC 24 V)must be avoided.
- **Disconnect the supply voltage before opening the apparatus cabinet. Never work when thepower is on!**
- Avoid electromagnetic and other interference voltages in signal and connection cables.
- Assembly and installation of system and plant components may only be performed in accordance withcorresponding installation instructions and instructions for use.
- Every electric part of the system must be protected against static charging: electronic components, open printed circuit boards, freely accessible connectors and apparatus components that are connected with the internal connection.
- All equipment that is connected to the system must be CE marked and comply with the Machine SafetyDirective.

3 INTRODUCTION

This operating manual provides basic information that allows the control of the Daikin Air Handling Unit (AHU).
Compact L AHUs are used for air conditioning and air handling in terms of pressure and temperature level control.

3.1 Basic Control System Diagnostic

Unit controllers, extension modules and communication modules are equipped with two status LED, BSP and BUS, to indicate the operational status of the devices. The “BUS” LED indicates the status of the communication with the controller. The meaning of the two status LED is indicated below.

MAIN CONTROLLER

BSP LED

LED Color	Mode
Solid Green	Application running
Solid Yellow	Application loaded but not running (*) or BSP Upgrade mode active
Solid Red	Hardware Error (*)
Flashing Green	BSP startup phase. The controller needs time for starting.
Flashing Yellow	Application not loaded (*)
Flashing Yellow/Red	Fail safe mode (in case that the BSP upgrade was interrupted)
Flashing Red	BSP Error (software error*)
Flashing Red/Green	Application/BSP update or initialization

(*) Contact Service.

EXTENSION MODULES

BSP LED

LED Color	Mode
Solid Green	BSP running
Solid Red	Hardware Error (*)
Flashing Red	BSP Error (*)
Flashing Red/Green	BSP upgrade mode

BUS LED

LED Color	Mode
Solid Green	Communication running, I/O working
Solid Yellow	Communication running but parameter from the application wrong ormissing, or incorrect factory calibration
Solid Red	Communication down (*)

3.2 Room Interface

Unit has 2 different human machine interfaces (HMI from here on), one is an 822 default, the other is POL895 or POL871, these have a lcd that can be plugged in the HMI port on controller (Th).
Explanation of hot points on both is explained here down:

3.2.1 Room Unit Interface

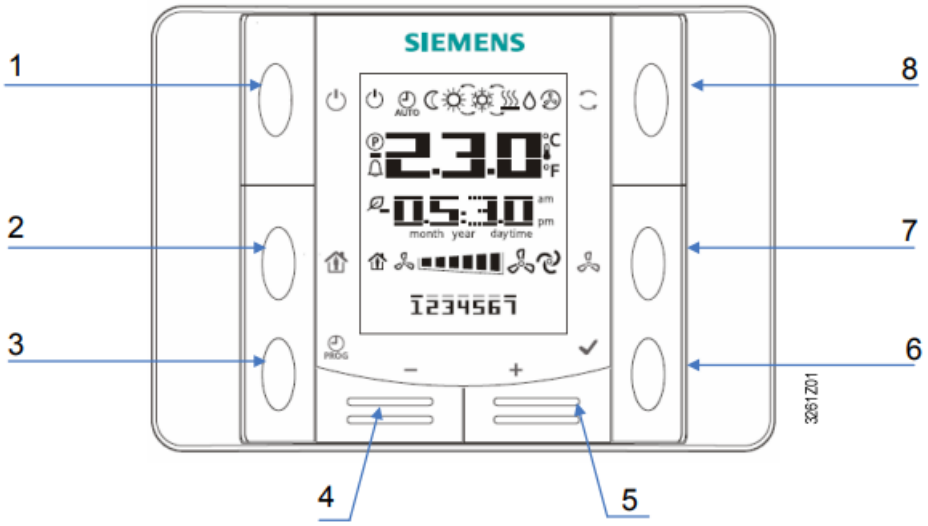


Figure 1 POL 822

Legend

No.	Icon	Name	Function
1	⏻	On/Off	Button for power on or power off
4	-	Minus	Button for set-point adjustment, each operation of the Minus (-) reduces the setpoint by 0.1°C/0.5°F or 0.5°C/1.0°F, which is defined in controller's settings.
5	+	Plus	Button for set-point adjustment, each operation of the Plus (+) increases the setpoint by 0.1°C/0.5°F or 0.5°C/1.0°F, which is defined in controller's settings.
6	✓	Ok	Button for confirmation of Date/Time and Scheduler settings (for POL822.60/XXX only)
8	⟳	Mode	Cooling/Heating mode

3.2.2 LCD

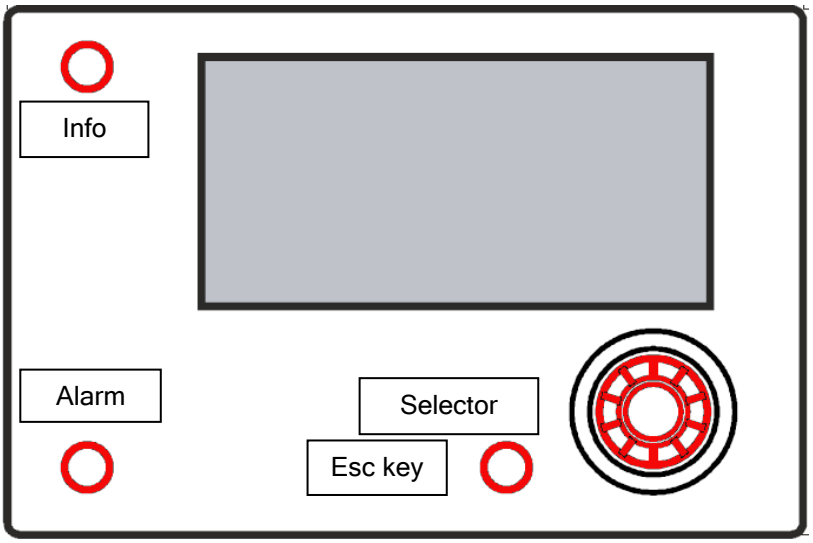


Figure 2 POL 895

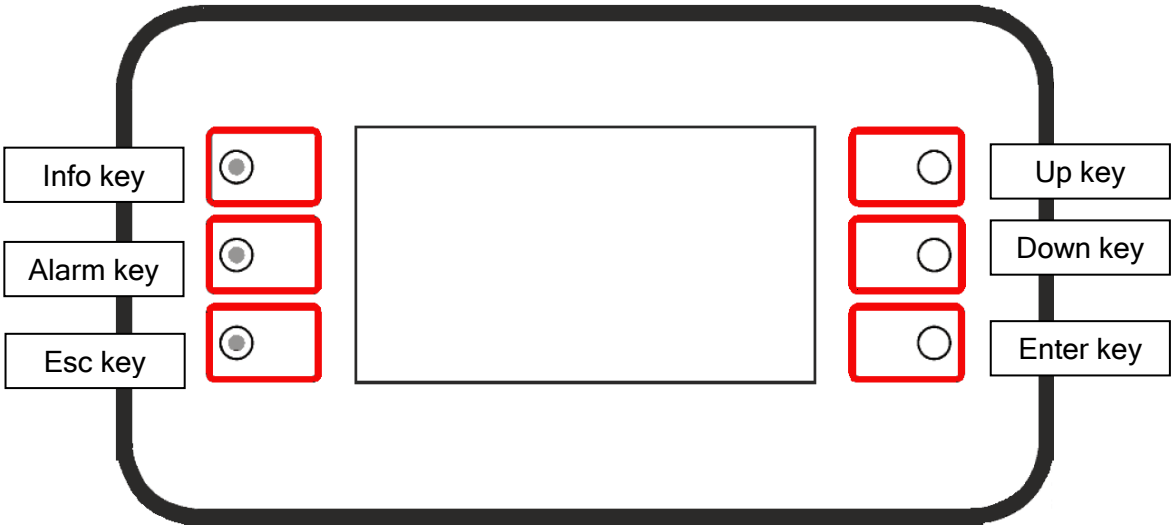


Figure 3 POL 822

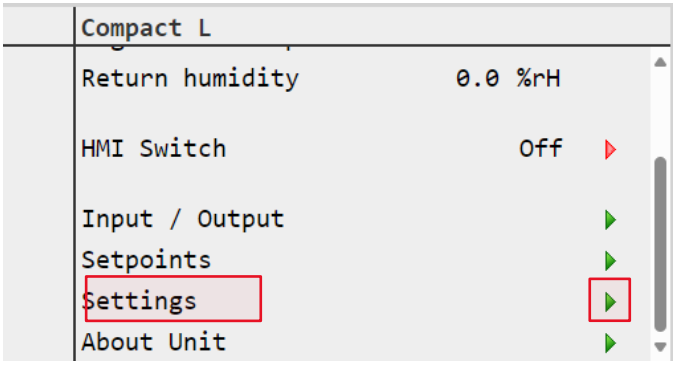
All HMIs except POL 822 allow navigation through the application pages, the available data can change, the LCD shows additional data to configure optional items such as BMS configuration, some of the additional values are protected with different level passwords to prevent wrong parameterizations to unauthorized users.
To select the voice the user must click on green triangle (web interface) or pushing knob POL895 or Enter key POL871.

3.3 Password

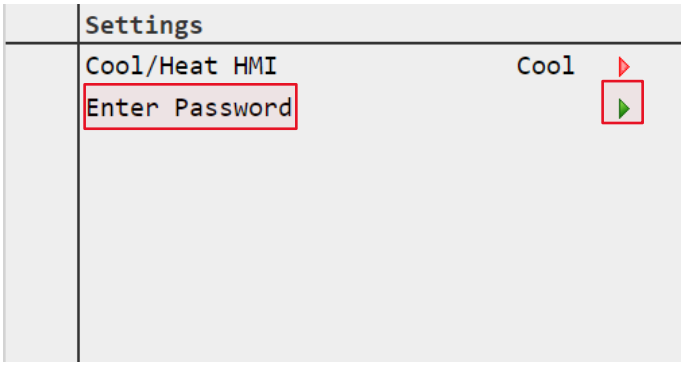
Different levels of password are available in the application, at each level different parameters are accessible. Summary of password and access level in the table below

Level name	Level index	Password
End user	--	--
User	6	5321
Maintenance	4	2526

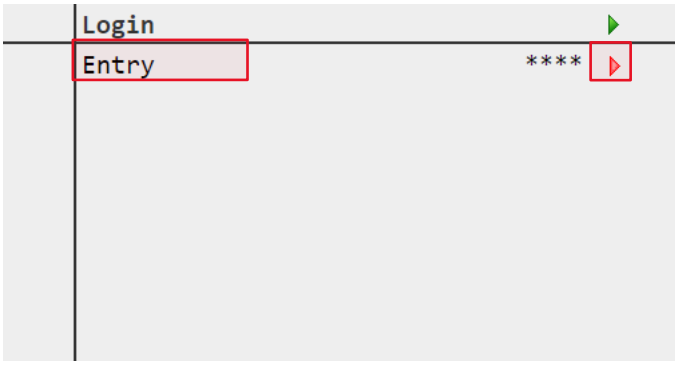
To access password input page, select “Settings” from main menu as shown below:



Select “Enter Password” to show menu with “Login”



Select “Entry” and use the needed value as reported in table at the beginning of the chapter.



4 CONTROL FUNCTIONS

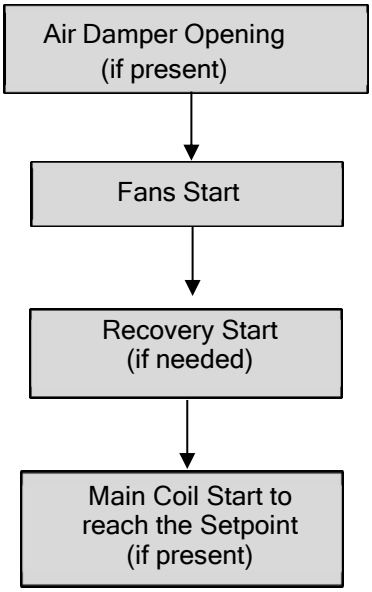
This section describes the main control functions available in Daikin Compact L Air Handling Units. The activation sequence of the devices installed in Daikin AHU for thermoregulation control is shown below.

- On the Base Unit the fans will be free to start immediately, while if you have dampers the fans will wait for the minimum opening before starting.

- Fan speed is monitored with an algorithm that evaluates the differential pressure by reading the pressure difference between the zone before the fan and the fan impeller. This placement allows us to control the machine in constant air flow, the system will adjust the fan speed to reach the setpoint and keep it as stable as possible.

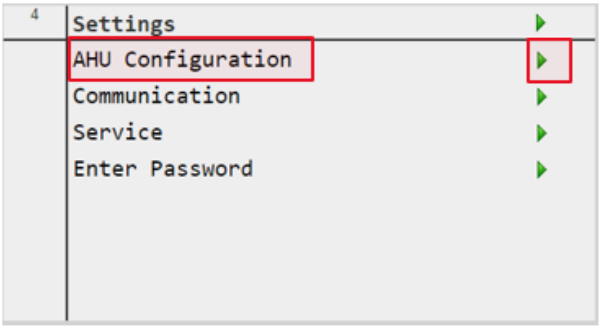
- While reaching the setpoint the system will start treating the air with the heat recovery unit by-pass.

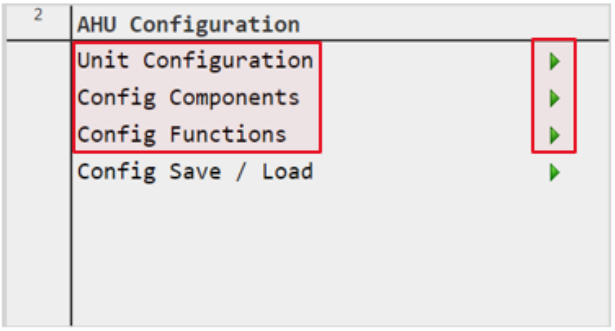
- If coils are present, the algorithm will start the control loops on Temperature and/or Humidity to meet the demand. Treatment control can be done on the supply temperature or the return temperature.



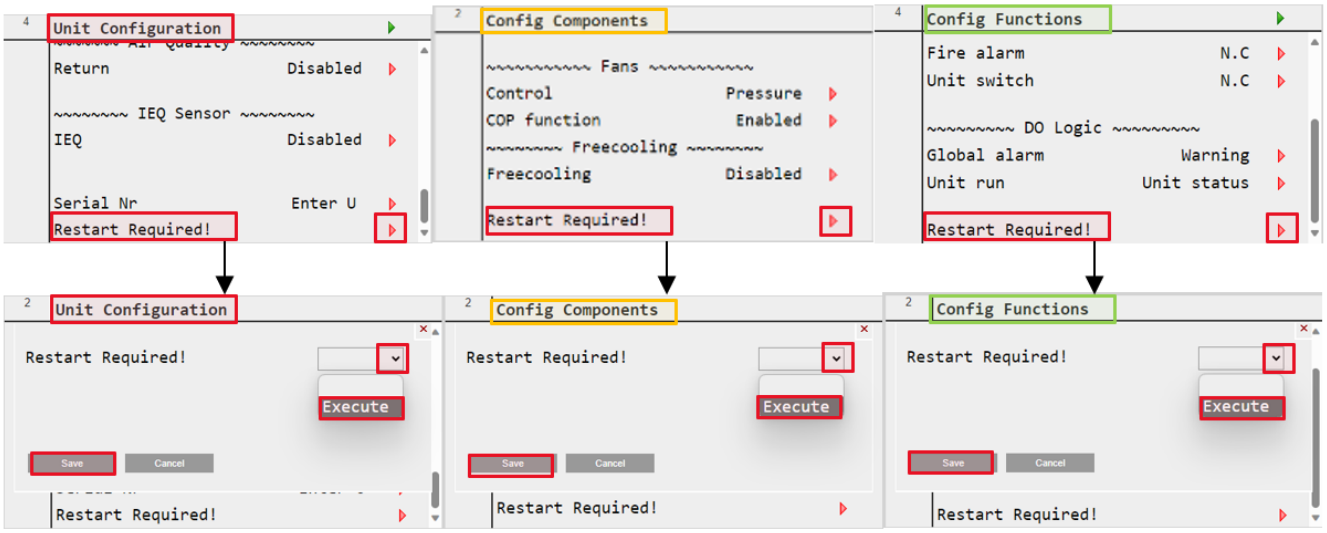
The start-up sequence is performed to meet the desired pressure/airflow and temperature setpoints as efficiently as, to keep energy consumption low.

The Compact L is sold in its standard configuration and is dedicated to air exchange with heat exchanger with By-pass and external air filter, but there are various possibilities for configuration by adding the various Optional.
For activation of the various components go, after putting the password in Settings, to the AHU Configuration, Unit Configuration, Config Components and Config Function.





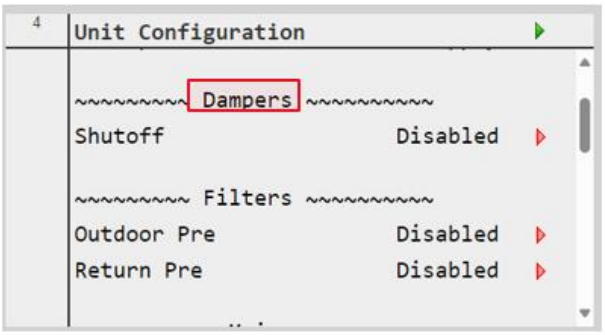
Remember to go to the "Restart required!" item after you have made all the changes to each individual menu.



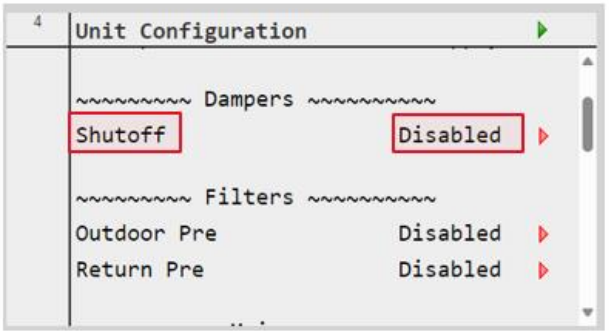
You can also restart with each individual change for each menu.

4.1 Dampers

4.1.1 Base Unit

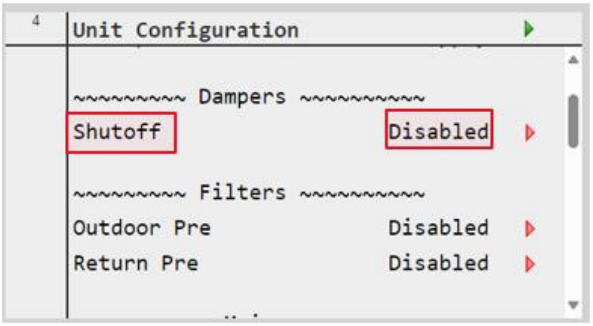


4.1.2 Outdoor and Exhaust air dampers



Which allows exclusion of AHU from direct and coming from outdoor ducts.
Connect Shutoff Damper on pin X2.1 on
terminal Y.

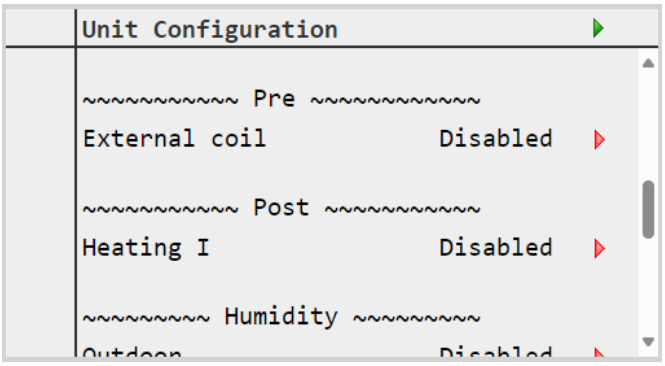
4.1.3 Supply and Return air dampers.



Which allows the exclusion of AHU from direct and coming from indoor ducts.
Connect Shutoff Damper on pin X2.2 on
terminal Y.

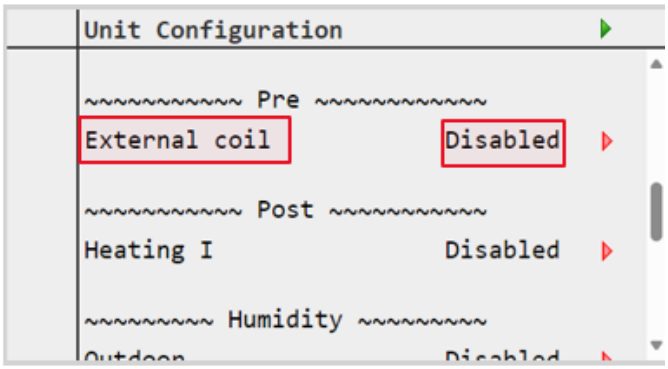
4.2 Coils

4.2.1 Base Unit

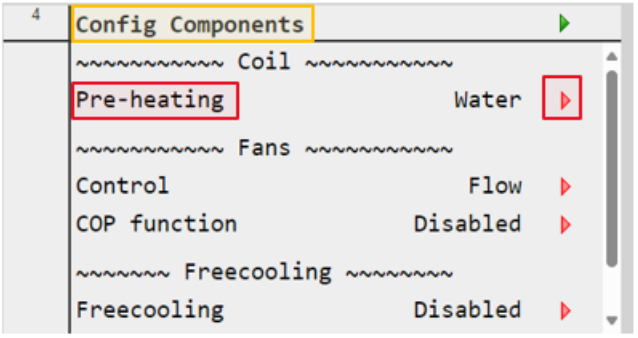


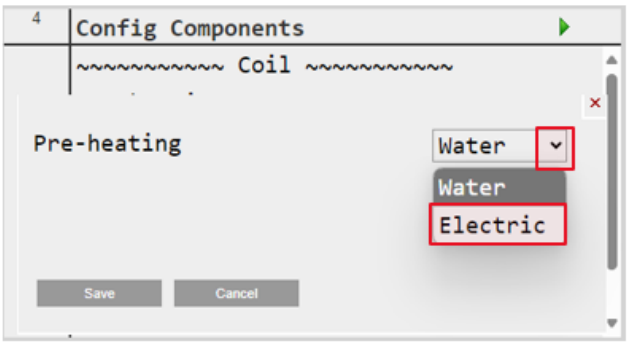
4.2.2 External Pre-heating coil

This Coil can be either Electric or Water, it is used to raise the inlet temperature of the AHU before the heat recovers.
Enable coil on Unit Configuration



Select coil type on Config. Components

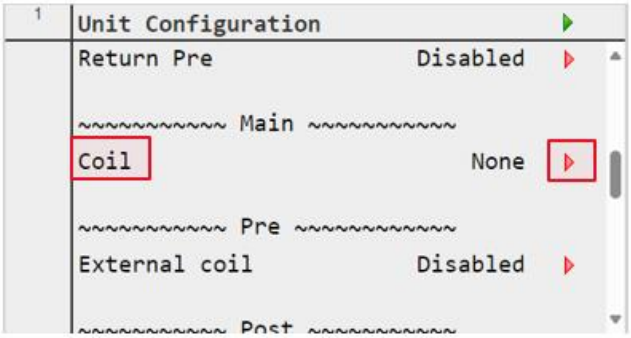




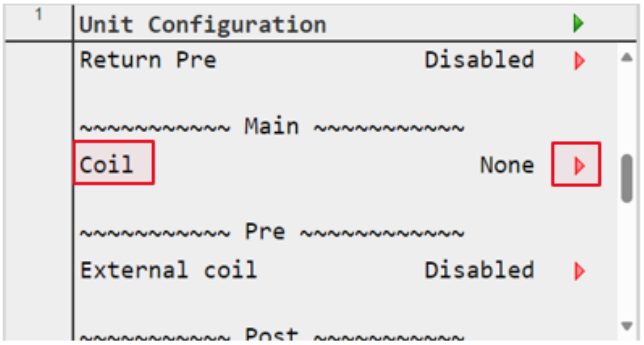
When selecting Electric Pre-heat, you need to install the additional Outdoor temperature sensor on the duct before the Pre-heat coil

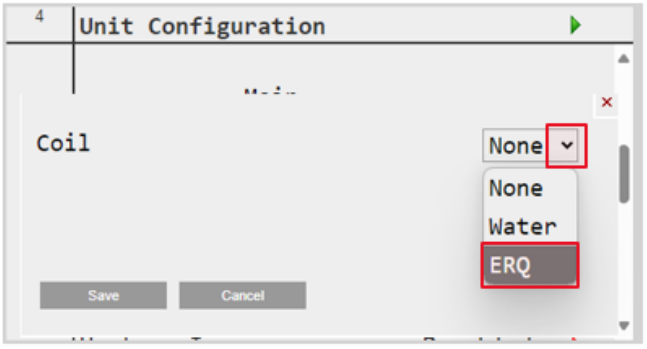
4.3 Main coil DX or Water

Enable coil on Unit Configuration

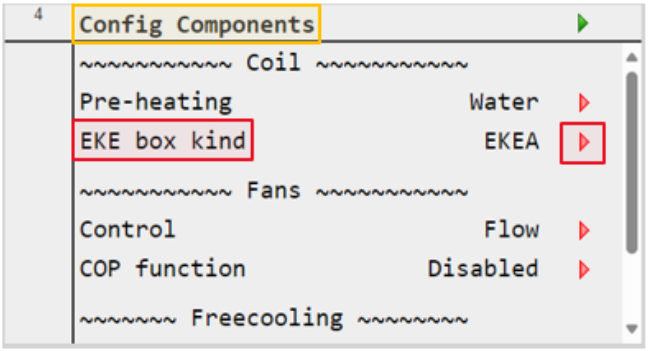


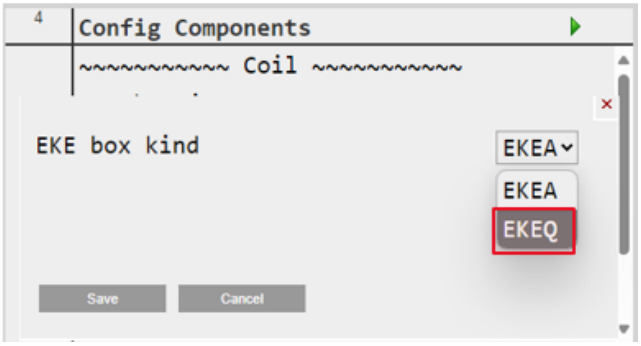
Select coil type on Config. Components.
For DX solution, it provides the installation of our ERQ, maximum one circuit.





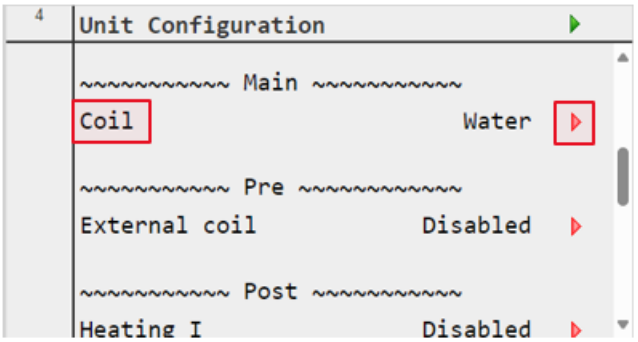
Choose the EKE box kind from the config. components



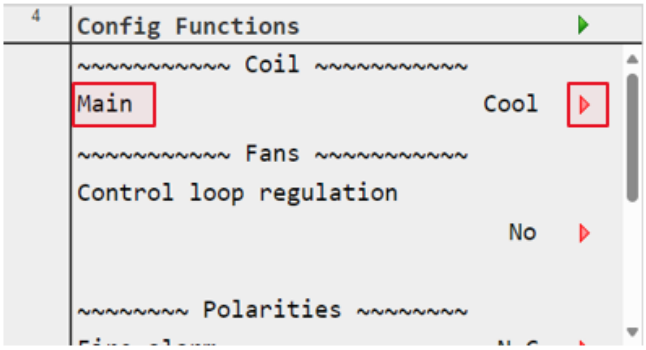


4.3.1 Water main coil

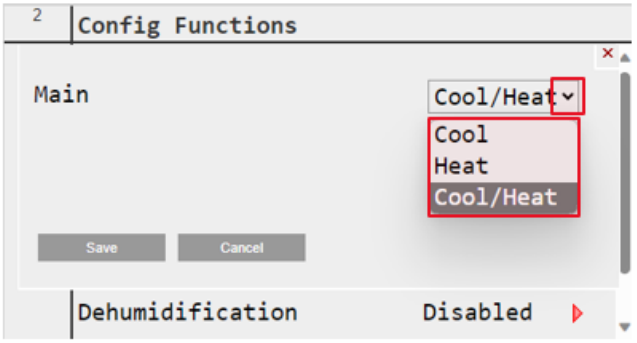
For the water solution through the software, you can decide whether to have a heat only, cool only or a combined water coil.
Select coil type on Unit Configuration



Select coil function on Config. Function

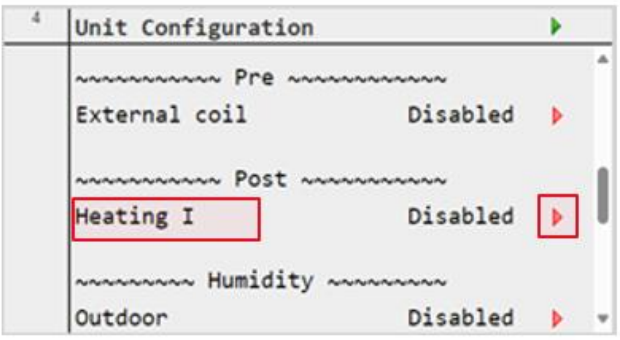


These coils are used to treat the air and reach the temperature setpoint.

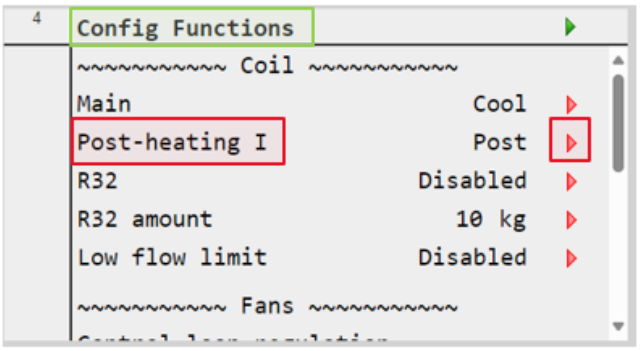


4.3.2 Post Heating 1 Coil

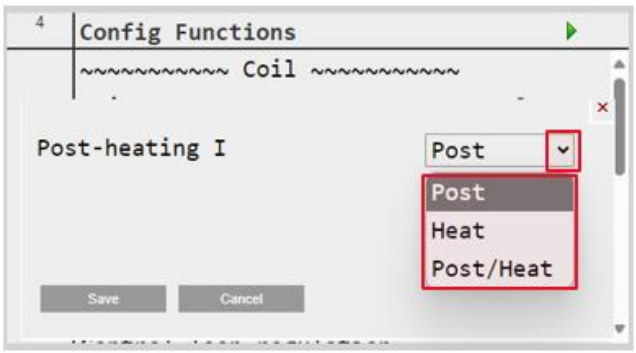
Enabled Post heating 1 coil on Unit Configuration



Select coil Function on Config. Function



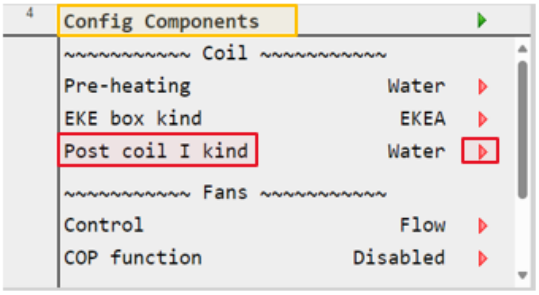
Select the type of internal coil installed.

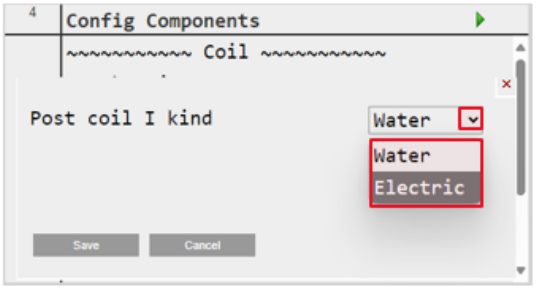


5 POST-HEATING COIL

It can be either Electric or Water coil, the Electric one is a duct coil mounted externally to the AHU and can only be a Post-heating coil, while the Water coil is mounted internally to the unit on the slides just after the supply fan (Attention! If you install the water coil you cannot install the Supply filter) and can be used either as a Post or Heat water coil if you have provided a main cold water only coil.

Choose the Post coil 1 kind from the Config. Components. (After enabling the Post Coil 1 form the Unit Conf.)

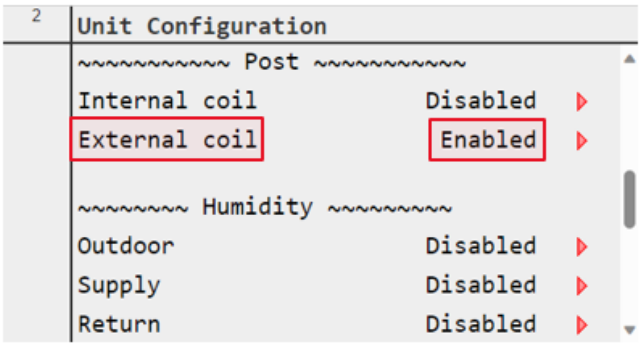




5.1.1 External coil

Enable External coil on Unit Configuration. This coil is used to supplement heat during heating when the main coil cannot reach in setpoint and/or for dehumidification.

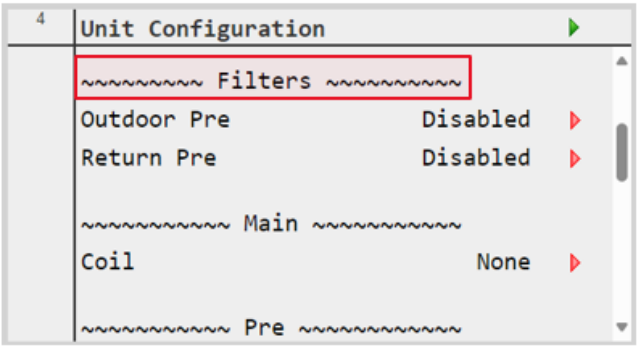
When you enable the external coil you are selecting Electric Post-heat, when you make this choice you need to install the additional Supply temperature sensor on the duct after the Post-heat coil



5.2 Filters

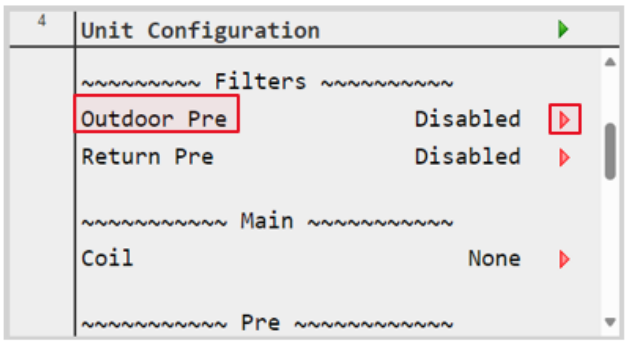
5.2.1 Base Unit

Outdoor and/or return pre-filters can be added to the unit. However, a pressure transducer is required to monitor the pressure differential and trigger an alarm if necessary.



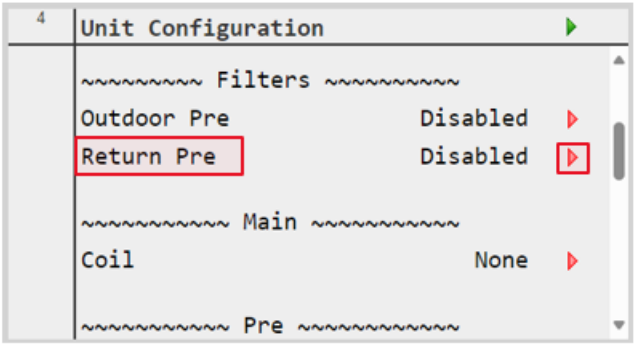
5.2.2 Outdoor air Pre-filter

If the Outdoor Pre-filter is available, a pressure transducer should be connected to pin X1A on terminal Y



5.2.3 Return air Filter.

If the Return Pre-filter is available, pressure transducer should be connected to pin X5B on terminal Y.



5.3 Optional POL955 A/B (OPTIONs)

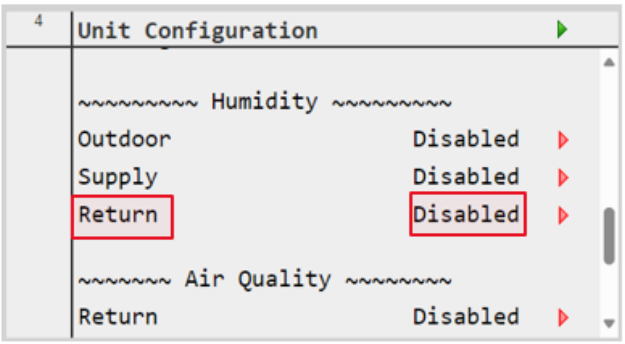
The optional POL955 A/B are used to manage some components that can be added to the unit configuration.

The Components in POL955 A are:

POL955 OPTION A		
EKEA	Error status	X4A on -X
	R32 Alarm	X5A on -X
	Defrost	X6A on -X
	Input ON/OFF	Q13A/Q14A on -X
	Cool/Heat status	Q23A/Q24A on -X
	Malfunction Low flow	Q33A/Q34A on -X
	0-10 DC	Y1A on -X
Post Heating	Supply Air Temperature	X7A on -X
	(Electric/ Water Coil Pump) Alarm	X8A on -X
	(Electric/ Water Coil Pump) ON/OFF	Q43A/Q44A on -X
	(Electric/ Water Coil Pump) Signal	Y2A on -X
Return Air	CO2	X2A on -X
	Humidity	X3A on -X
DPT	Outdoor Air Prefilter	X1A on -X
Water Coil	(Cooling/Heating/Cooling-Heating) Alarm	X4A on -X
	(Cooling/Heating/Cooling-Heating) ON/OFF	Q13A/Q14A on -X
	(Cooling/Heating/Cooling-Heating) Signal	Y1A on -X

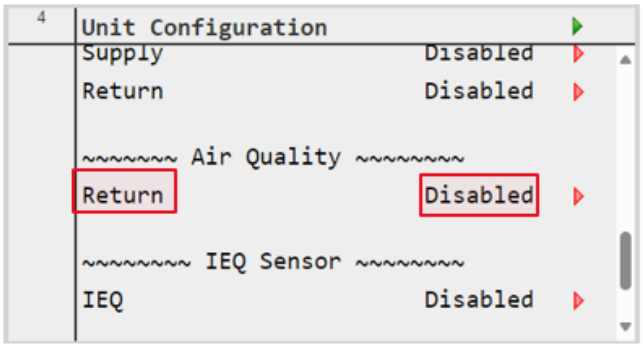
5.3.1 Return air humidity

If available, connect the Return Humidity probe to pin X3A on terminal X



5.3.2 CO2 probe

If available, connect the CO2 probe to pin X2A on terminal X



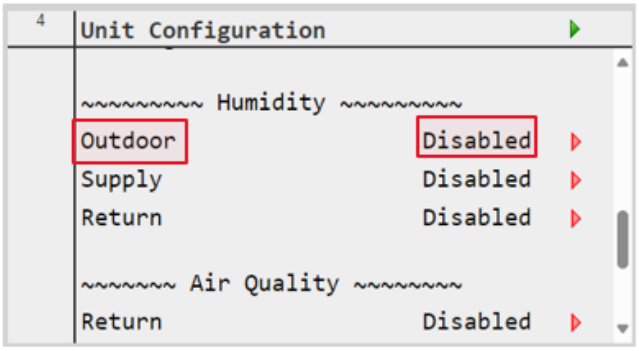
5.4 Optional POL955 B OPTION

The Components in POL955 B are:

POL955 OPTION B		
Pre-Heating	Outdoor Air Temperature	X1B on -Y
	(Electric/ Water Coil Pump) Alarm	X4B on -X
	(Electric/ Water Coil Pump) ON/OFF	Q14B on -X
	(Electric/ Water Coil Pump) Signal	Y1B on -X
DPT	Return Air Prefilter	X5B on -Y
	Supply/Return Duct pressure control	X6B on -Y
Comfort Economy	-	X7B on -X
Humidity	Outdoor Air	X2B on -X
	Supply Air	X3B on -X

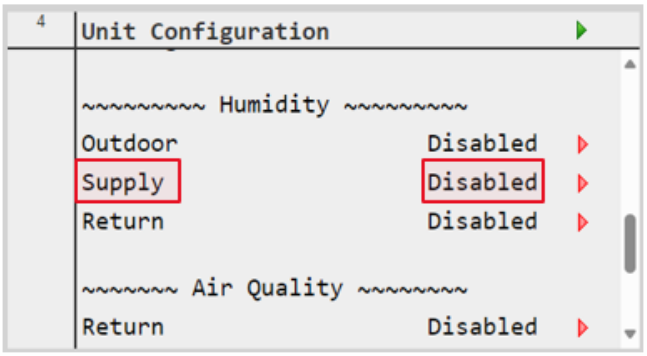
5.4.1 Outdoor air humidity

If available, connect the Outdoor Humidity probe to pin X2B on terminal X



5.4.2 Supply air humidity

If available, connect the Supply Humidity probe to pin X3B on terminal X



6 MAIN MENU SCREEN

The unit is sold without its own on-board interface. the parameters can be accessed in various ways, via web interface if the unit is connected to the network, via Pol 895 with which you have the possibility to access the various menus of the AHU depending on the password entered and with Pol 822 which it only allows you to read the temperature of the environment where it is installed, turn the AHU ON/OFF, change the temperature set point and change the hot/cold status of the unit (if set by the HMI on the control).

6.1 LCD/Web interface

Through Main Menu screen the user can read the main important information necessary for monitoring the AHU status. In particular, the user can:

- Control the AHU status
- Read main values
- Switch unit Off/On
- Change the AHU Setpoint
- Access to the I/O overview menu
- Access settings
- About Unit
- Restore alarm conditions

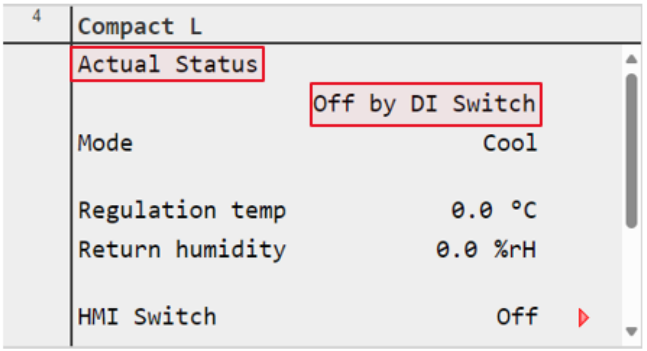
Next chapters will describe any item of he main menu. In the following table the user can find all the items ofthe main menu screen and the section where it is described.

Main Menu item	Section
Actual status	Display the actual status of the AHU.
Mode	Display the type of treatment Cool or Heat
Supply/Return temp	Display actual supply, return temperature used to regulate treatment system.
HMI switch	Change the unit status from OFF to On and vice versa.
Input/Output	Allow user to access menu that shows all the input/output values of the AHU.
Setpoints	Allow user to access menu that shows unit setpoints.
Settings	Allow user to access menu that shows all unit settings (up to the password input).
About unit	Allow user to access information about control system of the AHU.
Restore alarm condition	Allow user to reset alarms once the problem is fixed.

7 ACTUAL STATUS

This item displays the actual status of the AHU. All possible statuses are reported in the table below.

HMI Path: Main page -> Actual status



Main Menu item	Value	Description
Actual status	Off by fire alarm Off by alarm Off by DI switch Off by BMS Off On	**Off by fire alarm:** Highest priority alarm, the unit is switched off immediately. **Off by alarm** Unit is switched off due to alarms that doesn't allow the system to work in safety condition. **Off by DI switch** The unit is switched off by the selector on the electrical panel. **Off by BMS** The unit is switched off by BMS command. **Off** The unit is switched off by HMI command **On** The unit is witched on and operational

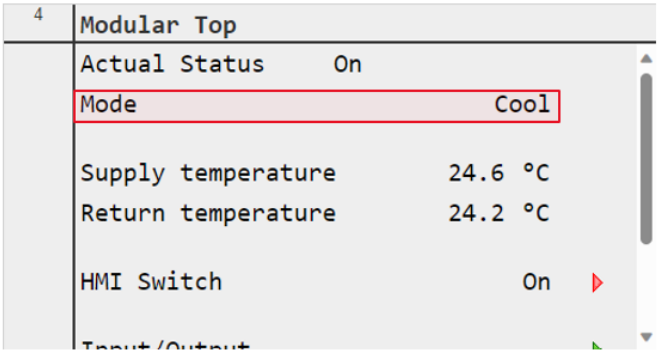
On status follows a priority chain according to the following table:

HMI switch	Panel switch	BMS	Unit actual status
Off	X	X	Off
On	Off	X	Off
On	On	Off	Off (if BMS enabled) On (if BMS disabled)
On	On	On	On

The "X" value means that whichever state doesn't affect the unit actual status.

8 MODE

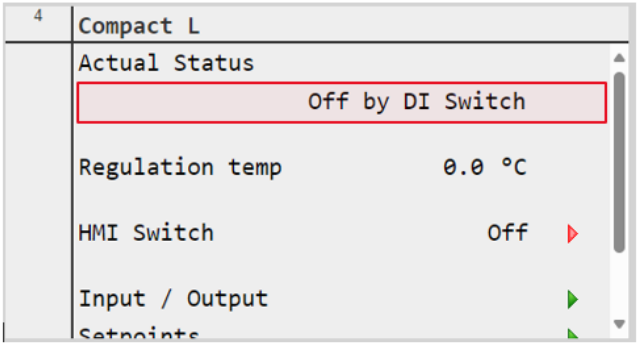
This item displays the mode of the AHU. the possible mode are cool or heat.



9 SUPPLY/RETURN TEMP

This item (read-only) displays the actual average supply air temperature value used to regulate the AHU.

HMI Path: Main page -> Supply temp

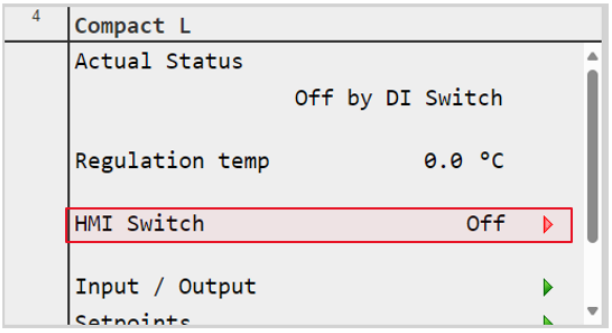


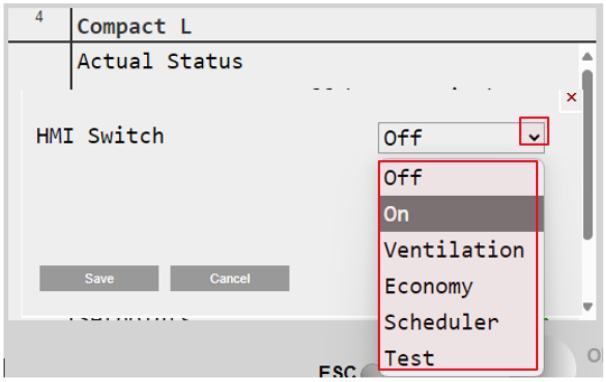
The probe will monitor the temperature value, and the system will use the temperature to ensure the setpoint is maintained.
The system will be able to provide optimized commands to correct any deviation from the temperature set point with all the treatment systems envisaged, increasing or decreasing the signal sent to the treatment system.
The same applies to the return probe if selected as the control temperature.

10 HMI SWITCH

This item displays and allows you to set the status of the AHU.

HMI Path: Main Menu -> HMI Switch

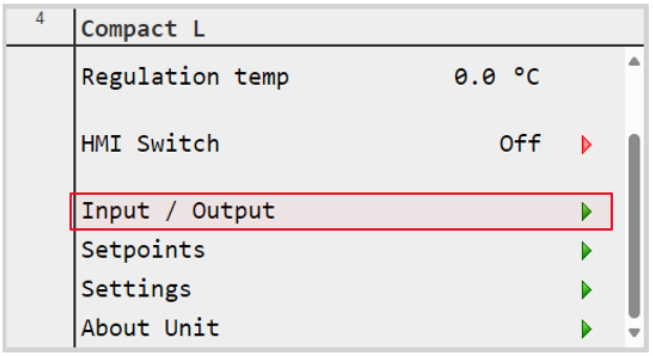




11 INPUT/OUTPUT

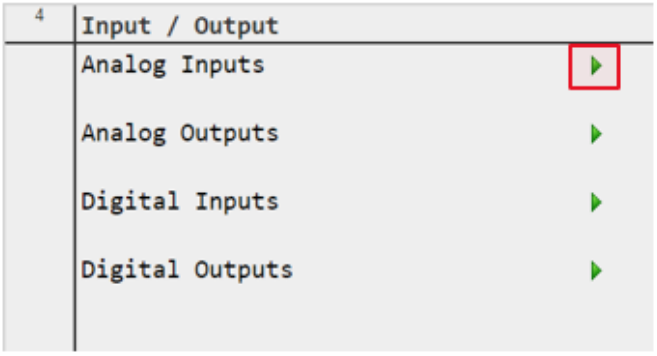
This menu (read-only) allow to access submenus of read values throughout the application.

HMI Path: Main Menu -> Input/Output

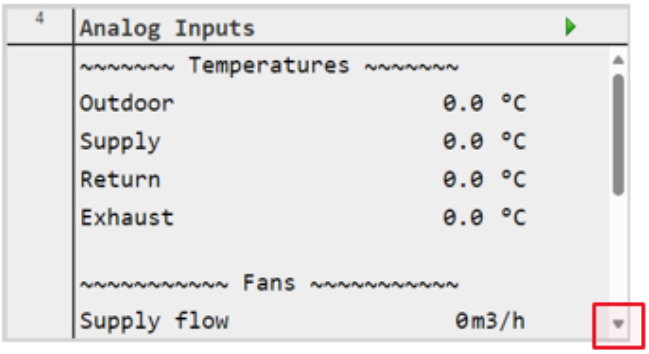


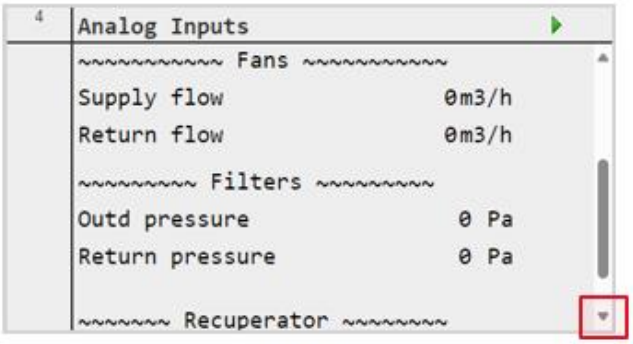
Selecting “Input/Output” a menu shows the access to sub menus dedicated to different signals of the system as explained below:

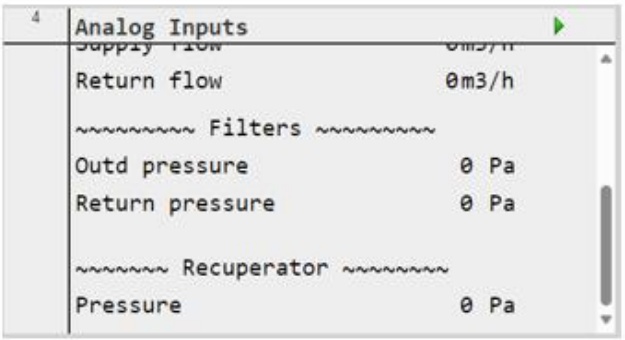
Select “Analog Inputs” to show probes and transducers values.



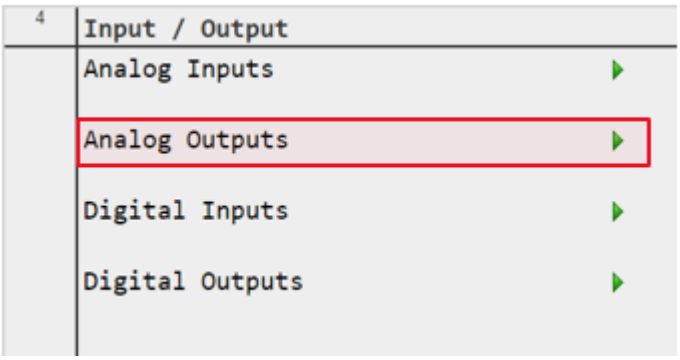
Scroll down to show remaining values.



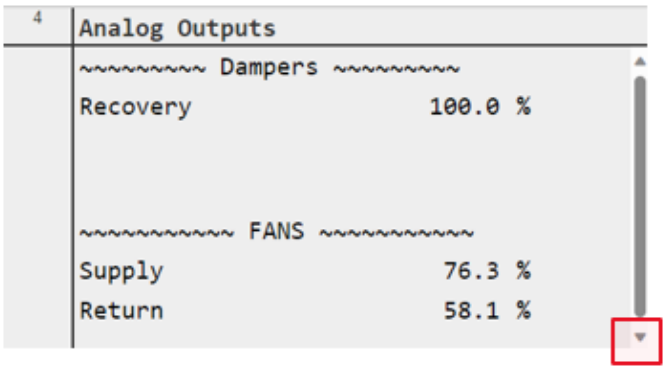

4
Analog Inputs
~~~~~~~~~~~ Fans ~~~~~~~~~~~
Supply flow 0m3/h
Return flow 0m3/h
~~~~~~~~~~ Filters ~~~~~~~~~~
Outd pressure 0 Pa
Return pressure 0 Pa
~~~~~~~~ Recuperator ~~~~~~~~


4
Analog Inputs
Return flow 0m3/h
~~~~~~~~~~ Filters ~~~~~~~~~~
Outd pressure 0 Pa
Return pressure 0 Pa
~~~~~~~~ Recuperator ~~~~~~~~
Pressure 0 Pa
~~~~~~~~

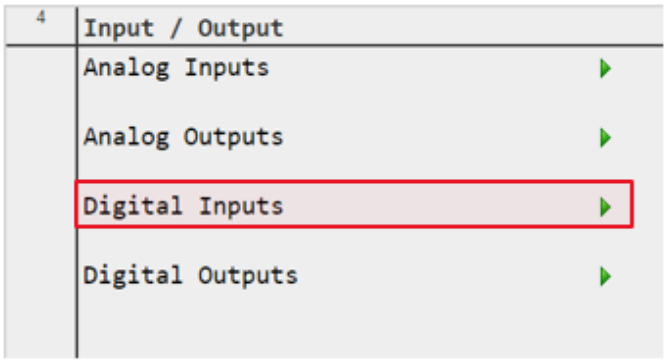
Select “Analog Outputs” to show coil and fans values.



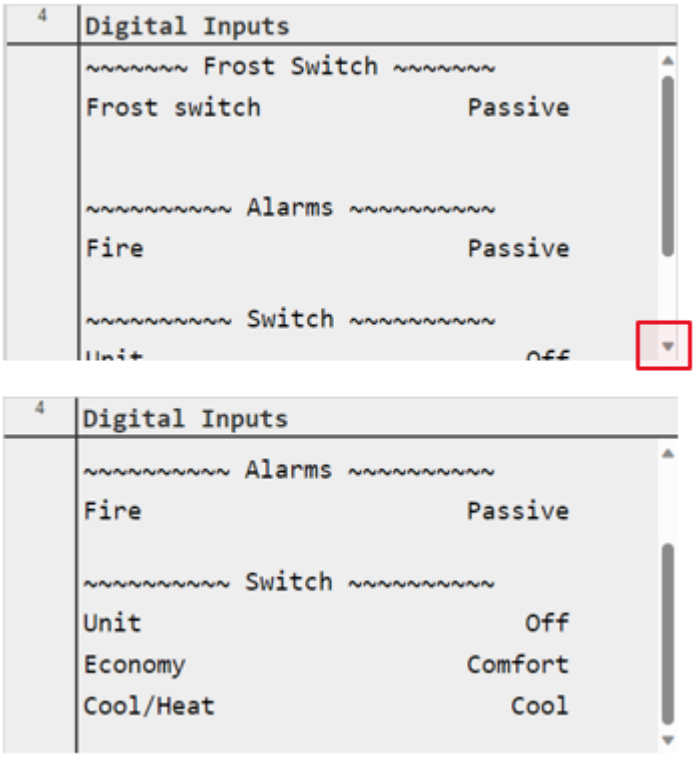
When you enable the components the various sections will be created, scroll to view all.



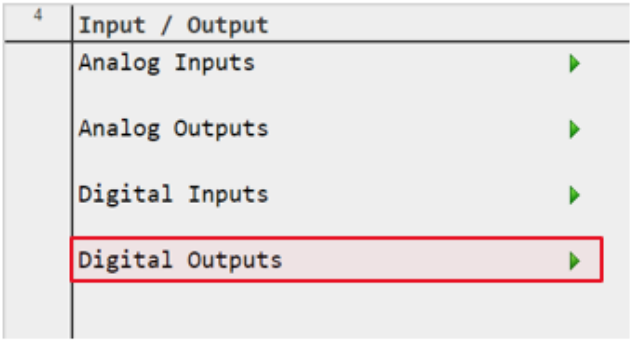
Select “Digital Inputs” to show alarms and switch status.



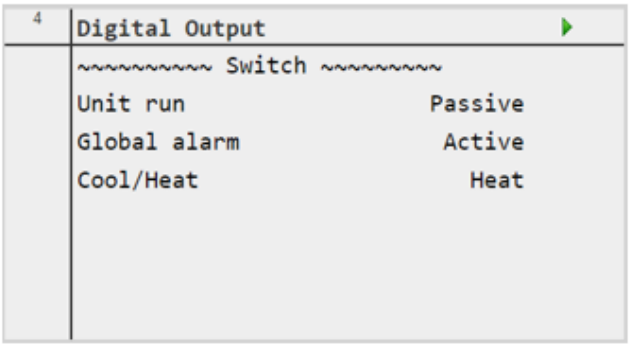
Scroll down to show remaining values.



Select “Digital Outputs” to show command and switch.



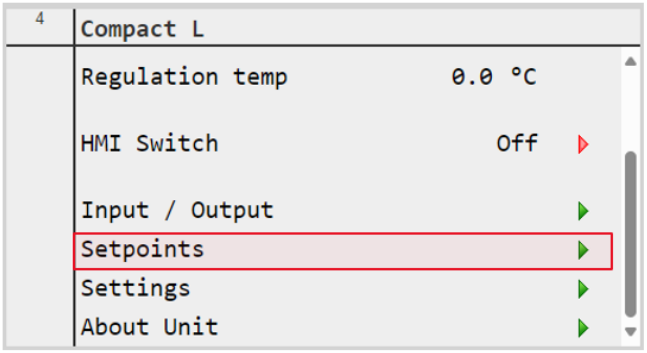
When you enable the components, the various sections will be created, scroll to view all.



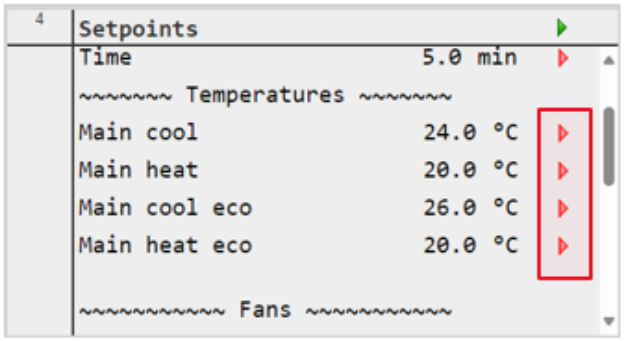
12 SETPOINT

This menu allows the user to access all setpoints used to control AHU.

HMI Path: Main Menu -> Setpoints

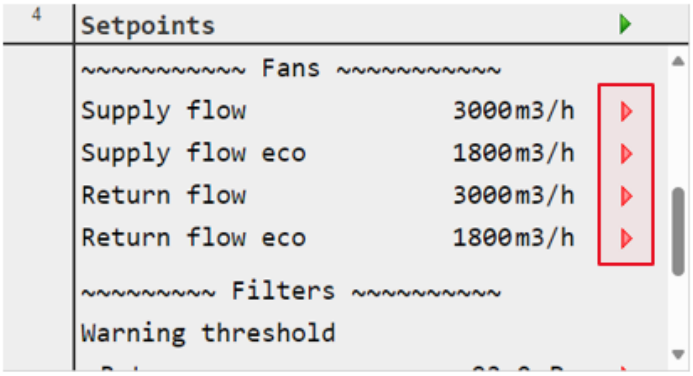


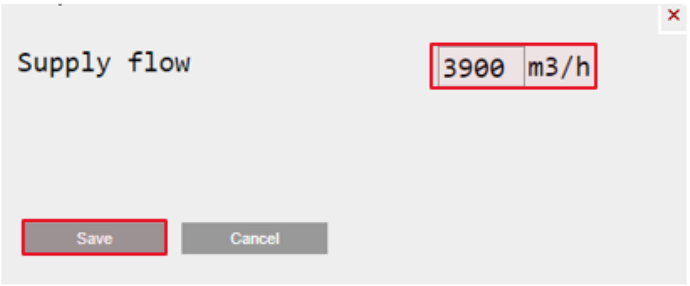
Selecting “Setpoints” a page allows to change all setpoints values, used by the system to target regulation algorithm. This setpoint is used to regulate the treatment system modulation by a PI algo using supply/return temperature as feedback.
if the regulation temperature is the return one you will have four setpoints (as in the image) if instead you regulate on the supply, you will only have the first two setpoints.



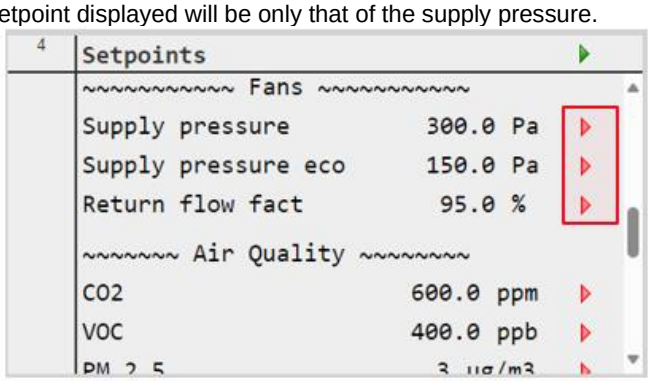
When adjusting on the return temperature we need to set the desired temperature on the Main cool or Main heat item after which we need to set the threshold below which we do not want to go in case of Cool (supply min) on the supply temperature and the threshold above which we do not want to go in case of Heat (supply max) also on the supply temperature.
This allows us to adjust the temperature within a range between the return and supply temperatures. This type of regulation is used to avoid excessive temperature changes and to have high energy savings.

These setpoints are used to set air flow or pressure you want for the environment and keep the fan as stable as possible.
Set both air flow.

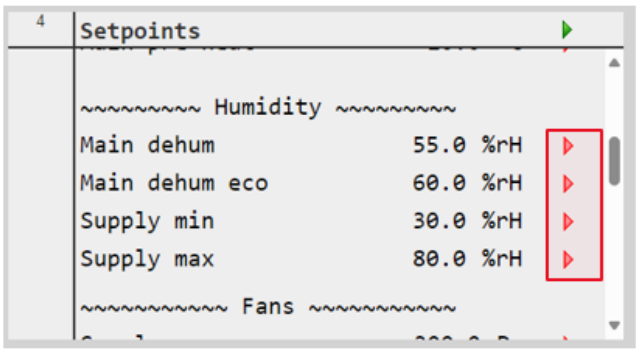




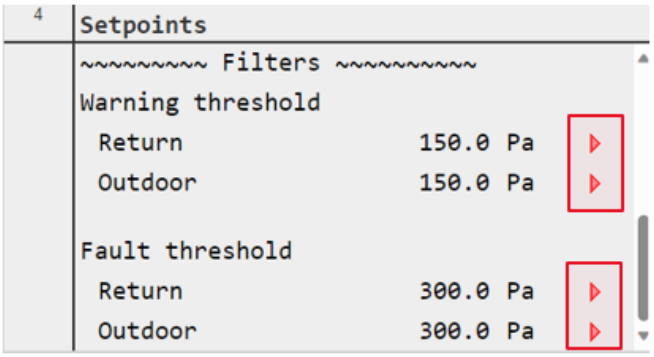
This setpoint is used to set the pressure you want for the environment and keep the fan as stable as possible.
Attention! to set the pressure you must change the tubes configuration on the supply and return Fans of base unit as per the instructions.
You can also enable the COP function, which will adjust on the supply pressure and, thanks to the algorithm, manage the speed of the return fan. The setpoint displayed will be only that of the supply pressure.



If the humidifier and humidity probes are enabled, you can be set the humidification setpoint and the minimum and maximum supply humidity thresholds.
This control loop has the same operation as the temperature loop. This allows us to have high energy saving and excellent accuracy on the regulation.



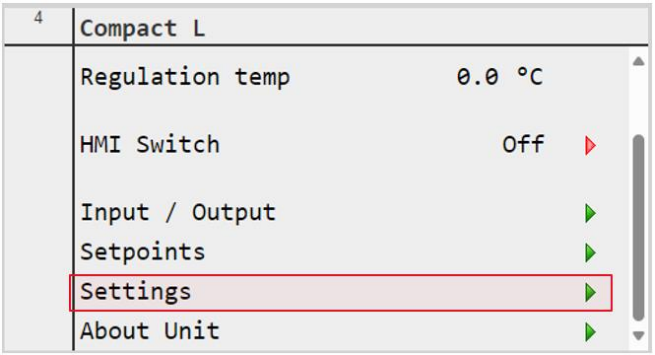
This setpoint is used to set the pressure difference you want to report on each activated filter. The first is just a warning, the second is a fault that stopped the AHU.



13 SETTINGS

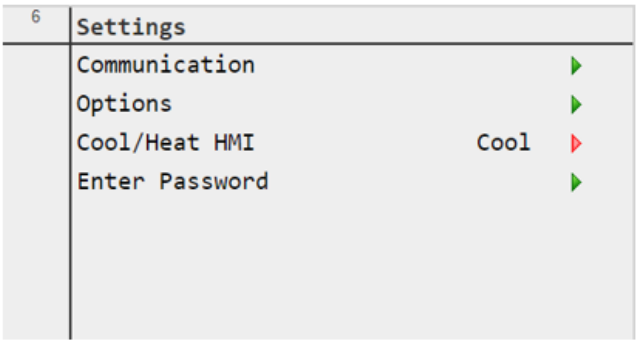
This menu, up to the password level, allows the user to access submenus for communication channels.

HMI Path: Main Menu -> Setting

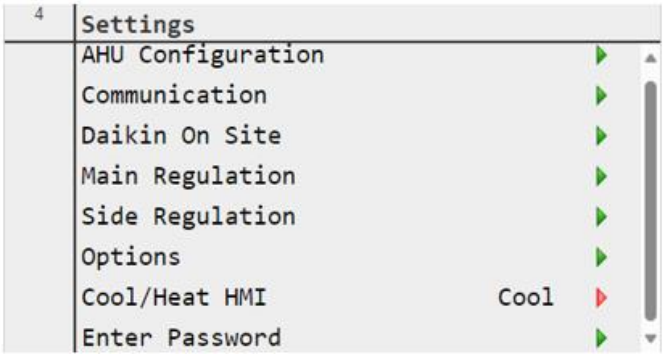


Selecting settings and log with needed password to access different menu as show below:

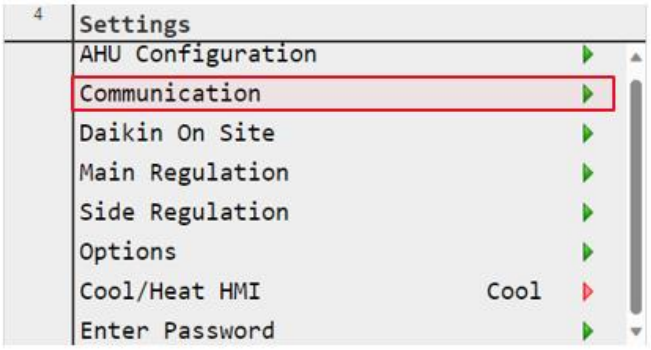
Menu with User level password.



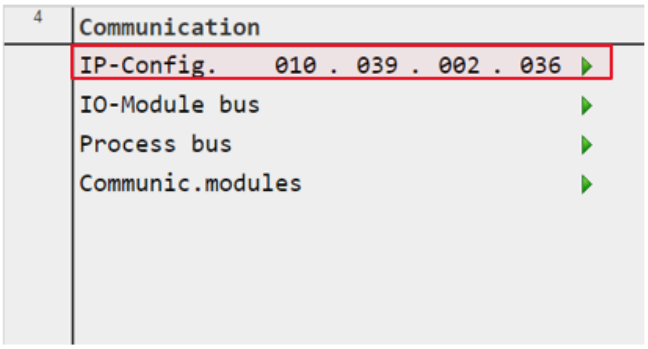
Menu with Maintenance level password.



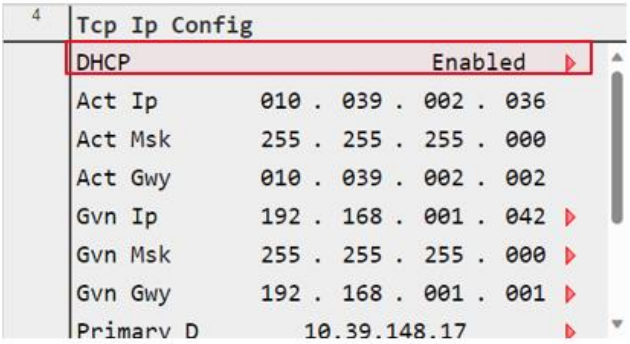
Select “Communication” to access different channel parametrization.



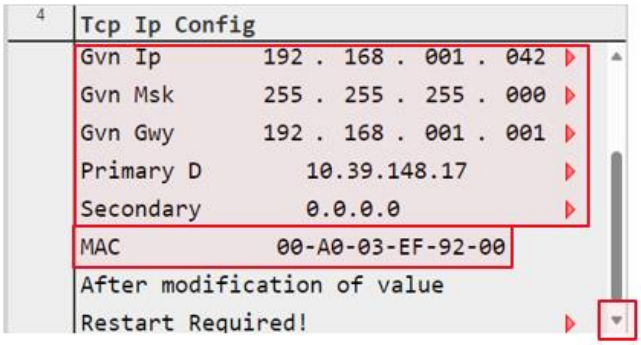
Select “IP-Config.” to access configuration of IP address of the control system.



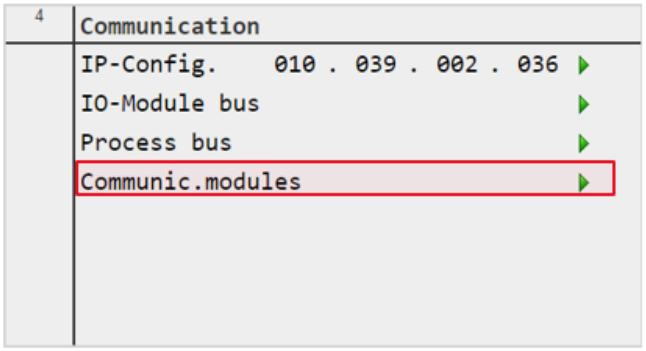
Select “DHCP” to enable or disable the service.



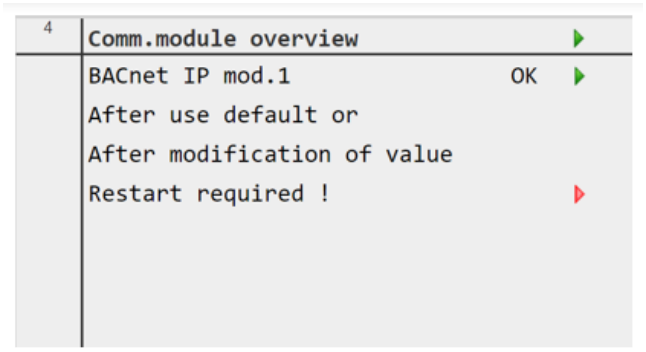
Scroll down to show remaining values.
In case of DHCP disabled use Gvn (given) fields to assign specific IP values to the control system.
MAC is the mac address of the POL688 (control system) of the unit.



Select “Communic.modules” to access configuration of additional comm modules if present.



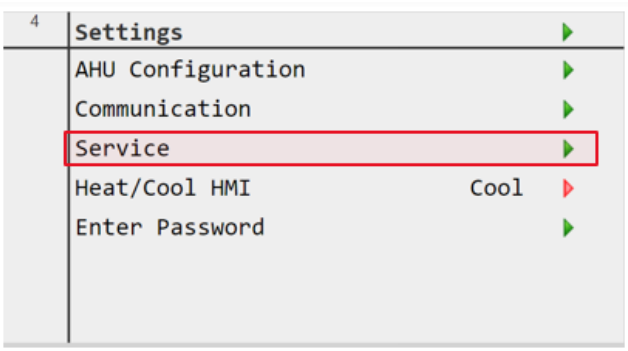
In the presence of a connected module, specific menu will appear to allow parametrization (communication setting) of every single module installed.



From Settings you can enter to Service where you can access several services as

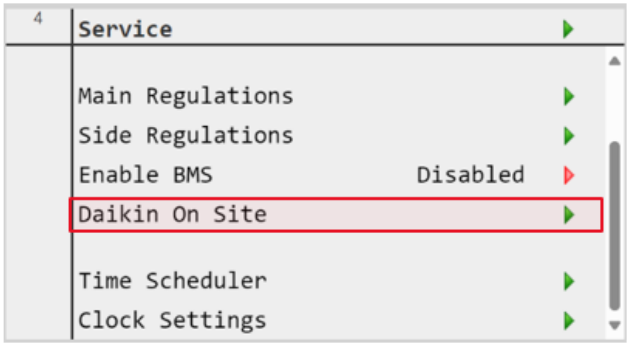
- Daikin On Site
- Main regulation
- Language Selection
- Heat/Cool kind
- Enabling BMS
- Time Scheduler
- Clock Settings

HMI Path: Main Menu -> Service



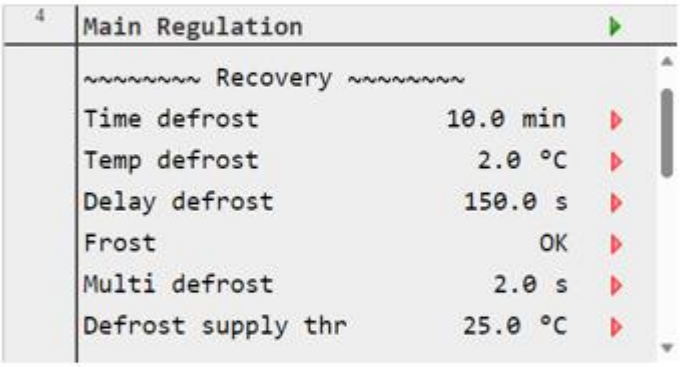
- **Daikin On Site**

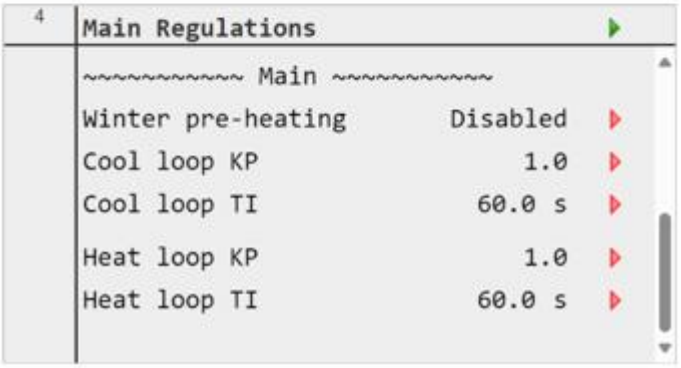
  Select “Daikin On Site” to access cloud connection if available.



- **Main Regulation**

  Select “Main Regulation” to adjust the loop timing of some features.



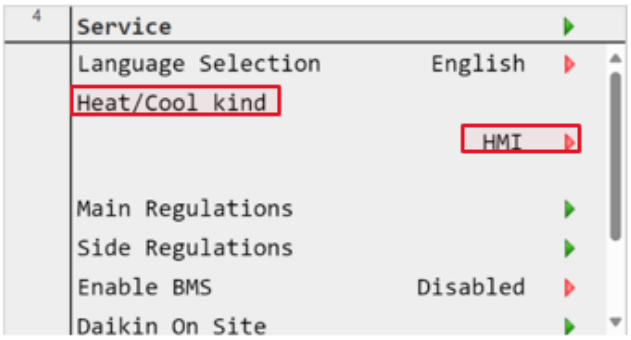


- **Language Selection**

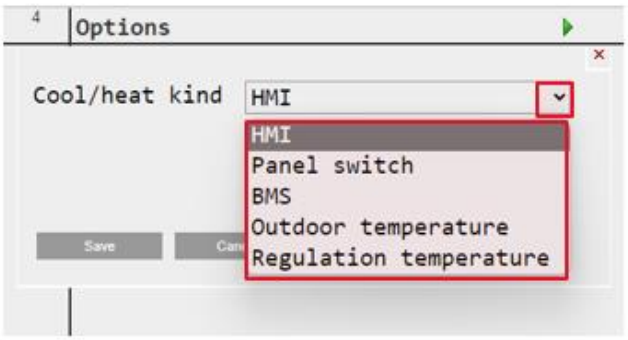
  Select “Language Selection” to change language of HMI if available.

- **Cool/Heat kind**

  Select “Cool/Heat kind” to access menu.

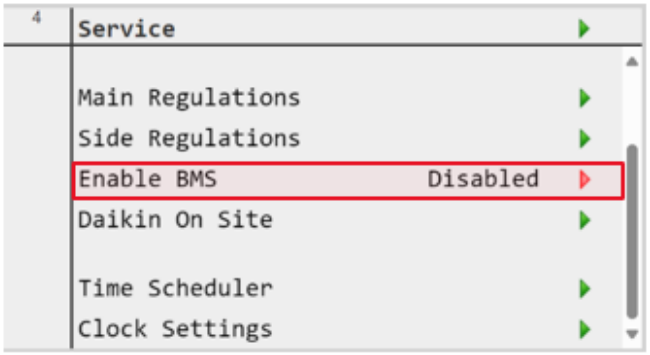


  Select the season change input mode.



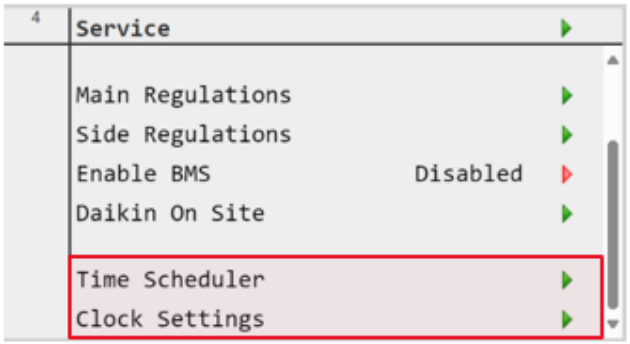
- **Enabling BMS**

  Select “Enable BMS” to access menu that Allow to enable or disable BMS functionality (Off / On of the unit). from emote).



- **Time Scheduler and Clock Settings**

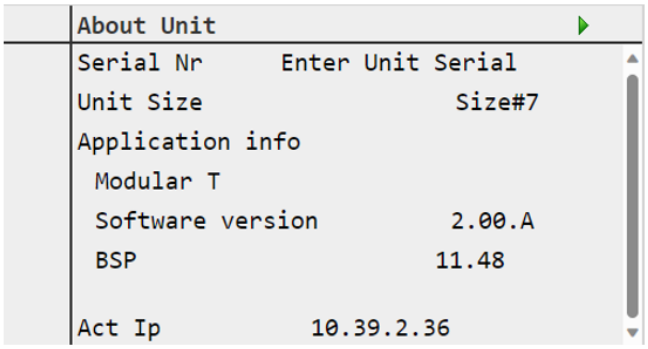
  Select “Time Scheduler” and “Clock Settings” to program the start-up and shutdown of the unit by time slots and days of the week.


4
Service
Main Regulations
Side Regulations
Enable BMS
Disabled
Daikin On Site
Time Scheduler
Clock Settings

14 ABOUT UNIT

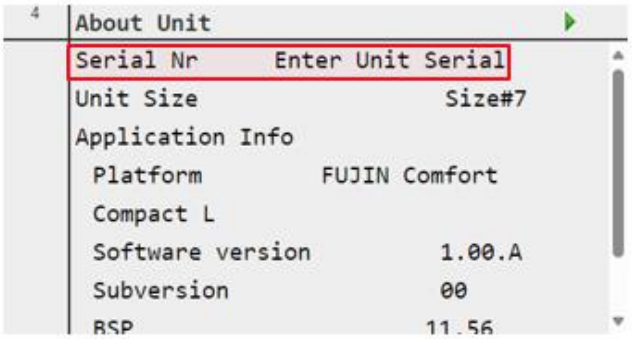
This menu allows users to access pages with information about unit software.

HMI Path: Main Menu -> About unit

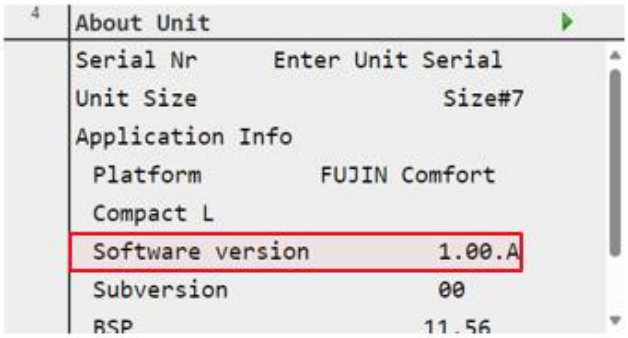


This page shows useful information to note while contacting service in case of need.
Single information is explained below:

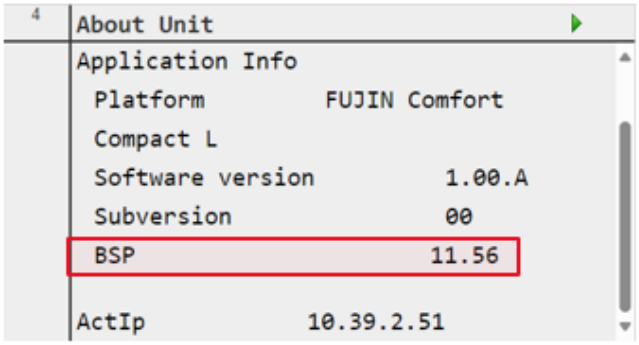
“Serial Nr” show the specific serial number of the unit.



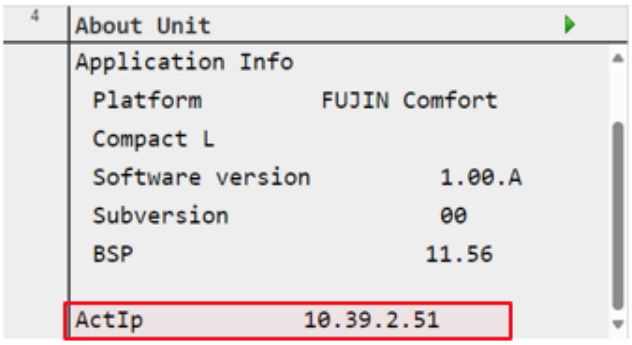
“Software version:” shows the application release running on the unit control system.



“BSP” shows the release of the operating system running on the unit control system.



“Act IP” show the actual IP address of the control system board.



15 ALARM

15.1 Alarm list

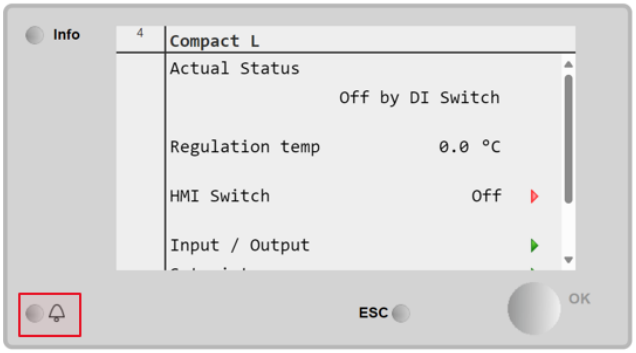
Alarms		Class	High Limit	Low Limit
Type	Name			
Digital Inputs	PreHeating electrical alarm	WA1		
	Combine pump alarm	WA1		
	ERQ alarm	WA1		
	Humidifier alarm	WA1		
	Fire alarm	FL1		
	Post heathing pump alarm	WA1		
	Post Heathing electrical alarm	WA1		
Analog inputs	Outdoor temperature	WA1	80 °C	- 20 °C
	Outdoor temperature optional	WA1	80 °C	- 20 °C
	Supply temperature	FL1	80 °C	- 20 °C
	Supply temperature optional	FL1	80 °C	- 20 °C
	Return temperature	WA1	80 °C	- 20 °C
	Exhaust temperature	WA1	1000 Pa	0 Pa
	Outdoor pre-filter optional pressure	WA1	1000 Pa	0 Pa
	Outdoor filter pressure	WA1	1000 Pa	0 Pa
	Supply fan pressure	FL1	1000 Pa	0 Pa
	Supply fan pressure optional	FL1	1000 Pa	0 Pa
	Return fan pressure optional	FL1	1000 Pa	0 Pa
	Supply filter pressure optional	WA1	1000 Pa	0 Pa
	Return filter pressure	WA1	1000 Pa	0 Pa
	Return fan pressure	FL1	1000 Pa	0 Pa
	Outdoor humidity	WA1	100 %r.H	0 %r.H
	Supply humidity	WA1	100 %r.H	0 %r.H
	Return humidity	WA1	100 %r.H	0 %r.H
	Return CO2	WA1	2000 ppb	0 ppb
Com	FAN	FL1		

Legend		
WA1 =	Warning	The unit will continue to work by reporting the alarm.
FL1 =	Fault	The unit will stop operation as it is a critical alarm.

15.2 Alarm Reset

This menu allows the user to reset alarms once the problem is fixed.

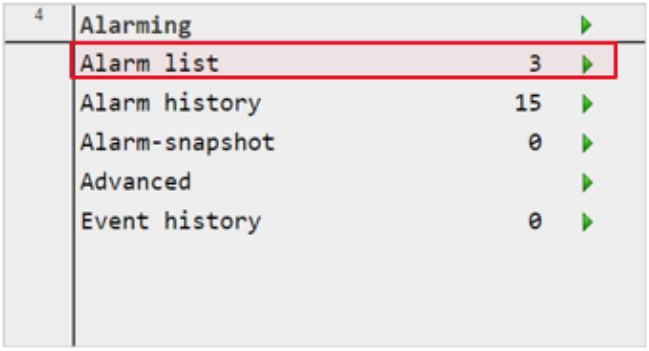
HMI Path: Main Menu -> Red blinking bell



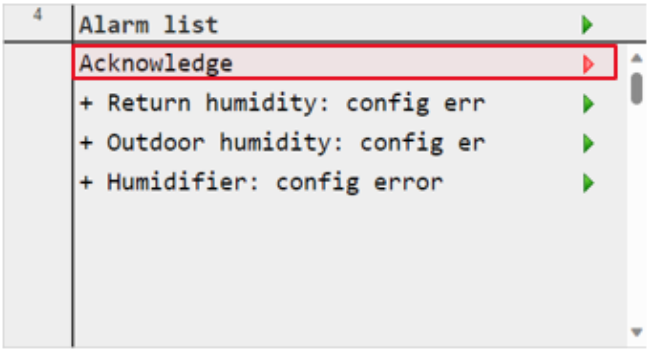
This page shows everything about the alarms and allows reset once the problem is fixed.
To access the reset, you must enter one of the passwords described in the previous chapters.

Select “Alarm list” to open the page where all the alarms are shown.

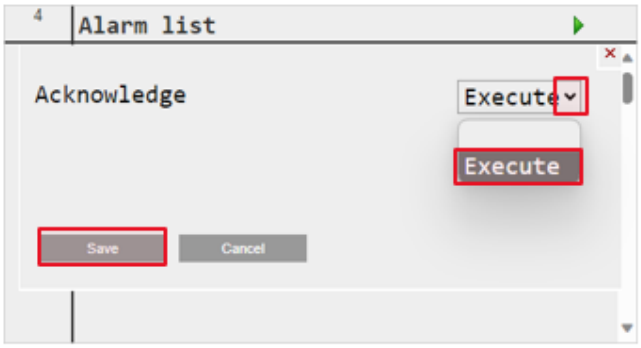
The number next to the green triangle means the number of alarms present.



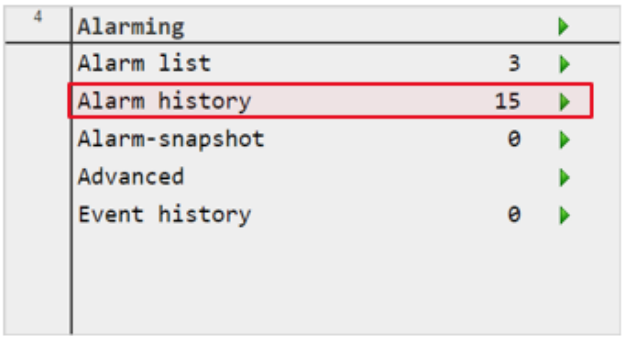
Select "Acknowledge" to open the page where you can execute the reset command select execute and press save.



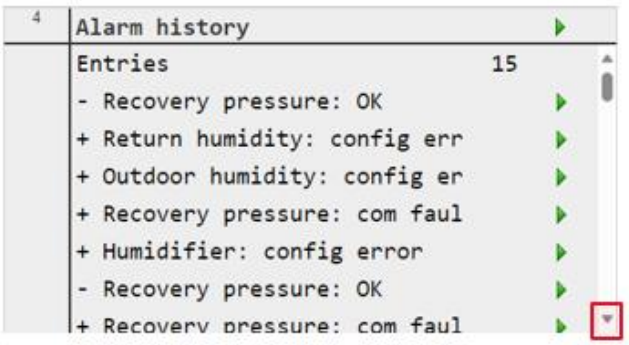
If the problem has been solved the alarm will disappear from the list.



Select "Alarm history" to view the list of actions taken for each alarm.



Scroll to view all list.



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