EN 7486826-06

07 - 2022

CLIMACIAT®

Control manual

(For AHU CONTROL software version V07)

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Translation of the original document

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1.1 - General information

Installation, start-up and maintenance operations for this equipment may be dangerous if certain factors particular to this installation, such as the presence of electrical and live components and the installation location, are not taken into account.

Only authorised, qualified installers and technicians, who have undergone specific training on the product in question, are permitted to install and start up this equipment.

During any servicing operations, all the recommendations and instructions given in the maintenance brochures, on the labels or in the instructions accompanying the equipment must be observed, along with any other applicable safety instructions.

- Observe all the regulations in the safety codes.
- Wear safety goggles and work gloves and any PPE required for the specific working conditions and specified in the site safety rules.
- Handle heavy and bulky equipment with care when lifting, handling and setting down.

During normal use, this unit is intended to operate under the following site conditions:

- Maximum altitude: 1000 m,
- Minimum and maximum temperatures: -10 °C + 40 °C,
- Overvoltage category: III
- Pollution degree: 3

1.2 - Protection against electrocution

Only personnel qualified in accordance with the IEC (International Electrotechnical Commission) recommendations must be allowed to access the electrical components. Disconnect all power supplies to the unit before carrying out any work on the unit. Cut the main power supply using the disconnect switch or circuit breaker.

Important: the control system includes electronic components. These may cause or be subject to electromagnetic disturbance if they are not installed and used in accordance with these instructions.

1.3 - Use

This appliance is not designed to be used by persons (including children) with limited physical, sensory or mental capabilities, or by persons with insufficient experience or knowledge, unless they are being supervised by a person responsible for their safety or have received instructions on the use of the appliance from such a person.

Children should be supervised to ensure that they do not play with the unit.

1.4 - Regulations

CE

EU Declaration of Conformity

This unit complies with the provisions of the following European directives:

2006/42/EC (Machinery)

2014/30/UE (CEM)

2011/65/EU (RoHS)

REGULATION (EC) no. 1907/2006 (REACH)

UK CA

UK Declaration of Conformity

This unit complies with the requirements of:

Supply of Machinery (Safety) Regulations 2008

Electromagnetic Compatibility Regulations 2016

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

UK REACH Regulations 2019

UK Importer:

Toshiba Carrier UK Ltd, Porsham Close, Roborough, Plymouth, PL6 7DB

2 - ELECTRICAL AND HYDRAULIC CONNECTIONS

2.1 - Electrics boxes

2.1.1 - Presentation of the electrics boxes

The air handling unit can be controlled by one or more electrics boxes, depending on the configuration.

► Main electrics box

The main electrics box controls the air handling unit; it can be identified by its door, which is a different colour on standard appliances.

The main unit requires a 50 HZ 400 V three-phase power supply (with no neutral). It is compatible with TT and TN neutral systems.

This unit is built into the AHU in the factory.

However, if the air handling unit includes:
- Lighting portholes
- Heater cables for safety dampers

then a separate 230 V power supply is required.

Refer to the wiring diagram for the electrical data.

► Electric heater unit

The electric heater unit is dedicated to the operation of the electric heater. It is controlled by the main unit for the air handling unit using two cables supplied by the factory, one for communication and one for start-up authorisation. This unit is built into the AHU in the factory.

The electric heater unit requires an additional power supply to the main unit power supplies (50 HZ 400 V three-phase with no neutral).

► Steam humidifier unit

The humidifier unit is dedicated to operating the steam humidifier. It is controlled by the main unit for the air handling unit using the W1.116 cable supplied in the accessories unit.

The humidifier unit requires an additional power supply to the main unit power supplies (50 HZ 400 V three-phase with no neutral). The power cable from the unit to the humidifier (marked W3.1) is supplied in the accessories unit.

The humidifier unit is not delivered fitted on the AHU. Its installation and electrical connection must be carried out by you. Refer to the wiring diagram delivered with the AHU for more information.

► Drip humidifier control unit

The humidifier control unit is dedicated to operating the drip humidifier. It is controlled by the main unit for the air handling unit using the W1-189 cable supplied in the accessories unit.

The humidifier control unit requires an additional power supply to the main unit power supplies (50 HZ 400 V three-phase with neutral).

The humidifier unit is not delivered fitted on the AHU. Its installation and electrical connection must be carried out by you. Refer to the wiring diagram supplied with the unit and the installation, operating and maintenance manual for the drip humidifier for more information.

► Wall-mounted EC motor unit (if there are several EC motors in a single air stream)

The wall-mounted EC motor unit is a power distribution and control unit secured to the corresponding fan unit. This unit is delivered fitted and prewired in the factory on the AHU. The wall-mounted EC motor unit is powered from the main unit.

► DAD unit (standalone trigger sensor)

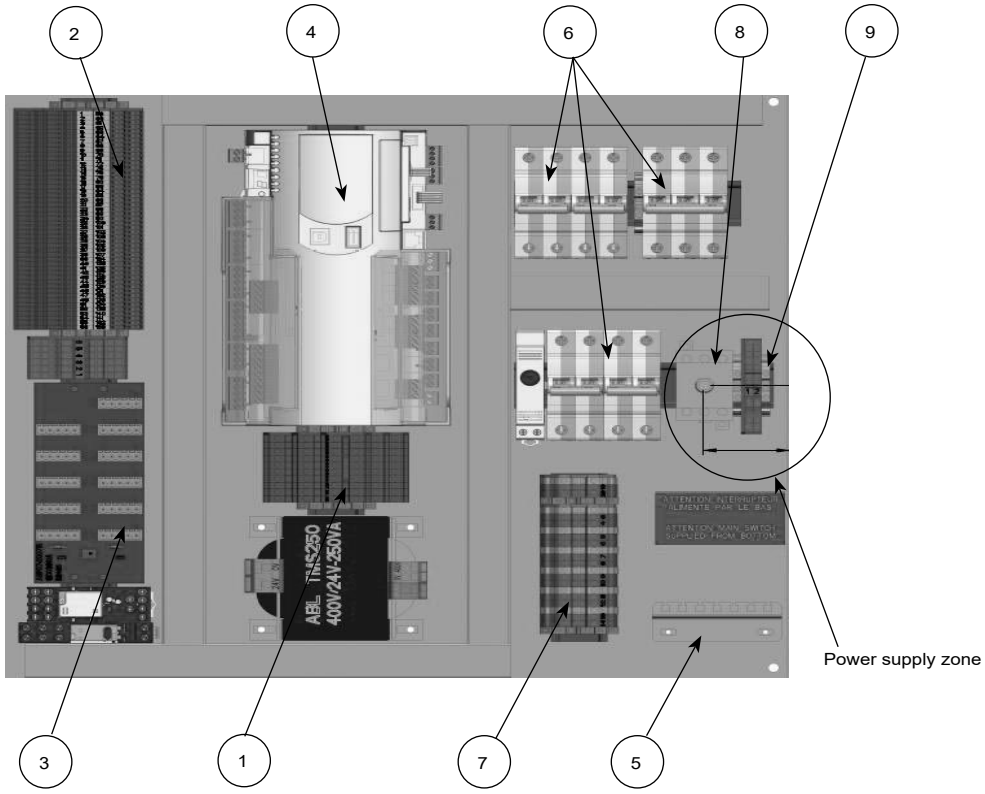
The DAD unit is designed to detect fumes in the air intake fan compartment. It is delivered in the accessories unit. It is up to you to secure it on the unit or on another support, keeping to the cable length supplied (10 metres).

The fire detection sensor is delivered pre-wired into the AHU on the intake fan motor assembly (cable W4.2).

The standalone trigger sensor unit is powered and controlled from the main unit by cables W4.1 and W4.3, to be connected by you. Refer to the wiring diagram delivered with the AHU for more information

Unit size: Lxhxd or hxLxd = 200x300x120mm

2.1.2 - Presentation of the main electrics box board



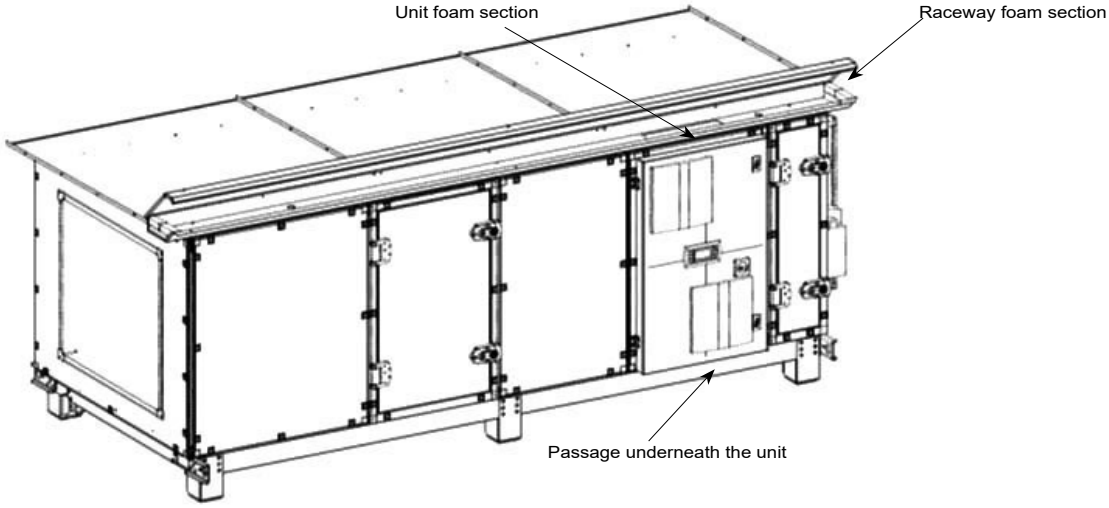
① Terminal strip
② Connector terminal
③ RS485 board for controlling board internal components
④ PLC
⑤ Cable support comb
⑥ Switch (motor connection)
⑦ Orange disconnect terminals, 230V single-phase supply
⑧ Disconnect switch
⑨ Main earth terminal (PE)

2.1.3 - Customer power supply

The customer power supplies are connected either underneath the unit door or via the upper raceway using the foam sections specifically provided.

After cabling, it is essential that the presence and correct positioning of the foam sections on top of the units and at the end of each raceway is checked.

We cannot be held liable for any damage resulting from a failure to perform this check.



400 V three-phase power supply (without neutral)

The power supply cable must be sized in accordance with current standards and regulations.

Respect the current assigned to the disconnect switch for the air handling unit. This current is noted on the wiring diagram.

The machine must be connected permanently to the network.

Characteristics of the disconnect switch terminals

Disconnect switch size	Current A		Terminal max cross section	Tightening torque
	at 40 °C	at 50 °C	mm²	Nm
OT16	16	14,4	0.75 to 10 mm²	0,8 Nm
OT25	25	22,5	0.75 to 10 mm²	0,8 Nm
OT40	40	36,0	36.00.75 to 10 mm²	0,8 Nm
OT63	63	56	1.5 to 35 mm²	2 Nm
OT80	80	72	1.5 to 35 mm²	2 Nm
OT100	100	90	10 to 70 mm²	6 Nm
OT125	125	112	10 to 70 mm²	6 Nm
OT160	160	144	M8x25	15-22Nm
OT200	200	180	M8x25	15-22Nm
OT250	250	225	M8x25	15-22Nm
OT315	315	283	M10x30	30-44Nm
OT400	400	360	M10x30	30-44Nm
OT630	630	567	M12x40	50-75Nm

► Additional 230 V single-phase power supply (with lighting and heater cable option)

An accessible and identified manual disconnect switchgear within your scope of supply must be installed upstream of the 230 V power supply terminals (orange terminals). It must be locked in the open position for the entire duration of the installation and maintenance operations. This disconnect switch must comply with current local regulations relating to safety.

The 230 V connection terminals are the ‘‘push-in’’ type.

The power supply cables should be secured to the specifically provided cable support comb.

⚠ Earth connection

An earth connection is compulsory. Each unit is equipped with a general earth terminal (PE), marked 9, indicated by the logo ⏚

All the earths should be connected to the specially provided green/yellow terminals ⏚

We cannot be held liable for incidents resulting from faulty or non-existent earthing.

⚠ Orange terminals live

The disconnect switch for the unit does not cut the power to the orange terminals

2.1.4 - Other equipment

► Variable frequency drive

Refer to the "Frequency inverter" summary

► EC motor

Refer to the general manual

2.2 - Sensors

2.2.1 - Glossary

- **Return air:** duct for air extracted from the building
- **Fresh air:** air taken from outside the building
- **Supply air:** duct for air taken into the building
- **Room air:** air within the room
- **Combined sensor:** sensor measuring the temperature and humidity
- **DAD:** standalone trigger sensor for optical detection of fumes.

2.2.2 - Presentation of the sensors supplied in the kit

► Duct sensors

The sensors provided in the duct are supplied as a kit with their wiring bundles (10 metres) for connection to the main electrics box terminal. (if a cable longer than 10 metres is required (not provided), see the recommendations in the section on room sensors)

► Room sensors

The room sensors are supplied as a kit with connectors for connection to the main electrics box terminal. The cable is to be provided by the client.

For a length less than 10 metres, a non-shielded cable may be used.

For a length greater than 10 metres and up to a maximum of 30 metres, select a shielded twisted pair cable with shielding and a separate wire connected to the main unit earth on the air handling unit.

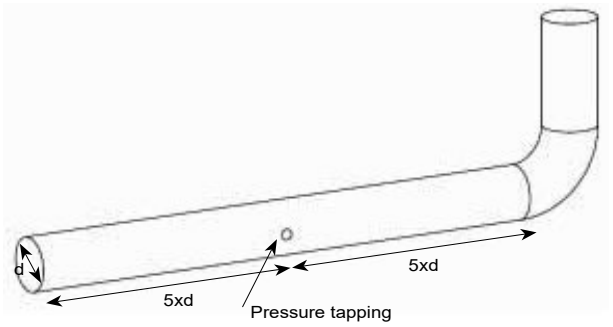
Recommended cable cross-section: 0.5 to 1.5 mm², with a maximum external diameter of 8 mm.

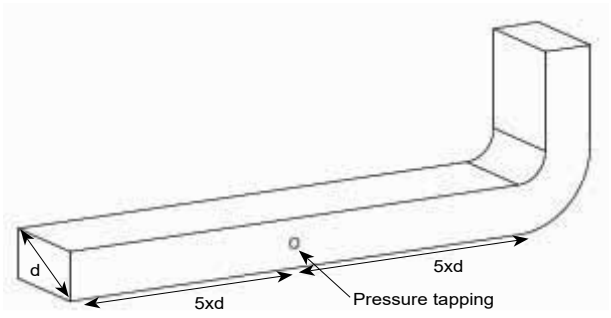
2.2.3 - Positioning of the sensors

► Duct pressure sensor

The duct pressure sensor is used when an air handling unit must be actuated under "constant pressure".

The duct pressure sensor must be positioned in a straight section. It must be positioned away from any angled sections (to prevent disturbance), at a minimum distance of 5 times the duct's diameter or diagonal





The black pressure tapping on the sensor must remain unused (atmospheric pressure).

The red pressure tapping on the sensor must be connected to the duct pressure tapping, placed perpendicular to the air stream and centred along the height of the duct.

► CO_2 sensor, temperature sensor and combined temperature + humidity duct sensor

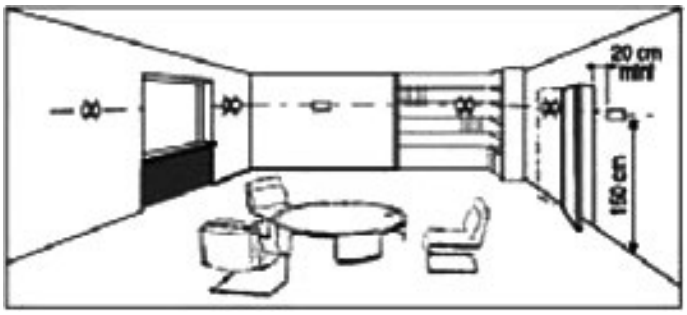
The $_{CO2}$, temperature, and combined temperature + humidity sensors must be positioned in an air flow zone.

► CO_2 sensor, temperature sensor and combined temperature + humidity room sensor

The room sensors must be positioned in accordance with the diagram below.

Particular care must be taken in choosing the location of the room terminal in the room (do not expose it to sunlight or place it on top of a device giving off heat.)

The end of the wiring raceway must be heat insulated.



► DAD sensor (standalone trigger sensor)

The DAD sensor is positioned in the air intake FMA section. A unit is supplied as a kit with the wiring bundles.

For a main unit with supply air filters, the DAD must be placed downstream of these filters

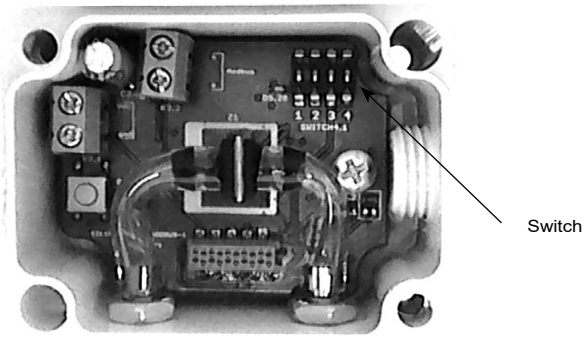
2.2.4 - Electrical connection

For the sensor cabling, refer to the wiring diagram (supplied in the main unit)

2.2.5 - Setting the sensors

► Switch for the pressure sensors (factory configuration)

To configure your device, switch it off and adjust the desired settings using the switches as shown on the wiring diagram. Once configured, switch the sensor back on.

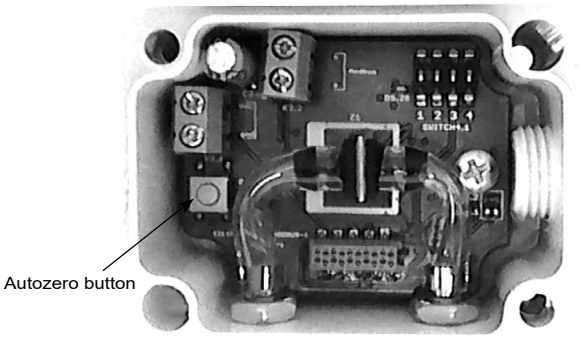


⚠ Pressure sensor autozero (to be performed on site)

The "Autozero" must be performed once the equipment has been connected and powered up. The unit must be stopped and the air flow must be zero. To perform an Autozero, disconnect the tubing from the 2 pressure tappings, marking their positions, and press the "Autozero" button found inside the sensor. Refit the two pressure tubes in their respective positions.

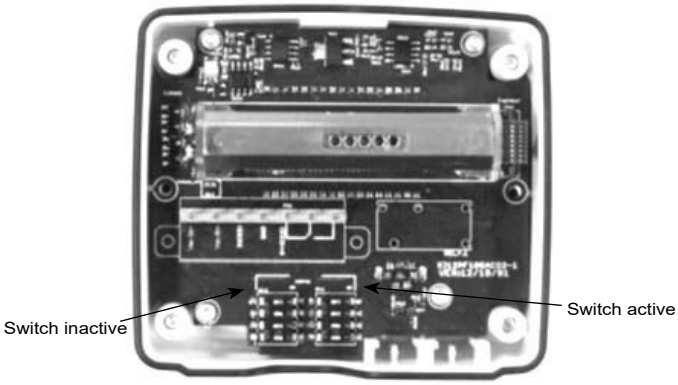
The autozero procedure ensures that the sensor operates correctly in any position.

This autozero should be checked once a year.



► Switch for the $_{CO2}$ sensors (factory setting)

To configure your device, switch it off and adjust the desired settings using the switches as shown on the wiring diagram. Once configured, switch the sensor back on.



2.2.6 - Main specifications for the sensors

► Pressure sensor

Differential pressure transmission sensor with an adjustable measurement range
- from 0 to 1000 Pa
- from 0 to 2500 Pa
- from 0 to 5000 Pa

Piezoresistive type sensing element

24 Vac/Vdc power supply ± 10%
Active 0-10 V output
Number of wires: 3
Minimum load: 1 K Ohms (0-10 V)
Consumption: 2 VA (0-10 V)

±2% accuracy over the full scale
Response time 1/e (63%) 0.3 sec.
Type of fluid, air and neutral gas
Index of Protection: IP65

Operating temperature from -20 to +50 °C
Storage temperature from -30 to +70 °C

► CO_2 sensor

CO_2 sensor with infrared cell

Measurement range from 0 to 5000 ppm

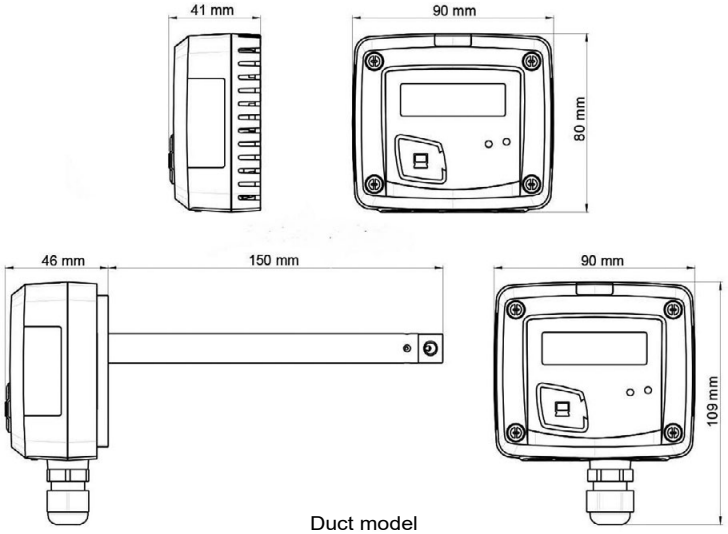
24 Vac/Vdc power supply ± 10%
Active 0-10 V output
Number of wires: 3
Minimum load: 1 K Ohms (0-10 V)
Consumption: 2 VA (0-10 V)

Accuracy of ±3% of the reading ±50 ppm
T63 response time = 30 s
Type of fluid, Air and neutral gas
Index of Protection IP20 room model
IP65 duct model

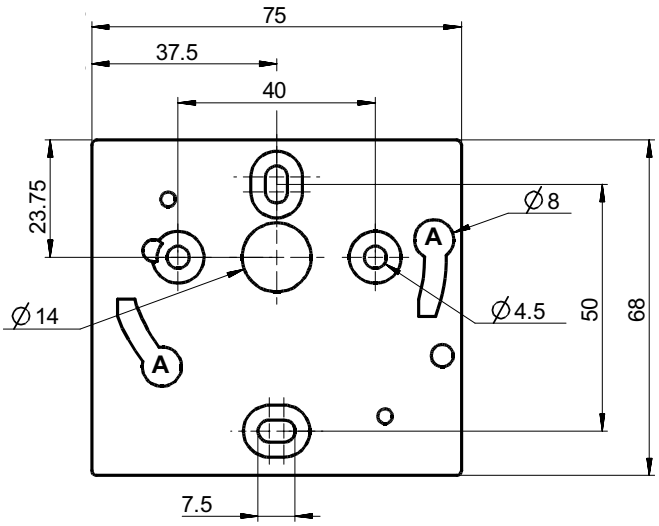
Operating temperature from 0 to +50 °C
Storage temperature of -10 to +70 °C

2 - ELECTRICAL AND HYDRAULIC CONNECTIONS

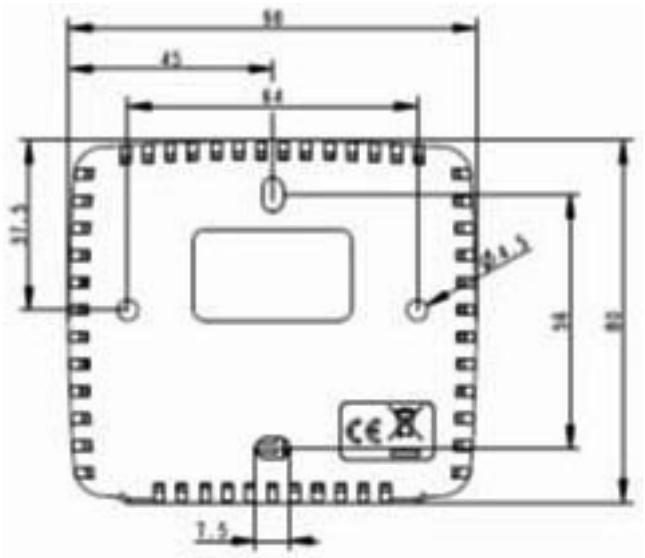
► **Mounting:**



Duct model



Duct model



Room model

► Temperature sensor

Temperature sensor

Measurement range from 0 to 50 °C (room model) or -20 to + 80 °C (duct model)

Type of sensing element: NTC 10 kΩ at 25 °C

Temperature °C	Resistance Ohms
5	22050
10	17960
15	14690
20	12090
25	10000
30	8313
35	6940

NTC temperature tolerances: ±0.3 °C (from -40 °C to 70 °C); ±0.5 °C outside of the previous range

Number of wires: 2

Response time: Humidity 1/e (63%) 4 s

Type of fluid, Air and neutral gas

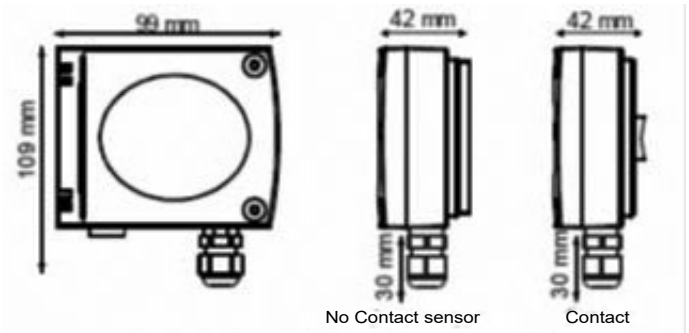
Index of Protection IP20 room model

IP65 duct model

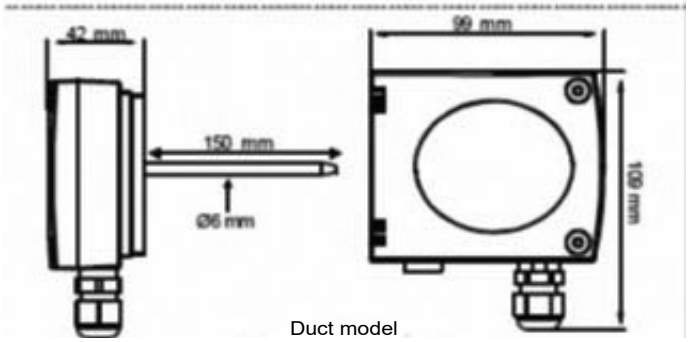
Operating temperature from 0 to 50 °C, room model

from -20 to +80 °C duct model

Storage temperature of -10 to +70 °C



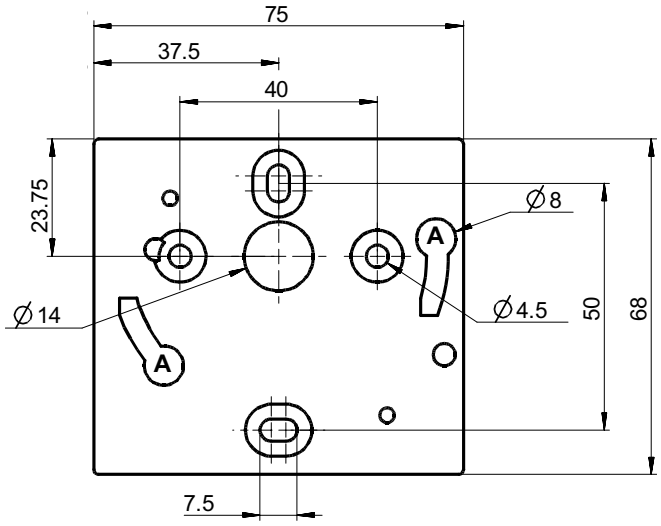
Room model, indoor AHU and contact



Duct model

2 - ELECTRICAL AND HYDRAULIC CONNECTIONS

► **Mounting:**



► **Combined temperature + humidity sensor**

Temperature and humidity sensor

Measurement range from 5 to 95%RH and from 0 to 50 °C (room model) or from -20 to +80 °C (duct model)

Type of humidity sensing element: capacitive

Type of temperature sensing element: NTC 10 kΩ at 25 °C

Temperature °C	Resistance Ohms
5	22050
10	17960
15	14690
20	12090
25	10000
30	8313
35	6940

24 Vac/Vdc power supply ± 10%

Active 0-10 V output + passive loop

Number of wires: 5

Minimum load: 1 K Ohms (0-10 V)

Consumption: 2 VA (0-10 V)

NTC temperature tolerances: ±0.3 °C (from -40 °C to 70 °C); ±0.5 °C outside of the previous range

Humidity accuracy: ±1.5% RH (if 15 °C ≤ T ≤ 25 °C) on remote and duct models

±1.8% RH (if 15 °C ≤ T ≤ 25 °C) on room model

Response time: Temperature 1/e (63%) 15 s

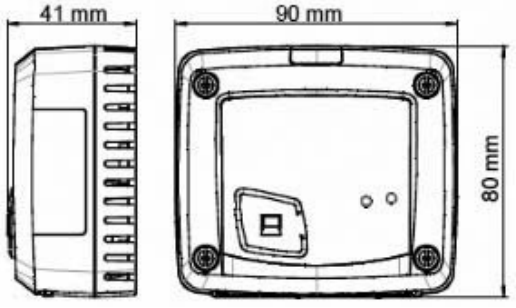
Humidity 1/e (63%) 4 s

Type of fluid, Air and neutral gas

Index of Protection IP20 room model

IP65 duct model

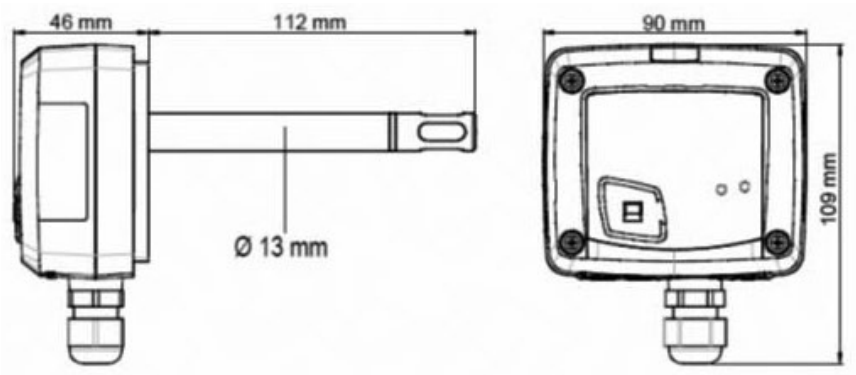
► **Dimension: room model**



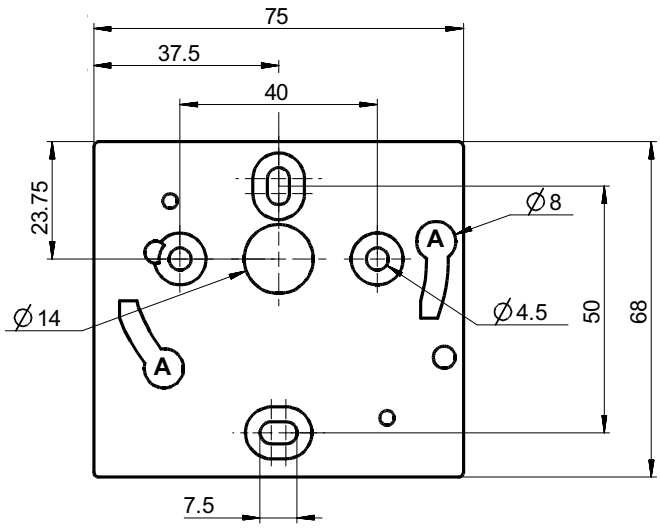
2 - ELECTRICAL AND HYDRAULIC CONNECTIONS

► **Duct model dimensions:**

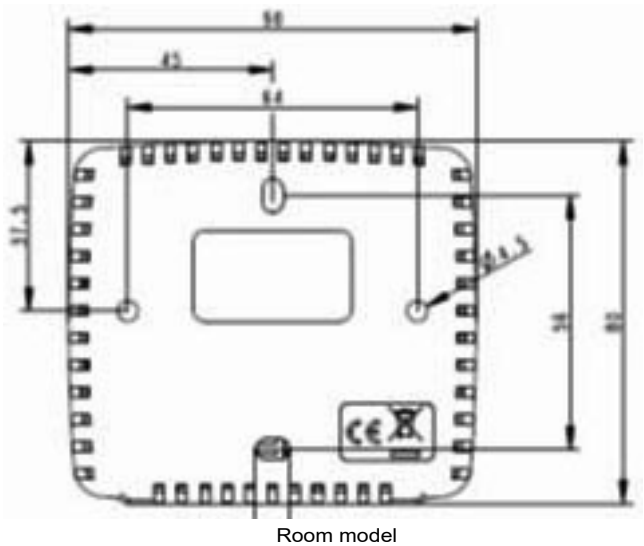
Duct model



► **Mounting:**



Duct model



Room model

Operating temperature from 0 to 50 °C, room model and duct model unit
from -20 to +80 °C duct model

Storage temperature of -10 to +70 °C

► **DAD sensor:**

Optical chamber sensor

24 V power supply

Consumption: on standby 70 µA
in alarm mode 25 mA

2.3 - Valves

2.3.1 - Receipt

Upon delivery, before starting to assemble the kit, it is essential to check the elements received and to ensure that no damage has occurred during transport.

- Valve
- Tubes + O-rings of flanges
- Valve servomotor and wiring loom
- Changeover sensor (option)

2.3.2 - Installation

The three-way valves with built-in bypass must be mounted as mixing valves.

The two-way valves must be mounted in the lower section of the coil.

To ensure the couplings and valves we have supplied are not damaged, apply the tightening torques indicated in the table, paragraph 2.3.3. Use two wrenches, one to hold and the other to tighten, to ensure a tight seal.

Always fit the valve in the right direction. On these 2 couplings, circulation must move from A to AB. We recommend that 60 kPa is not exceeded.

Perform assembly in accordance with the above recommendations.

The pipes and valves must not under any circumstances place any additional load on the unit. Always ensure that there is adequate support for pipes secured to the wall or floor of the building.

Open the servomotor enclosure and check the position of the action direction switches (refer to the wiring diagram)

Switch the controller to test mode and force the valve to the fully open and fully closed position to check the direction of operation. Check the manoeuvring rod travel (see valve documentation)

► Air handling units installed inside a building

If the hydraulic connections are completed

- **With the valve fitted outside of the AHU**

It is recommended that the valves are insulated to prevent condensation.

- **With the valve fitted inside the AHU**

If the valve-servomotor assembly is not located on top of the condensate drain pan, insulation is mandatory.

► Air handling units installed outside of a building

- **With the valve fitted outside of the AHU**

If the hydraulic connections are completed, insulate the valves.

- **With the valve fitted inside the AHU**

If the valve-servomotor assembly is not located on top of the condensate drain pan, insulation is mandatory; provide antifreeze protection for the valve actuators in the event of temperatures below 0 °C (area around the motor)

For valves installed outdoors, provide an enclosure for the motors to protect them from the weather.

2.3.3 - Fitting the components

For screw-on valves, position the valve on the rotating couplings, ensuring that the O-ring is fitted.

When installing the valve, check that the drain direction is correct (see the marking on the valve).

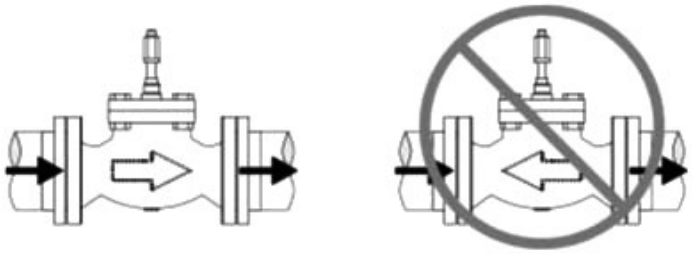
The valve must not be fitted with the rod pointing downwards.

Tighten the couplings to their final torque.

For flanged valves, position the valve on the flange, checking that it is correctly aligned. When installing the valve, check that the drain direction is correct (see the marking on the valve).

The valve must not be fitted with the rod pointing downwards.

Tighten the flanges to their final torque.



The tightening torque to be applied depends on the diameter:

► **Screw valves**

Type	Torque
DN15	25 Nm
DN20	50 Nm
DN25	75 Nm
DN32	100 Nm
DN40	125 Nm
DN50	150 Nm

► **Flanged valves:**

Type	Torque
DN65	15 Nm
DN80	15 Nm

Flanges compliant with ISO 7005-2

Check that the valves are correctly assembled (passage direction)

Check the supply voltage

Important: Leaks, incorrectly tightened couplings or poor sealing quality are entirely due to incorrect installation; no other liability is incurred. We cannot be held liable for any subsequent water damage.

Max operating pressure = 16 bar

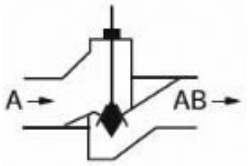
Two-way valve

The only permissible flow rate is in the direction of the arrow A -> AB (arrow on the valve body)

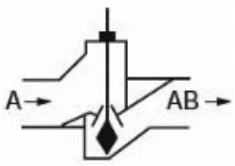
Channel A = variable flow in the straight passage (inlet)

Channel AB = variable flow in the straight passage (outlet)

► **Valves VSMF2 and V5832B**

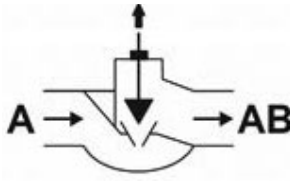


The valve rod extends: straight passage A → AB closes,

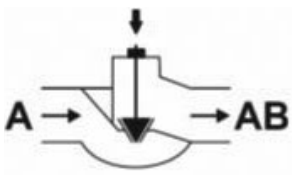


The valve rod retracts: straight passage A → AB opens,

► **Valves V5011E and V5328A and V5832A**



The valve rod extends: straight passage A → AB opens,



The valve rod retracts: straight passage A → AB closes

► Three- or four-way valves with built-in T-shaped bypass

Mixing installation:

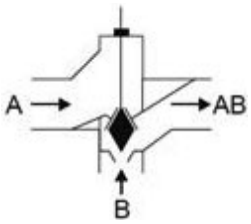
Flow from A and B -> AB

Channel AB = constant total flow rate (outlet)

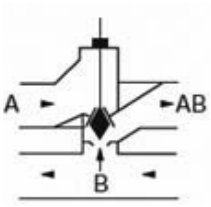
Channel A = variable flow A -> AB (inlet A)

Channel B = variable flow B ->AB in the bypass (inlet B)

The valve rod extends: straight passage A -> AB closes, the bypass B opens:

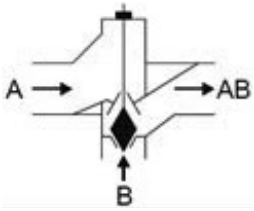


three-way valve

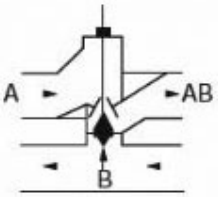


four-way valve

The valve rod retracts: straight passage A -> AB opens, the bypass B closes:



three-way valve



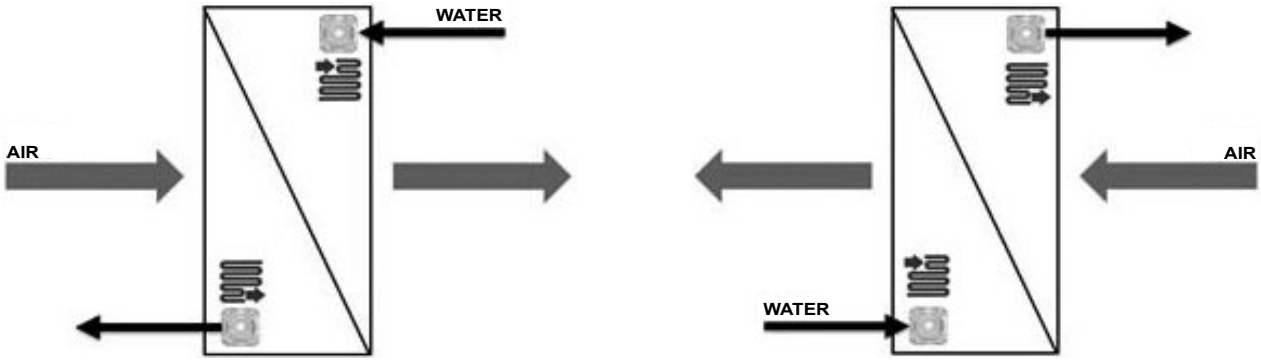
four-way valve

⚠ Always fit the circulation arrow shown on the valve in the right direction

Until the temperature setpoint is reached, the servomotor actuates the valve rod.

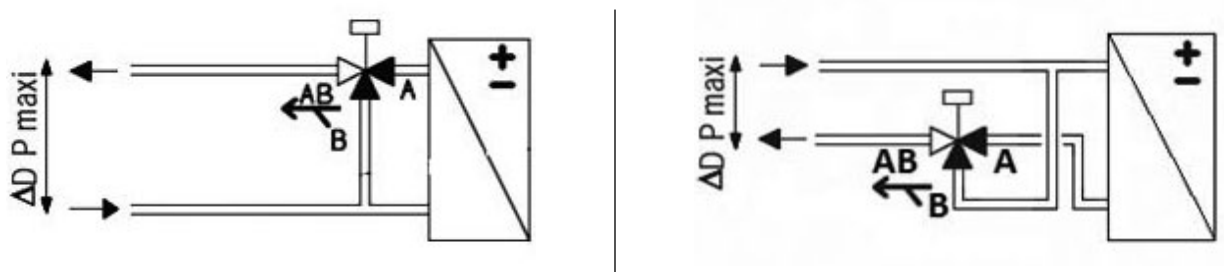
This opens to allow water to circulate in the coil.

The coil water outlet and inlet depend on the air flow direction. The air/water counter-current must be respected.

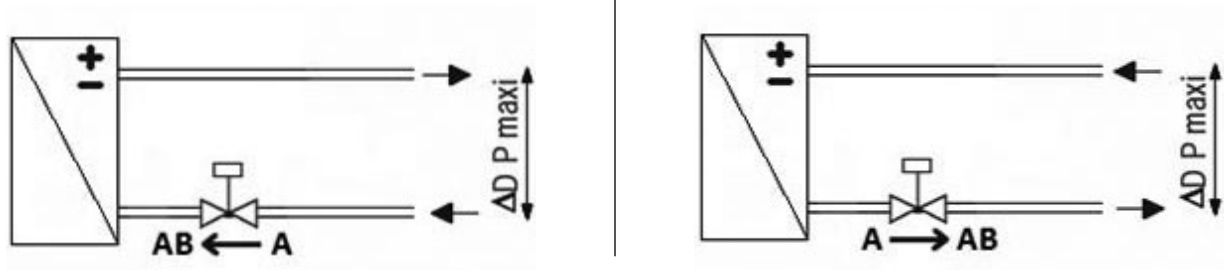


The connection of the valve depends on the direction of the water outlet/inlet on the coil

► **Three- or four-way valves**



► **2-way valves**



Permissible max ΔP

We recommend that a differential pressure of 60 kPa is not exceeded.

2.3.4 - Design of the hydraulic systems

The installation of the hydraulic systems is crucial to the correct operation of the system. Drain valves should therefore be placed at the appropriate points and in sufficient number. In addition, strainers should be fitted, as well as drains at circuit high points, balancing tees and shut-off valves on each coil and, if necessary, discharge valves

⚠ The concentration of glycol in the water must not exceed 50%.

2.3.5 - Filtration

An efficient filtration system (recommended efficiency of 0.5 mm) should be fitted on the supply water lines.

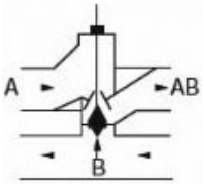
2.3.6 - Flushing

The system must be flushed completely and filled with treated water to prevent the build-up of scale or sludge in the circuit. When flushing the circuit, **the valves must be open** to prevent any build-up of sludge and impurities in the coil.

2.3.7 - Valve opening

There are two options:

1) Remove the servomotor and fit the cap (if available), which will cause pressure to be applied to the shaft, thereby opening the valve.
2) Request that the control valve opens via the controller.



During a power cut, if the valve is in the closed position, there will be no water circulation inside the coil (risk of freezing)

2.3.8 - Water filling

Vent the coils during commissioning.

2.3.9 - Water quality recommended for hydraulic coils

It is recommended to carry out a bacteriological analysis (detection of ferrobacteria, bacteria producing H2S and reducing sulphates) and a chemical analysis (to avoid problems with scaling and corrosion) of the water.

- Total hardness (French scale) 10 < TH < 15
- Chloride [Cl^-] < 10 mg/l
- Sulfate [SO_4^{2-}] < 30 mg/l
- Nitrate [NO_3^-] = 0 mg/l
- Dissolved iron < 0.5 mg/l
- Dissolved oxygen 4 < [O_2] < 9 mg/l
- Carbon dioxide [CO_2] < 30 mg/l
- Resistivity 2000 < Resistivity < 5000 Ωcm
- pH 6.9 < pH < 8

2.3.10 - Operating limit recommendations

- Cooling coil inlet minimum water temperature: 5 °C
- Heating coil inlet maximum water temperature: 80 °C
- Maximum operating pressure: 16 Bar
- Valve motor min/max room temperature: +0 °C / +50 °C

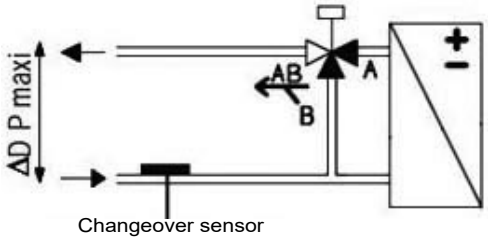
2.3.11 - Operating guidelines

We cannot be held liable for damage to valves caused by faulty design of the hydraulic supply network or incorrect system start-up.
To protect against the risk of condensation when using chilled water, lagging should be placed along the entire lengths of pipes and completely sealed at its ends.
We recommend that a differential pressure of 60 kPa is not exceeded.

2.3.12 - Changeover sensor (option)

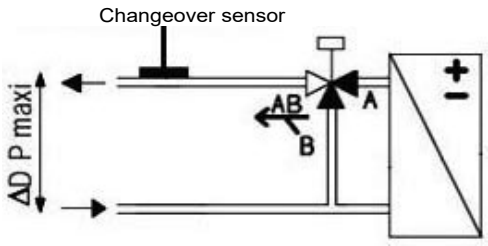
This cannot be used on air handling units equipped with two-way valves.

It must be placed upstream of the three- or four-way valve by the installer. It is fastened to the pipe by means of electrician's clamps.



► Warning, special case:

If a mixed coil is supplied by a dedicated heat pump, the water network temperature sensor must be placed on the three-way valve outlet (hydraulic system side AB) to be able to benefit from the limitation function (see 4.11.1).



The hot water or cold water sensing temperatures depend on the control.

The changeover sensor measures the surface temperature of the piping. There is an obvious difference between the actual water temperature and the surface temperature. The water speed will therefore be selected so as to guarantee changeover switching.

Electrical connections

Refer to the wiring diagram for information on the cabling.

2.4 - Control and power cables

2.4.1 - Presentation of the wiring looms

Each bundle is delivered the right length, and must be routed inside the cable passages provided and described below.

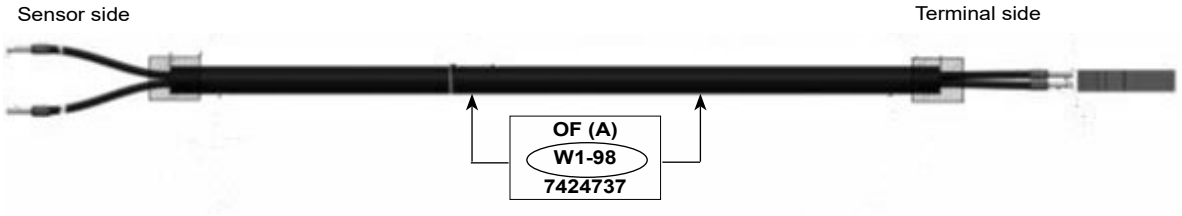
The bundles are supplied coiled around the units and must be laid on site.

The label present on each bundle bears the name of the cable which is listed in the wiring diagram and the associated wiring dossier.

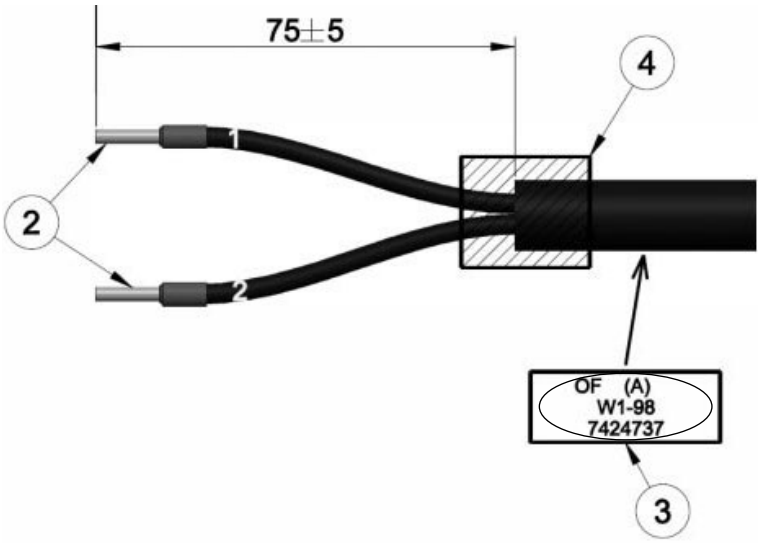
Example: Return air temperature sensor

The cable name is circled on each of these images.

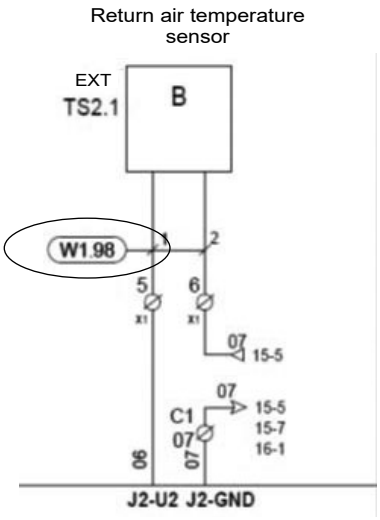
► **Wiring loom:**



► **Close-up of the label:**



► **Extract from the wiring diagram:**



Extract from the wiring dossier:

IDENTIFIER	TYPE/SECTION	FROM	TO	COMMENTS
W1.98		CP	EXT	

2.4.2 - Cable routing

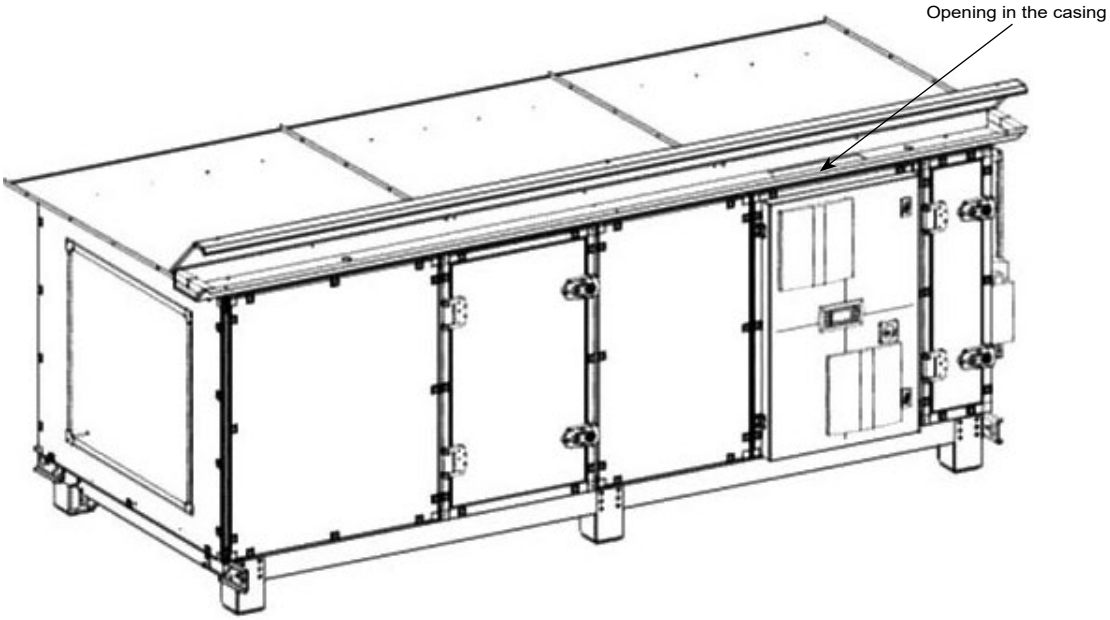
The bundles are already cabled at one end. When connecting on site, the cables must be routed into the raceways provided until they reach the corresponding units.

If the end piece is delivered in the accessories unit, the associated wiring looms are delivered unconnected. The fitting of the end-piece, its electrical connection and the cable routing in the raceways should be carried out by you.

Please refer to the wiring diagram delivered with the AHU to identify the function of each cable based on its marker.

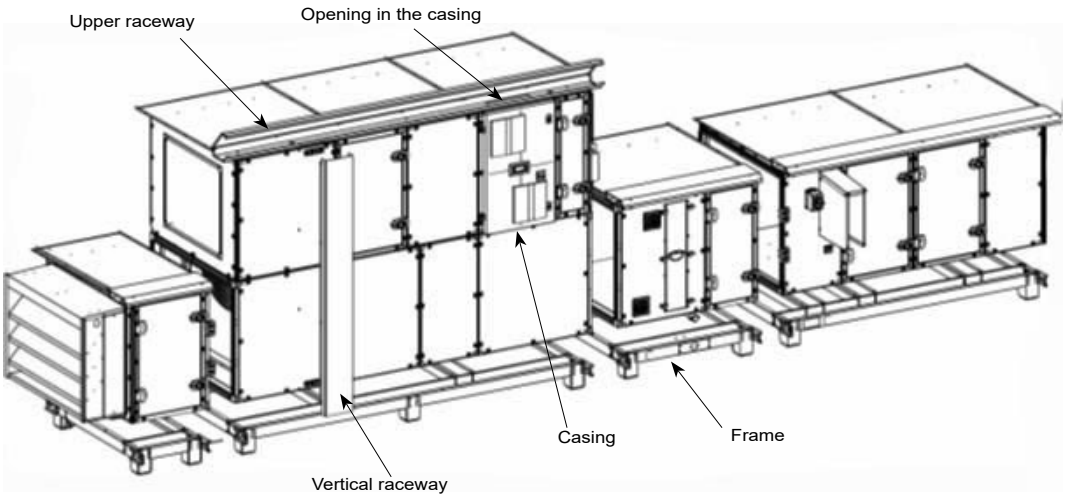
Note: Separate the power and control cables.

► Single-flow air handling unit:



The cables are laid in the raceway on top of the unit and are routed inside the casing via the opening on top of the unit.

► Stacked dual-flow air handling unit:



► Lower blocks

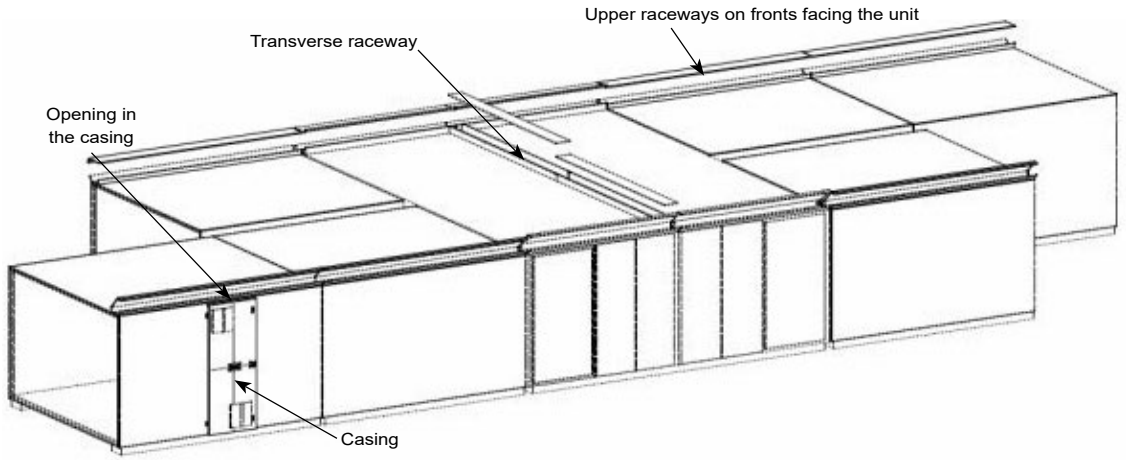
The cables are laid in the frame and meet in the vertical raceway to be routed inside the casing via the opening in the top.

⚠ **The raceways on the lower blocks are not used for routing cables provided with our control system.**

► **Upper blocks**

The cables are laid in the raceway on top of the unit and are routed inside the casing via the opening in the top.

► **Juxtaposed dual-flow air handling unit:**



The cables are laid in the raceway on top of the unit and are routed inside the casing via the opening in the top. A transverse raceway crosses the unit to distribute the cables to the two front access panels in the air handling unit.

2.4.3 - Connections

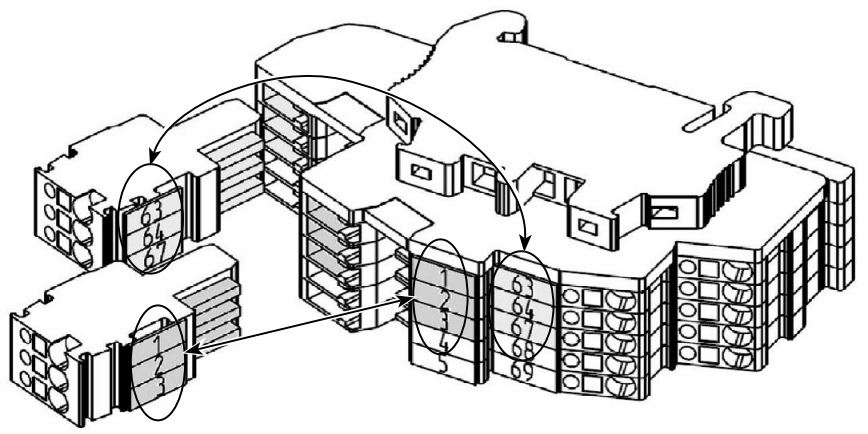
► **Power cables**

The power wiring bundles must be connected and screwed in to the torque recommended in the manufacturer's documentation. Refer to the wiring diagram for information on the cabling.

Characteristics of the disconnect switch terminals (see table in section 2.1.3)

► **Control cables**

The wiring bundles equipped with detachable terminals must be connected to the terminal block according to the corresponding identifiers, as follows. Refer to the wiring diagram for information on the cabling.



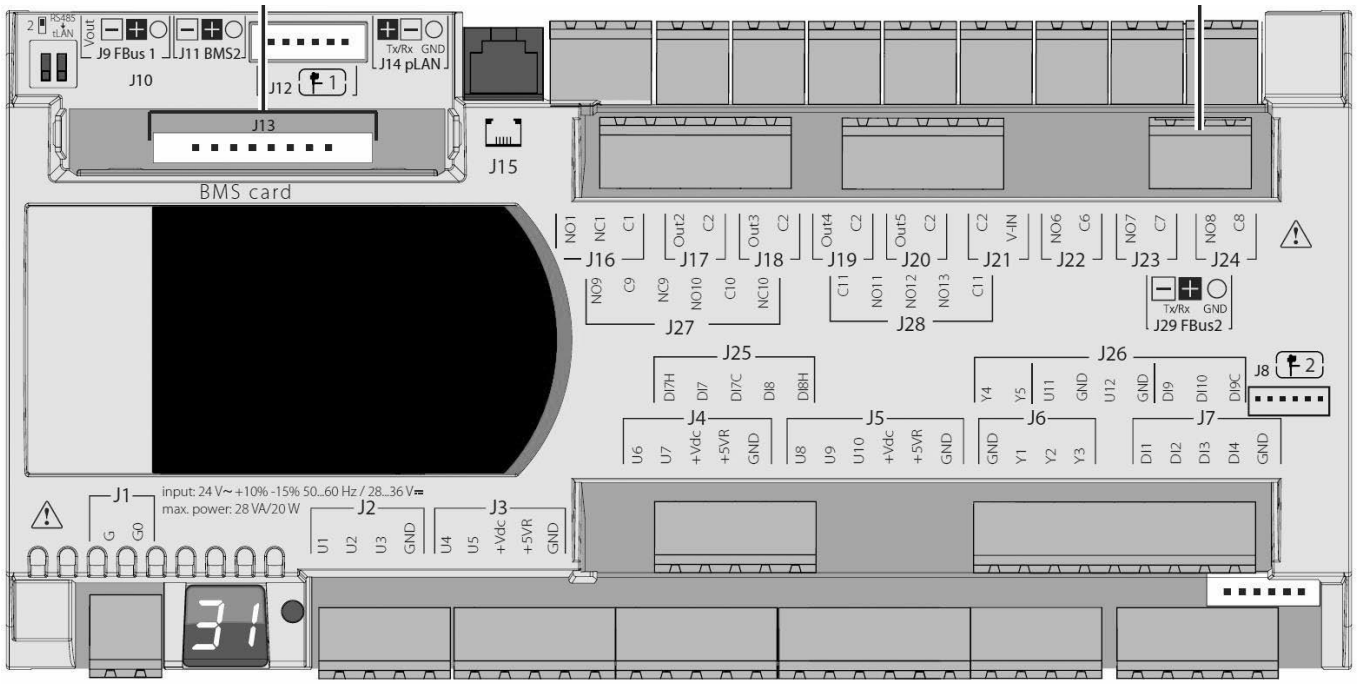
3.1 - Introduction

The control PLC is used to control and monitor the operating status of the various components of the air handling unit. Depending on the options, it provides temperature control, humidity control and management of the fans. It can be connected to a CMS so that it can be controlled remotely.

3.2 - Inputs/outputs

The PLC has analogue and on/off inputs/outputs. The list of inputs/outputs is described below (depending on the options installed).

The PLC is installed in the main electrics box and the expansion modules (if present) are in the additional boxes installed as close as possible to the elements being controlled.



Terminal name	Type
U	Universal input (analogue or on/off)
GND, C	Shared
DI	On/Off input (dry contact)
Y	Analogue output
Out	Polarised 24 VAC on/off output
NO	Normally open potential-free on/off output
NC	Normally closed potential-free on/off output

Connector	Terminal	Type	Description
J1	G		+24 Vac power supply
	G0		Shared
J2	U1	0-10 V	Supply air duct pressure sensor or CO_2 air quality or flow rate measurement sensor on external signal
	U2	NTC	Room or return air temperature sensor
	U3	NTC	Supply air temperature sensor
	GND		Shared
J3	U4	NTC	Fresh air temperature sensor
	U5	NTC	Mixed coil water network or changeover thermostat or DX unit fault temperature sensor
	+Vdc		Not used
	+5VR		Not used
	GND		Shared
J4	U6	0-10 V	Intake filter 1 fouling measurement pressure sensor
	U7	0-10 V	Intake filter 2 fouling measurement pressure sensor
	+Vdc		Not used
	+5VR		Not used
	GND		Not used

Connector	Terminal	Type	Description
J5	U8	0-10 V	Intake filter 3 or exhaust filter 2 fouling measurement pressure sensor
	U9	0-10 V	Room or return air humidity measurement sensor
	U10		Setpoint 1 or setpoint 2 selection
	+Vdc		Not used
	+5VR		Not used
	GND		Shared
J6	GND		Not used
	Y1	0-10 V	Hydraulic coil 1 valve control or DX unit stage 1 power
	Y2	0-10 V	Hydraulic coil 2 valve control or DX unit stage 1 or 2 power
	Y3	0-10 V	Hydraulic coil 3 valve control or DX unit stage 2 power
J7	DI1	ON/OFF	Intake door opening check
	DI2	ON/OFF	Remote control
	DI3	ON/OFF	Antifreeze thermostat
	DI4	ON/OFF	Isolation damper end of travel contact
	GND		Shared
J8			Not used
J9	Vout		Not used
	FBus1 -		Connection to the air intake fan (EC or inverter) and expansion modules - Tx/Rx -
	FBus1 +		Connection to the air intake fan (EC or inverter) and expansion modules 1 - Tx/Rx +
	GND		Connection to the air intake fan (EC or inverter) and expansion modules 1 - shared
J10			Not used
J11	BMS2 -		ModBus RS485 CMS connection - Tx/Rx -
	BMS2 +		ModBus RS485 CMS connection - Tx/Rx +
	GND		ModBus RS485 CMS connection - shared
J12			Not used
J13			Position for CMS communication board
J14	pLAN -		pLAN - Rx/Tx-
	pLAN +		pLAN - Rx/Tx+
	GND		pLAN - shared
J15			pLAN connector for HMI
J16	NO1		DX unit on/off control
	NC1		Not used
	C1		Shared
J17	Out2	ON/OFF	Electric heater start-up authorisation
	C2		Not used
J18	Out3	ON/OFF	Isolation damper opening control
	C2		Not used
J19	Out4	ON/OFF	Mixing damper opening control
	C2		Not used
J20	Out5	ON/OFF	Mixing damper closing control
	C2		Not used
J21	C2		Shared
	V-IN		+24 Vac power supply
J22	NO6	ON/OFF	Drip humidifier vent control or DX unit activation authorisation
	C6		Shared
J23	NO7	ON/OFF	"Danger" fault summary relay
	C7		Shared
J24	NO8	ON/OFF	"Maintenance" fault summary relay
	C8		Shared
J25	DI7H		Not used
	DI7		Exhaust door opening check
	DI7C		Shared
	DI8		Rotary heat exchanger monitoring
	DI8H		Not used

Connector	Terminal	Type	Description
J26	Y4	0-10 V	Steam humidifier control
	Y5	0-10 V	Variable-speed rotary heat exchanger control
	U11	0-10 V	Exhaust 1 filter fouling measurement pressure sensor
	GND		Shared
	U12	0-10 V	Heat recovery unit fouling measurement pressure sensor or CO_2 air quality measurement sensor or return air duct pressure sensor
	GND		Shared
	DI9		Humidifier operation monitoring or DX unit defrosting
	DI10		Fire sensor
	DI9C		Shared
J27	NO9		Plate heat recovery unit bypass opening control
	C9		Shared
	NC9		Not used
	NO10		Plate heat recovery unit bypass closing control
	C10		Shared
	NC10		Not used
J28	C11		Shared
	NO11		Not used
	NO12		Glycol/water mix heat recovery unit pump or fixed speed rotary heat exchanger on control
	NO13		Drip humidifier control or DX unit heating/cooling control
	C11		Shared
J29	FBus2 -		Connection to the extraction fan (EC or inverter) - Tx/Rx -
	FBus2 +		Connection to the extraction fan (EC or inverter) - Tx/Rx +
	GND		Connection to the extraction fan (EC or inverter) - shared

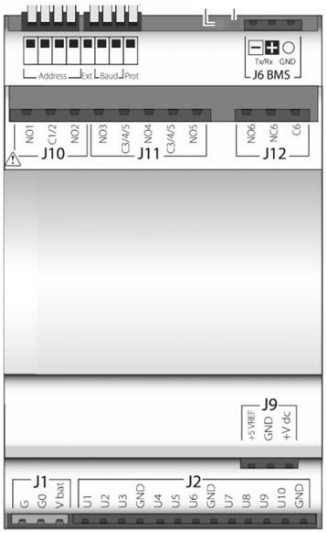
Customer terminals are used to control the machine and to feed back the AHU status. These are available on the terminal strip:

PLC	Terminal strip	Function	Type
J5-U10	X1/124-125	Setpoint 1/Setpoint 2	Non-optically insulated dry contact input
J7-DI2	X1/3-4	Remote control	Non-optically insulated dry contact input
J26-DI10	X1/162-163	Fire	Non-optically insulated dry contact input
J23-NO7	X2/3-4	Danger fault summary relay	Dry contact output (250 Vac, 1 A resistance, 1 A induction with cosφ=0,6)
J24-NO8	X2/5-6	Maintenance fault summary relay	Dry contact output (250 Vac, 1 A resistance, 1 A induction with cosφ=0,6)

3.3 - Extension module

If an electric heater is present within the unit, an expansion module is required so that inputs/outputs can be added. This module is connected to the port "J9 FBus 1" on the main PLC.

Please refer to section "7.2 - Addressing" for further details



3 - THE CONTROL PLC

The connector J6 BMS is used to communicate with the main PLC. It must be connected to the connector J9 FBus 1 on the PLC. The connection is as follows:

Connector	Terminal	Description
J1	G	+24 Vac power supply
	G0	Shared
	Vbat	Not used
J2	U1	Electric heater bypass
	U2	Choice of hot water or electric heating coil
	U3	Electric heater safety thermostat with manual reset
	GND	Shared
	U4	Electric heater safety thermostat with automatic reset
	U5	Not used
	U6	Not used
	GND	Not used
	U7	Not used
	U8	Not used
	U9	Not used
	U10	Triac control
	GND	Shared
J6	BMS -	Connection with the PLC - Tx/Rx -
	BMS +	Connection with the PLC - Tx/Rx +
	GND	Connection with the PLC - shared
J9	+5VREF	Not used
	GND	Not used
	+Vdc	Not used
J10	NO1	Electric heater stage 1 control
	C1/2	Shared
	NO2	Electric heater stage 2 control
J11	NO3	Electric heater stage 3 control
	C3/4/5	Shared
	NO4	Electric heater stage 4 control
	C3/4/5	Shared
	NO5	Not used
J12	NO6	Not used
	NC6	Not used
	C6	Not used

3.4 - List of inverter inputs/outputs

Please refer to the inverter summary.

Terminal	Description
AI1	Flow rate measurement pressure sensor
DGND	Shared
+24 V	24 Vdc output - sensor power supply
DGND	Shared
DI6	Motor PTC sensors
B+	Connection to the PLC - Tx/Rx +
B-	Connection to the PLC - Tx/Rx -
DGND	Connection to the PLC - shared

3.5 - List of EC fan inputs/outputs

Please refer to the connection section in the instruction manual.

Terminal	Description
E1	Flow rate measurement pressure sensor
GND	Shared
+24 V	24 Vdc output - sensor power supply
A+	Connection to the PLC - Tx/Rx +
B-	Connection to the PLC - Tx/Rx -
GND	Connection to the PLC - shared

3.6 - Alphanumeric terminal

The terminal is supplied equipped with an alphanumeric screen (8 lines x 22 characters) and 6 keys. It is installed on the front of the electrics box for the unit or remotely. It is connected to connector J15 on the PLC via a telephone cable.

It is used to modify the programme parameters and view the machine state

3.6.1 - Machine status

The terminal is used to view the machine state.

List of symbols and explanations

ON Indicates the unit on/off request

Icon	On/off request for the unit
OFF	Off from the terminal or the CMS
ON	On from the terminal or the CMS and off via the remote control
ON Flashing	On from the terminal or the CMS

ON Indicates the time schedule status

Icon	Time schedule state
	No validated time schedule
OFF	At least one time schedule is validated but not active
ON	At least one time schedule is validated and active

U:01 Indicates the unit's address on the pLAN bus
15:30 Indicates the time
051% Indicates the controlled humidity value (return or room air)
21.4 °C Indicates the controlled temperature value (supply, return or room air)
On Indicates the unit state

Unit state	Description
Off	The unit is off
Off due to a fault	The unit is stopped following a fault
Shut-down via external signal	The unit is shut down by the external signal value
DX unit defrosting shut-down	The unit is shut down during DX unit defrosting
On	The unit is operational
On setpoint 1	The unit is operational with the setpoints 1
On setpoint 2	The unit is operational with the setpoints 2
Night cooling	Night cooling mode is active
Frost protection	The unit is stopped but is providing frost protection
Test mode	Test mode is active
Fire protection	The unit is in fire protection mode

Control active Indicates the operating status

Operating status	Description
Damper opening	The isolation damper is in the process of opening and/or mixing damper positioning
Ventilation start-up	The ventilation is in the process of starting up
Control active	The control functions are active
Control limited	Certain control functions are not authorised (for example, flow rate insufficient for the operation of the electric heater)
Fan delay	The AHU is in the process of shutting down but the ventilation remains active to cool the electric heaters
DX unit defrosting	The DX unit is defrosting

Lower line (symbol fixed if operation requested but inactive, symbol animated if operation requested and active)

Indicates the operation of the fan(s)
Indicates the "Cooling" operating mode
Indicates the "Heating" operating mode
Indicates the "Dehumidification" operating mode
Indicates the "Humidification" operating mode
Indicates the "Air quality" operating mode

3.6.2 - Menus

The user interface is organised according to the menus below (certain menus are only accessible when the access level is 2 or 3 (see 4.18) and when the option is present on the machine):

1 / Machine status
2 / Setpoints
3 / Faults
4 / Fault memory
5 / Time schedule
  5.1 / Weekly
  5.2 / Annual
6 / Access levels
7 / Machine parameters (P01 to P99)
8 / Settings parameters (P100 to P299)
9 / Reading parameters (P300 to P549)
10 / Versions (P550 to P599)
11 / Fault level (P600 to P699)
12 / Communication
  12.1/ BMS1 (P700 to P709)
  12.1/ BMS1 (P700 to P709)
  12.2/ BMS2 (P710 to P719)
  12.3/ pLAN (P720 to P729)
13 / Calibration (P800 to P849)
15 / Prioritisation (P900 to P999)
16 / Intake FMA inverter
  16.0 / Inverter setting (P1000 to P1099)
  16.1 / Inverter read-only (P1100 to P1199)
17 / Air intake FMA EC motor
17.0 / FMA settings (P1200 to P1219)
  17.1 / Air intake FMA1 (P1220 to P1239)
  17.2 / Air intake FMA2 (P1240 to P1259)
  17.3 / Air intake FMA3 (P1260 to P1279)
  17.4 / Air intake FMA4 (P1280 to P1299)
  17.5 / Air intake FMA5 (P1300 to P1319)
  17.6 / Air intake FMA6 (P1320 to P1339)
  17.7 / Air intake FMA7 (P1340 to P1359)
  17.8 / Air intake FMA8 (P1360 to P1379)
18 / Extraction FMA inverter
  18.0 / Inverter setting (P2000 to P2099)
  18.1 / Inverter read-only (P2100 to P2199)
19 / Extraction FMA EC motor
  19.0 / FMA settings (P2200 to P2219)
  19.1 / Air extraction FMA1 (P2220 to P2239)
  19.2 / Air extraction FMA2 (P2240 to P2259)
  19.3 / Air extraction FMA3 (P2260 to P2279)
  19.4 / Air extraction FMA4 (P2280 to P2299)
  19.5 / Air extraction FMA5 (P2300 to P2319)
  19.6 / Air extraction FMA6 (P2320 to P2339)
  19.7 / Air extraction FMA7 (P2340 to P2359)
  19.8 / Air extraction FMA8 (P2360 to P2379)
21 / Test mode (P3500 to P3599)
22 / Measured values

3.6.3 - Keys

The 6 keys on the interface are used to change the parameters, acknowledge faults, and switch the unit on or off. The operation of these keys is described below.

Key	Description
Esc	Used to go up one level in the menu tree and access the machine status menu from the general menu
	This key is used to view the faults on the display and indicates the presence of a fault ( )
Prg + 	Acknowledgement of a fault.
	This key has several functions: 1. to manage the masks on the display (next mask) 2. to go to the next line in the menu 3. to adjust the values of the monitoring parameters (decrease)
	This key has several functions: 1. to manage the masks on the display (previous mask) 2. to go to the previous line in the menu 3. to adjust the values of the monitoring parameters (increase)
Prg +	Switches the unit on.
Prg +	Switches the unit off.
	Used to validate the data entered and go into a menu. It is continuously backlit to indicate when the power is on

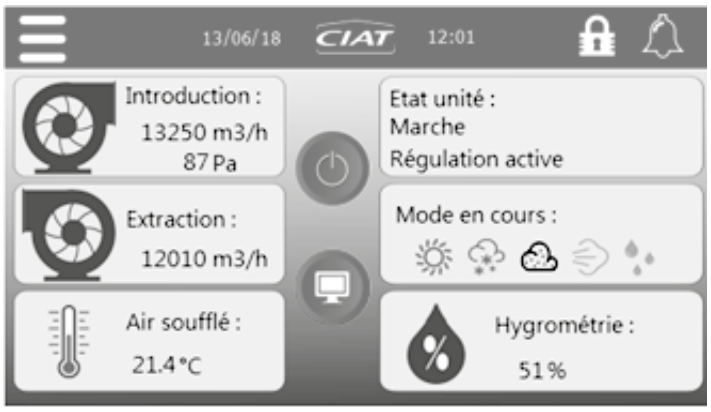
3.7 - Touchscreen terminal

The terminal supplied is equipped with a 4.3" touchscreen display. It is installed on the front of the unit's electrics box. It is connected to connector J15 on the PLC via a telephone cable.

It is used to modify the programme parameters and view the machine state

3.7.1 - Machine status

The terminal is used to view the machine state.



- **Humidity 051%** Indicates the controlled humidity value (return or room air)
- **Supply air 21.4 °C** Indicates the controlled temperature value (supply, return or room air)
- **Intake 13250 m³/h 87 Pa**: indicates the flow rate or pressure value measured at the intake
- **Exhaust 12010 m³/h**: indicates the flow rate value measured at the exhaust

: Indicates the operation of the fan(s) (rotates when the fans are working)

- Unit status **On** Indicates the unit state

Unit state	Description
Off	The unit is off
Off due to a fault	The unit is stopped following a fault
Shut-down via external signal	The unit is shut down by the external signal value
DX unit defrosting shut-down	The unit is shut down during DX unit defrosting
On	The unit is operational
On setpoint 1	The unit is operational with the setpoints 1
On setpoint 2	The unit is operational with the setpoints 2
Night cooling	Night cooling mode is active
Frost protection	The unit is stopped but is providing frost protection
Test mode	Test mode is active
Fire protection	The unit is in fire protection mode

- **Control active** Indicates the operating status

Operating status	Description
Damper opening	The isolation damper is in the process of opening
Ventilation start-up	The ventilation is in the process of starting up
Control active	The control functions are active
Control limited	Certain control functions are not authorised (E.g.: flow rate insufficient for the electric heater operation)
Fan delay	The AHU is in the process of shutting down but the ventilation remains active to cool the electric heaters
DX unit defrosting	The DX unit is defrosting

- **Current mode**: symbol grey if operation requested but inactive, symbol coloured if operation requested and active

: Indicates the "Cooling" operating mode
: Indicates the "Heating" operating mode
: Indicates the "Dehumidification" operating mode
: Indicates the "Humidification" operating mode
: Indicates the "Air quality" operating mode

3.7.2 - Menu bar

Go back to the home screen

Go back to the top menu level

Select the access level

No active faults.

Fault detected (in this case, the LED bar is lit, red for critical faults, and yellow for maintenance faults). Link to the list of active faults.

3.7.3 - Menus

Main menu

Level 1	Level 2	Level 3	Access level
Information			1
Login			1
Setpoints	Setpoints 1		1
	Setpoints 2		1
	Setpoint change		2
	Night cooling		2
Time program	Weekly 1		1
	Weekly 2		1
	Weekly 3		1
	Weekly 4		1
	Weekly 5		1
	Weekly 6		1
	Annual 1		1
	Annual 2		1
	Annual 3		1
	Annual 4		1
	Annual 5		1
	Annual 6		1
Faults	Current fault		1
	History		1
	Faults level		2
Value reading	Ventilation		1
	Filters		1
	Coils		1
	Heat recovery units		1
	Dampers		1
	Inputs / Outputs		1
	Temperatures		1
	Meters		1
	Humidity		1
	Humidifier		1
	Setpoint change		1
	EC FMA	Intake FMA	1
		Exhaust FMA	1
	Inverter		1
	DX unit		1
Curves	Temperature curves		1
	Ventilation curves		1
	Humidity curves		1
	Filter curves		1
	Real time curves		1

Level 1	Level 2	Level 3	Access level
Settings	Language		1
	Date and time		1
	Ventilation	Fan management	2
		Fan PID	2
		Pressure thresholds	2
		Air quality	2
		External signal setpoint	2
		DX unit	2
		Fire	2
	Energy optimisation	Night cooling and free cooling	2
		Heat recovery unit	2
	Communication		2
	Temperature	Temperature management	2
		Temperature threshold	2
		Temperature PID	2
		Neutral zone limitation and compensation	2
		Changeover	2
		Frost protection	2
		Pre-heating	2
	Input/output management	I/O direction	2
		Calibration	2
	Filters		2
	Prioritisation		2
	Time del. / selections	Time delays	2
		Selections	2
	Humidity	Humidity PID	2
		Humidity thresholds	2
	EC fans		3
	Inverters		3
	Emulation PGD		3
	Service	Fault memory full	3
		Machine parameters	3
		Parameters back-up	3
		Operating readings	3
		Test mode	3
		Initialising operating-hour meters	3
		EC fan addressing	3
		Electric heater ext. module addressing	3

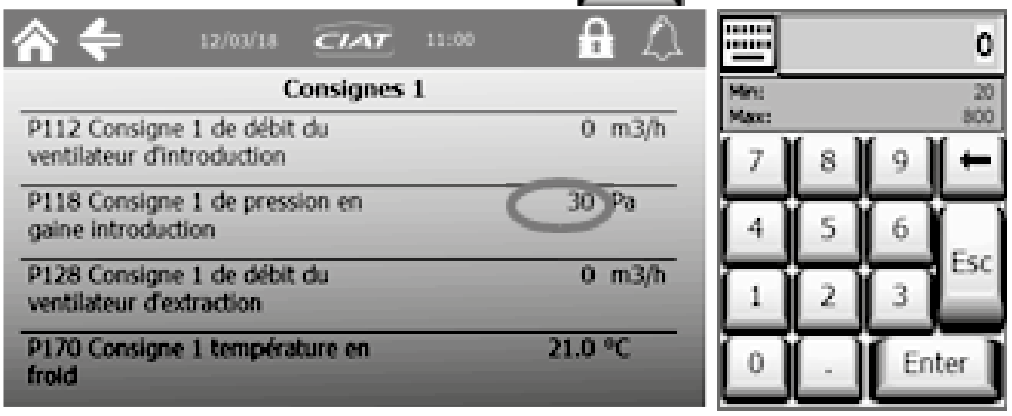
3.7.4 - Use

Action	Description
Start-up/shutdown	From the menu bar, press and confirm
Fault acknowledgement	Press the alarm icon in the menu bar and press
Status: machine shut down	blue
Status: machine on	green: in this case the LED bar is lit green (unless there is a fault present)
Status: on request, but remote control input open	blue/green flashing

Accessing the parameters

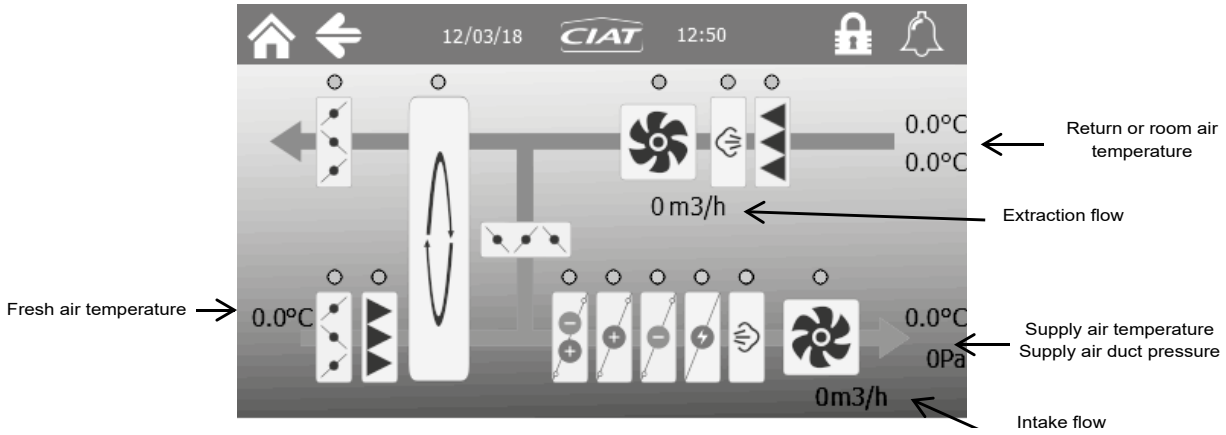
In each parameters table, it is possible to scroll down the table with a finger.

In the setpoint or setting parameters table, it is possible to modify a value by pressing on it. A numeric pad will open, indicating the possible setting range (min. and max.), and this must be confirmed via Enter



Overview

The home screen shows an overview of the operation of the machine. Only the components present in the machine are visible.

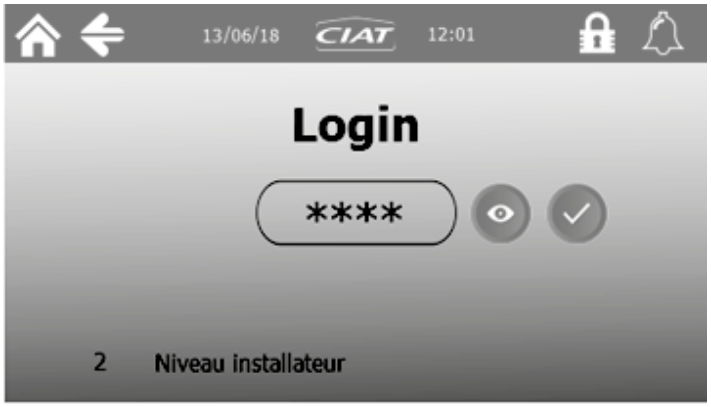


Pressing on each component will access the corresponding reading parameters.

A ring positioned beside each component indicates its status:
- Grey: inactive
- Green: in operation
- Orange: maintenance fault
- Red: danger fault

Access level

Pressing on the padlock in the menu bar or main menu will access the access level selection.



The current level is displayed at the bottom of the screen. To go back to level 1, you need to enter the password "1111".

Pressing on the starts will bring up a numeric keypad to enter the password for the desired level:

Curves

The screen records the values of the main parameters (temperatures, flow rate, duct pressure and filter differential pressure). It is possible to choose the record duration (1, 6, or 12 months), the oldest values are erased, which sets the sampling period (1 acquisition every 60 s for example))

1 month (1 every 60 s)

6 months (1 every 400 s)

12 months (1 every 800 s)

Pressing  brings up the curve settings:

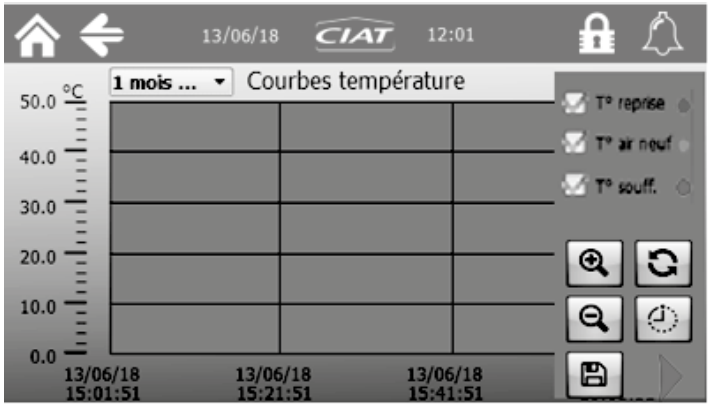
 : zoom out on the vertical axis

 : zoom out on the vertical axis

 : zoom reset

 : change horizontal axis duration

 : save values to csv on USB stick



4.1 - Management of on and off modes

The unit can be started by the terminal or by the CMS. Parameter P716 is used to authorise or deny CMS control of the unit.

When the unit is operating, an on/off "remote control" input is used to stop the unit. This may have been previously started up by the HMI in the ON position.

The unit's various operating modes can also be programmed (see time schedule).

The unit has a "frost protection" mode which is only used when the controlled temperature is the room temperature. When this mode is activated, if the unit is off, it will automatically restart if the room temperature drops below the threshold set as P228.

To be able to start up the unit, the machine parameters must be locked (P99 = yes)

Warning: if the AHU is shut down by the terminal, but the remote control is authorised (P716=remote), then the air handling unit may potentially start if commanded by the CMS. To prevent this, the remote control needs to be deactivated. (P716=local).

99	Configuration locked
716	Control type
228	Frost protection temperature setpoint

4.2 - Managing setpoints

The PLC manages setpoints 1 and setpoints 2 for the temperatures and flow rates/pressures. Setpoints 1 are, for example used when the building is occupied and setpoints 2 when the building is unoccupied.

Parameter P160 is used to choose between setpoints 1/2 either by:
- time schedule or CMS command: whichever is the last command received, time schedule or CMS, is taken into account.
- the on-off input J5 U10 only: depending on the input status (open/closed), the operation is setpoint 1 or 2
- on-off input J5 U10 override: the setpoint 1 or 2 status is given by the time schedule or CMS, but the on-off input is used to force setpoint 1: for example a presence detector is used to take priority over the CMS or time schedule.

Parameter P161 is used to select whether the change in setpoint is based on the temperature setpoints, on the ventilation setpoints (flow rate or pressure) or on both.

Setting P161	**Operation**		
	Setpoint	**Selection setpoint 1**	**Selection Setpoint 2**
Temperature	Temperature and mixing	Setpoint 1	Setpoint 2
	Flow rate or pressure	Setpoint 1	
Ventilation	Temperature and mixing	Setpoint 1	
	Flow rate or pressure	Setpoint 1	Setpoint 2
Temperature + Ventilation	Temperature and mixing	Setpoint 1	Setpoint 2
	Flow rate or pressure		

If the actuation takes place via the CMS, then the input becomes inactive.

160	Setpoint 1/Setpoint 2 selection
161	Application of setpoint 1/setpoint 2 selection

4.3 - Safety and isolation damper

The unit may have up to 4 isolation dampers and one safety damper. They are all cabled in parallel and the end of travel contacts are in series. The presence of at least one damper is given by parameter P26.

The insulating damper is activated by an On/Off servomotor with spring-return. The time required for it to open is P108.

When the unit is shut down, this damper is normally closed.

When unit start-up is requested, it will open then send the information used to open it back to the PLC (via an end of travel contact); the unit will then be switched to "Start-up" mode and the damper will be kept open until the next unit shutdown request or the appearance of a "danger" fault

26	Isolation damper
108	Damper opening time delay

4.4 - Mixing damper

When a mixing damper is present in the unit (P27 = with), it is necessary to configure its opening time (P166).

It is possible to configure a minimum fresh air rate with the parameters P208 and P209, and a maximum fresh air rate for the air quality control with the parameters P214 and P215.

The choice of setpoint 1 or 2 is active if the setpoint 1 or 2 selection, parameter P160, is applied to the ventilation.

4.4.1 - Standard operation:

The damper is modulated according to the free-cooling or air quality requirement.
The damper operates with 100% fresh air in night cooling mode.

4.4.2 - Operation with a fixed speed wheel partial heat recovery unit:

The mixing damper can have two positions:
- At minimal fresh air, depending on the setting of parameters P208 or P209.
- At 100% fresh air, if the free-cooling demand is above 50% (returning to minimum with zero demand) or in night cooling mode.

27	Mixing damper
166	Mixing damper opening time
208	Fresh air minimum setpoint 1
209	Fresh air minimum setpoint 2
214	Fresh air maximum setpoint 1
215	Fresh air maximum setpoint 2

4.5 - Filter management

The PLC measures the pressure drop for the filters installed in the unit (up to 4 filters). Differential pressure sensors measure the fouling level and a fault appears if the filter is fouled (new filter must be ordered and replacement scheduled) or clogged (the machine stops).

The number of filters can be configured (P20 and P21), along with the fault trigger thresholds (P138 to P147).

20	Number of intake filters
21	Number of extraction filters
138	Intake filter 1 fouled fault threshold
139	Intake filter 1 clogged fault threshold
140	Intake filter 2 fouled fault threshold
141	Intake filter 2 clogged fault threshold
142	Intake filter 3 fouled fault threshold
143	Intake filter 3 clogged fault threshold
144	Extraction filter 1 fouled fault threshold
145	Extraction filter 1 clogged fault threshold
146	Extraction filter 2 fouled fault threshold
147	Extraction filter 2 clogged fault threshold

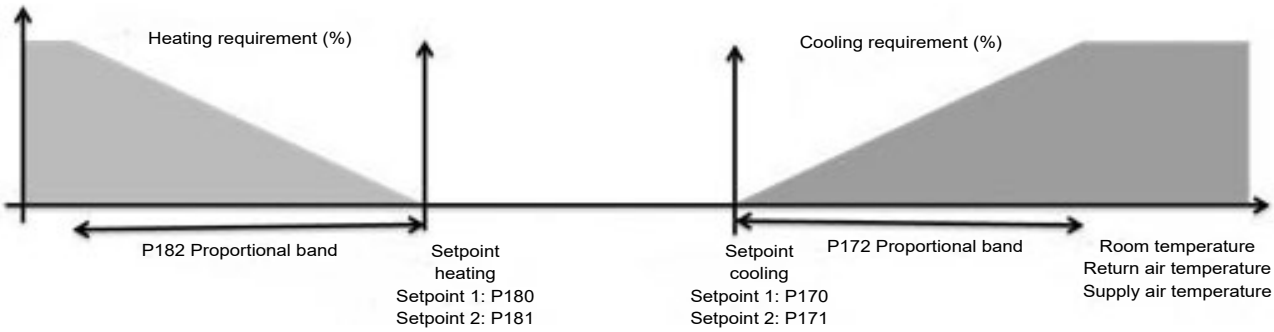
It is possible to view the pressure drop for each filter (P310 to P315).

4.6 - Temperature control

The set temperature may be:
- the return air temperature
- the room temperature
- the supply air temperature

This choice is made via parameter P154

The temperature is set via a PID which calculates a heating requirement (P395) or a cooling requirement (P394). There is one heating setpoint (P180) and one cooling setpoint (P170), with the option to have a deadband between these two different setpoints. The calculated requirement is then split between the heating and cooling elements.



- The heating and cooling setpoints must not overlap in automatic mode (P155)
- in heating only or cooling only mode, the setpoints may overlap.

154	Target temperature selection
155	Temperature control mode selection
168	Heating or cooling change authorisation time delay

Cooling PID:

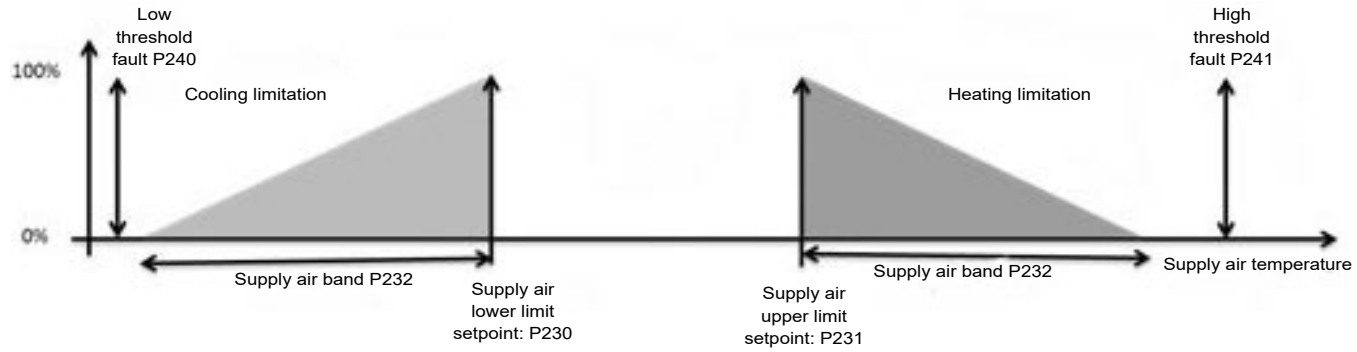
170	Temperature setpoint 1 in cooling mode
171	Temperature setpoint 2 in cooling mode
172	Temperature control PID proportional band (P) in cooling mode
173	Temperature control PID integral time (I) in cooling mode
174	Temperature control PID derivative time (D) in cooling mode

Heating PID:

180	Temperature setpoint 1 in heating mode
181	Temperature setpoint 2 in heating mode
182	Temperature control PID proportional band (P) in heating mode
183	Temperature control PID integral time (I) in heating mode
184	Temperature control PID derivative time (D) in heating mode

Supply air limitation

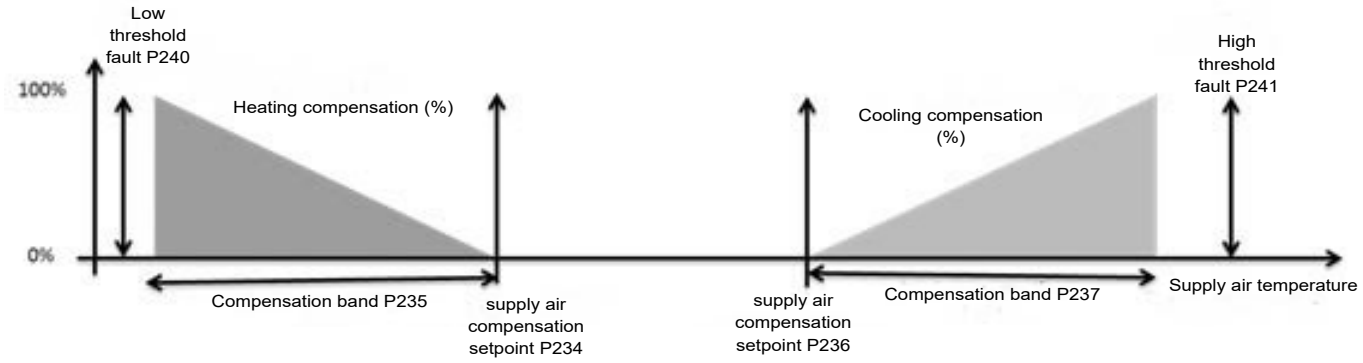
When control is being applied to the return air or room air, the supply air temperature can be limited. This limitation is used to avoid blowing air at too high a temperature in heating mode or too cold a temperature in cooling mode. This limitation is activated by parameter P156.



156	Supply air limitation = With or None
230	Supply air temperature low limit setpoint
231	Supply air temperature upper limit setpoint
232	Supply air temperature limit proportional band
233	Supply air temperature limit integration time

► Supply air compensation

When control is being applied to the return air or room air, the supply air temperature can be compensated. This compensation is used avoid blowing air at too cold or too high a temperature when the control is in deadband mode (no heating or cooling requirement calculated). This compensation is activated by parameter P157.



157	Supply air compensation in deadband = With or None
234	Low supply air temperature compensation setpoint in deadband
235	Low supply air temperature compensation proportional band in deadband
236	High supply air temperature compensation setpoint in deadband
237	High supply air temperature compensation proportional band in deadband

The temperature upper and lower thresholds (P240 to P245) are used to trigger a fault if the temperature is outside of these limits.

240	Supply air temperature low limit threshold
241	Supply air temperature upper limit threshold
242	Return air temperature low limit threshold
243	Return air temperature upper limit threshold
244	Room temperature low limit threshold
245	Room temperature upper limit threshold

4.7 - Humidity control

The control manages humidification and dehumidification. The humidity upper and lower thresholds (P246 to P247) are used to trigger a fault if the humidity is outside of these limits.

246	Humidity low limit threshold
247	Humidity upper limit threshold

4.7.1 - Humidification

The presence of a humidifier at the intake must be configured (P39). it may be steam or drip type. The humidification requirement (P397) is calculated by a PID. The humidity sensor can be placed in the extracted air flow or in the room. It must be in the same location as the controlled temperature.

The humidification setpoint (P194) and the PID parameters must then be set (P195 to P197).

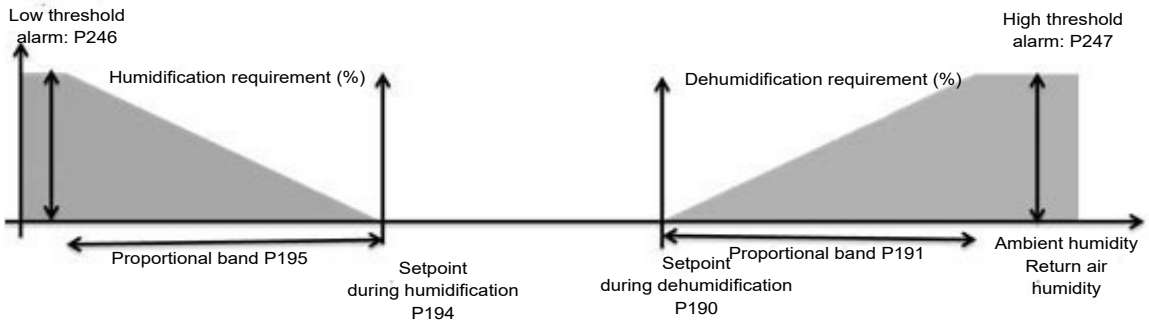
39	Air intake humidifier
194	Humidity setpoint during humidification
195	Humidity control PID proportional band (P) in humidification mode
196	Humidity control PID integral time (I) in humidification mode
197	Humidity control PID derivative time (D) in humidification mode

4.7.2 - Dehumidification

If a cooling coil is present, it is possible to carry out dehumidification. This function is activated by parameter P38. A humidity sensor must be present. The dehumidification requirement (P396) is calculated by a PID.

The dehumidification setpoint (P190) and the PID parameters must then be set (P191 to P193).

38	Dehumidification control
190	Humidity setpoint during dehumidification
191	Humidity control PID proportional band (P) in dehumidification mode
192	Humidity control PID integral time (I) in dehumidification mode
193	Humidity control PID derivative time (D) in dehumidification mode



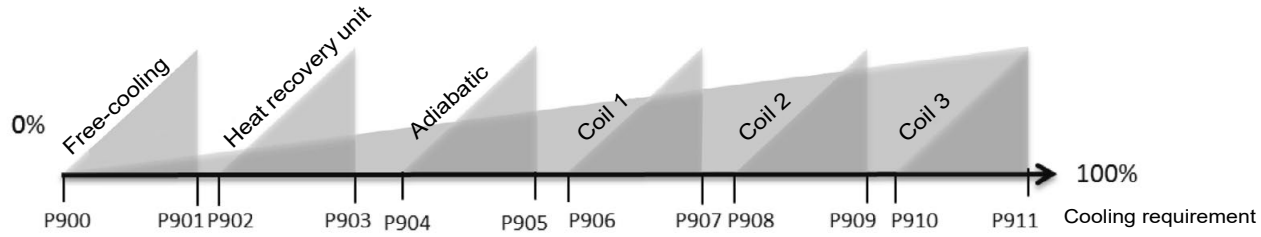
4.8 - Distribution of requirements

The unit may contain several heating or cooling elements. A function distributes the heating, cooling, humidification and dehumidification requirements amongst these different elements.

Using sets of percentages, the triggering order for the various elements can be configured to suit your needs. The default triggering order is the one shown in the diagrams below (the ranges are juxtaposed). The "distribution of requirements" function automatically allocates the percentages based on the number of elements present when heating elements are added or removed.

► Cooling requirement

Parameters P900 to P911 are used to define the percentages for the cooling requirement at the start and end of operation of the various components.

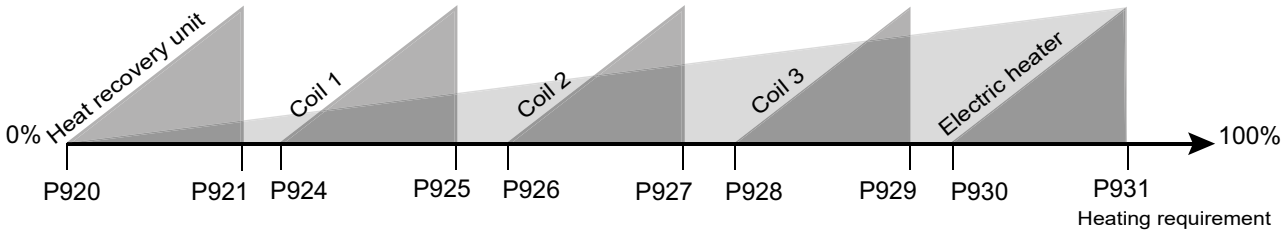


When free cooling and the heat recovery unit are present, they are counted as a single element and therefore have the same ranges for start and end of operation.

900	Free cooling operation start cooling percentage
901	Free cooling operation end cooling percentage
902	Heat recovery unit operation start cooling percentage
903	Heat recovery unit operation end cooling percentage
904	Drip humidifier operation start cooling percentage
905	Drip humidifier operation end cooling percentage
906	Coil 1 operation start cooling percentage
907	Coil 1 operation end cooling percentage
908	Coil 2 operation start cooling percentage
909	Coil 2 operation end cooling percentage
910	Coil 3 operation start cooling percentage
911	Coil 3 operation end cooling percentage

► Heating requirement

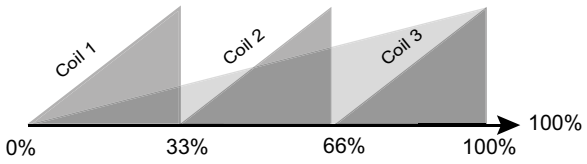
Parameters P920 to P931 are used to define the percentages for the heating requirement at the start and end of operation of the various elements. The following order is the default order (and the ranges are juxtaposed):



920	Heat recovery unit operation start heating percentage
921	Heat recovery unit operation end heating percentage
924	Coil 1 operation start heating percentage
925	Coil 1 operation end heating percentage
926	Coil 2 operation start heating percentage
927	Coil 2 operation end heating percentage
928	Coil 3 operation start heating percentage
929	Coil 3 operation end heating percentage
930	Electric heater operation start heating percentage
931	Electric heater operation end heating percentage

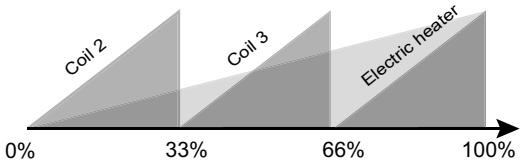
► Dehumidification requirement

The dehumidification requirement is equally distributed amongst the available cooling coils. Here is the distribution if 3 cooling coils are present:



Dehumidification requirement

When dehumidification is activated, it is possible to define the post-heating coils. These are used to compensate for cooling due to dehumidification, and are placed downstream of the dehumidification coil. In this case, the heating requirement is equally distributed amongst the available post-heating coils. Here is the distribution if 3 post-heating coils are present:



Post-heating requirement

4.9 - Fan control

The control can manage plug fans with an EC motor or with a frequency inverter. The type of intake and extraction fan can be configured (P2 and P10).

A pressure sensor used to measure the air flow is wired to the EC motor or the frequency inverter. Its presence and measuring scale are given in P4 and P12.

The K factors of the intake and exhaust fans (P5 and P13) must be entered so that the flow rate can be calculated. When several fans are present in the same air flow, the software multiplies the read value by the number of motors in operation to calculate the total flow rate.

► Constant air flow control (P104)

The flow rate setpoints can be configured: Air intake flow rate setpoints 1 / 2 (P112, P113) and Air extraction flow rate setpoints 1 /2 (P128, P129)

The PID for the Intake motors control is managed via P114 to P116 and the Exhaust motors via P130 to P132

► Intake flow

112	Air intake fan flow rate setpoint 1
113	Air intake fan flow rate setpoint 2
114	Air intake fan flow control PID proportional band (P)
115	Air intake fan flow rate control PID integral time (I)
116	Air intake fan flow rate control PID derivative time (D)

► Extraction flow

128	Air extraction fan flow rate setpoint 1
129	Air extraction fan flow rate setpoint 2
130	Air extraction fan flow rate control PID proportional band (P)
131	Air extraction fan flow rate control PID integral time (I)
132	Air extraction fan flow rate control PID derivative time (D)

Air intake duct constant pressure control (P104)

A pressure sensor must be added and installed in the supply air duct. This sensor must be connected to the main PLC. The air intake duct pressure sensor is configured with the parameter P07.

The intake pressure setpoints are adjustable: setpoints 1/2 (P118, P119)

The PID for control of the air intake motors is managed via P120 to P122.

► Intake duct pressure

118	Air intake duct pressure setpoint 1
119	Air intake duct pressure setpoint 2
120	Air intake duct pressure control proportional band (P)
121	Air intake duct pressure control integration time (I)
122	Air intake duct pressure control derivative time (D)
124	Air intake duct pressure low limit threshold
125	Air intake duct pressure high limit threshold

In this case, the extraction fans are operating according to the setting for P105:

- Either by copying the air intake flow rate with a multiplier factor (P106) to create an overpressure or depression at the exhaust
- Or by copying the intake control with a multiplier factor (P106) to create an overpressure or depression at the exhaust.
- Or using the duct pressure, in this case a pressure sensor must be added and installed in the supply air duct. This sensor must be connected to the main PLC. The exhaust duct pressure sensor is configured with the parameter P15.

The exhaust pressure setpoints can be adjusted: setpoints 1/2 (P292, P293)

The PID for control of the exhaust motors is managed via P294 to P296

► Exhaust duct pressure

292	Air exhaust duct pressure setpoint 1
293	Air exhaust duct pressure setpoint 2
294	Air exhaust duct pressure control proportional band (P)
295	Air exhaust duct pressure control integration time (I)
296	Air exhaust duct pressure control derivative time (D)
298	Air exhaust duct pressure low limit threshold
299	Air exhaust duct pressure upper limit threshold

Controlling the flow rate via the external 0-10 V signal

The operation and flow rate setpoint can be controlled via an external signal.

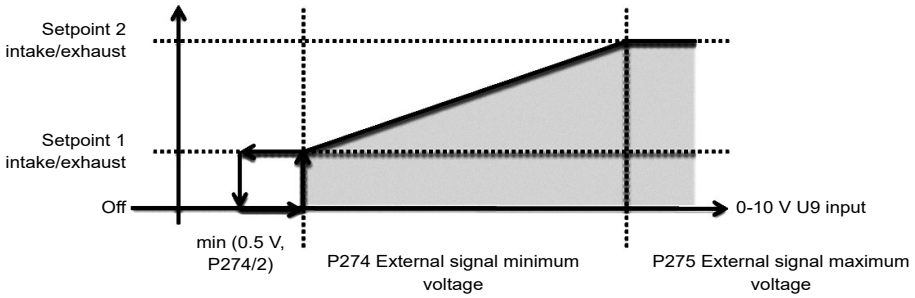
When the voltage is above the minimum voltage (P274), the machine starts up. If the voltage is below the minimum (between 0.5 V and P274/2), the machine stops.

If the voltage of the external signal is equal to the minimum voltage (P274 value), the machine operates on flow rate setpoint 1. If the voltage of the external signal is above the maximum voltage (P275 value), the machine operates on flow rate setpoint 2.

Between these two values, the machine's flow rate setpoint is proportional to the voltage.

Flow rate setpoint 2 should always be above flow rate setpoint 1.

This function can be used, for example, to compensate for the flow rate of an extractor, by interlocking the AHU flow rate setpoint with the extractor control signal.



274	External signal minimum voltage (setpoint 1)
275	External signal maximum voltage (setpoint 2)

► EC motor

There may be a maximum of 8 of these for intake and a maximum of 8 for extraction (P3 and P11). Controlled via ModBus, they must be addressed and parameters P51 to P78 indicate whether or not their ModBus addresses have been configured.

If several EC motors are installed in the same air flow, a single pressure sensor is present, and installed on motor 1. The control takes the value for this sensor into account, multiplying it by the number of motors in operation.

Motor 1 is the one on top of the wall, on the access side.

► Configuration

51	Air intake FMA1 configuration

52	Air intake FMA2 configuration
53	Air intake FMA3 configuration
54	Air intake FMA4 configuration
55	Air intake FMA5 configuration
56	Air intake FMA6 configuration
57	Air intake FMA7 configuration
58	Air intake FMA8 configuration
71	Air extraction FMA1 configuration
72	Air extraction FMA2 configuration
73	Air extraction FMA3 configuration
74	Air extraction FMA4 configuration
75	Air extraction FMA5 configuration
76	Air extraction FMA6 configuration
77	Air extraction FMA7 configuration
78	Air extraction FMA8 configuration

► Faults

The pressure sensors installed on the FMAs are used to detect the presence of the air flow (threshold P111). The flow rate setpoint high threshold is limited to the AHU's maximum flow rate. The PLC triggers a fault if the flow rate is less than the fixed low limit.

► Flow rate control

110	AHU max flow rate
111	AHU flow rate low limit threshold

Door opening contacts can be installed and configured using parameters P6 and P14. When triggered, these stop the fans and the unit.

► Air intake fan

2	Air intake fan
3	Number of intake EC fans
4	Characteristics of the pressure sensor for the air intake fan
5	Coefficient value K for the intake fan
6	Air intake fan door contact
7	Specifications for the air intake duct pressure sensor
104	Air intake ventilation control

► Air extraction fan

10	Air extraction fan
11	Number of EC air extraction fans
12	Characteristics of the pressure sensor for the air extraction fan
13	Coefficient value K for the exhaust fan
14	Air extraction fan door contact
15	Specifications for the air exhaust duct pressure sensor
105	Air extraction ventilation control
106	Multiplication factor value of the signal sent by the air extraction fan with pressure control in the supply air duct

4.10 - Energy recovery

A dual-flow unit may have a heat recovery unit (plate, fixed speed wheel, gradual speed wheel, glycol/water mix and partial fixed-speed wheel). This is used to warm fresh air up in winter or cool fresh air down in summer.

This heat recovery unit is chosen using parameter P36.

► Operation :

- When the heat recovery unit heating requirement is greater than 0% and the return air temperature is greater than the fresh air temperature plus the difference (P225), then it is operational (for a Gradual speed wheel heat recovery unit, its speed is proportional to the heat recovery unit heating requirement).
- When the heat recovery unit heating requirement is greater than 0% and the return air temperature is less than the fresh air temperature minus the difference (P225), then it is operational (for a Gradual speed wheel heat recovery unit, its speed is proportional to the heat recovery unit cooling requirement).
- If there is a free cooling or night cooling requirement, the heat recovery unit is shut down.
- There is a 1 °C hysteresis between start-up/shut-down.

Fixed-speed or Gradual speed wheel heat recovery unit seizing prevention:

When a variable speed wheel is used, its controller automatically restarts it to prevent seizing. For a fixed speed wheel, the PLC gives the order to run the wheel for 1 minute every 4 hours.

► Plate heat exchanger

For a plate heat recovery unit, the opening time for the bypass must be entered (P224).

The plate heat recovery unit bypass is normally closed and is 100% open in free cooling or night cooling mode. A PID (P221 to P223) is used to monitor the fouling level of the heat recovery unit by gradually opening the bypass when necessary (if the sensor P37 is present).

► Fault

A sensor may be present (P37) to measure the heat recovery unit pressure drop and to trigger a fault if this is above the threshold (P220).

		Temperature			
		Return air < fresh air + difference		**Return air** > fresh air + difference	
		Wheel	**Plate**	**Wheel**	**Plate+**
Heat recovery unit requirement	Cooling > 0%	On	Modulated bypass based on the Pdiff	Off	Bypass open
	None	Off	Bypass open	Off	Bypass open
	Heating > 0%	Off	Bypass open	On	Modulated bypass based on the Pdiff
	Free cooling Night cooling	Off	Bypass open	Off	Bypass open

► Heat recovery unit

36	Heat recovery unit
37	Differential pressure sensor on the heat recovery unit
220	Heat recovery unit pressure drop setpoint
225	Temperature difference for heat recovery unit start-up authorisation

► Plate heat exchanger only

221	Heat recovery unit fouling control PID proportional band (P)
222	Heat recovery unit fouling control PID integral time (I)
223	Heat recovery unit fouling control PID derivative time (D)
224	Plate heat recovery unit bypass opening time

4.11 - Hydraulic coil and DX unit

The unit may include up to 3 coils. These may be hydraulic or DX unit. The maximum number of DX unit coils is 2. If there are 2 DX unit coils, these are part of the same DX unit (2 stages).

The hydraulic coils comprise a two- or three-way valve which enables the water flow rate to be varied, thereby varying the power emitted by the coil.

The DX unit coils are linked to the DX unit controlled, and their emitted power depends on the DX unit control.

Coil no. 1 may be a hydraulic cooling, heating or mixed (heating or cooling according to the network temperature, an on-off input or information from the CMS), preheating or DX unit type coil.

Coil no. 2 may be a hydraulic cooling, heating, post-heating or DX unit type coil

Coil no. 3 may be a hydraulic cooling, post-heating or DX unit type coil

The DX unit may be a cooling, heating or reversible unit.

28	Coil no.1
29	Coil no.2
30	Coil no.3
35	DX unit

4.11.1 - Scenario of a mixed coil with heating, cooling selection according to network temperature

If a mixed coil is being used, two parameters give the operating thresholds in heating mode or in cooling mode. When the water network temperature is less than the changeover setpoint for cooling mode (P250), then the mixed coil operates in cooling mode. When the water network temperature is greater than the changeover setpoint for heating mode (P251), then the mixed coil operates in heating mode.

The water network temperature sensor (changeover) must be fitted by the installer on the mixed coil inlet in an area where water is constantly circulating.

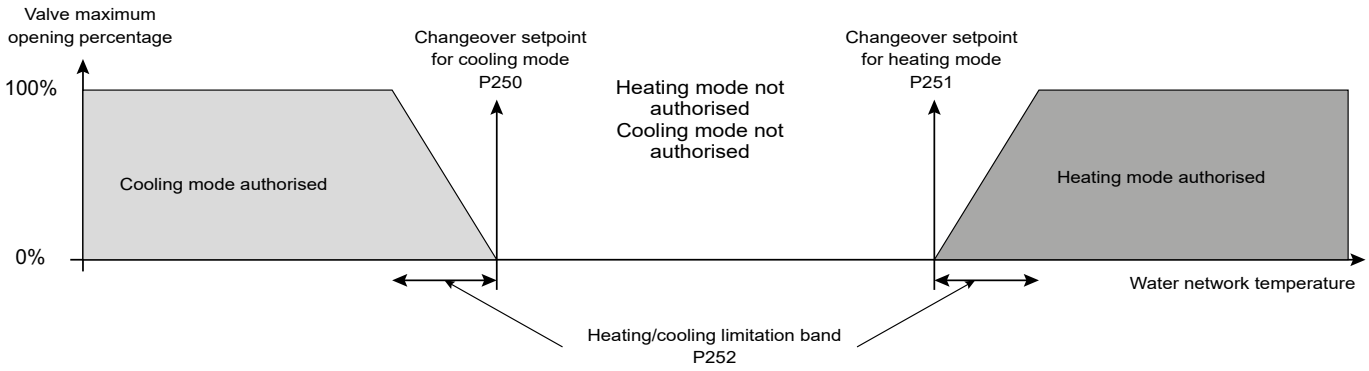
(see section 2.3)

► Limitation function

When the mixed coil is supplied by a dedicated heat pump, a function allows the power supplied by the coil to be limited (useful when the coil is too large for the heating request).

In this case, the water network temperature sensor must be positioned on the coil outlet, hydraulic system side, downstream of the valve.

A limitation band (P252) limits the maximum opening of the valve when the water network temperature drops slightly below P250 or rises slightly above P251.



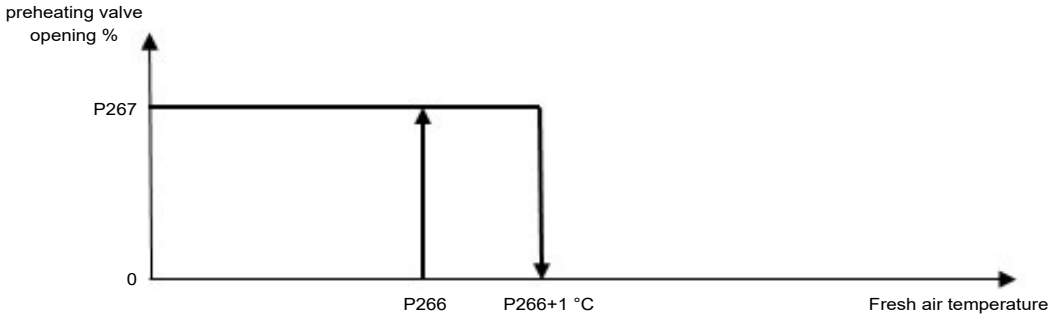
250	Changeover setpoint for cooling mode (mixed coil)
251	Changeover setpoint for heating mode (mixed coil)
252	Network temperature cooling/heating band limit (mixed coil)

4.11.2 - Preheating coil

The preheating coil is controlled depending on the fresh air temperature, and it is not activated based on the heating demand.

When the unit is off, the valve of coil 1 opens at an opening percentage of coil 1 at shut-down (P260).

When the unit is on, if the fresh air temperature is below the threshold set on P266, the valve of the preheating coil opens at the percentage set on P267. If the fresh air temperature rises above P266 +1 °C again, the valve of coil 1 is closed.

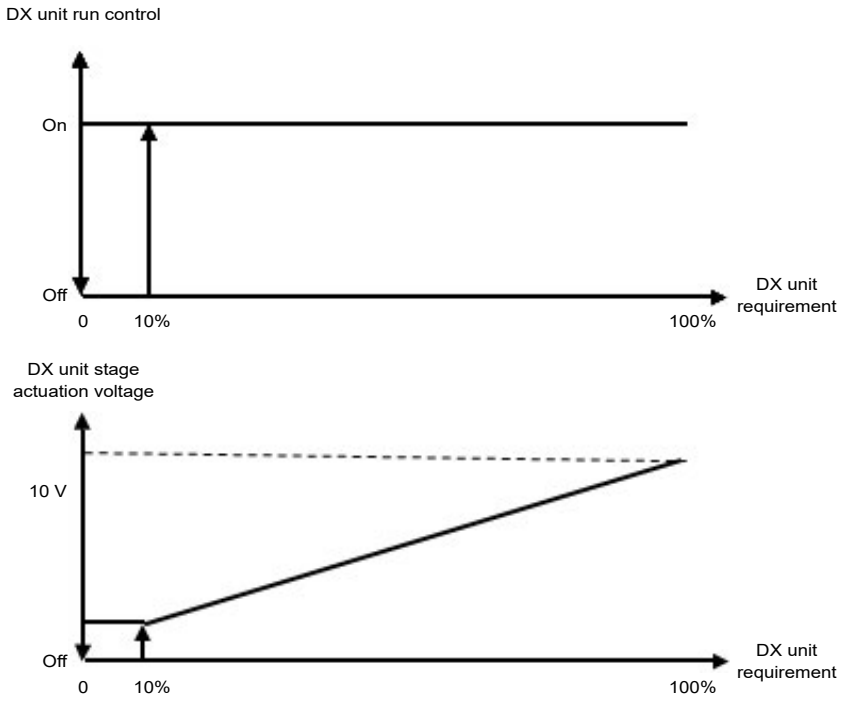


266	Fresh air temperature threshold for preheating
267	Opening percentage for coil 1 valve, preheating on

4.11.3 - DX unit coil scenario

The DX unit activation authorisation is activated at the end of the damper initialisation process (if present) when the unit is started up.

The unit is started up if the DX unit requirement is greater than 10%, and the unit is shut down when this requirement is at 0%. The unit then regulates its power between the minimum and maximum levels. If the DX unit has 2 stages, the 2 stages are controlled in parallel (same signal on the 0-10 V controls).



Defrosting management

When the DX unit switches to the defrosting phase, the unit adapts its flow rate/pressure based on the selection on parameter P286 :
- None: the unit continues to operate on its current setpoint
- Derated mode: the unit switches to the flow rate or pressure setpoints P287, P288, P289, P290.
- AHU shut-down: the unit shuts down during the defrosting phase.

286	DX unit defrosting management
287	DX unit intake pressure setpoint during defrosting
288	DX unit intake flow rate during defrosting
289	DX unit exhaust flow rate during defrosting
290	DX unit exhaust pressure setpoint during defrosting

Minimum flow rate

A minimum air flow rate is required to use the DX coil (P126). If the flow rate is less than this parameter, the DX coil will not start up and a "control limited" message will appear in the machine state menu.

4.11.4 - Antifreeze thermostat (option)

The antifreeze thermostat (selected by P25) has an automatic reset (but requires a manual reset from the HMI) and is constantly monitored as soon as the controller is powered on.

If there is a frost protection fault, the isolation damper closes, the ventilation stops and all the valves for the coils installed in the unit open to 100%.

A frost prevention function is available once the unit is off (via the HMI, the CMS or a danger fault). It consists of leaving the valves for the hydraulic coils slightly open (adjustable value) to maintain water circulation (P260, P261 and P262), until the control is active.

25	Antifreeze thermostat
260	Opening percentage for the coil 1 valve when unit stopped
261	Opening percentage for the coil 2 valve when unit stopped
262	Opening percentage for the coil 3 valve when unit stopped

To prevent the frost protection fault at start-up in units in all fresh air, with parameter P263 it is possible to open the valve for the first heating coil at a threshold other than the one set on the minimum valve opening parameter (P260 or P261 or P262) for this first heating coil.

The valve for the first heating coil will remain at the value set on parameter P263 until the control is requested. Once the control is active, this value will decrease following a ramp of 10 mins, enabling switching from P263 to 0%.

The percentage applied to this first hot valve will be the maximum value between this decreasing value and the PID result.

263	Opening percentage for the first hot valve at start-up

4.11.5 - Cooling coil fan delay

When a cooling coil is activated and the unit is requested to shut down, an adjustable fan delay (P175) can be used to dry the cooling coil. During this fan delay, the valve is open to the percentage of the valve on the coil when it is shut down. If this percentage is not 0 (because the water network is not mixed with glycol, for example), there is a risk that the coil will not dry.

This fan delay is mandatory for compliance with VDI6022 & DIN1946 standards.

175	Cooling coil fan time delay

4.12 - Electric heater

The control is used to control electric heaters comprising up to 4 on/off stages or 3 on/off stages and a modulating stage (triac). The configuration of the electric heaters must be entered via parameter P32. The electric heater may provide a heating requirement or post-heating requirement (P33).

The electric heater is connected to an expansion board which must be configured in the event of a change (P48).

A minimum air flow rate is required to use the electric heaters (P126). If the flow rate is below this parameter, the electric heaters will not be able to start up and the message "control limited" will appear.

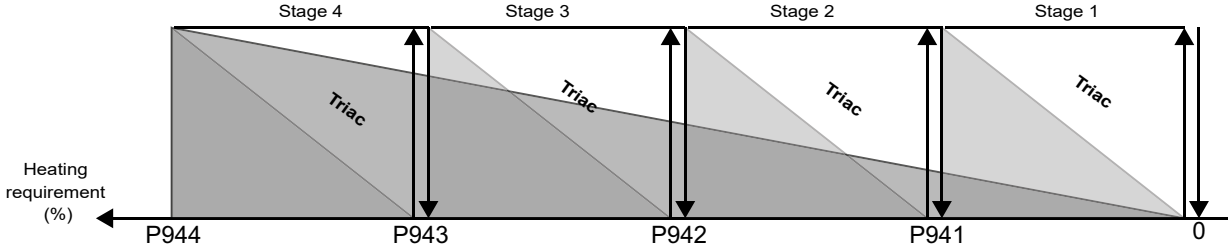
► Electric heater configuration

32	Electric heater
33	Electric heater function
48	Electric heater expansion configuration
126	Minimum flow rate for electric heater operation

Caution : reducing the minimum flow rate can damage the machine and pose a fire risk. The manufacturer accepts no responsibility if this parameter is reduced.

When a modulating stage is present in the unit, this varies so as to provide linear power corresponding to the heating request for the electric heater.

Similarly, to obtain a power response which is as linear as possible, and therefore control which is as precise as possible, all the stages need to have the same power.



Distribution of the electric heater requirement

941	Electric heater stage 1 range end percentage
942	Electric heater stage 2 range end percentage
943	Electric heater stage 3 range end percentage
944	Electric heater stage 4 range end percentage

Fan delay

When the electric heater is operating and a request to stop the unit appears, adjustable post ventilation (P164) provides cooling of the electric heaters

164	Fan delay time
284	Post ventilation on fire safety
285	Post ventilation time on fire safety

Two non-combinable fan delay levels are available.
- Timeout 164 must allow parts accessible to operators during work to return to a safe contact temperature. The default value is 240s.
- Timeout 285 must allow the energy stored in the electric heater elements to be reduced if the fire alarm is triggered. This reduces the risk of damage to the unit's components. The default value is 60 s. This timeout can be reduced or eliminated (parameter 284), however this may result in internal damage to the unit. No work should be carried out on the unit until the heat has dissipated.

It is possible to bypass the electric heater, either via an on/off input (J2-U1) or via the CMS.

159	Electric heater load shedding selection

4.13 - Free Cooling

Free cooling is used to cool the building when the outdoor temperature is lower than that inside the building.

This operating mode is used when the following conditions are met:
- Function activated in the P150 parameters (only if control takes place on the return air or room temperature).
- Cooling requirement: the PID output must be greater than 0%
- The difference between the controlled temperature (measured return air or room) and the fresh air must be sufficient: fresh air temperature < controlled temperature – P206 (3 °C factory value).
- The fresh air temperature is above the "free cooling temperature low limit" (P207)

When operating in free cooling mode, the supply air temperature is not controlled. It is important to configure a fresh air temperature low limit which is sufficiently high to ensure no discomfort is caused.

150	Free cooling control
206	Free cooling and night cooling operating differential compared to the controlled temperature
207	Temperature low limit for free cooling and night cooling

4.14 - Night cooling

The controlled temperature must be the return or room air value.

The unit must be equipped with a mixing damper or flow rate control for the FMAs.

Night cooling is used to cool the building using the colder night air

In this case, when night cooling is active, the ventilation flow rate setpoint is the "night cooling" flow rate (P212 and P213) and the mixing damper is in the 100% fresh air position.

Several conditions must be met to activate night cooling:
- The function must be activated by parameter P151
- The controller is located in a "night cooling" time slot, or it is forced via the CMS.
- Cooling requirement: the controlled temperature must be greater than the night cooling temperature setpoint P210.
- There must be sufficient difference between the controlled temperature and the fresh air: fresh air temperature < controlled temperature – P206 (3 °C factory value).
- The fresh air temperature is above the "night cooling temperature low limit" (P207)

Periodic restarts: if one of the conditions for activation of night cooling is not verified (fresh air temperature, night cooling difference, or cooling requirement), the unit stops.

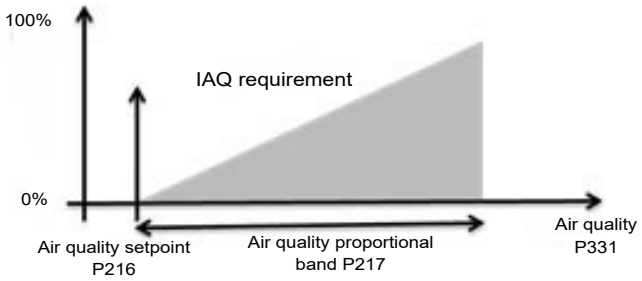
The fans will be restarted at the night cooling flow rate for 5 minutes each hour, and night cooling will be reactivated if all the conditions are verified. Otherwise, the AHU will stop again.

If, during the periodic restart, the fresh air temperature is 3 °C below the "low temperature limit in night-cooling mode" (P207) for 5 seconds, this periodic restart is stopped and a new restart will be launched one hour later.

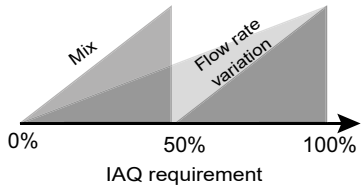
151	Night cooling control
206	Free cooling and night cooling operating differential compared to the controlled temperature
207	Temperature low limit for free cooling and night cooling
210	Control setpoint in night cooling mode
212	Air intake fan flow rate setpoint in night cooling mode
213	Air extraction fan flow rate setpoint in night cooling mode

4.15 - CO_2 air quality

When a $_{CO2}$ sensor is present in the exhaust air flow and a mixing damper is present or when the FMAs are under flow rate control, it is possible to activate the air quality function (P152). This function calculates an IAQ (Indoor Air Quality) requirement thanks to a proportional controller (P217) so that the CO_2 concentration setpoint (P216) can be monitored.



This function acts firstly on the mixing damper (increase in the fresh air rate), if present, then it increases the flow rate, up to the maximum value set by P218 and P219.



152	Air quality control
216	Air quality setpoint
217	Air quality proportional band
218	Air flow max setpoint on intake for air quality
219	Air flow max setpoint on exhaust for air quality

4.16 - Humidifier

The humidifier may be a steam or a drip type humidifier. It is equipped with its own control electronics.

When a humidifier is activated and the unit is requested to shut down, an adjustable fan delay (P198) can be used to dry the humidifier.

This fan delay is mandatory for compliance with VDI6022 & DIN1946 standards.

198	Humidifier fan delay time

4.16.1 - Steam humidifier:

This is controlled according to the humidification requirements by a 0-10 V control signal.

4.16.2 - Drip humidifier:

This is controlled according to the humidification requirements by an On/Off control. When the humidification requirements are 100%, the humidifier is activated; when the requirements are 0%, it is deactivated.

If the AHU is shut down or there is a danger fault, the humidifier is purged.

4.17 - Indirect adiabatic cooling

The presence of a drip humidifier on the return is indicated by parameter P40. The humidifier on the return is activated if the drip humidifier cooling demand (adiabatic cooling) is greater than 0 and the temperature after the humidifier is less than the fresh air temperature. In this case the wheel heat recovery unit is activated or the plate heat recovery unit bypass closed.

If the return air temperature is less than 20 °C, this operation is deactivated.

If the AHU is shut down or there is a danger fault, the humidifier is purged.

40	Return humidifier

4.18 - Fire protection

If there is a DAD (stand-alone activating detector) in the unit, the control's fire monitoring needs to be activated (P24). There are several operating modes in case of fire detection:
- Unit shut down
- Intake fan forced to P282 flow rate and exhaust fan shut down
- Intake fan forced to P283 flow rate and exhaust fan shut down
- Intake fan forced to P282 flow rate and exhaust fan to P283 flow rate

24	Fire detection
280	Fire protection operating mode
282	Intake flow rate in case of fire
283	Exhaust flow rate in case of fire
284	Post ventilation on fire safety
285	Post ventilation time on fire safety

The fire fault management strategy must be chosen according to the regulations in force in the AHU's country of installation. The AHU is not a smoke extraction device.

4.19 - Time management

The date and time are set using parameters P102 and P103. The date enables annual/monthly/weekly programming to be used and the time at which a fault occurs to be recorded.

The PLC contains a battery to prevent the time being wiped in the event of a power cut. If the time is not stored after a power cut, the battery needs to be changed (service life approximately **10 years** – varies according to ambient conditions).

102	Date
103	Time

4.20 - Time schedule

The time schedule is used to change the unit's operating mode (off, setpoints 1, setpoints 2, frost protection, etc.) according to the time, day of the week or the season.

The PLC authorises 6 periods of weekly programming and 6 periods of annual programming, which may overlap and be individually validated.

Selections for weekly time schedule:

Requested state	Display condition
Off	
Frost protection	P154 Target temperature selection = room
Night cooling (programmed weekly only)	P151 Night cooling = with
On setpoint 1	P160 Setpoint 1/Setpoint 2 selection = time sched./CMS or on-off input override only
On setpoint 2	

Selections for annual time schedule:

Requested state	Display condition
Off	
Frost protection	P154 Target temperature selection = room
On setpoint 1	P160 Setpoint 1/Setpoint 2 selection = time sched./CMS or on/off input override
On setpoint 2	
Weekly programming 1	
Weekly programming 2	
Weekly programming 3	
Weekly programming 4	
Weekly programming 5	
Weekly programming 6	

When the ranges overlap, the priority, from least to most important, is as follows:
1. Off
2. Frost protection
3. Night cooling
4. On setpoint 2
5. On setpoint 1

The annual programming takes priority over the weekly programming.

Example of weekly programming:

Programmed shutdown of the unit, every Saturday and Sunday, 09:00 - 16:00.

Note: if the end time is earlier than the start time (e.g. time schedule from 18:00 to 07:00 from Monday to Friday), then the time schedule continues until the next day (until Saturday at 07:00).

Example of annual programming:

Annual programming between 15th October and 1st April, the frost protection state will be active.

4.21 - Access level

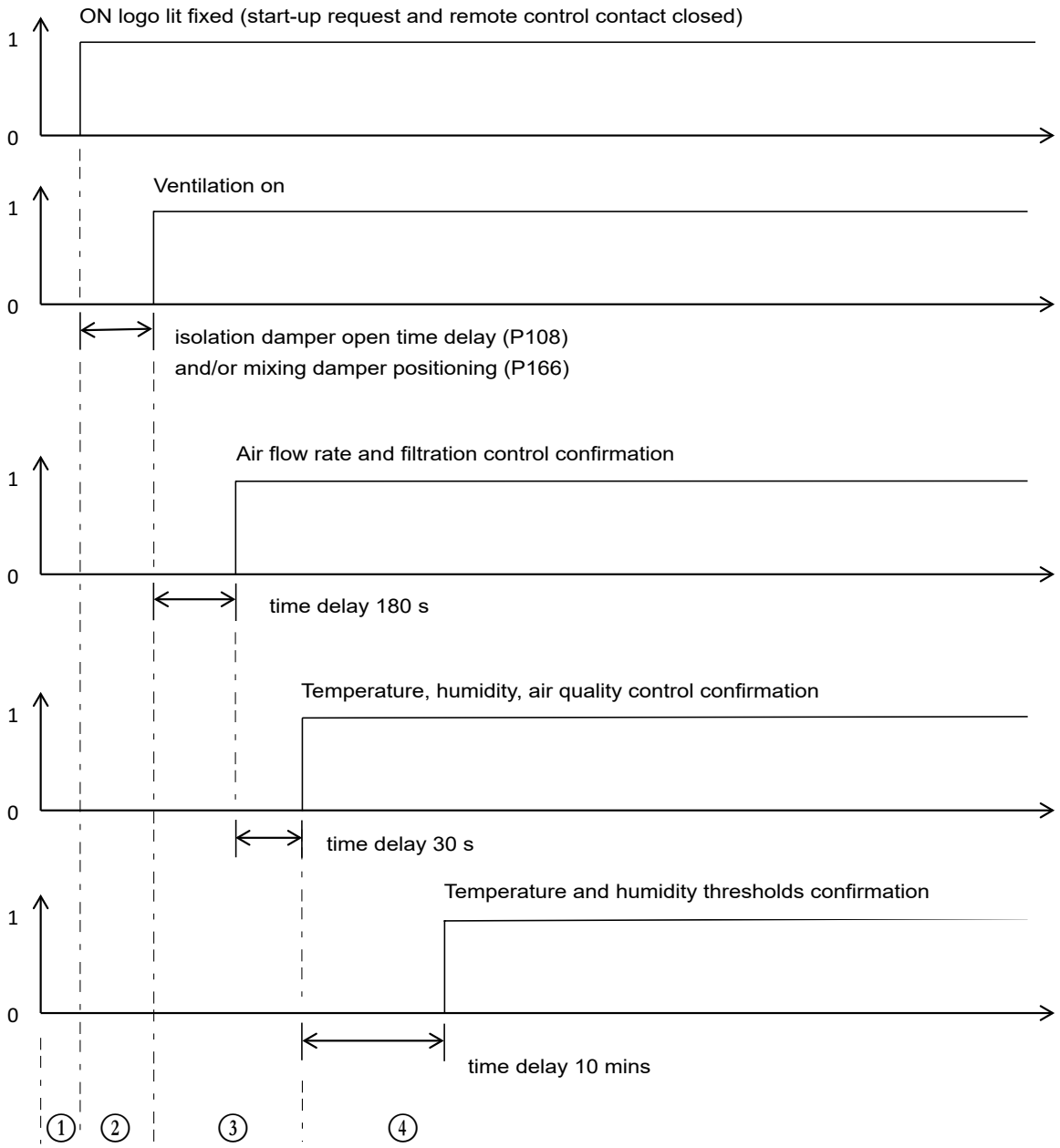
The PLC comprises 3 access levels, which are used to prevent unauthorised persons from altering certain parameters.

Level 1 is the "customer" level. It is used to alter the setpoints.

Level 2 is the "installer" level. It is used to alter the settings parameters.

Level 3 is the "manufacturer" level. It is used to alter the machine parameters.

4.22 - Start-up chronology



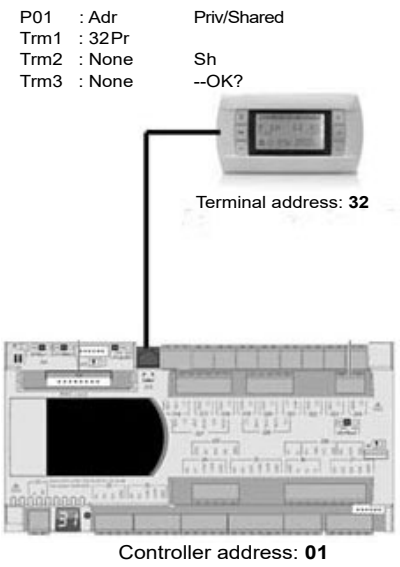
Operating status:
① ⟶ Off
② ⟶ Damper opening
③ ⟶ Ventilation start-up
④ ⟶ Control active

5 - MANAGING THE CONNECTION BETWEEN CONTROLLERS AND ALPHANUMERIC TERMINALS

This paragraph applies only to alphanumeric terminals.

To establish communication between controllers and terminals, it is necessary to give an address to each of the elements.

This addressing is performed at the factory, but if a defective component is replaced (controller or terminal), it may have to be performed on site.



5.1 - One controller and one terminal:

The procedure for allocating an address to the Terminal is described in the following section, paragraph 5.4.3. The procedure for the controller is in paragraph 5.4.3.

The controller and terminal must have different addresses

The example opposite shows one addressing option

5.2 - Several controllers and terminals:

Several terminals or controllers may be interconnected, without any additional components, using the pLAN (local area network).

This enables several terminals to be used to display the parameters from one controller or, conversely, one terminal can be used to display the parameters from several controllers.

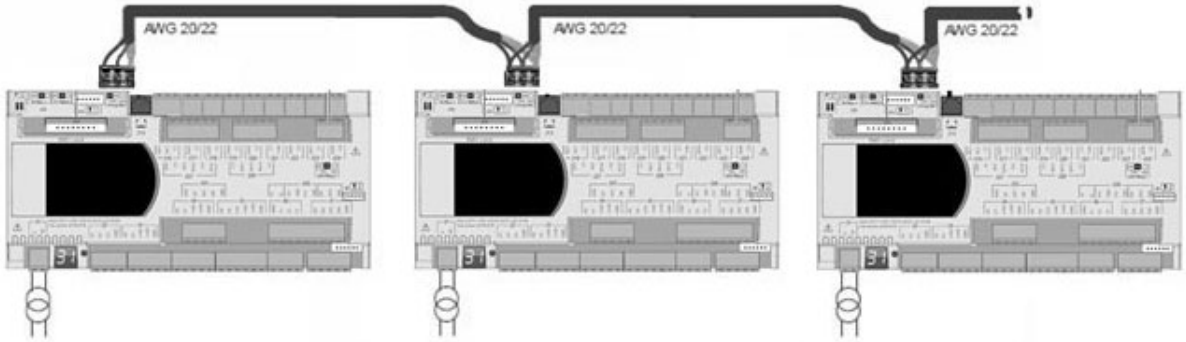
Only the electrical connection and configuration of the addresses need to be performed by the user.

5.3 - Electrical connections for the pLAN (local area network)

5.3.1 - Connecting controllers to the pLAN

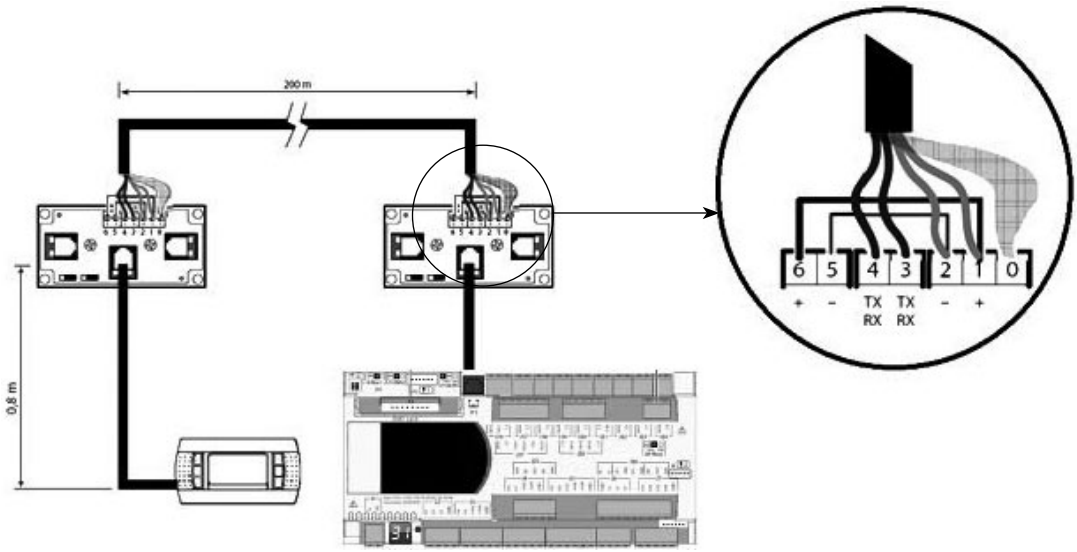
The electrical connection between the controllers in the pLAN (RS485) is carried out using an AWG20/22 shielded cable composed of a twisted pair and a shield. The cards must be connected in parallel using the J14 connector.

The first and last controller must be no more than 500m apart.



5.3.2 - Connecting a remote screen or screens to the pLAN

The user can connect a user terminal to connector J15 up to a distance of 50m. For a greater distance, 2 TCONN boards and a AWG20/22/24 shielded cable comprising 2 twisted pairs and shielding must be used. The shielded cable must be no longer than 200m.



5 - MANAGING THE CONNECTION BETWEEN CONTROLLERS AND ALPHANUMERIC TERMINALS

5.4 - Addressing the pLAN

5.4.1 - Operation

Once the controllers are connected over the pLAN network, the controllers and the terminals must be addressed.

The range of addresses which can be used is from 1 to 32.

This means that a total of 32 controllers and terminals can be connected over the pLAN.

The pLAN will not work if the same address is shared by two components

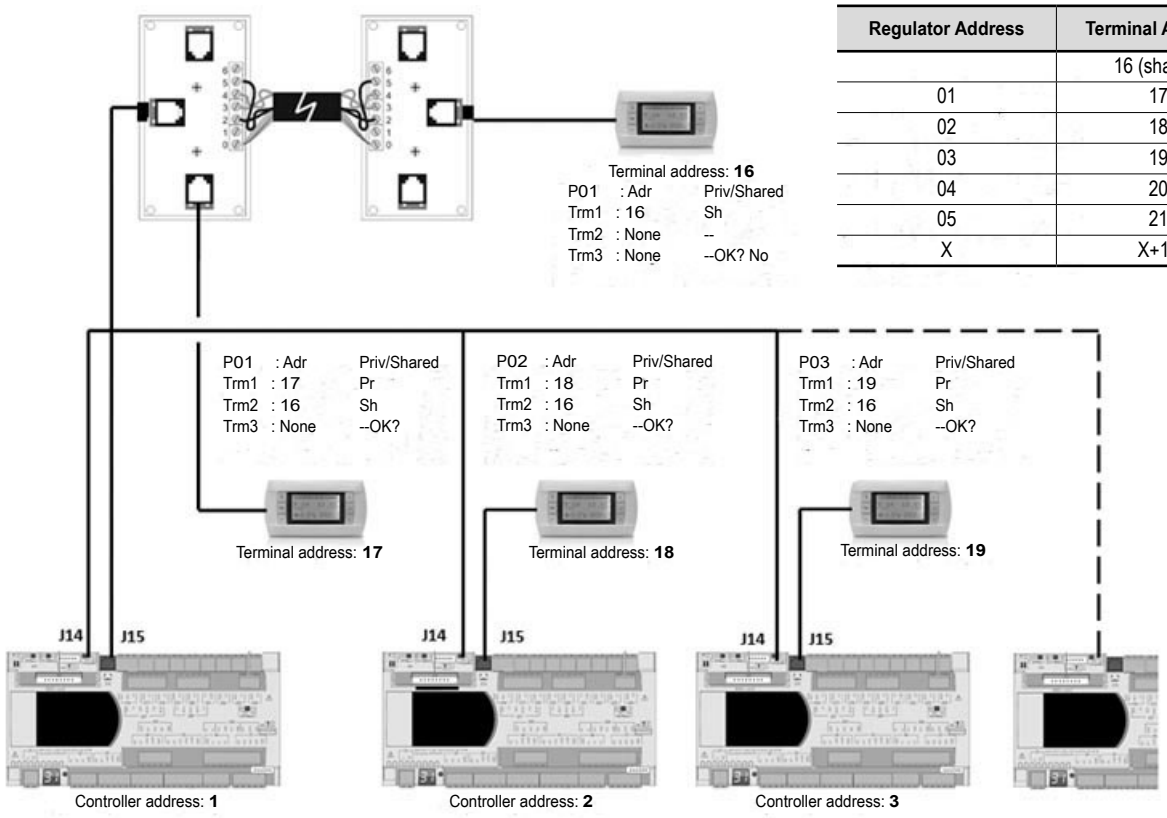
► **Recommended addressing:**

It is generally recommended to use a commonly used system of addressing:

The address for the terminals must be equal to the: **controller address +16**

The shared terminal address must be equal to 16

Please ensure the addressing diagram below is respected:



Regulator Address	Terminal Address
	16 (shared)
01	17
02	18
03	19
04	20
05	21
X	X+16

5 - MANAGING THE CONNECTION BETWEEN CONTROLLERS AND ALPHANUMERIC TERMINALS

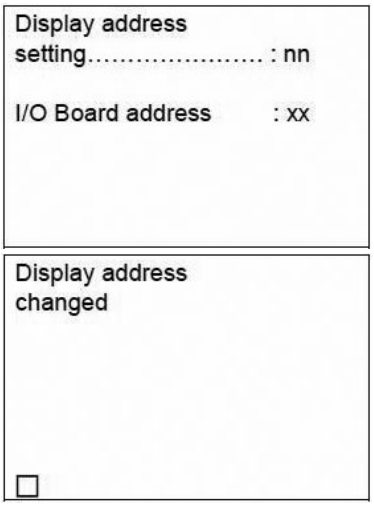
In the following procedures, it is possible that the message "NO LINK" will appear. If this occurs, please repeat the procedure.

5.4.2 - Modifying the HMI terminal addresses

It is only possible to modify the address of the terminal when it is connected to the controller (telephone connector) and when the controller is powered on.

To switch to configuration mode, simultaneously press the ↑↓and ←keys for at least 5 seconds; the page shown below will be displayed, with the cursor flashing in the top left corner:

- to change the terminal's address (Display address setting) press ↵ _once: the cursor will move to the address field (nn).
- select the desired value using the ↓↑keys, and confirm by pressing the ↵ key again.



If the value selected is different from that previously stored in the memory, the page shown below will appear and the new value will be stored in the terminal's permanent memory.

Please note: if you need to change the address of a controller using a terminal, you may only do so with a terminal with the address 0.

After having changed the controller address, remember to change the terminal address from 0 to a different value to ensure normal operation.

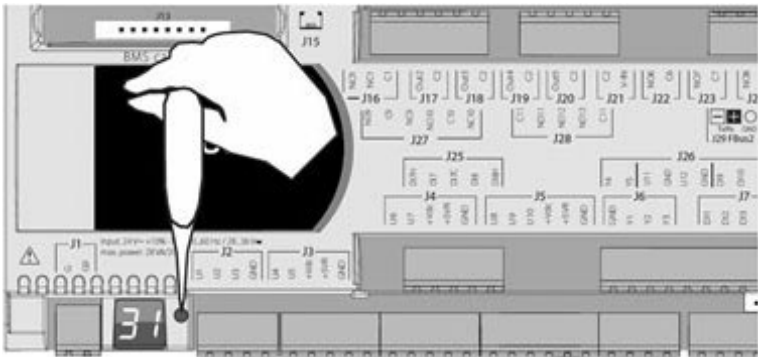
5.4.3 - Modifying the controller addresses

The value of the factory-set address is '1'. The controller pLAN address can be modified, if the controller needs to be networked.

a - Directly from the controller

To modify the address, it is necessary to use a screwdriver and to follow the procedure below:

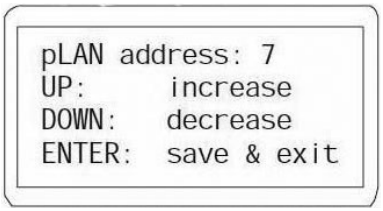
- Press the button for 5 seconds: the address should flash
- Press the button several times or press and hold until the desired address is obtained
- Wait for the address to flash rapidly.
- The address is now saved.
- Disconnect then reconnect the controller (powering off confirms the change)



b - From a terminal

To modify the address for the controllers:
- The terminal must have an address set to 0 (see the procedure in section 5.4.2)
- Switch off the power
- Once the unit is powered back on, press the 🔔 + ↑ keys simultaneously until the following screen appears, then release.

• Select the controller address using the ↑ and ↓ keys and confirm with the ↵ key



5.4.4 - Allocating private and shared HMI terminals

At this point, it is necessary to modify the list of terminals linked to each controller; to do so, follow the procedure below:
- enter configuration mode by pressing the ↑↓and ← buttons as described in the previous section;
- press ← until the cursor moves to the (I/O board address) field;
- using the ↑↓ keys, select the desired address for the controller. The only values selectable will be those of the controllers that are on the network. If the pLAN is not working correctly or if there is no controller present, the field cannot be changed and will simply display "—";
- pressing the ↵ key again will bring up the mask sequences here on the right
- here too, the ← key will move the cursor from field to field. The ↑↓keys will change the value of the current field. The P:xx field shows the address of the selected controller. In the example shown, No. 12 is selected;

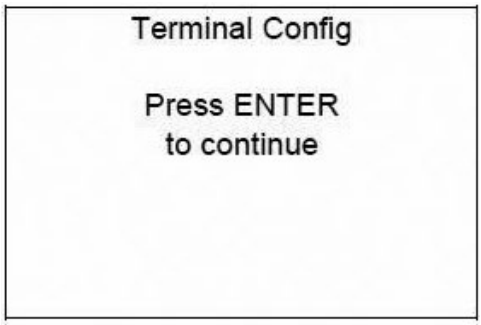
In the case of a shared display for a set of units (maximum 31), the terminal must be configured on each unit in "Sh" mode.

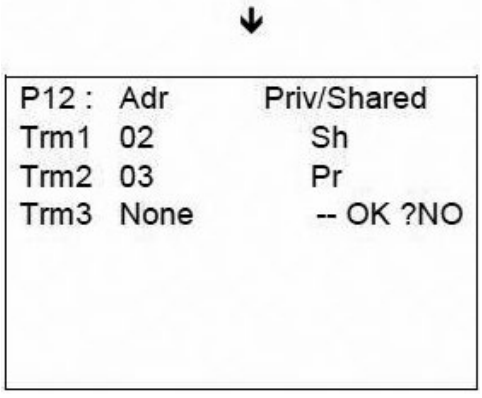
The fields in the "Adr" column contain the addresses of the terminals associated with the controller whose address is **12**; the "Priv/Shared" column shows the terminal type.

► **Shared = Sh= means that this terminal 02 may also be used with the other controllers present on the loop (shared terminal)**

► **Priv = Pr= means that this terminal 03 can only operate with this controller no.12 (private terminal)**
- to exit the configuration procedure and store the data, select "YES" in response to "OK?" and confirm with the ← key.

If the terminal remains inactive (no buttons pressed) for more than 30 seconds, it will automatically exit configuration mode without saving any changes made.



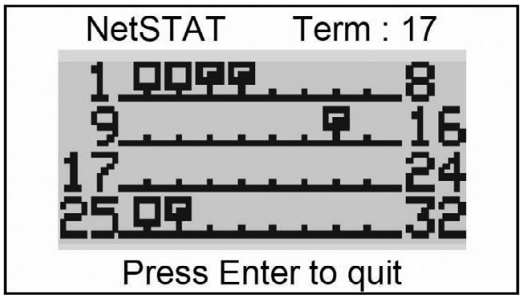


5.4.5 - Checking the pLAN address

The pLAN address is displayed at the top of the main screen, in the centre. It is also possible to access parameter P720 in the configuration parameters so that the controller address on the pLAN can be read.

When the system starts up, the pLAN may encounter a number of problems (board fault and terminal start-up) caused by incorrect connections or if an incorrect address has been assigned. The state of the pLAN can be displayed in real time on a special mask in order to identify which devices (controller or terminal) are correctly connected and addressed.

To display this special page, simultaneously press ↑↓and ← on any other network terminal for at least 10 seconds. After the first 5 seconds, a page is displayed; after 5 more seconds, the following page appears:



Controllers

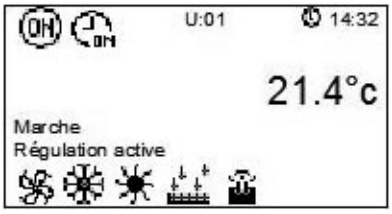
Terminals

Once on the screen, network addresses 1 to 32 are displayed. The small rectangles represent the terminals and the large rectangles , the controllers. If symbols appear then disappear, the pLAN may be unstable or, more likely, two components share the same address. The number after Term indicates the address of the terminal used. The example shows that the network is made up of 3 controllers with the addresses 1, 2, 25 and 4 terminals with the addresses 3, 4, 15 and 26. Once the page has been verified, turn off the power, check the connections and addresses, then power the system back on.

5.4.6 - Accessing the various controllers on a network from a shared HMI terminal

When a terminal is shared so that it can be used with several controllers, simultaneously press the ***Esc*** + ↓ keys to switch between controllers. The pLAN address for the controller is displayed on the "Machine status" screen, providing information on which control the HMI is connected to.

- For example, the screen below is the main screen for the board with the address 1:



6 - CONNECTING TO A CMS

The controller may be connected to a local or remote supervision PC or to most types of CMS (ModBus RTU, ModBus IP, Lonworks, KNX or BACnet IP).

Using KNX, LonWorks, ModBus IP or BACnet IP requires the installation of optional boards.

The ModBus, KNX, LON and BACnet communication tables are available separately.

NOTE:

If using a communication bus, the routing and processing of the available data are outside of our scope of supply. They must be provided by the installer, and require the involvement of an integrator.

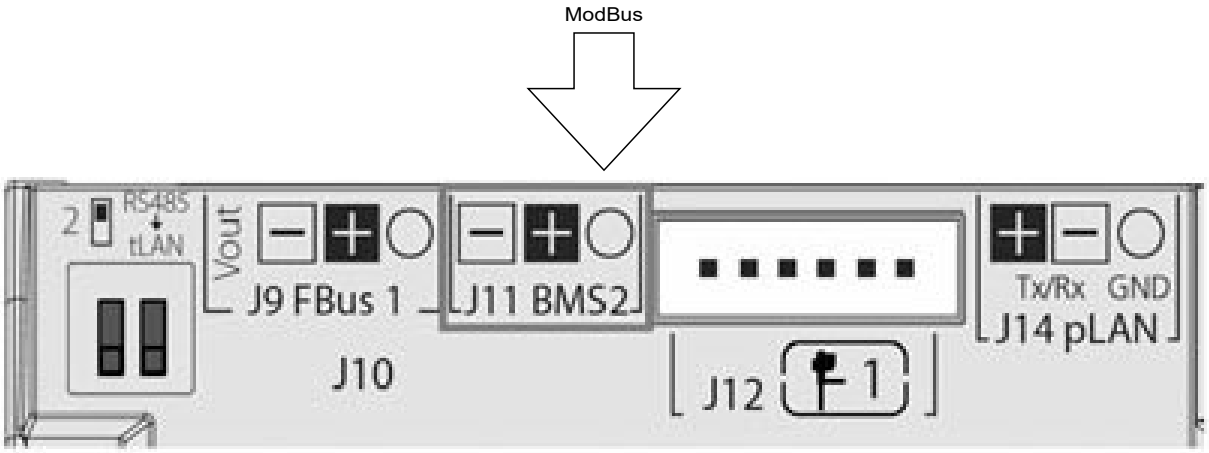
Parameter P716 indicates whether buses BMS1 and BMS2 are operating in read only mode (local control) or read/write mode (remote control).

716	Control type	0: local 1: Remote

6.1 - Modbus RTU

The controller has a built-in RS485 port and can automatically communicate via ModBus RTU. The controller is a ModBus slave on port J11-BMS2. Parameters P710 to P716 are used to configure this port.

710	Selection of the type of communication protocol used on the BMS2 port	1 : ModBus RTU
711	Selection of the transmission speed on the BMS2 port	0 : 1200 1 : 2400 2 : 4800 3 : 9600 4 : 19200
712	Parity on the BMS2 port	0: none 1 : even 2 : odd
713	Number of stop bits on the BMS2 port	
715	Selection of the controller address on the BMS2 bus	
716	Control type	0: Local 1: Remote



The cable must be a type AWG20/22/24 (Filotex FMA-2P, Belden ref 9842 / 9842NH 24AWG or equivalent) shielded cable**,** not included in our scope of supply, comprising a twisted pair and shielding, and must be no longer than 1000m. This network must never run parallel to power cables at a distance of less than 50 cm. These cables may cross, but perpendicularly. You are requested not to form a loop with the network cable or the earth braid, and to properly separate the various cable families (control, power, earth and communication bus).

A 120Ω ¼W electrical heater must be connected to the RS485 serial, in the last position on the bus.

The data format (16 bits, signed or Boolean) is standard for ModBus except for analogue data which is in the format "Integer multiplied by 10".

The codes for the ModBus functions used are:
- 1 or 2: Read several bits
- 3 or 4: Read several registers (16 bits)
- 5: Write one bit
- 6: Write one register (16 bits)
- 15: Write several bits
- 16: Write several registers (16 bits)

6.2 - ModBus TCP/IP

The use of ModBus TCP/IP requires an optional board and for P700 to be configured as ModBus TCP.

Configuring the board:

Switch off the controller and insert the optional board in the controller.
Press the button found on the board whilst switching the power to the controller back on.
The left-hand LED will start to flash rapidly.

Keep pressing the reset button.
The left-hand LED switches from green to red.
It then switches back to green after around 9 seconds.
Release the button when the LED switches back to red.

The board is now initialised to the address 172.16.0.1.

The PC must now be configured.

To do so, go into the start menu in the PC then Parameter>Network connection>Local network properties>Properties (TCP/IP).
Enter the IP address: 172.16.0.2.
Subnet mask: 255.255.0.0

Once these elements have been edited, connect a crossover network cable between the PC and the board.

Open Internet Explorer and enter 172.16.0.1 in the address bar

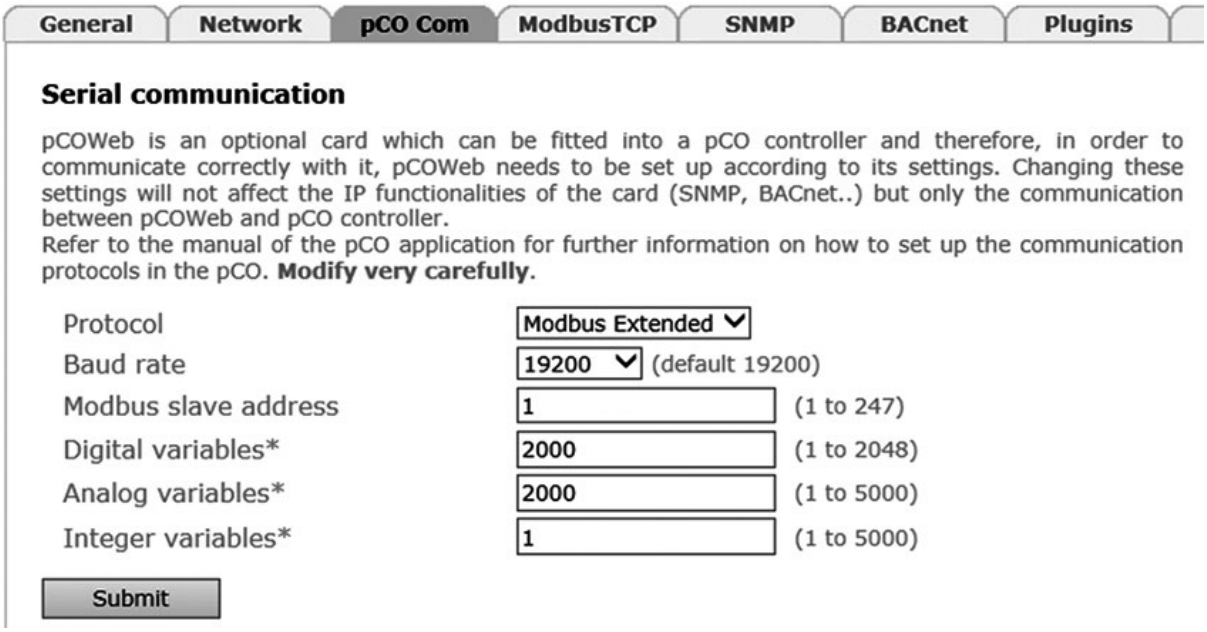
You will now be connected to the web server for the board.

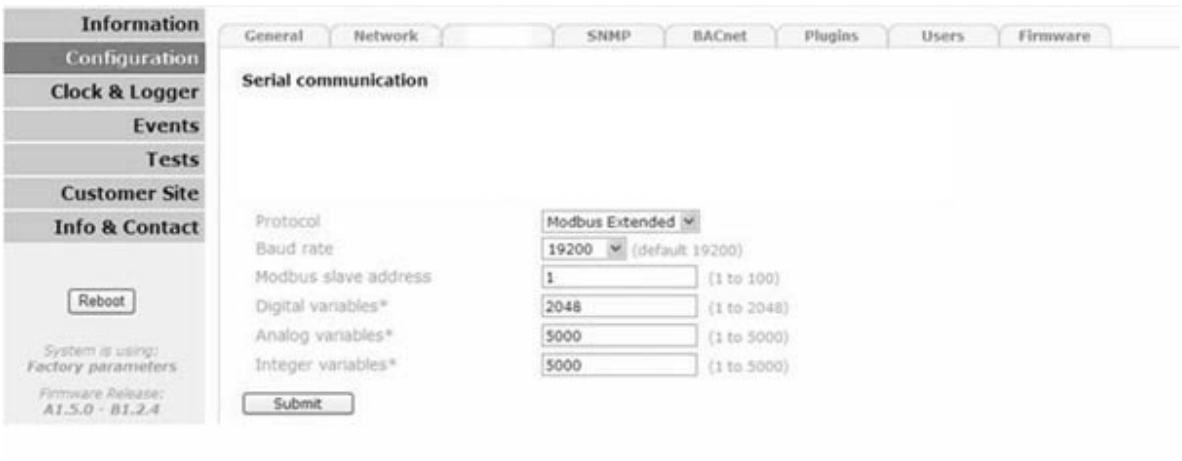
The login for access is **admin** and the password is **fadmin**

Click in the configuration menu for the board and select the Network tab.
Complete this page with the information for your local network.

Once complete, confirm the page, disconnect the computer, restart the controller and connect it to the network.

Connection via the ModBus TCP protocol requires the optional board to be configured as detailed below.





6.3 - BACnet IP

The use of BACnet IP requires an optional board and for P700 to be configured as BACNET IP.

Configuring the board:

Switch off the controller and insert the optional board in the controller.
Press the button found on the board whilst switching the power to the controller back on.
The left-hand LED will start to flash rapidly.

Keep pressing the reset button.
The left-hand LED switches from green to red. It then switches back to green after around 9 seconds. Release the button when the LED switches back to red.

The board is now initialised to the address 172.16.0.1.

The PC must now be configured.

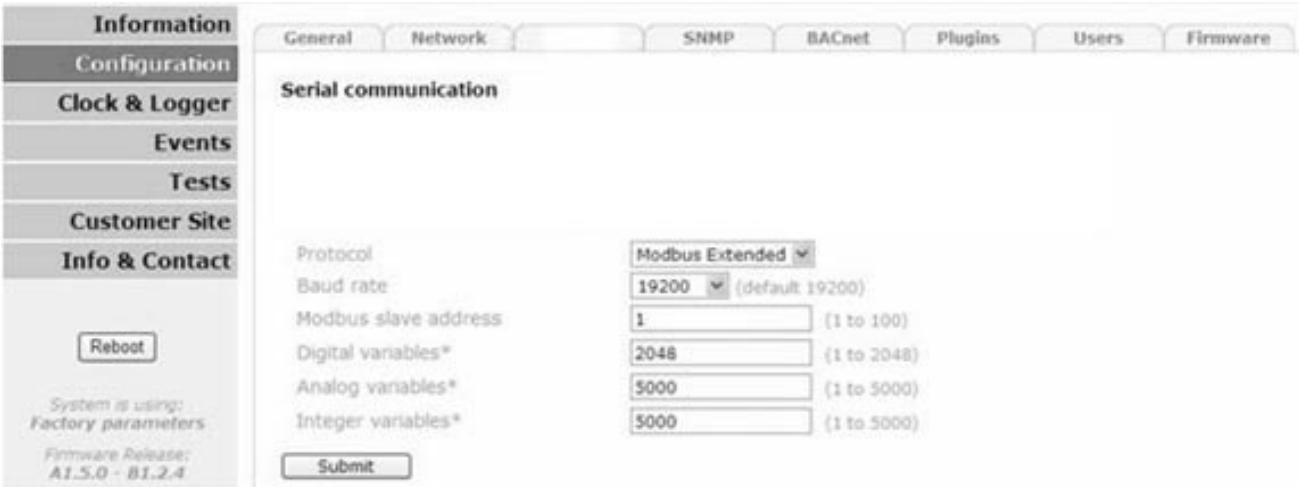
To do so, go into the start menu in the PC then Parameter>Network connection>Local network properties>Properties (TCP/IP).
Enter the IP address: 172.16.0.2.
Subnet mask: 255.255.0.0

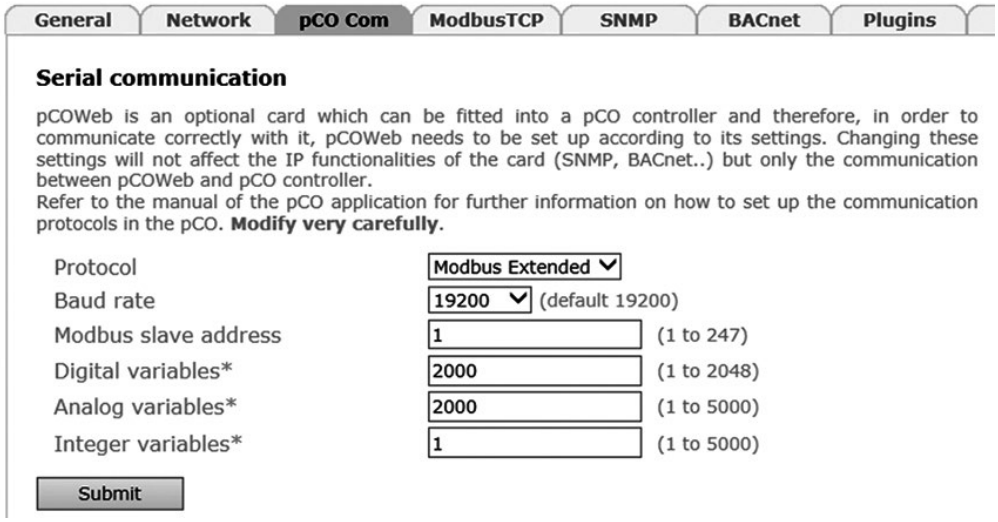
Once these elements have been edited, connect a crossover network cable between the PC and the board.
Open Internet Explorer and enter 172.16.0.1 in the address bar
You will now be connected to the web server for the board.

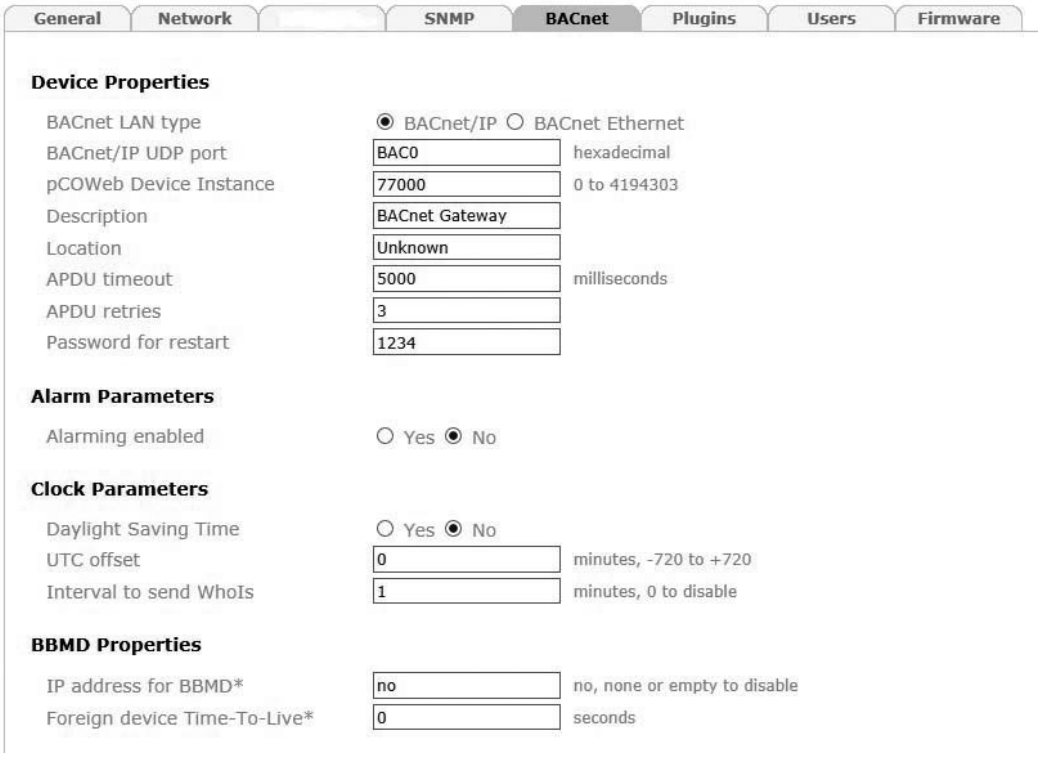
The login for access is **admin** and the password is **fadmin**

Click in the configuration menu for the board and select the Network tab.
Complete this page with the information for your local network.

Once complete, confirm the page, disconnect the computer, restart the controller and connect it to the network.
Connection via the BACnet protocol requires the optional board to be configured as detailed below.


Information
Configuration
Clock & Logger
Events
Tests
Customer Site
Info & Contact
Reboot
System is using:
Factory parameters
Firmware Release:
A1.5.0 - B1.2.4
General
Network
SNMP
BACnet
Plugins
Users
Firmware
Serial communication
Protocol
Modbus Extended
Baud rate
19200
(default 19200)
Modbus slave address
1
(1 to 100)
Digital variables*
2048
(1 to 2048)
Analog variables*
5000
(1 to 5000)
Integer variables*
5000
(1 to 5000)
Submit


General
Network
pCO Com
ModbusTCP
SNMP
BACnet
Plugins
Serial communication
pCOWeb is an optional card which can be fitted into a pCO controller and therefore, in order to communicate correctly with it, pCOWeb needs to be set up according to its settings. Changing these settings will not affect the IP functionalities of the card (SNMP, BACnet..) but only the communication between pCOWeb and pCO controller.
Refer to the manual of the pCO application for further information on how to set up the communication protocols in the pCO. Modify very carefully.
Protocol
Modbus Extended
Baud rate
19200
(default 19200)
Modbus slave address
1
(1 to 247)
Digital variables*
2000
(1 to 2048)
Analog variables*
2000
(1 to 5000)
Integer variables*
1
(1 to 5000)
Submit


General
Network
SNMP
BACnet
Plugins
Users
Firmware
Device Properties
BACnet LAN type
BACnet/IP
BACnet Ethernet
BACnet/IP UDP port
BAC0
hexadecimal
pCOWeb Device Instance
77000
0 to 4194303
Description
BACnet Gateway
Location
Unknown
APDU timeout
5000
milliseconds
APDU retries
3
Password for restart
1234
Alarm Parameters
Alarming enabled
Yes
No
Clock Parameters
Daylight Saving Time
Yes
No
UTC offset
0
minutes, -720 to +720
Interval to send WhoIs
1
minutes, 0 to disable
BBMD Properties
IP address for BBMD*
no
no, none or empty to disable
Foreign device Time-To-Live*
0
seconds

Service configuration

BACnet status	Enabled

Device Properties

BACnet LAN type	◉ BACnet/IP ○ BACnet Ethernet	
BACnet/IP UDP port	BAC0	hexadecimal
pCOWeb Device Instance	77000	0 to 4194303
Description	BACnet Gateway	
Location	Unknown	
APDU timeout	5000	milliseconds
APDU retries	3	
Password for restart	1234	

pCO Mapping Parameters

Mapped digital variables	2048	0 to 207 Carel, 0 to 2048 Modbus
Mapped analog variables	2048	0 to 207 Carel, 0 to 2048 Modbus
Mapped integer variables	0	0 to 207 Carel, 0 to 2048 Modbus

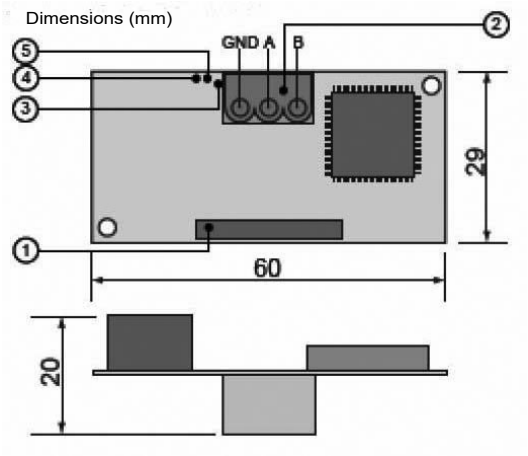
Submit

The PLC only manages Bacnet variables in digital format (Dxxx type address) and analogue format (Axxx type address)

6.4 - LON

Use of LON requires a board (type FTT-10 A), supplied pre-loaded by the manufacturer. It may be recharged on site if required using the nxe file available on request.

1. Connector for the controller
2. Withdrawable terminal for connecting the LonWorks® network (GND, A, B)
3. Service pin (create a temporary shunt between the 2 terminals to create a service PIN; disconnect this shunt after finishing the operation)
4. Green service LED: state of the node, lit during the pin service, flashing when the board receives a command from the network, if permanently lit = board faulty
5. Red fault LED: signals an installation issue (incorrect connection to the PLC) or communication configuration issue (check parameter P700)



To validate the LON communication protocol on the PLC, adjust the following values in the "Communication" menu on the user terminal:

- P700 = Protocol = LON
- P716 = Control type = Local for LON access to the read only datapoints (nvo)
  Remote for LON access to the read and write datapoints (nvi/nvo)

The manufacturer does not provide a system start-up, configuration, parameter setting or LonWorks network addressing service. The configuration of this type of network requires the creation of an LNS database. This database may only be used and managed by personnel trained in the use of LON configuration tools and their associated specifications. Refer to the recommendations issued by LonMark (www.lonmark.org) for more information on this matter.

To ensure the LonWorks network is correctly configured, each party must undertake to adhere to the following roles.

Task	Brand	Integrator	Installer
Supply of the loaded LON communication board	X		
Supply of the .XIF integration file	X		
Installation of units equipped with LON controller			X
Record of barcodes (NeuronID)		X*	X*
Creation of the LON database		X	
Addressing and configuration of LON network		X	
Definition of the bindings between LON controllers and with the BMS		X	
Definition of BMS setpoints and time schedules		X	

X* Method to be defined jointly by the integrator and installer.

Considering the central role of the integrator, it is essential that the latter is included in the project as early as possible so as to be able to anticipate and validate the BMS architectures, integration tools, etc.

► Configuration process

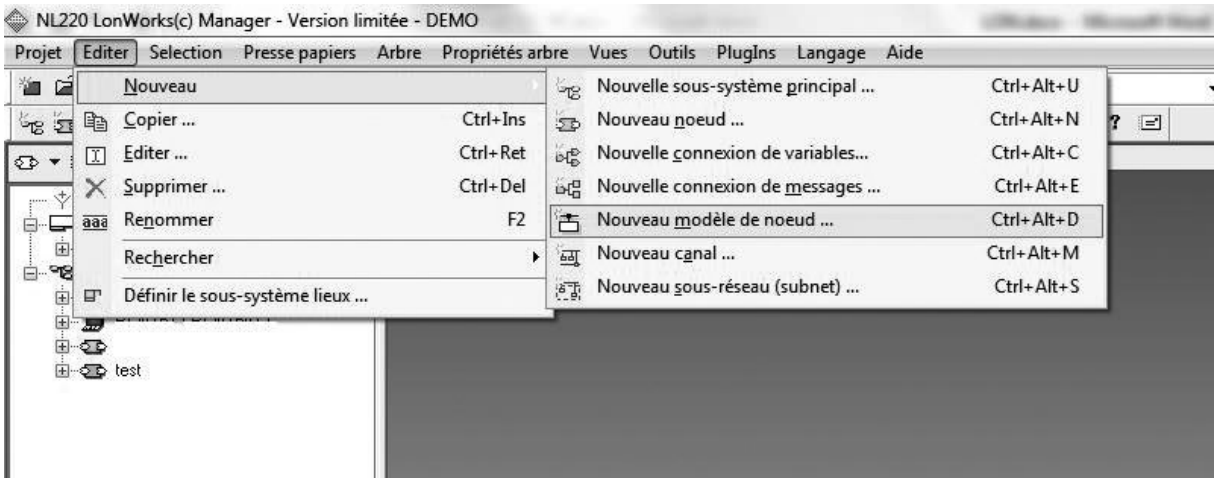
The creation of the LNS database requires the use of a LON configuration tool such as NL220, NLFacilities or LonMaker. This step is performed OFFline (i.e. whilst disconnected from the network) and consists of defining the list of controllers present, the configured parameters, the bindings, etc.

To facilitate this, the manufacturer provides an xif file describing the LON communication table for the supplied controller. This file enables the integrator to create the corresponding model in his/her LNS database. This can then be duplicated as many times as there are controllers present on the bus.

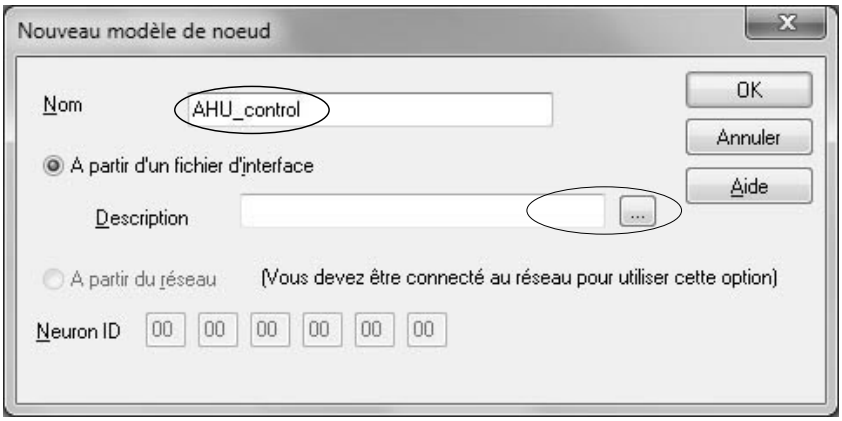
The air handling units do not require Resource Files other than the LonMarkResourceFiles1400 included as standard in all of the official LON tools.

Example of import of the xif file with NL220:

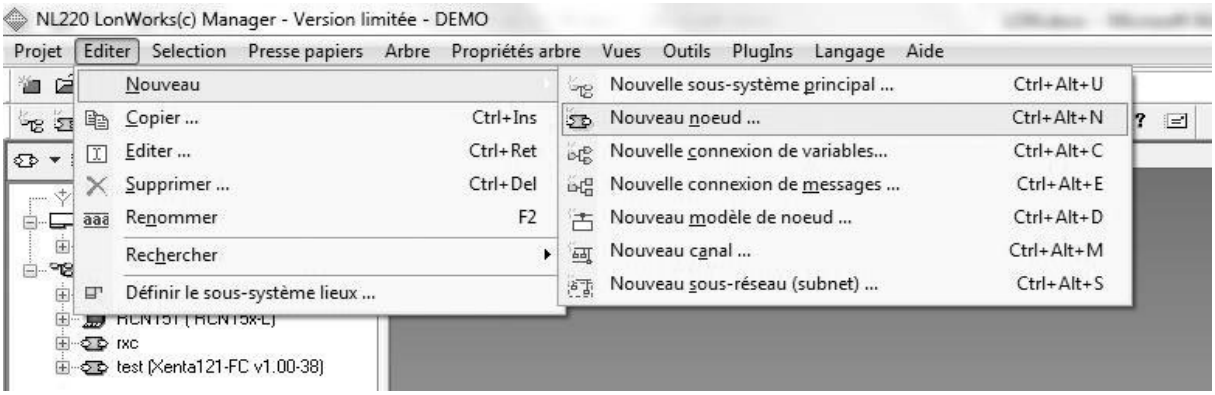
Once the project has been opened, create a new node model:

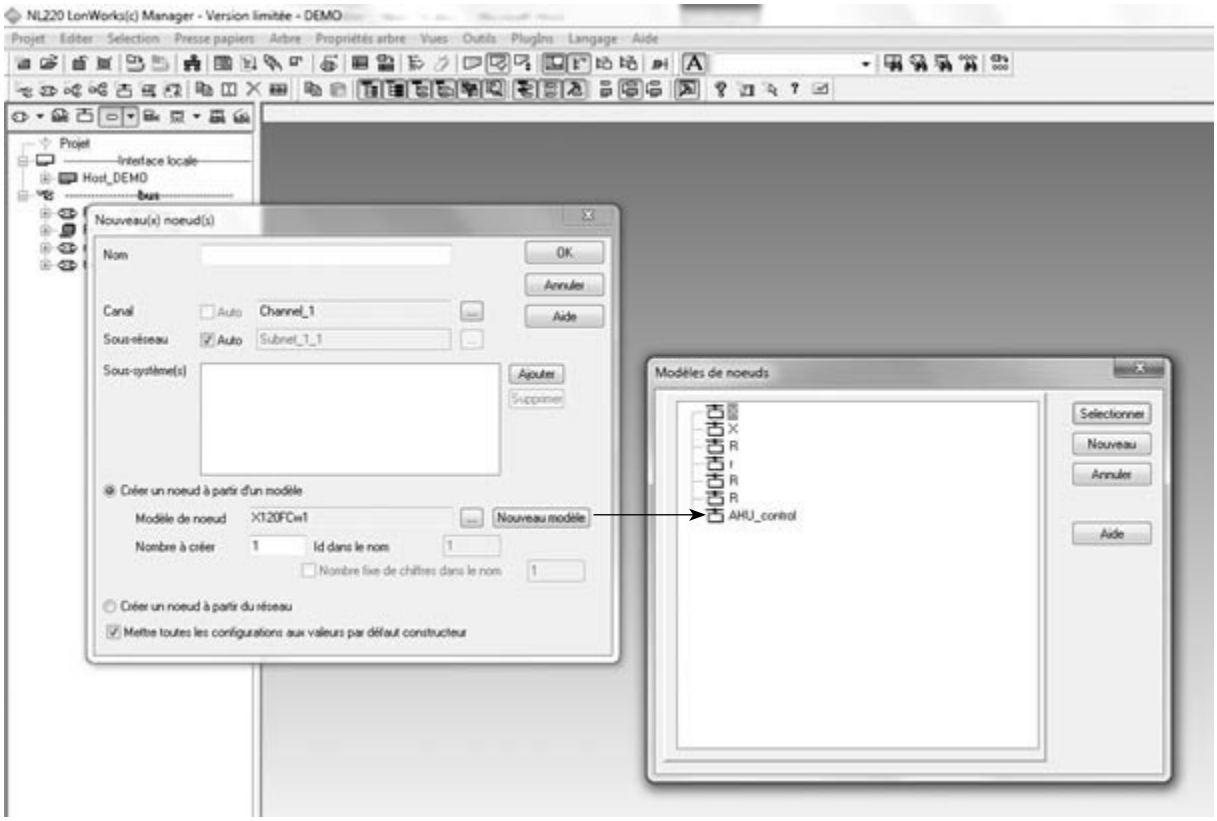


Give this model a name and, in the description box, select the xif provided using the " ... " key.



The air handling unit controller will now appear in the list of node models, which will enable as many controllers to be created in the database as there are controllers present on the network.



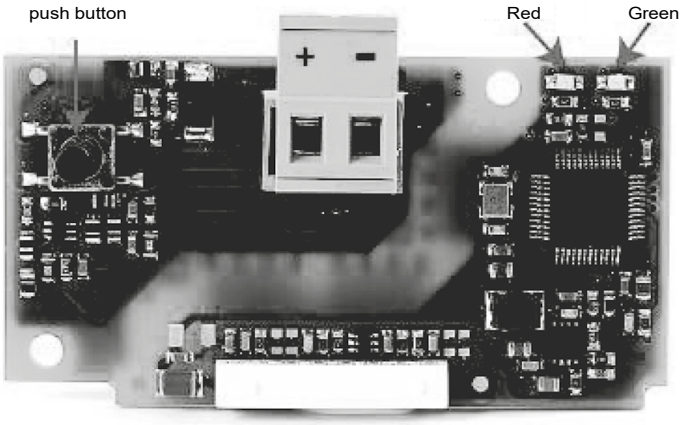


The rest of the configuration (creation of the bindings on the nvi/nvo type datapoints) is carried out normally, as it would be for any other LON product. Our PLC does not have any nci/SCPT/UCPT type datapoints. The configuration parameters are only accessible from the HMI terminal.

6.5 - KNX

The use of KNX requires an optional board. The board is factory assembled. If this is not the case, switch off the controller and insert the board in J13 (entitled BMS card or BMS1) on the controller.

The bus used is a TP1, with a transmission speed of 9600 Bds. This bus requires a specific external power supply.



LED		Meaning	Cause / solution
Red	Constantly lit	No communication between KNX board and the controller.	Check the configuration: - controller address incorrect - transmission speed incorrect - wrong protocol
	Flashing	Communication error between KNX card and the controller	The board has been configured with a version or address not recognised by the controller BIOS.
	Off	Communication with the controller is established	
Green	Constantly lit	The button has been pressed to allocate the address, and the board is awaiting the corresponding procedure from ETS	
	Rapidly flashing	The board has not been loaded	Perform configuration from ETS
	Slow flashing	Configuration in progress: ETS is loading the configuration	
Green + Red	Both constantly lit	No power supply on KNX bus	Check: KNX bus power supply (29 V DC), electrical connections and polarity of connections on the connector + and - terminals

To validate the KNX communication protocol on the PLC, adjust the following values in the "Communication" menu on the user terminal:

- P700 = Protocol = KNX
- P716 = Control type = Local for KNX access to the read only datapoints
  Remote for KNX access to the read and write datapoints

The manufacturer does not provide a system start-up, configuration, parameter setting or KNX network addressing service. The configuration of this type of network requires the creation of an ETS database. This database may only be used and managed by personnel trained and expert in the use of KNX configuration tools and their associated specifications. Refer to the recommendations issued by the KNX association (www.knx.org) for more information on this matter.

To ensure the KNX network is correctly configured, each party must undertake to adhere to the following roles.

Task	Brand	Integrator	Installer
Supply of the KNX communication board	X		
Supply of the KSet software, the plug-in and the xml integration file	X		
Installation of units equipped with KNX controller			X
Creation of the ETS database		X	
Addressing and configuration of the KNX network		X	
Definition of the links between KNX controllers and with the BMS		X	
Definition of BMS setpoints and time schedules		X	

Considering the central role of the integrator, it is essential that the latter is included in the project as early as possible so as to be able to anticipate and validate the BMS architectures, integration tools, etc.

Configuration process

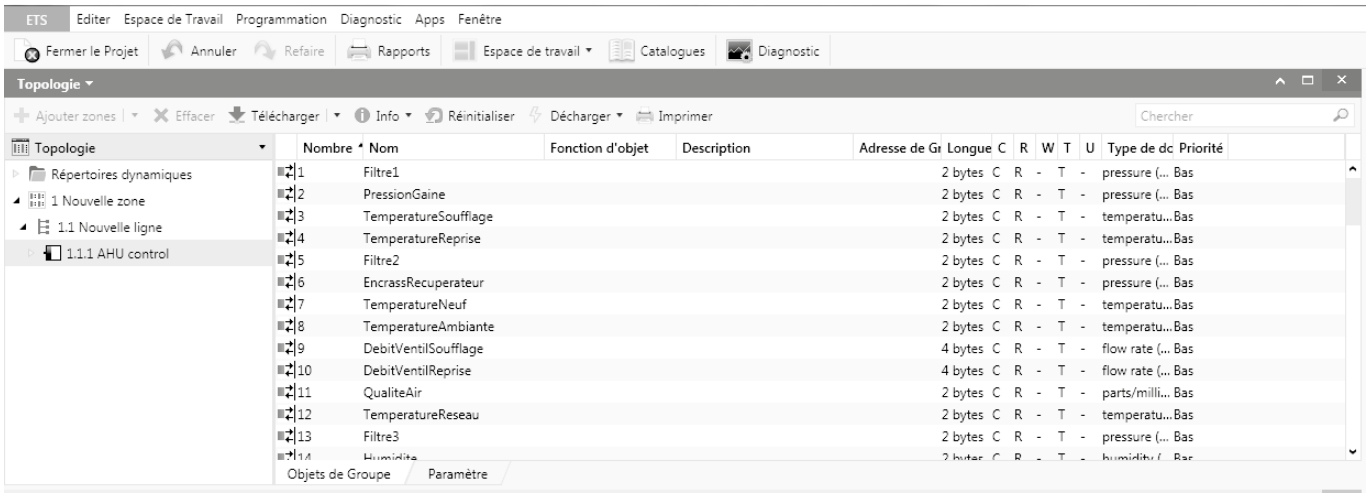
The first step of the configuration is performed OFFline (i.e. disconnected from the network). It consists of defining, within ETS, the list of products used in the project and of defining the group addresses (i.e. the data which will be exchanged between the KNX controllers). To do so, the manufacturer supplies a knxproj file (ETS compatible from version 5.6) describing the KNX communication table for the delivered controller. This file contains a preconfigured PLC model, which can be duplicated as many times as there are controllers on the bus.

The air handling unit program uses the KNX Datapoint types below:

Type Name	Standard ID	Format	KNX range
Boolean (DPT_Switch)	1.xxx	1 bit	Off /On
Unsigned 8 bits (DPT_Value_1_Ucount)	5.xxx	Unsigned 8 bits	0 to 255
Unsigned 16 bits (DPT_Value_2_Ucount)	7.xxx	Unsigned 16 bits	0 to 65535
16 bit floating (DPT_KNX_Float)	9.xxx	16 bit floating	-671 088,64 to +670 760,96
32 bits sign (DPT_Value_4_Count)	13.xxx	Signed 32 bits	-2 147 483 648 to +2 147 483 647

The air handling unit PLC comes as standard in the knxproj file with 2 tabs :

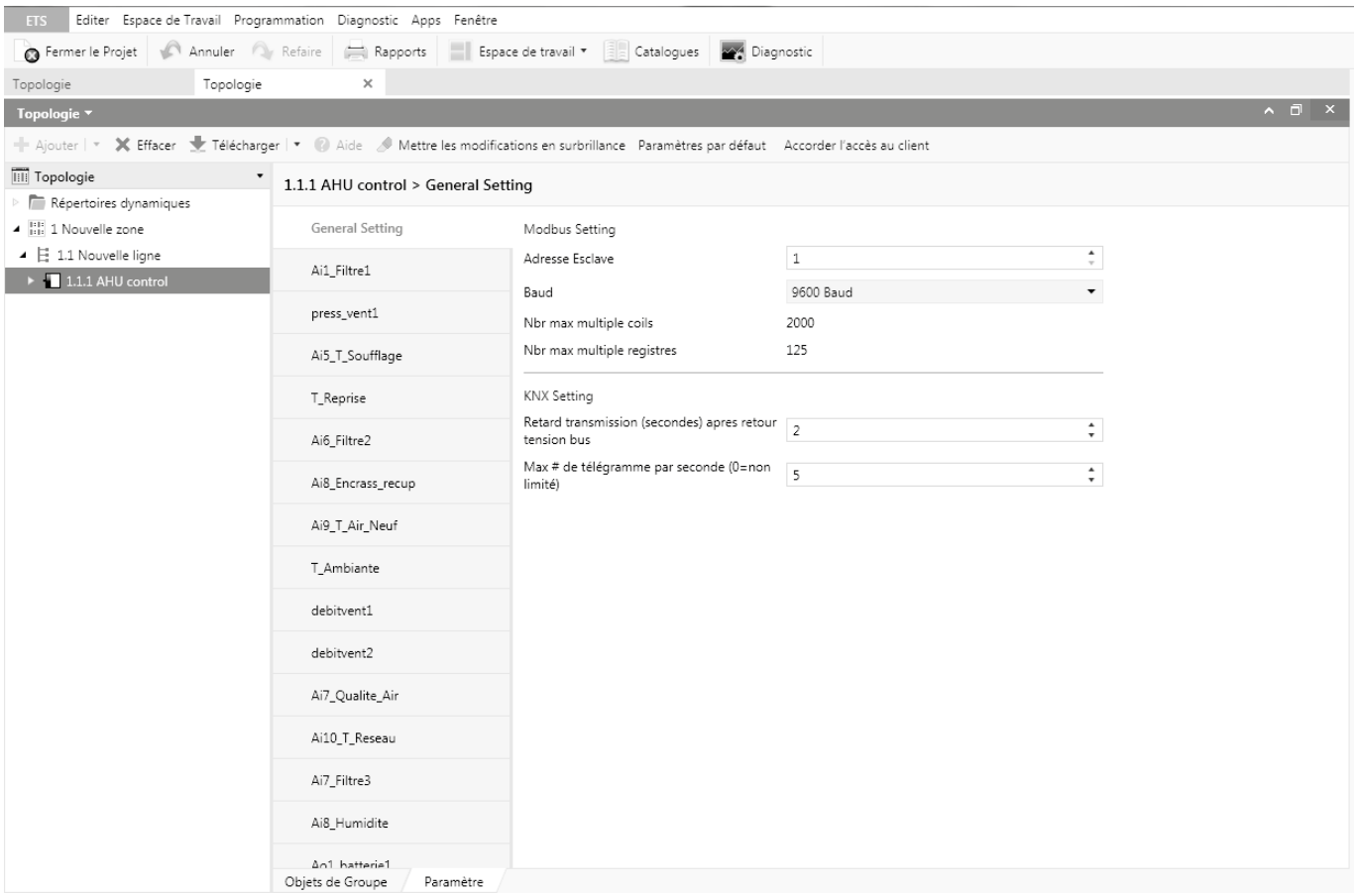
- The Group objects tab is used to select and address the desired KNX datapoints

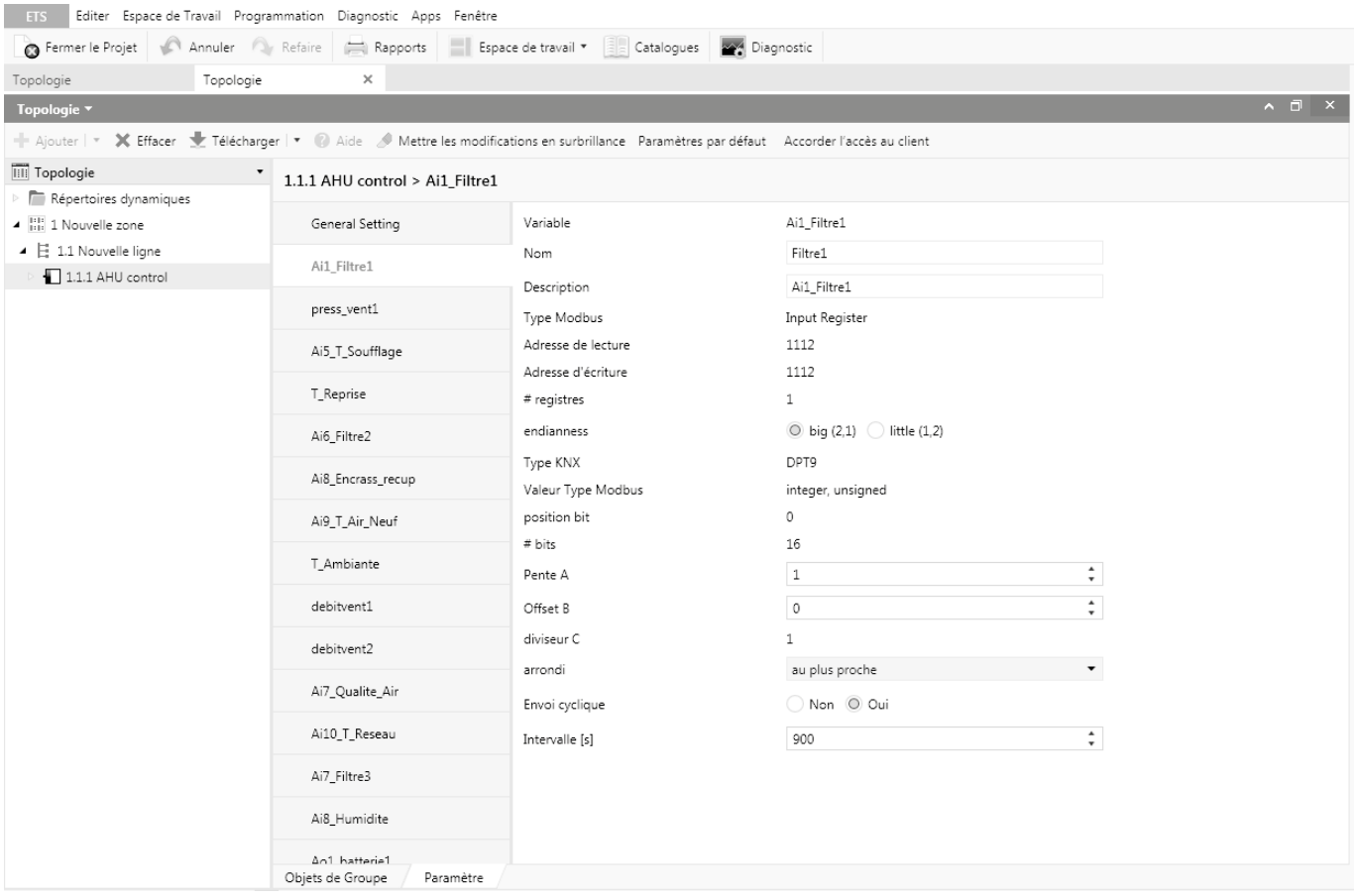


- The Parameter tab is used to adjust the variables emission frequencies in order to optimise the bus bandwidth. The others parameters have been preset, and must not be modified.

  None of the machine configuration parameters are available in KNX, they are only accessible from the air handling unit's HMI terminal.

6 - CONNECTING TO A CMS





The assignment of the individual address, and the loading of the addresses and parameters are carried out as normal for any other KNX product

7 - COMMISSIONING

7.1 - Actions required prior to commissioning

To perform system start-up on the air handling unit, it is necessary to check that the electric cabling complies with the diagram and with best industry practice. The air handling and hydraulic circuits must be compliant and in perfect working order.

Once these actions are complete, it is necessary to complete the "assembly completion notice" document and to return it to your regional office at least 15 days before the intended system start-up date.

No movement can take place until your office has received this document.

If commissioning should prove impossible due to a failure to comply with the instructions in the assembly completion notice, additional costs would be incurred at the applicable rate.

7.2 - Addressing

7.2.1 - Addressing the expansion board for electric heaters

The expansion board has been configured in the factory.

If you need to reconfigure the board (following replacement, for example), proceed as follows:

The configuration is performed in the "Machine parameters" menu, parameter P48. This launches a configuration wizard for the expansion board. It is necessary to have access to this board to be able to modify the dipswitches and to cut the power supply at the wizard's request

The configuration for the dipswitches, once the configuration is complete, is as follows:

Ext	Baud		Prot
1	2	3	4
OFF	OFF	OFF	OFF

Address			
1	2	3	4
ON	ON	OFF	OFF

7.2.2 - Inverter addressing

The inverter addressing is performed in the factory.

If you need to change the inverter address (following replacement, for example), proceed as follows:

Launch the start-up wizard. This starts up automatically as soon as the power is switched on.

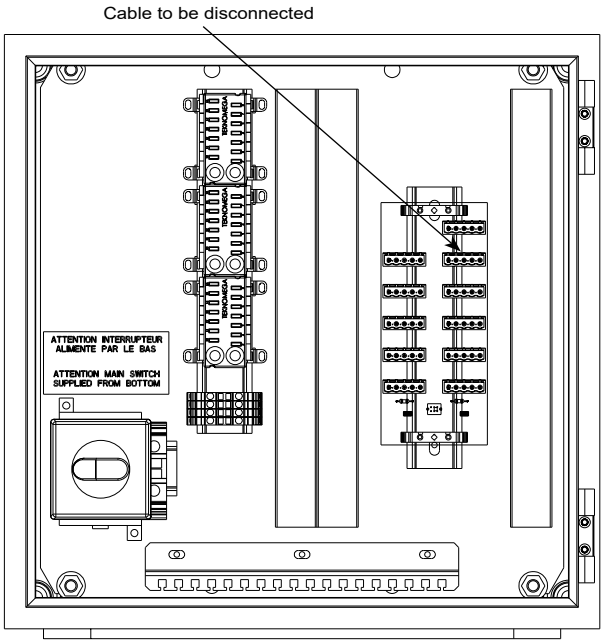
It is possible to restart the start-up wizard from the Primary settings menu/Recover presettings/Reset start-up wizard.

When the wizard requests, select the application "ModBus control", then indicate whether the inverter is located on the air intake fan or the extraction fan. The address will be automatically allocated.

Continue to execute the start-up wizard to enter the details on the motor name plate and check its direction of rotation. We cannot be held liable in the event of any issues caused by the fan rotating in the wrong direction.

After exiting the start-up wizard, check and/or alter parameters 1000 to 1015 and 2000 to 2015 on the control PLC. Check that the information on the name plate is correctly entered and that the min and max frequencies comply with the limits permitted by the motor and the plug fan: the minimum frequency must never be less than 20 Hz; refer to your order to determine the maximum frequency.

We cannot be held responsible in the event of any issues caused by a data entry error relating to the motor or by a failure to respect these recommendations.



7.2.3 - EC motor addressing

The EC motors have been allocated addresses in the factory.

If you need to change a motor address (following its replacement, for example), proceed as follows:

If you have several motors requiring addresses, this procedure must be performed on each motor in turn. Disconnect the ModBus connections for all the motors and reconnect just the motor in question.

In the machine parameters menu (warning: this operation requires level 3 access), select parameter P51 to P78 "addressing config" corresponding to the motor to be addressed.

If the motor does not have an address, or has an incorrect address, this parameter indicates "not performed". Confirm this parameter to launch the addressing wizard: the "Start ad", "Config" and "Status" rows will appear on part of the screen.

In the "Start ad" field, select the current motor address. For a motor which has never been addressed, select "Factory FMA"; otherwise, select FMA 1 to 8 depending on the current address of the motor. To find out the current address of the motor, disconnect the ModBus connections from all the other motors, and look for the motor which is still "online" in menus 17 and 19:

parameter P1231 for intake FMA1, P1251 for intake FMA2, P2231 for extraction FMA1, and so on.

Confirm the field "Start ad" and, in the "Config" field, select and confirm "requested" to start the automatic addressing procedure. The "State" field starts on "Awaiting start proc.", then automatically scrolls to indicate the configuration step in progress (awaiting connection, FMA stop, com. param. sent., reset FMA soft, awaiting restart). When the addressing procedure is complete, the "Status" field switches to "configuration OK" and the selected "addressing config." parameter (for example P51 for intake FMA1) switches to "complete."

If the configuration ends with the message "config failed", check:
- The motor's power supply
- The ModBus connection for the motor to be addressed
- The start address for the FMA
- Ensure that just one non-addressed motor is connected to the ModBus link
- Ensure that the final address has not already been allocated to another motor

Then restart the configuration.

Repeat this operation for each motor requiring addressing or re-addressing.

7.3 - Test mode

Test mode is a mode which enables the installer to individually test the PLC's different outputs.

In this mode, faults are no longer managed.

If the display is disconnected, the override is maintained and may result in damage to the equipment.

This menu can only be accessed in level 3.

WARNING!
ACTIVATION OF ALL OVERRIDES IS THE PROGRAMMER'S RESPONSIBILITY
NONE OF THE SAFETY DEVICES ARE OPERATIONAL

The unit stops automatically if test mode is confirmed (Override validation).

Select the unit to be changed by pressing the ↑ button or the ↓ button. Confirm with ↵

The cursor places itself below the override authorisation (free or overridden). Confirm with ↵

The cursor places itself under the override value. Display the new value by pressing the ↑ button or the ↓ button. Confirm with ↵.

The unit is now in "manual mode".

The overrides will be cancelled if the user does not confirm the override.

7.4 - Calibration

Menu 13 "Calibration" is used to correct a deviation between a read pressure or temperature value and a measured pressure or temperature value.

It is possible to add an offset of +- 5°K to the values read by the temperature sensors, an offset of +- 10% to the values read by the humidity sensors, and +- 100 ppm on the values read by the $_{CO2}$ sensor.

The pressure sensors are calibrated by a wizard: in the calibration menu, when the parameter corresponding to the sensor which requires calibration has switched to "yes" then the measured value is saved and used as the offset. The adjusted value then becomes 0.

To calibrate the pressure sensors, the unit must be stopped and the air flow must be zero. It is also possible to temporarily disconnect the connection tubing from the pressure sensor.

8 - FAULTS

When the PLC detects an issue, it triggers a fault.

8.1 - Type of faults

Faults may either be "maintenance" or "danger" type faults.

"Maintenance" faults are information provided to the user and signal that the unit is not operating correctly, but that this does not have any immediate consequences (a fouled filter, for example). These may be cleared once the issue has been resolved.

"Danger" faults are issues which prevent the unit from operating; the unit will shut down immediately (or after the fan delay). The issue must be resolved before the unit can be restarted. The faults may be cleared once the AHU has been shut down and the fault has disappeared.

"Maintenance" faults may be configured as "danger" faults using parameters P600 to P634. Conversely, for safety reasons, it is not possible to configure "danger" faults as "maintenance" faults.

8.2 - Fault relays

The PLC contains a "Maintenance" fault summary relay (contact N08) and a "Danger" fault summary relay (contact N07). These relays are 250 Vac / 6 A type relays.

The "maintenance" fault summary relay is triggered when at least one "maintenance" fault is present.

The "danger" fault summary relay is triggered when at least one "danger" fault is present.

Their direction of action can be configured (P880, P881).

8.3 - Fault memory

The PLC stores the last 100 faults and the date and time that each of these faults occurred. They can be found in menu 4 "fault memory". This memory cannot be cleared.

8.4 - List of faults

Below is the list of the different faults:

No.	Factory level	Designation of faults
1		Powered down
2	Danger	Fire protection
3	Danger	Isolation damper
4	Danger	Frost protection
8	Danger	Intake door contact
9	Danger	Air intake fan motor
10	Danger	Intake inverter
11	Danger	Intake FMA1 EC motor
12	Maintenance	Intake FMA2 EC motor
13	Maintenance	Intake FMA3 EC motor
14	Maintenance	Intake FMA4 EC motor
15	Maintenance	Intake FMA5 EC motor
16	Maintenance	Intake FMA6 EC motor
17	Maintenance	Intake FMA7 EC motor
18	Maintenance	Intake FMA8 EC motor
28	Danger	Extraction door contact
29	Danger	Extraction fan motor
30	Danger	Exhaust variable drive
31	Danger	Extraction FMA1 EC motor
32	Maintenance	Extraction FMA2 EC motor
33	Maintenance	Extraction FMA3 EC motor
34	Maintenance	Extraction FMA4 EC motor
35	Maintenance	Extraction FMA5 EC motor
36	Maintenance	Extraction FMA6 EC motor
37	Maintenance	Extraction FMA7 EC motor
38	Maintenance	Extraction FMA8 EC motor
48	Danger	Intake air flow low limit
49	Danger	Extraction air flow low limit
50	Danger	Intake airflow rate
51	Danger	Exhaust airflow rate
52	Maintenance	Air intake filter 1 fouled
53	Danger	Intake filter 1 blocked
54	Maintenance	Air intake filter 2 fouled
55	Danger	Intake filter 2 blocked
56	Maintenance	Air intake filter 3 fouled
57	Danger	Intake filter 3 blocked
58	Maintenance	Extraction filter 1 fouled
59	Danger	Extraction filter 1 blocked
60	Maintenance	Extraction filter 2 fouled
61	Danger	Extraction filter 2 blocked
65	Maintenance	Rotary heat exchanger
66	Maintenance	Heat recovery unit fouled
67	Maintenance	Heat recovery unit in frosting phase
68	Maintenance	Glycol/water mix heat recovery unit
69	Maintenance	Heat recovery unit
70	Maintenance	Electric heater automatic reset safety thermostat
71	Maintenance	Electric heater automatic reset safety thermostat
72	Maintenance	Loss of communication with the electric heater expansion board
73	Maintenance	DX unit
78	Maintenance	Exhaust duct pressure too low
79	Maintenance	Exhaust duct pressure too high

No.	Factory level	Designation of faults
80	Maintenance	Intake duct pressure too low
81	Maintenance	Intake duct pressure too high
82	Maintenance	Supply air temperature too low
83	Maintenance	Supply air temperature too high
84	Maintenance	Return temperature too low
85	Maintenance	Return temperature too high
86	Maintenance	Room temperature too low
87	Maintenance	Room temperature too high
88	Maintenance	Humidity too low
89	Maintenance	Humidity too high
90	Maintenance	Fresh air temperature sensor
91	Danger	Supply air temperature sensor
92	Danger	Return air temperature sensor
93	Danger	Room air temperature sensor
94	Maintenance	Network temperature sensor
100	Danger	Loss of communication with the intake inverter
101	Danger	Loss of communication with the intake FMA1
102	Maintenance	Loss of communication with the intake FMA2
103	Maintenance	Loss of communication with the intake FMA3
104	Maintenance	Loss of communication with the intake FMA4
105	Maintenance	Loss of communication with the intake FMA5
106	Maintenance	Loss of communication with the intake FMA6
107	Maintenance	Loss of communication with the extraction FMA7
108	Maintenance	Loss of communication with the extraction FMA8
120	Danger	Loss of communication with the inverter
121	Danger	Loss of communication with the extraction FMA1
122	Maintenance	Loss of communication with the extraction FMA2
123	Maintenance	Loss of communication with the extraction FMA3
124	Maintenance	Loss of communication with the extraction FMA4
125	Maintenance	Loss of communication with the extraction FMA5
126	Maintenance	Loss of communication with the extraction FMA6
127	Maintenance	Loss of communication with the extraction FMA7
128	Maintenance	Loss of communication with the extraction FMA8
150	Maintenance	Intake inverter warning
151	Maintenance	Intake FMA1 EC motor warning
152	Maintenance	Intake GMV2 EC motor warning
153	Maintenance	Intake GMV3 EC motor warning
154	Maintenance	Intake GMV4 EC motor warning
155	Maintenance	Intake GMV5 EC motor warning
156	Maintenance	Intake GMV6 EC motor warning
157	Maintenance	Intake GMV7 EC motor warning
158	Maintenance	Intake GMV8 EC motor warning
170	Maintenance	Exhaust inverter warning
171	Maintenance	Exhaust FMA1 EC motor warning
172	Maintenance	Exhaust GMV2 EC motor warning
173	Maintenance	Exhaust GMV3 EC motor warning
174	Maintenance	Exhaust GMV4 EC motor warning
175	Maintenance	Exhaust GMV5 EC motor warning
176	Maintenance	Exhaust GMV6 EC motor warning
177	Maintenance	Exhaust GMV7 EC motor warning
178	Maintenance	Exhaust GMV8 EC motor warning

8.5 - Diagnostics

Fault	Sources	Causes	Solutions
Powered down	The power supply has been cut	The circuit breaker has been triggered	Check the wiring and the components
		Voluntary stop	Empty
Fire protection	The "fire protection" contact has been triggered	Triggered by the fume detector or by the external fire contact managed by the operator	Check the condition of the contacts
Isolation damper	The damper end of travel time delay elapses before the end of travel contact is activated	The isolation damper does not open	Check the operation and the wiring of the isolation damper servomotor
		The end of travel contact does not detect opening of the damper	Check the end of travel operation and wiring
		The time delay is too short	Check that the opening time delay is equal to the time taken for the damper to open
Frost protection	The antifreeze thermostat for the hydraulic coils is activated	The air temperature at the outlet for the 1st hydraulic coil is too cold	Check the operation of the first coil: valve jammed, no flow, no hot water, etc.
Intake door contact	A door contact indicates that a door in the intake unit is open	A door is open	Close the door and check the condition of the contact
Intake inverter	The FMA inverter at the intake indicates a fault	Overvoltage, motor overload, motor power supply problem, etc.	Refer to the manual for the inverter drives and check the condition of the inverter and motor
Intake FMA 1 to 8 EC motor	The intake EC motor indicates a fault	Overvoltage, motor overload, motor power supply problem, etc.	Refer to the manual for the EC motors and check the condition of the motor
Extraction door contact	A door contact indicates that a door on the extraction unit is open	A door is open	Close the door and check the condition of the contact.
Exhaust variable drive	The FMA inverter at the extraction indicates a fault	Overvoltage, motor overload, motor power supply problem, etc.	Refer to the manual for the inverter drives and check the condition of the inverter and motor
Extraction FMA 1 to 8 EC motor	The extraction EC motor indicates a fault	Overvoltage, motor overload, motor power supply problem, etc.	Check the condition of the motor
Intake air flow low limit	The intake air flow rate is less than the set limit P111	The air passage is blocked	Check the pressure drops and ensure there are no foreign bodies in the ducts and the unit
		The pressure measurement sensor is defective	Check the operation of the sensor
		Constant pressure control: the pressure drops in the network are too great	Check the opening/closing of the duct network dampers
Extraction air flow low limit	The air flow at the extraction is less than the set limit of P111	The air passage is blocked	Check the pressure drops and ensure there are no foreign bodies in the ducts and the unit
		The pressure measurement sensor is defective	Check the operation of the sensor
Intake airflow rate	The pressure measured by the intake FMA sensor is below the set threshold P136	No air flow is detected at the intake	Check the operation of the intake FMAs
		The air passage is blocked	Check the pressure drops and ensure there are no foreign bodies in the ducts and the unit
		The pressure measurement sensor is defective	Check the operation of the sensor
Exhaust airflow rate	The pressure measured by the exhaust FMA sensor is below the set threshold P137	No air flow is detected at the extraction	Check the operation of the extraction FMAs.
		The air passage is blocked	Check the pressure drops and ensure there are no foreign bodies in the ducts and the unit
		The pressure measurement sensor is defective	Check the operation of the sensor
Air intake filter 1 fouled	The pressure drop in the filter is greater than the "filter fouled" threshold	The filter is dirty	Schedule replacement of the filter before it becomes clogged
Air intake filter 2 fouled			
Air intake filter 3 fouled			
Extraction filter 1 fouled			
Extraction filter 2 fouled			
Intake filter 1 blocked	The filter pressure drop is greater than the "filter blocked" threshold	The filter is blocked	Replace the filter
Intake filter 2 blocked			
Intake filter 3 blocked			
Extraction filter 1 blocked			
Extraction filter 2 blocked			
Rotary heat exchanger	The rotary heat recovery unit indicates a fault	The heat recovery unit controller has detected a fault	Check the operation of the heat recovery unit and the condition of the belt
Heat recovery unit fouled	The pressure drop measurement for the heat recovery unit is greater than the threshold P220	Operating problem with the differential pressure sensor	Check the operation of the sensor
		The heat recovery unit is clogged	Clean the heat recovery unit
		The heat recovery unit is frozen	Wait for the heat recovery unit to be defrosted

Fault	Sources	Causes	Solutions
Heat recovery unit in frosting phase	The plate heat recovery unit is clogged and the bypass is fully open	The heat recovery unit is probably frozen	Wait for the heat recovery unit to be defrosted
Glycol/water mix heat recovery unit	The operating contact for the accelerator pump indicates a fault	Overvoltage, overload, accelerator pump power supply problem, etc.	Check the operation and wiring of the accelerator pump
Humidifier	The humidifier indicates a fault	The humidifier controller has indicated a fault	Refer to the humidifier manual and check the operation of the humidifier
Electric heater automatic safety thermostat	The automatic-reset thermostat for the electric heaters has been triggered	The temperature in the electric heater is greater than the thermostat limit (80 °C)	Check that the air flow is sufficient and check the condition of the switches and the electric heater
Electric heater manual safety thermostat	The manual-reset thermostat for the electric heaters has been triggered	The temperature in the electric heater is greater than the thermostat limit (115 °C)	Check that the air flow is sufficient and check the condition of the switches and the electric heater
Loss of communication with the electric heater expansion board	The expansion board controlling the electric heater has stopped communicating	The wiring between the PLC and the expansion board is damaged	Check the wiring between the PLC and the expansion board
		Communication with the expansion board has not been configured	Check parameter P48
		The expansion board is defective	Replace the expansion board
DX unit	The DX unit indicates a fault	The DX unit controller has detected a fault	Refer to the DX unit manual and check that the DX unit is operating correctly
Intake duct pressure too low	The intake duct pressure is below the fixed limit P124	Operating problem with the air intake pressure sensor	Check the operation of the sensor
		Operating problem with the FMAs	Check the maximum frequency of the inverter/motor and check that the motor turns correctly
Intake duct pressure too high	The intake duct pressure is above the fixed limit P125	Operating problem with the air intake pressure sensor	Check the operation of the sensor
		Operating problem with the FMAs	Check the minimum frequency of the inverter/motor
Exhaust duct pressure too low	The exhaust duct pressure is below the fixed limit P298	Operating problem with the air exhaust pressure sensor	Check the operation of the sensor
		Operating problem with the FMAs	Check the maximum frequency of the inverter/motor and check that the motor turns correctly
Exhaust duct pressure too high	The exhaust duct pressure is above the fixed limit P299	Operating problem with the air exhaust pressure sensor	Check the operation of the sensor
		Operating problem with the FMAs	Check the minimum frequency of the inverter/motor
Supply air temperature too low	The supply air temperature is below the fixed limit P240	Operating problem with the supply air temperature sensor	Check the operation of the sensor
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
Supply air temperature too high	The supply air temperature is below above the fixed limit P241	Operating problem with the supply air temperature sensor	Check the operation of the sensor
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
Return temperature too low	The return air temperature is below the fixed limit P242	Operating problem with the return air temperature sensor	Check the operation of the sensor
		Supply air temperature limits incorrectly configured	Check the configuration
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
Return temperature too high	The return air temperature is above the fixed limit P243	Operating problem with the return air temperature sensor	Check the operation of the sensor
		Supply air temperature limits incorrectly configured	Check the configuration
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.

Fault	Sources	Causes	Solutions
Room temperature too low	The room temperature is below the fixed limit P244	Operating problem with the room temperature sensor	Check the operation of the sensor
		Supply air temperature limits incorrectly configured	Check the configuration
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
Room temperature too high	The room temperature is above the fixed limit P245	Operating problem with the room temperature sensor	Check the operation of the sensor
		Supply air temperature limits incorrectly configured	Check the configuration
		Operating problem with the heating elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
		Operating problem with the cooling elements	Check the operation of the valves, heat recovery unit, mixing box, etc.
Humidity too low	The measured humidity is below the fixed limit P246	The humidifier does not function correctly	Check the condition of the humidifier
		Dehumidification does not function correctly	Ensure that the cooling coil valve is not jammed
		The humidity sensor is not working correctly	Check the condition of the humidity sensor
Humidity too high	The measured humidity is above the fixed limit P247	Dehumidification does not function correctly	Ensure that the cooling coil valve is not jammed
		The humidifier does not function correctly	Check the condition of the humidifier
		The humidity sensor is not working correctly	Check the condition of the humidity sensor
Temperature sensor	Temperature measurement <-50° C or >90° C	Temperature sensor open circuit or short-circuit	Check the sensor wiring or replace the sensor
Loss of communication with the intake inverter	The inverter for the intake FMA has stopped communicating with the PLC	The wiring between the PLC and the inverter is damaged	Check the wiring between the PLC and the inverter
		Communication with the PLC has not been configured	Check the inverter configuration
Loss of communication with intake FMAs 1 to 8	The FMA no longer communicates with the PLC	The wiring between the PLC and the EC motor is damaged	Check the wiring between the PLC and the EC motor
		Communication with the PLC has not been configured	Check parameters P51 to P58
Loss of communication with the extraction inverter	The inverter for the extraction FMA has stopped communicating with the PLC	The wiring between the PLC and the inverter is damaged	Check the wiring between the PLC and the inverter
		Communication with the PLC has not been configured	Check the inverter configuration
Loss of communication with extraction FMAs 1 to 8	The FMA no longer communicates with the PLC	The wiring between the PLC and the EC motor is damaged	Check the wiring between the PLC and the EC motor
		Communication with the PLC has not been configured	Check parameters P71 to P78
Intake inverter warning	Non-critical problem on the inverter. Motor still running	High temperature, current or power near the limit, …	If the warning appears too frequently, contact the manufacturer
Exhaust inverter warning			
Intake FMA 1 to 8 EC motor warning	Non-critical problem on the EC motor. Motor still running	High temperature, current or power near the limit, …	If the warning appears too frequently, contact the manufacturer
Exhaust FMA 1 to 8 EC motor warning			

9 - PARAMETERS

Below is the list of parameters which can be adjusted by the user (level 1 access - no password required), the installer (level 2 access), or the manufacturer (access level 3). The level 2 password can be requested from your technical support. Some parameters are not always visible and depend on the machine's configuration.

9.1 - Machine parameters

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
2	Air intake fan	1 : On/Off control 2 : Inverter ModBus 3 : EC ModBus	1		3
3	Number of intake EC fans		1	P02 Air intake fan = EC ModBus	3
4	Characteristics of the pressure sensor for the air intake fan	0: None	1	P02 Air intake fan = Inverter ModBus	3
		1 : 0-1000 Pa 10 V 2 : 0-2500 Pa 10 V 3 : 0-5000 Pa 10 V		P02 Air intake fan = Inverter ModBus or EC ModBus	
5	Coefficient value K for the intake fan	See values at the end of the table	31	(P02 Air intake fan = Inverter ModBus and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or P02 Air intake fan = EC ModBus	3
6	Air intake fan door contact	0: None 1: With	0		3
7	Specifications for the air intake duct pressure sensor	0: None 1: 0-1000 Pa 0-10 V 2: 0-2500 Pa 0-10 V	0	P02 Air intake fan = Inverter ModBus or EC ModBus	3
10	Air extraction fan	0: None	0		3
		1 : On/Off control		P02 Air intake fan = On/Off control	
		2 : Inverter ModBus 3 : EC ModBus		P02 Air intake fan = inverter ModBus or EC ModBus	
11	Number of EC air extraction fans		1	P10 Extraction fan = EC ModBus	3
12	Characteristics of the pressure sensor for the air extraction fan	0: None	1	P04 = None	3
		1 : 0-1000 Pa 10 V 2 : 0-2500 Pa 10 V 3 : 0-5000 Pa 10 V		P10 Extraction fan = inverter ModBus or EC ModBus and P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa	
13	Coefficient value K for the exhaust fan	See values at the end of the table	31	(P10 Extraction fan = inverter ModBus and (P12 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or EC ModBus	3
14	Air extraction fan door contact	0: None 1: With	0	P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus	3
15	Specifications for the air exhaust duct pressure sensor	0: None 1: 0-1000 Pa 0-10 V 2: 0-2500 Pa 0-10 V	0	P07 = 0-1000 Pa 0-10 V or 0-2500 Pa 0-10 V And P10 Air extraction fan = Inverter ModBus or EC ModBus	3
20	Number of intake filtration stage(s)	1 to 3 filters	1		3
21	Number of extraction filter(s)	1 to 2 filters	0	P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus	3
22	FMA extraction differential pressure sensor	0: None 1: With	0	(P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus) and P21 Number of extraction filters = 0	3
24	Fire detection	0: None 1: With	0		3
25	Antifreeze thermostat	0: None 1: With	0		3
26	Isolation damper	0: None 1: With	0		3
27	Mixing damper	0: None 1: With	0		3

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
28	Coil no. 1	0 : None 1 : Cold water 2 : Pre-heating water 3 : Hot water 4 : Mixed (water) 5 : DX unit	0		3
29	Coil no. 2	0 : None 1 : Cold water 2 : Hot water 3 : Post-heating water 4 : DX unit	0		3
		5 : Mixed (water)		P28 Coil no. 1 ≠ Mixed (water)	
30	Coil no. 3	0 : None 1 : Cold water 2 : Post-heating water	0		3
		3 : DX unit		P28 Coil no. 1 ≠ DX unit or P29 Coil no. 2 ≠ DX unit	
		4 : Mixed (water)		P28 Coil no. 1 ≠ Mixed (water) and P29 Coil no. 2 ≠ Mixed (water)	
32	Electric heater	1 On/Off stage 2: 2 On/Off stages 3: 3 On/Off stages 4: 4 On/Off stages 5: 1 gradual stage 6: 1 gradual stage and 1 On/Off stage 7: 1 gradual stage and 2 On/Off stages 8: 1 gradual stage and 3 On/Off stages	0		3
33	Electric heater function	0: Heating 1: Post-heating	0	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
35	DX unit	0: None 1: Cooling 2: Heating 3: Reversible	0	P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	3
36	Heat recovery unit	0: None 1: Plate 2: Fixed speed wheel 3: Gradual speed wheel 4 : Glycol/water mix 5: Partial fixed speed wheel	0	P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus	3
37	Differential pressure sensor on the heat recovery unit	0: None 1: With	0	P15 air exhaust duct pressure sensor = none and P36 Heat recovery unit = Plate or Gradual speed wheel or Fixed speed wheel or Glycol/water mix or Partial fixed speed wheel	3
38	Dehumidification control	0: None 1: With	0	P28 Coil no. 1 = Cold water or mixed (water) or P29 Coil no.2 = Cold water or mixed (water) or P30 Coil no.3 = Cold water or mixed (water) or (P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit and P35 DX unit = cooling or reversible)	2
39	Air intake humidifier	0: None 1: Steam 2: Drip	0	P40 Return humidifier = None and P35 DX unit = None	3
40	Return humidifier	0: None 1: Drip (65%) 2: Drip (85%)	0	P27 Mixing damper = None and P35 DX unit = None and P39 Air intake humidifier = None and (P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus) and (P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or Fixed speed partial heat recovery unit)	3

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
42	Presence of temperature sensors for calculating the heat recovery unit energy efficiency	0: None 1: With	0	P36 Heat recovery unit = Plate or Gradual speed or Fixed speed	3
48	Electric heater expansion configuration	0: Not completed 1: Completed	0	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
51	Air intake FMA1 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus	3
52	Air intake FMA2 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 1	3
53	Air intake FMA3 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 2	3
54	Air intake FMA4 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 3	3
55	Air intake FMA5 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 4	3
56	Air intake FMA6 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 5	3
57	Air intake FMA7 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 6	3
58	Air intake FMA8 configuration	0: Not completed 1: Completed	0	P02 Air intake fan = EC ModBus and P03 Number of intake EC fans > 7	3
71	Air extraction FMA1 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus	3
72	Air extraction FMA2 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 1	3
73	Air extraction FMA3 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 2	3
74	Air extraction FMA4 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 3	3
75	Air extraction FMA5 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 4	3
76	Air extraction FMA6 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 5	3
77	Air extraction FMA7 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 6	3
78	Air extraction FMA8 configuration	0: Not completed 1: Completed	0	P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans > 7	3
90	Humidity sensor 0-10 V value at 0 V	Can be adjusted from 0 to 20%	0%	P38 Dehumidification control = with or P39 Air intake humidifier = steam or drip type	3
91	Humidity sensor 0-10 V value at 10 V	Can be adjusted from 80 to 100%	100%	P38 Dehumidification control = with or P39 Air intake humidifier = steam or drip type	3
99	Configuration locked	0: unlocked 1: locked	0		3

K coefficients for the plug fans controlled by the frequency inverter

Wheel Ø	200	225	250	280	315	355	400	450	500	560	630	710
NPL	31	40	49	60	74	100	139	178	218	268	349	455
NPA	-	-	64	80	101	134	173	192	259	329	413	558

K coefficients for the EC fan motor assemblies

Fan type	K coefficient
GR31C-ZID.DC.1R	95
GR35C-ZID.DC.1R	121
GR40C-ZID.GG.1R	154
GR45C-ZID.GG.1R	197
GR50C-ZID.GL.1R	252
GR56C-ZID.GL.1R	308

9.2 - Setting parameters

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
100	Language	0: French 1: English 2: German 3: Spanish 4: Italian 5: Dutch	0	5	1	0			1
102	Date	DD/MM/YYYY							1
103	Time	HH/MM							1
104	Air intake ventilation control	0: None	0	0	1	0		P02 Air intake fan = On/Off control	2
		1: Flow rate						(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or (P02 Air intake fan = EC ModBus	
		2: Duct pressure	0	2	1	0		P02 Air intake fan = inverter ModBus or EC ModBus and P07 Air intake duct pressure sensor = 0-1000 Pa 10 V or 0-2500 Pa 10 V	
		3: Flow rate on external signal (0-10 V)	0	3	1	0		((P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or (P02 Air intake fan = EC ModBus))	
105	Air extraction ventilation control	0: Copy of the air intake fan control	0	2	1	0		P10 Extraction fan = inverter ModBus or EC ModBus and P104 Extraction ventilation control = Duct pressure	2
		1 : Copy of the air intake fan flow rate						((P10 Extraction fan = inverter ModBus and (P12 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or P10 Extraction fan = EC ModBus) and P104 Extraction ventilation control = Duct pressure	
		2: Duct pressure						P10 Extraction fan = Inverter ModBus or EC ModBus and P15 Air exhaust duct pressure s ensor = 1000 Pa or 2500 Pa and P104 Extraction ventilation control = Duct pressure	

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
106	Multiplication factor value of the signal sent by the air extraction fan with pressure control in the supply air duct		0,5	1,5	0,1	1		P10 Extraction fan = inverter ModBus or EC ModBus and P104 Air intake ventilation control = Duct pressure and P105 Extraction ventilation control = Copy of the intake ventilation control or Copy of the air intake fan flow rate	2
108	Damper opening time delay		0	999	1	180	s	P26 Isolation damper = With	2
110	AHU max flow rate		0	150000	10	10000	m³/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or EC ModBus	3
111	AHU flow rate low limit threshold		0	100000	5	50% of P110	m³/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or P02 Air intake fan = EC ModBus	3
112	Air intake fan flow rate setpoint 1		P111	P110	10	10000	m³/h	P104 Air intake ventilation control = Flow rate or flow rate on external signal	1
113	Air intake fan flow rate setpoint 2		P111	P110	10	10000	m³/h	(P104 Air intake ventilation control = Flow rate and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = Ventilation or temperature + ventilation) or P104 Air intake ventilation control = Flow rate on external signal	1
114	Air intake fan flow control PID proportional band (P)		0	30000	1	6000	m³/h	P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
115	Air intake fan flow rate control PID integral time (I)		0	2000	1	150	s	P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
116	Air intake fan flow rate control PID derivative time (D)		0	2000	1	0	s	P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
118	Intake duct pressure setpoint 1		20	1500	1	200	Pa	P104 Air intake ventilation control = Duct pressure	1
119	Air intake duct pressure setpoint 2		20	1500	1	100	Pa	P104 Air intake ventilation control = Duct pressure and P160 Setpoint 1/setpoint2 selection = time sched./CMS or on-off input only, or on-off input override and P161 Application of the setpoint 1/setpoint2 selection = ventilation or temperature + ventilation	1
120	Air intake duct pressure control PID proportional band (P)		0	2000	1	50	Pa	P104 Air intake ventilation control = Duct pressure	2
121	Air intake duct pressure control PID integral time (I)		0	2000	1	4	s	P104 Air intake ventilation control = Duct pressure	2
122	Air intake duct pressure control PID derivative time (D)		0	2000	1	1	s	P104 Air intake ventilation control = Duct pressure	2
124	Air intake duct pressure low limit threshold		0	P125	1	10	Pa	P104 Air intake ventilation control = Duct pressure	2
125	Air intake duct pressure high limit threshold		P124	2500	1	900	Pa	P104 Air intake ventilation control = Duct pressure	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
126	Minimum flow rate for electric heater operation or DX unit		P111	P110	10	10000	m³/h	((P02 Air intake fan = inverter ModBus and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa 10 V)) or EC ModBus) and ((P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stage or 1 gradual stage and 3 On/Off stage) or P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit)	3
128	Extraction fan flow rate setpoint 1		P111	P110	10	10000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate or flow rate on external signal)	1
129	Extraction fan flow rate setpoint 2		P111	P110	10	10000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = Ventilation or temperature + ventilation) or P104 Air intake ventilation control = Flow rate on external signal)	1
130	Air extraction fan flow rate control PID proportional band (P)		0	30000	1	6000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate or flow rate on external signal or P105 Extraction ventilation control = Copy of the air intake fan flow rate)	2
131	Air extraction fan flow rate control PID integral time (I)		0	2000	1	150	s	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate or flow rate on external signal or P105 Extraction ventilation control = Copy of the air intake fan flow rate)	1
132	Air extraction fan flow rate control PID derivative time (D)		0	2000	1	0	s	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = flow rate or P105 Air extraction ventilation control = Copy of the air intake fan flow rate)	2
136	Air presence threshold at intake		0	1000	1	10	Pa	(P02 Air intake fan = On/Off) or (P02 Air intake fan = Inverter ModBus and P04 = none)	2
137	Air presence threshold at extraction		0	1000	1	10	Pa	(P10 Extraction fan = On/Off control or P10 Extraction fan = inverter ModBus and P12 = none) and P21 Number of extraction filters >0) or (P22 Extraction differential pressure sensor = With)	2
138	Intake filter 1 fouled fault threshold		0	1000	1	250	Pa		2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
139	Intake filter 1 clogged fault threshold		0	1000	1	400	Pa		2
140	Intake filter 2 fouled fault threshold		0	1000	1	250	Pa	P20 Number of intake filters > 1	2
141	Intake filter 2 clogged fault threshold		0	1000	1	400	Pa	P20 Number of intake filters > 1	2
142	Intake filter 3 fouled fault threshold		0	1000	1	250	Pa	P20 Number of intake filters > 2	2
143	Intake filter 3 clogged fault threshold		0	1000	1	400	Pa	P20 Number of intake filters > 2	2
144	Extraction filter 1 fouled fault threshold		0	1000	1	250	Pa	P21 Number of extraction filters > 0	2
145	Extraction filter 1 clogged fault threshold		0	1000	1	400	Pa	P21 Number of extraction filters > 0	2
146	Extraction filter 2 fouled fault threshold		0	1000	1	250	Pa	P21 Number of extraction filters > 1	2
147	Extraction filter 2 clogged fault threshold		0	1000	1	400	Pa	P21 Number of extraction filters > 1	2
150	Free cooling control	0: None 1: With	0	1	1	0		P27 Mixing damper = With	2
151	Night cooling control	0: None 1: With	0	1	1	0		P27 Mixing damper = With or P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
152	Air quality control	0: None 1: With	0	1	1	0		(P104 Air intake ventilation control = Flow rate or (P27 Mixing damper = With and P104 Air intake ventilation control ≠ Duct pressure) or (P27 Mixing damper = With and P37 Differential pressure sensor on the heat recovery unit = None and (P104 Air intake ventilation control = Duct pressure)) and P36 Heat recovery unit ≠ Partial fixed speed wheel and P105 Exhaust ventilation control ≠ Duct pressure	2
154	Target temperature selection	0 : Supply air	0	2	1	0		(Temperature control in cooling mode = With or Temperature control in heating mode = With) and P150 Free cooling control = None and P151 Night cooling control = None and P38 Dehumidification = None and P39 Humidification = None	2
		1 : Return 2: Ambient						Temperature control in cooling mode = With or Temperature control in heating mode = With or P150 Free cooling control = With or P151 Night cooling control = With	
155	Temperature control mode selection	0: Automatic 1: Cooling only 2: Heating only	0	2	1	0		Temperature control in cooling mode = With and Temperature control in heating mode = With	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
156	Supply air limitation	0: none 1: with	0	1	1	1		(Temperature control in cooling mode = With or Temperature control in heating mode = With) and P154 Target temperature selection = return or room air	2
157	Supply air compensation in deadband	0: none 1: with	0	1	1	1		(Temperature control in cooling mode = With or Temperature control in heating mode = With) and P154 Target temperature selection = return or room air	2
159	Electric heater load shedding selection	0: CMS 1 : On/Off input	0	1	1	1		P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
160	Setpoint 1/Setpoint 2 selection	0: None 1: Time sched. or CMS	0	1	1	0		(P104 Air intake ventilation control = Flow rate or Temperature control in cooling mode = With or Temperature control in heating mode = With	2
		2: On-Off input only 3: On/Off input override		3					
161	Application of setpoint 1/setpoint 2 selection	0: Temperature	0	2	1	0		P160 Setpoint 1/Setpoint 2 selection = time sched./CMS or on/off input only or on/off input override and (T° control in cooling mode=With or Temperature control in heating mode = With)	2
		1: Ventilation						P160 Setpoint 1/Setpoint 2 selection = time sched./CMS or on/off input only or on/off input override and P104 Air intake ventilation control = Duct pressure or flow rate	
		2 : Temperature and ventilation						P160 Setpoint 1/Setpoint 2 selection = time sched./CMS or on/off input only or on/off input override and P104 Air intake ventilation control = Duct pressure or flow rate and (T° control in cooling mode = With or Temperature control in heating mode = With)	
162	Changeover selection	0 : CMS	0	0	1	2		P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water)	3
		1 : On-Off input 2: Network temperature		2				(P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water)) and P35 DX unit = none	
164	Fan delay time		120	999	1	240	s	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
165	Heating coil selection	0 : None 1 : On-Off input 2 : CMS	0	2	1	0		(P28 Coil no. 1 = hot water or mixed or P29 Coil no. 2 = hot water or Post-heating water or mixed or P30 Coil no. 3 = Post-heating water or mixed) and (P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages)	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
166	Mixing damper opening time		0	500	1	110	s	P27 Mixing damper = With	2
168	Heating or cooling change authorisation time delay		0	360	1	1	min	Temperature control in cooling mode = With and Temperature control in heating mode = With	2
170	Temperature setpoint 1 in cooling mode		0,0	50,0	0,1	25,0	°C	Temperature control in cooling mode = With	1
171	Temperature setpoint 2 in cooling mode		0,0	50,0	0,1	30,0	°C	Temperature control in cooling mode = With and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = temperature or temperature + ventilation	1
172	Temperature control PID proportional band (P) in cooling mode		1,0	99,9	0,1	5,0	°C	Temperature control in cooling mode = With	2
173	Temperature control PID integral time (I) in cooling mode		0	2000	1	150	s	Temperature control in cooling mode = With	2
174	Temperature control PID derivative time (D) in cooling mode		0	2000	1	0	s	Temperature control in cooling mode = With	2
175	Cooling coil fan time delay		0	999	1	0	s	(P28 Coil no. 1 = cold water or mixed or P29 Coil no. 2 = cold water or mixed or P30 Coil no. 3 = cold water or mixed) or ((P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and P35 DX unit = cooling or reversible)	2
180	Temperature setpoint 1 in heating mode		0,0	50,0	0,1	23,0	°C	Temperature control in heating mode = With	1
181	Temperature setpoint 2 in heating mode		0,0	50,0	0,1	18,0	°C	Temperature control in heating mode = With and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = temperature or temperature + ventilation	1
182	Temperature control PID proportional band (P) in heating mode		1,0	99,9	0,1	5,0	°C	Temperature control in heating mode = With	2
183	Temperature control PID integral time (I) in heating mode		0	2000	1	150	s	Temperature control in heating mode = With	2
184	Temperature control PID derivative time (D) in heating mode		0	2000	1	0	s	Temperature control in heating mode = With	2
190	Humidity setpoint during dehumidification		0	100	1	50	%	P38 Dehumidification control = With	1
191	Humidity control PID proportional band (P) in dehumidification mode		1	50	1	10	%	P38 Dehumidification control = With	2
192	Humidity control PID integral time (I) in dehumidification mode		0	2000	1	150	s	P38 Dehumidification control = With	2
193	Humidity control PID derivative time (D) in dehumidification mode		0	2000	1	0	s	P38 Dehumidification control = With	2
194	Humidity setpoint during humidification		0	100	1	50	%	P39 Air intake humidifier = steam or drip	1
195	Humidity control PID proportional band (P) in humidification mode		1	50	1	10	%	P39 Air intake humidifier = steam or drip	2
196	Humidity control PID integral time (I) in humidification mode		0	2000	1	150	s	P39 Air intake humidifier = steam or drip	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
197	Humidity control PID derivative time (D) in humidification mode		0	2000	1	0	s	P39 Air intake humidifier = steam or drip	2
198	Humidifier fan delay time		0	999	1	900	s	P39 air intake humidifier = Drip or P40 return air humidifier = 65% drip or P40 return air humidifier = 85% drip	2
206	Free cooling and night cooling operating differential compared to the controlled temperature		1,0	20,0	0,1	3,0	°C	P150 Free cooling control = With or P151 Night cooling control = With	2
207	Temperature low limit for free cooling and night cooling		0,0	30,0	0,1	8,0	°C	P150 Free cooling control = With or P151 Night cooling control = With	2
208	Fresh air minimum setpoint 1		0	100 or P214 if P152=1	1	20	%	P27 Mixing damper = With	2
209	Fresh air minimum setpoint 2		0	100 or P215 if P152=1	1	20	%	P27 Mixing damper = With and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = temperature or temperature + ventilation	2
210	Control setpoint in night cooling mode		0,0	30,0	0,1	17,0	°C	P151 Night cooling control = With	1
212	Air intake fan flow rate setpoint in night cooling mode		P111	P110	10	10000	m^3/h	P151 Night cooling = With and P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
213	Air extraction fan flow rate setpoint in night cooling mode		P111	P110	10	10000	m^3/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and P151 Night cooling = With and P104 Air intake ventilation control = Flow rate or flow rate on external signal	2
214	Fresh air maximum setpoint 1		P208	100	1	100	%	P27 Mixing damper = With and P152 Air quality control = With	2
215	Fresh air maximum setpoint 2		P209	100	1	100	%	P27 Mixing damper = With and P152 Air quality control = With and P160 Setpoint 1/setpoint 2 selection = time schedule/CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	2
216	Air quality setpoint		0	2000	1	800	ppm	P152 Air quality control = With	2
217	Air quality proportional band		10	999	1	100	ppm	P152 Air quality control = With	2
218	Air flow max setpoint on intake for air quality		P111	P110	10	10000	m^3/h	P152 Air quality control = With and P104 Air intake ventilation control = Flow rate	2
219	Air flow max. setpoint on exhaust for air quality		P111	P110	10	P110		P152 Air quality control = With and (P10 Extraction fan = inverter ModBus or EC ModBus) and P104 Air intake ventilation control = Flow rate	2
220	Heat recovery unit pressure drop setpoint		0	1000	1	250	Pa	(P36 Heat recovery unit = Plate or Gradual speed wheel or fixed speed wheel or Glycol/water mix or fixed speed partial) and P37 Differential pressure sensor on the heat recovery unit = With	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
221	Heat recovery unit fouling control PID proportional band (P)		1	1000	1	50	Pa	P36 Heat recovery unit = Plate and P37 Differential pressure sensor on the heat recovery unit = With	2
222	Heat recovery unit fouling control PID integral time (I)		0	2000	1	0	s	P36 Heat recovery unit = Plate and P37 Differential pressure sensor on the heat recovery unit = With	2
223	Heat recovery unit fouling control PID derivative time (D)		0	2000	1	0	s	P36 Heat recovery unit = Plate and P37 Differential pressure sensor on the heat recovery unit = With	2
224	Plate heat recovery unit bypass opening time		0	500	1	110	s	P36 Heat recovery unit = Plate	2
225	Temperature difference for heat recovery unit start-up authorisation		1,0	10,0	0,1	3,0	°C	P36 Heat recovery unit = Plate or Gradual speed wheel or fixed speed wheel or Glycol/water mix or fixed speed partial)	2
226	Gradual speed heat recovery unit minimum speed		0	100	1	10	%	P36 Heat recovery unit = Gradual speed heat recovery unit	3
228	Frost protection temperature setpoint		0,0	30,0	0,1	17,0	°C	P154 Target temperature selection = room	2
230	Supply air temperature low limit setpoint		0,0	30,0	0,1	16,0	°C	P156 Supply air limitation = with	2
231	Supply air temperature upper limit setpoint		0,0	50,0	0,1	26,0	°C	P156 Supply air limitation = with	2
232	Supply air temperature limit proportional band		1,0	99,9	0,1	20,0	°C	P156 Supply air limitation = with	2
233	Supply air temperature limit integration time		0	2000	1	150	s	P156 Supply air limitation = with	2
234	Low supply air temperature compensation setpoint in deadband		0,0	30,0	0,1	16,0	°C	P157 Supply air compensation in deadband = with	2
235	Low supply air temperature compensation proportional band in deadband		1,0	10,0	0,1	5,0	°C	P157 Supply air compensation in deadband = with	2
236	High supply air temperature compensation setpoint in deadband		0,0	50,0	0,1	35,0	°C	P157 Supply air compensation in deadband = with	2
237	High supply air temperature compensation proportional band in deadband		1,0	10,0	0,1	5,0	°C	P157 Supply air compensation in deadband = with	2
240	Supply air temperature low limit threshold		0,0	30,0	0,1	15,0	°C		2
241	Supply air temperature upper limit threshold		20,0	50,0	0,1	35,0	°C		2
242	Return air temperature low limit threshold		0,0	30,0	0,1	15,0	°C	P154 Target temperature selection = return air	2
243	Return air temperature upper limit threshold		20,0	50,0	0,1	35,0	°C	P154 Target temperature selection = return air	2
244	Room temperature low limit threshold		0,0	30,0	0,1	15,0	°C	P154 Target temperature selection = room	2
245	Room temperature upper limit threshold		20,0	50,0	0,1	35,0	°C	P154 Target temperature selection = room	2
246	Humidity low limit threshold		10,0	60,0	1,0	20	%	P38 Dehumidification control = With or P39 Air intake humidifier = steam or drip	2
247	Humidity upper limit threshold		40,0	100,0	1,0	80	%		2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
250	Changeover setpoint for cooling mode (mixed coil)		0,0	P251	0,1	10,0	°C	(P28 Coil no. 1 = cold water or mixed or P29 Coil no. 2 = cold water or mixed or P30 Coil no. 3 = cold water or mixed) and P162 Changeover selection = network temperature	2
251	Changeover setpoint for heating mode (mixed coil)		P250	50,0	0,1	40,0	°C	(P28 Coil no. 1 = cold water or mixed or P29 Coil no. 2 = cold water or mixed or P30 Coil no. 3 = cold water or mixed) and P162 Changeover selection = network temperature	2
252	Network temperature cooling/ heating band limit (mixed coil)		0,0	10,0	0,1	2,0	°C	(P28 Coil no. 1 = cold water or mixed or P29 Coil no. 2 = cold water or mixed or P30 Coil no. 3 = cold water or mixed) and P162 Changeover selection = network temperature	2
260	Opening percentage for the coil 1 valve when unit stopped		0	100	1	0	%	P28 Coil no. 1 = Cold water or Hot water or mixed (water) or Preheating water	2
261	Opening percentage for the coil 2 valve when unit stopped		0	100	1	0	%	P29 Coil no.2 = Cold water or Hot water or Post-heating water or Mixed (water)	2
262	Opening percentage for the coil 3 valve when unit stopped		0	100	1	0	%	P30 Coil. no.3 = Cold water or Post-heating water or Mixed (water)	2
263	Opening percentage for the first hot valve at start-up		0,0	100,0	1,0	0,0	%	P25 antifreeze thermostat = With and ((P28 Coil no. 1 = Hot water ou Mixed) or (P29 Coil no. 2 = Hot water ou Post-heating water) or P29 Coil no. 3 = Post-heating water)	2
266	Fresh air temperature threshold for preheating		0,0	15,0	1,0	5,0	°C	P28 Coil no.1 = Pre-heating water	2
267	Opening percentage for coil 1 valve, preheating on		0,0	100,0	1,0	0,0	%	P28 Coil no.1 = Pre-heating water	2
274	External signal minimum voltage (setpoint 1)		0,2	P275	0,1	1,0	V	P104 Air intake ventilation control = external signal	2
275	External signal maximum voltage (setpoint 2)		P274	10,0	0,1	10,0	V	P104 Air intake ventilation control = external signal	2
280	Fire protection operating mode	0 : off 1: Intake forced / exhaust shut down 2: Exhaust forced / intake shut down 3: Intake and exhaust forced	0,0	3,0	1,0	0,0		P24 fire detection = with P10 Air extraction fan = without and P24 fire detection = with and P104 = flow rate control Flow rate on external signal (0-10 V) P10 Air extraction fan > 0 and P24 fire detection = with and P104 = flow rate control Flow rate on external signal (0-10 V)	2
282	Intake flow rate in case of fire		P111	P110	10	P110	m^3/h	P280 Fire protection operating mode = 1 or 3 or P280 Fire protection operating mode = 2 and P284 Post ventilation on fire safety = with	2
283	Exhaust flow rate in case of fire		P111	P110	10	P110	m^3/h	P280 Fire protection operating mode = 2 or 3	2
284	Post ventilation on fire safety	0: None 1 : With	0	1	1	1		P24 = with and P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
285	Post ventilation time on fire safety		5	999	1	60	s	P284 Post ventilation time on fire safety = with	2
286	DX unit defrosting management	0: None	0	2	1	0		(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and (P35 DX unit = heating or reversible)	2
		1: Derated mode						(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and (P35 DX unit = heating or reversible) and (P104 Air intake ventilation control = Flow rate or Duct pressure or Flow rate on external signal)	
		2: AHU shut down						P32 Electric heater = none and (P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and (P35 DX unit = heating or reversible)	
287	DX unit defrosting pressure setpoint		20	1500	1	100	Pa	P286 DX unit defrost management = Derated mode and P104 Air intake ventilation control = Duct pressure	2
288	DX unit defrosting air intake flow rate setpoint		P126	P110	10	10000	m^3/h	P286 DX unit defrost management = Derated mode and (P104 Air intake ventilation control = Flow rate or flow rate on external signal)	2
289	DX unit defrosting exhaust flow rate setpoint		P126	P110	10	10000	m^3/h	P286 DX unit defrost management = Derated mode and (P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate or flow rate on external signal)	2
290	DX unit defrosting exhaust pressure setpoint		20	1500	1	100	Pa	P286 DX unit defrost management = Derated mode and P105 Extraction ventilation control = Duct pressure	2
292	Exhaust duct pressure setpoint 1		20	1500	1	200	Pa	P105 Extraction ventilation control = Duct pressure	1
293	Exhaust duct pressure setpoint 2		20	1500	1	100	Pa	P105 Extraction ventilation control = Duct pressure and P160 = Setpoint 1/setpoint 2 selection = time schedule/CMS or On/Off input or On/Off override and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	1
294	Exhaust duct pressure control PID proportional band (P)		0	2000	1	600	Pa	P105 Extraction ventilation control = Duct pressure	2
295	Exhaust duct pressure control PID integration time (I)		0	2000	1	4	s	P105 Extraction ventilation control = Duct pressure	2
296	Exhaust duct pressure control PID derivative time (D)		0	2000	1	1	s	P104 Air intake ventilation control = Duct pressure and P105 Extraction ventilation control = Duct pressure	2
298	Exhaust duct pressure lower limit threshold		0	P299	1	10	Pa	P105 Extraction ventilation control = Duct pressure	2
299	Exhaust duct pressure upper limit threshold		P298	2500	1	900	Pa	P105 Extraction ventilation control = Duct pressure	2

9.3 - Reading parameters

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
300	Calculated intake flow rate setpoint		0	150000	m³/h	P104 Air intake ventilation control = Flow rate or flow rate on external signal	1
301	Air intake fan flow rate		0	320000	m³/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or EC ModBus	1
302	Air intake fan differential pressure		0	5000	Pa	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or EC ModBus	1
304	Duct pressure calculated setpoint		0	1500	Pa	P104 Air intake ventilation control = Duct pressure	1
305	Duct pressure		0	2500	Pa	P104 Air intake ventilation control = Duct pressure	1
306	Calculated extraction flow rate setpoint		0	150000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and ((P104 Air intake ventilation control = Flow rate or flow rate on external signal) or (P104 Air intake ventilation control = Duct pressure and P105 Air extraction ventilation control = Copy of the air intake fan flow rate))	1
307	Air extraction fan flow rate		0	320000	m³/h	(P10 Extraction fan = inverter ModBus and P12 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa) or P10 Extraction fan = EC ModBus	1
308	Extraction fan differential pressure		0	5000	Pa	(P10 Extraction fan = inverter ModBus and P12 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa) or P10 Extraction fan = EC ModBus	1
310	Intake filter 1 differential pressure		0	1000	Pa		1
311	Intake filter 2 differential pressure		0	1000	Pa	P20 Number of intake filters >= 2	1
312	Intake filter 3 differential pressure		0	1000	Pa	P20 Number of intake filters >= 3	1
314	Extraction filter 1 differential pressure		0	1000	Pa	P21 Number of extraction filters >= 1	1
315	Extraction filter 2 differential pressure		0	1000	Pa	P21 Number of extraction filters >= 2	1
316	Extraction differential pressure		0	1000	Pa	P22 Extraction differential pressure sensor = With	1
318	Exhaust duct pressure calculated setpoint		0	1500	Pa	P105 Exhaust ventilation control = Duct pressure	1
319	Exhaust duct pressure		0	2500	Pa	P105 Exhaust ventilation control = Duct pressure	1
320	Calculated cooling setpoint		0,0	50,0	°C	Temperature control in cooling mode = with	1
321	Calculated heating setpoint		0,0	50,0	°C	Temperature control in heating mode = with	1
322	Supply air temperature		-99,0	99,0	°C	Temperature control in cooling mode = With or Temperature control in heating mode = With or supply air sensor present	1
323	Fresh air temperature		-99,0	99,9	°C	P150 Free cooling control = With or P151 Night cooling control = With or P36 Heat recovery unit = Plate or Gradual speed wheel or Fixed-speed wheel or glycol/water mix or Partial fixed speed wheel or P28 Coil no.1 = Preheating water or fresh air sensor present	1

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
324	Return air temperature		-99,0	99,9	°C	P154 Target temperature selection = return air or (P36 Heat recovery unit = Plate or Fixed-speed wheel or Gradual speed wheel or Glycol/water mix or Partial fixed speed wheel and P154 Choice of control temperature = supply air)	1
325	Return air humidity		0	100	%	P154 Target temperature selection = Return air and (RH dehumidification control = With or RH humidification control = With)	1
326	Room temperature		-99,0	99,9	°C	P154 Target temperature selection = Room	1
327	Ambient humidity		0	100	%	P154 Target temperature selection = Room and (RH dehumidification control = With or RH humidification control = With)	1
328	Mixed coil network temperature		-99,0	99,0	°C	(P28 Coil no. 1 = mixed (water) or P29 Coil no. 2 = mixed (water) or P30 Coil no. 3 = mixed (water) and P162 Changeover selection = network temperature	1
329	heat recovery unit ΔP		0	1000	Pa	P37 Differential pressure sensor on the heat recovery unit = With	1
331	CO_2 air quality		0	2000	ppm	P152 Air quality control = With	1
332	External signal voltage		0,0	10,0	V	P104 Air intake ventilation control = Flow rate on external signal (0-10 V)	1
334	Heat recovery unit outlet temperature, intake side		-99,0	99,0	°C	P42 Presence of temperature sensors for calculating energy efficiency = with	1
335	Heat recovery unit intake temperature, exhaust side		-99,0	99,0	°C	P42 Presence of temperature sensors for calculating energy efficiency = with and P40 Return air humidifier = Drip type (65%) or Drip type (85%)	1
340	Remote control	0: closed 1: open	0	1			1
341	Setpoint 1/Setpoint 2	0: closed 1: open	0	1		P160 Setpoint 1/Setpoint 2 selection = on/off input only or on/off input override	1
342	Fire	0: closed 1: open	0	1		P24 Fire detection = With	1
343	Antifreeze thermostat	0: closed 1: open	0	1		P25 Antifreeze thermostat = With	1
344	Isolation damper end of travel	0: closed 1: open	0	1		P26 =isolation damper = with/1	1
345	Mixed coil changeover thermostat	0: closed 1: open	0	1		(P28 Coil no. 1 = mixed (water) or P29 Coil no. 2 = mixed (water) or P30 Coil no. 3 = mixed (water) and P162 changeover selection = On/Off input	1
346	Air intake fan control	0: closed 1: open	0	1		P02 Air intake fan = On/Off control	1
347	Intake FMA access door contact	0: closed 1: open	0	1		(P02 Air intake fan = inverter ModBus or EC ModBus) and P06 Air intake fan door contact = with	1
348	Extraction fan control	0: closed 1: open	0	1		P10 Extraction fan = On/Off control	1
349	Extraction FMA access door contact	0: closed 1: open	0	1		(P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus) and P14 Extraction fan door contact = with	1
350	DX unit control	0: closed 1: open	0	1		P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	1
351	Rotary heat recovery unit control	0: closed 1: open	0	1		P36 Heat recovery unit = Fixed speed heat recovery unit or Gradual speed heat recovery unit or Glycol/water mix	1
352	Humidifier monitoring	0: closed 1: open	0	1		P39 intake humidification = steam or P39 intake humidification = drip or P40 return air humidifier = 65% drip or P40 return air humidifier = 85% drip	1

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
353	DX unit defrosting	0: closed 1: open	0	1		(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and P35 DX unit = heating or reversible	1
354	Bypass	0: closed 1: open	0	1		P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages and P159 Electric heater bypass selection = on-off input	1
355	Heating coil selection (water/heater)	0: closed 1: opena	0	1		(P28 Coil no. 1 = hot water or mixed (water) or P29 Coil no. 2 = hot water or post-heating water or mixed (water) ou P30 Coil no. 3 = post-heating water or mixed (water)) and (P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages) and P165 Heating coil selection = On/Off input	1
356	Electric heater auto safety thermostat	0: closed 1: open	0	1		P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
357	Electric heater manual safety thermostat	0: closed 1: open	0	1		P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
370	Isolation damper	0: off 1 : on	0	1		P26 Isolation damper = With	1
372	Air intake fan	0: off 1 : on	0	1			1
373	Air intake fan operating-hour meter		0	999999,0	h		1
374	Air intake fan percentage		0	100	%	P02 Air intake fan = Inverter ModBus or EC ModBus	
376	Air extraction fan	0: off 1 : on	0	1		P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus	1
377	Extraction fan operating-hour meter		0	999999,0	h	P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus	1
378	Extraction fan percentage		0	100	%	P10 Extraction fan = inverter ModBus or EC ModBus	1
382	Calculated air quality demand		0	100	%	P152 Air quality = with	1
384	Fresh air rate increase control	0: off 1 : on	0	1		P27 Mixing damper = With	1
385	Fresh air rate decrease control	0: off 1 : on	0	1		P27 Mixing damper = With	1
386	Fresh air percentage		0	100	%	P27 Mixing damper = With	1
392	Setpoint 1/Setpoint 2 state	0 : setpoint 1 1 : setpoint 2	0	1	1	P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on-off input only, or on-off input override	1
394	Calculated cooling demand		0	100	%	Temperature control in cooling mode = With	1
395	Calculated heating demand		0	100	%	Temperature control in heating mode = With	1

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
396	Calculated dehumidification demand		0	100	%	P38 Dehumidification control = With	1
397	Calculated humidification demand		0	100	%	P39 Air intake humidifier = steam Or P39 Air intake humidifier = drip	1
398	Cooling block	0: off 1 : on	0	1		Temperature control in cooling mode = With and Temperature control in heating mode = With	1
399	Heating block	0: off 1 : on	0	1		Temperature control in cooling mode = With and Temperature control in heating mode = With	1
400	Coil 1 Cooling		0	100	%	P08 Coil no.1 = mixed or cold water or P28 Coil no. 1 = DX unit and P35 DX unit = cooling or reversible)	1
401	Coil 1 Heating		0	100	%	P28 Coil no.1 = mixed or cold water or (P28 Coil no. 1 = DX unit and P35 DX unit = heating or reversible)	1
402	Coil 1 preheating		0	100	%	P28 Coil no.1 = Preheating water	1
404	Coil 2 Cooling		0	100	%	P29 Coil no. 2 = mixed or cold water or (P29 Coil no. 2 = DX unit and P35 DX unit = cooling or reversible)	1
405	Coil 2 Heating		0	100	%	P29 Coil no. 2 = mixed or hot water or (P29 Coil no. 2 = DX unit and P35 DX unit = heating or reversible)	1
406	Coil 2 Post-heating		0	100	%	P29 Coil no.2 = Post-heating water	1
407	Coil 3 Cooling		0	100	%	P30 Coil no. 3 = mixed or (P30 Coil no. 3 = DX unit and P35 DX unit = heating or reversible)	1
408	Coil 3 Cooling		0	100	%	P29 Coil no. 3 = mixed or cold water or (P29 Coil no. 3 = DX unit and P35 DX unit = cooling or reversible)	1
409	Coil 3 Post-heating		0	100	%	P30 Coil no.3 = Post-heating water	1
410	Stage 1 electric heater	0: off 1 : on	0	1		P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
411	Stage 1 electric heater operating-hour meter		0	999999,0	h	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
412	Gradual electric heater stage percentage		0	100	%	P32 Electric heater = 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
414	Stage 2 electric heater	0: off 1 : on	0	1		P32 Electric heater = 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
417	Stage 3 electric heater operating-hour meter		0	999999	h	P32 Electric heater = 3 On/Off stages or 4 On/Off stages or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
418	Stage 4 electric heater	0: off 1 : on	0	1		P32 Electric heater = 4 On/Off stages or 1 gradual stage and 3 On/Off stages	1
419	Stage 4 electric heater operating-hour meter		0	999999,0	h	P32 Electric heater = 4 On/Off stages or 1 gradual stage and 3 On/Off stages	1

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
420	Bypass state	0 : inactive 1 : active	0	1	1	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	1
421	Heating coil selection state	0 : electric heater 1 : hot water coil	0	1		(P28 Coil no. 1 = hot water or mixed or P29 Coil no. 2 = hot water or post-heating water or mixed or P30 Coil no. 3 = post-heating water or mixed) and (P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages)	1
422	Changeover status	0 : Hot 1 : Cold 2: Not set	0	2		P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water)	1
440	DX unit control	0: off 1 : on	0	1		P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	1
441	DX unit operating-hour meter		0	999999,9	H	P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	1
442	DX unit authorisation	0: off 1 : on	0	1		P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	1
446	DX unit defrosting status	0 : inactive 1 : active	0	1		(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and P35 DX unit = heating or Reversible	1
447	DX unit Heating/ Cooling	0: heating 1: cooling	0	1		(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and P35 DX unit = Reversible	1
450	Heat recovery unit	0: off 1 : on	0	1		P36 Heat recovery unit = Gradual speed wheel or Fixed-speed wheel or Partial fixed speed wheel	1
451	Heat recovery unit operating-hour meter		0	999999,0	h	P36 Heat recovery unit = Gradual speed wheel or Fixed-speed wheel or Partial fixed speed wheel	1
452	Heat recovery unit speed percentage		0	100	%	P36 Heat recovery unit = Gradual speed heat recovery unit	1
454	Heat recovery unit bypass opening	0: off 1 : on	0	1		P36 Heat recovery unit = Plate or Partial fixed speed wheel	1
455	Heat recovery unit bypass closing	0: off 1 : on	0	1		P36 Heat recovery unit = Plate or Partial fixed speed wheel	1
456	Heat recovery unit bypass opening percentage		0	100	%	P36 Heat recovery unit = Plate or Partial fixed speed wheel	1
458	Glycol/water mix heat recovery unit pump	0: off 1 : on	0	1		P36 Heat recovery unit = Glycol/water mix	1
459	Glycol/water mix heat recovery unit pump operating-hour meter		0	999999,0	h	P36 Heat recovery unit = Glycol/water mix	1
460	Steam humidifier		0	100	%	P39 air intake humidifier = steam	1
461	Humidifier operating-hour meter		0	999999	h	P39 air intake humidifier = steam	1
464	Drip humidifier	0: off 1 : on	0	1		P39 air intake humidifier = Drip or P40 return air humidifier = 65% drip or P40 return air humidifier = 85% drip	1
465	Drip humidifier operating-hour meter		0	999999,9	h	P39 air intake humidifier = Drip or P40 return air humidifier = 65% drip or P40 return air humidifier = 85% drip	1

No.	Description	Settings			Unit	Display conditions	Access level
		Enumeration	Min.	Max.			
Reading parameters							
466	Drip humidifier vent	0: off 1 : on	0	1		P39 air intake humidifier = Drip or P40 return air humidifier = 65% drip or P40 return air humidifier = 85% drip	1
468	Heat recovery unit instantaneous efficiency		0	100	%	P42 Presence of temperature sensors for calculating energy efficiency = with	1
470	Maintenance faults summary	0: off 1 : on	0	1			1
471	Danger fault summary	0: off 1 : on	0	1			1
490	Weekly programming request	0 : inactive 1 : active	0	1			1
491	State requested by the weekly programming	0: Off 1: Frost protection 2 : Night cooling 3: Setpoint 2 on 4 : Setpoint 1 on	0	4			1
492	Annual programming request	0 : inactive 1 : active	0	1			1
493	State requested by the annual programming	0: Off 1: Frost protection 3: Setpoint 2 on 4: Setpoint 1 on 11: Weekly prog. 1 12: Weekly prog. 2 13: Weekly prog. 3 14: Weekly prog. 4 15: Weekly prog. 5 16: Weekly prog. 6	0	16		0: Off 1: Frost protection 3: Setpoint 2 on 4: Setpoint 1 on 11: Weekly prog. 1 12: Weekly prog. 2 13: Weekly prog. 3 14: Weekly prog. 4 15: Weekly prog. 5 16: Weekly prog. 6	1

Note: With access level 3, the operating-hour meters may be reset and set to the desired value (after a component change in the AHU or a software update).

9.4 - Versions

No.	Description
551	AHU software version
552	AHU Bios version
553	AHU boot version
560	Electric heater expansion software version

9.5 - Setpoints

No.	Description	Settings				Unit	Display conditions	Access level
		Min.	Max.	Increment	By default			
112	Air intake fan flow rate setpoint 1	P111	P110	10	10000	m³/h	P104 Air intake ventilation control = Flow rate or flow rate on external signal	1
113	Air intake fan flow rate setpoint 2	P111	P110	10	10000	m³/h	(P104 Air intake ventilation control = Flow rate and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = Ventilation or temperature + ventilation) or P104 Air intake ventilation control = Flow rate on external signal	1
118	Air intake duct pressure setpoint 1	20	1500	1	200	Pa	P104 Air intake ventilation control = Duct pressure	1
119	Air intake duct pressure setpoint 2	20	1500	1	100	Pa	P104 Air intake ventilation control = Duct pressure and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	1
128	Air extraction fan flow rate setpoint 1	P111	P110	10	10000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate or flow rate on external signal)	1
129	Air extraction fan flow rate setpoint 2	P111	P110	10	10000	m³/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = Ventilation or temperature + ventilation) or P104 Air intake ventilation control = Flow rate on external signal)	1
170	Temperature setpoint 1 in cooling mode	0,0	50,0	0,1	25,0	°C	Temperature control in cooling mode = With	1
171	Temperature setpoint 2 in cooling mode	0,0	50,0	0,1	30,0	°C	Temperature control in cooling mode = With and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = temperature or temperature + ventilation	1
180	Temperature setpoint 1 in heating mode	0,0	50,0	0,1	23,0	°C	Temperature control in heating mode = With	1
181	Temperature setpoint 2 in heating mode	0,0	50,0	0,1	18,0	°C	Temperature control in heating mode = With and P160 Setpoint 1/setpoint 2 selection = time sched./CMS or on/off input only, or on/off input override and P161 Application of the setpoint 1/setpoint 2 selection = temperature or temperature + ventilation	1
190	Humidity setpoint during dehumidification	0	100	0	50	%	P32 RH dehumidification control = With	1
194	Humidity setpoint during humidification	0	100	0	50	%	P33 RH humidification control = With	1
210	Control setpoint in night cooling mode	0,0	50,0	0,1	17,0	°C		1
216	Air quality setpoint	0	2000	1	800	ppm	P37 Air quality control	1
228	Frost protection temperature setpoint	0,0	50,0	0,1	17,0	°C	P154 Target temperature selection = return or room air	2
292	Exhaust duct pressure setpoint 1	20	1500	1	200	Pa	P105 Extraction ventilation control = Duct pressure	2
293	Exhaust duct pressure setpoint 2	20	1500	1	100	Pa	P105 Extraction ventilation control = Duct pressure and P160 = Setpoint 1/setpoint 2 selection = time schedule/CMS or On/Off input or On/Off override and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	2

9.6 - Fault level

No.	Description	Setting		Display conditions	Access level
		Enumeration	By default		
600	FMA EC motor no.2 to 8	0 : Maintenance 1 : Danger	0	(P02 Air intake fan = EC ModBus and P03 Number of intake EC fans >1) or (P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans >1)	3
601	FMA EC communication no.2 to 8	0 : Maintenance 1 : Danger	0	(P02 Air intake fan = EC ModBus and P03 Number of intake EC fans >1) or (P10 Extraction fan = EC ModBus and P11 Number of extraction EC fans >1)	3
602	Air intake filter 1 fouled	0 : Maintenance 1 : Danger	0		2
603	Air intake filter 2 fouled	0 : Maintenance 1 : Danger	0	P20 Number of intake filters >= 2	2
604	Air intake filter 3 fouled	0 : Maintenance 1 : Danger	0	P20 Number of intake filters >= 3	2
606	Extraction filter 1 fouled	0 : Maintenance 1 : Danger	0	P21 Number of extraction filters >= 1	2
607	Extraction filter 2 fouled	0 : Maintenance 1 : Danger	0	P21 Number of extraction filters >= 2	2
608	Electric heater automatic reset safety thermostat	0 : Maintenance 1 : Danger	0	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
609	Electric heater manual reset safety thermostat	0 : Maintenance 1 : Danger	0	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
612	Humidifier	0 : Maintenance 1 : Danger	0	P38 Intake humidifier = with	2
613	DX unit	0 : Maintenance 1 : Danger	0	P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	2
615	rotary heat recovery unit	0 : Maintenance 1 : Danger	0	P36 Heat recovery unit = Fixed speed heat recovery unit	2
614	heat recovery unit fouled	0 : Maintenance 1 : Danger	0	P36 Heat recovery unit = Fixed speed wheel or Gradual speed wheel or Glycol/water mix or Partial fixed speed wheel	2
616	heat recovery unit in frosting phase	0 : Maintenance 1 : Danger	0	P36 Heat recovery unit = Plate	2
617	Glycol/water mix heat recovery unit	0 : Maintenance 1 : Danger	0	P36 Heat recovery unit = Glycol/water mix	2
620	Supply air temperature too high	0 : Maintenance 1 : Danger	0	Temperature control in cooling mode = With or Temperature control in heating mode = With	2
621	Supply air temperature too low	0 : Maintenance 1 : Danger	0	Temperature control in cooling mode = With or Temperature control in heating mode = With	2
622	Return temperature too high	0 : Maintenance 1 : Danger	0	P146 Target temperature selection = return air	2
623	Return temperature too low	0 : Maintenance 1 : Danger	0	P146 Target temperature selection = return air	2
624	Room temperature too high	0 : Maintenance 1 : Danger	0	P146 Target temperature selection = room	2
625	Room temperature too low	0 : Maintenance 1 : Danger	0	P146 Target temperature selection = room	2
626	humidity too high	0 : Maintenance 1 : Danger	0	P38 dehumidification = with or P39 intake humidification = steam or P39 intake humidification = drip	2

No.	Description	Setting		Display conditions	Access level
		Enumeration	By default		
627	Humidity too low	0 : Maintenance 1 : Danger	0	P38 dehumidification = with or P39 intake humidification = steam or P39 intake humidification = drip	2
628	Intake duct pressure too high	0 : Maintenance 1 : Danger	0	P104 Air intake ventilation control = Duct pressure	2
629	Intake duct pressure too low	0 : Maintenance 1 : Danger	0	P104 Air intake ventilation control = Duct pressure	2
630	Loss of communication with the electric heater expansion module	0 : Maintenance 1 : Danger	0	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
636	Loss of communication with the heat recovery unit outlet sensor, intake side	0: Maintenance 1: Danger	0	P42 Presence of temperature sensors for calculating energy efficiency = with	2
637	Loss of communication with the heat recovery unit inlet sensor, exhaust side	0: Maintenance 1: Danger	0	P42 Presence of temperature sensors for calculating energy efficiency = with and P40 Return air humidifier = Drip type (65%) or Drip type (85%)	2
641	Return air temperature sensor	0 : Maintenance 1 : Danger	0	(P36 Heat recovery unit = Plate or Fixed speed heat recovery unit or Gradual speed or glycol/water mix heat recovery unit) and P154 Choice of control temperature = supply air	2
642	Supply air temperature sensor	0 : Maintenance 1 : Danger	0	(Temperature control in cooling mode = With or T° control in heating mode = With) and (P154 Choice of control temperature = return air or P154 Choice of control temperature selection = room) and P156 Supply air limitation = with and P157 Supply air compensation in deadband = none	2
643	Fresh air temperature sensor	0 : Maintenance 1 : Danger	0	P150 Free cooling control = With or P151 Night cooling control = With or P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or glycol/water mix	2
644	Network temperature sensor	0 : Maintenance 1 : Danger	0	P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water) and P162 Changeover selection = network T°	2
652	Exhaust duct pressure too low	0: Maintenance 1: Danger	0	P105 Exhaust ventilation control = Duct pressure	2
653	Exhaust duct pressure too high	0: Maintenance 1: Danger	0	P105 Exhaust ventilation control = Duct pressure	2

9.7 - Communication

No.	Description	Settings				Display conditions	Access level
		Enumeration	Min.	Max.	By default		
700	Selection of the type of communication protocol used on the BMS1 port	0 : None 1 : ModBus RTU 2 : LON 3 : KNX 4 : ModBus TCP 5 : BACNET IP 6 : WEB	0	6	0		2
701	Selection of the transmission speed on the BMS1 port	0 : 1200 1 : 2400 2 : 4800 3 : 9600 4 : 19200	0	4		P700 = 1	2
702	Parity on the BMS1 port	0: none 1 : even 2 : odd	0	2	0	P700 = 1	2
703	Number of stop bits on the BMS1 port		1	2	1	P700 = 1	2
705	Selection of the controller address on the BMS1 bus		1	255	1	P700 = 1	2
716	Control type	0: Local 1: Remote	0	1	1		2
	BMS2						
710	Selection of the type of communication protocol used on the BMS2 port	1 : ModBus RTU	1	1	0		2
711	Selection of the transmission speed on the BMS2 port	0 : 1200 1 : 2400 2 : 4800 3 : 9600 4 : 19200	0	4	3		2
712	Parity on the BMS2 port	0: none 1 : even 2 : odd	0	2	0		2
713	Number of stop bits on the BMS2 port		1	2	1		2
715	Selection of the controller address on the BMS2 bus		1	255	1	P710 = 1	2
716	Control type	0: Local 1: Remote	0	1	1		2
	pLAN						
720	Controller address on the pLAN		0	31	1		

9.8 - Calibration

No.	Description	Settings				Unit	Display conditions	Access level
		Min.	Max.	Increment	By default			
800	Calibration of the air intake fan flow rate sensor	Offset performed automatically by the wizard (see section on system start-up)					(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa)) or EC ModBus	2
801	Calibration of the air extraction fan flow rate sensor						P10 Extraction fan = Inverter ModBus and P12 = 0-1000 Pa 10 V or 0-2500 Pa 10 V or 0-5000 Pa) or P10 Extraction fan = EC ModBus	2
802	Intake duct pressure sensor calibration						P104 Air intake ventilation control = Duct pressure	2
803	Intake filter 1 differential pressure							2
804	Intake filter 2 differential pressure						P20 Number of intake filters = 2 or 3	2
805	Intake filter 3 differential pressure						P20 Number of intake filters = 3	2
806	Extraction filter 1 differential pressure						P21 Number of extraction filters = 1 or 2	2
807	Extraction filter 2 differential pressure						P21 Number of extraction filters = 2	2
808	Extraction differential pressure						P21 Number of extraction filters = 0 and P22 Extraction differential pressure sensor = With	2
809	Calibration of supply air temperature sensor	-5,0	5,0	0,1	0,0	°C		2
810	Calibration of fresh air temperature sensor	-5,0	5,0	0,1	0,0	°C	P150 Free cooling control = With or P151 Night cooling control = With or P36 Heat recovery unit = Plate or gradual speed wheel or fixed speed wheel or glycol/water mix or partial fixed speed wheel or P28 Coil 1 = preheating water or Fresh air sensor present	2
811	Return air temperature sensor calibration	-5,0	5,0	0,1	0,0	°C	P146 Target temperature selection = return air	2
812	Calibration of the humidity sensor at the return	-10,0	10,0	0,1	0,0	%	P146 Choice of control temperature = Return air and (RH dehumidification control = With or RH humidification control = With)	2
813	Calibration of the room air temperature sensor	-5,0	5,0	0,1	0,0	°C	P146 Target temperature selection = Room	2
814	Calibration of the room humidity sensor	-10,0	10,0	0,1	0,0	%	P146 Target temperature selection = Room and (RH dehumidification control = With or RH humidification control = With)	2
815	Calibration of the mixed coil network temperature sensor	-5,0	5,0	0,1	0,0	°C	(P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water)) and P162 Changeover selection = network T°	2
816	Calibration of CO_2 Air Quality sensor	100	100	1	0	ppm	P149 Air quality control = With	2
817	Calibration of the heat recovery unit ΔP pressure sensor						P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit	2
818	Calibration of the heat recovery unit outlet temperature sensor, intake side	-3,0	3,0	0,1	0,0	°C	P105 Exhaust ventilation control = Duct pressure	2
819	Calibration of the heat recovery unit inlet temperature sensor, exhaust side	-3,0	3,0	0,1	0,0	°C	P105 Exhaust ventilation control = Duct pressure	2
820	Exhaust duct pressure sensor calibration					°C	P105 Exhaust ventilation control = Duct pressure	2

9.9 - Inputs/Outputs direction

No.	Description	Settings		Display conditions	Access level
		Enumeration	By default		
Settings parameters					
850	Remote control input direction	0 : Normally open 1 : Normally closed	1 (NC)		2
851	Setpoint 1/Setpoint 2 input direction	0: Normally open for setpoint 1 1: Normally closed for setpoint 1	0 (NO)	P160 Setpoint 1/Setpoint 2 selection = on/off input only or on/off input override	2
852	Fire detection input direction	0 : Normally open 1 : Normally closed	1 (NC)	P24 Fire detection = With	3
853	Antifreeze thermostat input direction	0 : Normally open 1 : Normally closed	1 (NC)	P25 Antifreeze thermostat = With	3
854	Damper end of travel input direction	0 : Normally open 1 : Normally closed	1 (NC)	P26 Isolation damper = With	3
855	Changeover thermostat input direction	0: Normally open for hot 1: Normally closed for hot	1 (NF)	P28 Coil no. 1 = Mixed (water) or P29 Coil no. 2 = Mixed (water) or P30 Coil no. 3 = Mixed (water) and P162 Changeover selection = On/Off input	2
860	Air intake fan check input direction	0 : Normally open 1 : Normally closed	1 (NC)	(P02 Air intake fan = On/Off control) or ((P02 Air intake fan = inverter ModBus or EC ModBus) and (P06 Air intake fan door contact = with))	3
861	Extraction fan check input direction	0 : Normally open 1 : Normally closed	1 (NC)	(P10 Extraction fan = On/Off control) or ((P10 Extraction fan = inverter ModBus or EC ModBus) and (P14 Extraction fan door contact = with))	3
862	Humidifier input direction	0 : Normally open 1 : Normally closed	0 (NO)	P39 intake humidification = steam Or P39 Intake humidification = drip Or P40 return air humidifier = 65% drip Or P40 return air humidifier = 85% drip	3
863	Wheel heat recovery unit control input direction	0 : Normally open 1 : Normally closed	1 (NC)	P36 Heat recovery unit = gradual speed wheel or fixed speed wheel or partial fixed speed wheel	3
866	DX unit defrosting input direction	0 : Normally open 1 : Normally closed	1 (NC)	(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and (P35 DX unit = heating or reversible)	3
867	DX unit control input direction	0 : Normally open 1 : Normally closed	1 (NC)	P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	3
870	Bypass input direction	0 : Normally open 1 : Normally closed	1 (NC)	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
871	Hot water/electric heater selection input direction	0: Normally open for electric heater 1: Normally closed for electric heater	1 (NC)	((P28 Coil no. 1 = hot water or mixed (water) or P29 Coil no. 2 = hot water or post-heating water or mixed (water) or P30 Coil no. 3 = post-heating water or mixed (water))) and (P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages) and P165 Heating coil selection = On/Off input	2

No.	Description	Settings		Display conditions	Access level
		Enumeration	By default		
Settings parameters					
872	Electric heater manual safety input direction	0 : Normally open 1 : Normally closed	1 (NC)	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
873	Electric heater auto safety input direction	0 : Normally open 1 : Normally closed	1 (NC)	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	3
880	Maintenance fault reporting output direction	0 : Normally open 1 : Normally closed	1 (NC)		2
881	Danger fault reporting output direction	0 : Normally open 1 : Normally closed	1 (NC)		2
886	Cooling/heating control output direction DX unit	0: Normally open during heating 1: Normally closed during heating	NC	(P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit) and P35 DX unit = reversible	3
887	DX unit authorisation output direction	0: Normally open 1: Normally closed	NO	P28 Coil no. 1 = DX unit or P29 Coil no. 2 = DX unit or P30 Coil no. 3 = DX unit	3

9.10 - Prioritisation

No.	Description	Settings				Unit	Display conditions	Access level
		Min.	Max.	Increment	By default			
Prioritisation for thermal elements								
900	Free cooling 1 operation start cooling percentage	0	P901	1	Calculated automatically based on the number of thermal elements	%	P142 Free cooling control = With	2
901	Free cooling 1 operation end cooling percentage	P900	100	1		%	P142 Free cooling control = With	2
902	Heat recovery unit operation start cooling percentage	0	P903	1		%	P36 Heat recovery unit = Plate or gradual speed wheel or fixed speed wheel or glycol/water mix or partial fixed speed wheel	2
903	Heat recovery unit operation end cooling percentage	P902	100	1		%	P36 Heat recovery unit = Plate or gradual speed wheel or fixed speed wheel or glycol/water mix or partial fixed speed wheel	2
904	Drip humidifier operation start cooling percentage	0	P905	1		%	P40 return air humidifier = 65% drip or 85% drip	2
905	Drip humidifier operation end cooling percentage	P904	100	1		%	P40 return air humidifier = 65% drip or 85% drip	2
906	Coil 1 operation start cooling percentage	0	P907	1		%	P28 Coil no. 1 = Cold water or mixed (water) or (P28 Coil no. 1 = DX unit and P35 DX unit = Cooling or reversible)	2
907	Coil 1 operation end cooling percentage	P906	100	1		%	P28 Coil no. 1 = Cold water or mixed (water) or (P28 Coil no. 1 = DX unit and P35 DX unit = Cooling or reversible)	2
908	Coil 2 operation start cooling percentage	0	P909	1		%	P29 Coil no. 2 = Cold water or mixed (water) or (P29 Coil no. 2 = DX unit and P35 DX unit = Cooling or reversible)	2
909	Coil 2 operation end cooling percentage	P908	100	1		%	P29 Coil no. 2 = Cold water or mixed (water) or (P29 Coil no. 2 = DX unit and P35 DX unit = Cooling or reversible)	2
910	Coil 3 operation start cooling percentage	0	P911	1		%	P30 Coil no. 3 = Cold water or mixed (water) or (P30 Coil no. 3 = DX unit and P35 DX unit = Cooling or reversible)	2
911	Coil 3 operation end cooling percentage	P910	100	1		%	P30 Coil no. 3 = Cold water or mixed (water) or (P30 Coil no. 3 = DX unit and P35 DX unit = Cooling or reversible)	2
920	Heat recovery unit operation start heating percentage	0	P921	1		%	P36 Heat recovery unit = Plate or gradual speed wheel or fixed speed wheel or glycol/water mix or partial fixed speed wheel	2
921	Heat recovery unit operation end heating percentage	P920	100	1		%	P36 Heat recovery unit = Plate or gradual speed wheel or fixed speed wheel or glycol/water mix or partial fixed speed wheel	2
924	Coil 1 operation start heating percentage	0	P925	1		%	P28 Coil no.1 = Hot water or mixed (water) or (P28 Coil no. 1 = DX unit and P35 DX unit = Heating or reversible)	2

No.	Description	Settings				Unit	Display conditions	Access level
		Min.	Max.	Increment	By default			
Prioritisation for thermal elements								
925	Coil 1 operation end heating percentage	P924	100	1	Calculated automatically based on the number of thermal elements	%	P28 Coil no.1 = Hot water or mixed (water) or (P28 Coil no. 1 = DX unit and P35 DX unit = Heating or reversible)	2
926	Coil 2 operation start heating percentage	0	P927	1		%	P29 Coil no. 2 = Hot water or Mixed (water) or Post-heating water or (P29 Coil no. 2 = DX unit and P35 DX unit = heating or reversible)	2
927	Coil 2 operation end heating percentage	P926	100	1		%	P29 Coil no. 2 = Hot water or Mixed (water) or Post-heating water or (P29 Coil no. 2 = DX unit and P35 DX unit = heating or reversible)	2
928	Coil 3 operation start heating percentage	0	P929	1		%	P30 Coil no. 3 = Eau Post-chauffage or Mixed (water) or (P30 Coil no. 3 = DX unit and P35 DX unit = heating or reversible)	2
929	Coil 3 operation end heating percentage	P928	100	1		%	P30 Coil no. 3 = Post-heating water or Mixed (water) or (P30 Coil no. 3 = DX unit and P35 DX unit = heating or reversible)	2
930	Electric heater operation start heating percentage	0	P931	1		%	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
931	Electric heater operation end heating percentage	P930	100	1		%	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
941	Electric heater stage 1 range end percentage	0	P942	1		%	P32 Electric heater = 1 On/Off stage or 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
942	Electric heater stage 2 range end percentage	P941	P943	1		%	P32 Electric heater = 2 On/Off stages or 3 On/Off stages or 4 On/Off stages or 1 gradual stage and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
943	Electric heater stage 3 range end percentage	P942	P944	1		%	P32 Electric heater = 3 On/Off stages or 4 On/Off stages or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages	2
944	Electric heater stage 4 range end percentage	P943	100	1		%	P32 Electric heater = 4 On/Off stages or 1 gradual stage and 3 On/Off stages	2

9.11 - Inverter parameters

No.	Description	Settings				Unit	Access level
		Min.	Max.	Increment	By default		
Air intake inverter settings parameters							
1000	Number of motors	1	2	1	1		3
1002	Min. frequency	0	400	1	0	Hz	3
1003	Max. frequency	0	400	1	50	Hz	3
1004	Acceleration time	0	1800	1	200	s	3
1005	Deceleration time	0	1800	1	200	s	3
1010	Nominal motor voltage	110	690	1	400	V	3
1011	Nominal motor current	0,5	100,0	0,1	6,3	A	3
1012	Nominal motor frequency	0	400	1	50	Hz	3
1013	Nominal motor speed	0	3000	1	1445	rpm	3
1014	Nominal motor capacity	0,25	55,0	0,05	3,00	kW	3
1015	Motor nominal cos φ	0,00	1,00	0,01	0,79		3
Air intake inverter reading parameters							
1100	Requested frequency	0	400			Hz	1
1101	Motor frequency	0	400			Hz	1
1102	Motor speed	0	9999			rpm	1
1104	Motor voltage	0	690			V	1
1105	Motor current	0,0	200,0			A	1
1106	Motor electrical power	0,00	200,0			kW	1
1107	Motor electrical consumption	0	65535			GWh	1
		0	1000			MWh	1
		0	1000			kWh	1
1110	Inverter fault summary	0	1				1
1111	Inverter alarm summary	0	1				1
1112	Communication status	0	1				1
1120	Control electronics temperature	-100	300			°C	1
1121	Power electronics load	-40	160			%	1
1147	Product code	0	4294967295				1
1149	Software version	0	65535				1
Extraction inverter settings parameters							
2000	Number of motors	1	2	1	1		3
2002	Min. frequency	0	400	1	0	Hz	3
2003	Max. frequency	0	400	1	50	Hz	3
2004	Acceleration time	0	1800	1	200	s	3
2005	Deceleration time	0	1800	1	200	s	3
2010	Nominal motor voltage	110	690	1	400	V	3
2011	Nominal current	0,5	100,0	0,1	6,3	A	3
2012	Nominal motor frequency	0	400	1	50	Hz	3
2013	Nominal motor speed	0	3000	1	1445	rpm	3
2014	Nominal motor capacity	0,25	55,0	0,05	3,00	kW	3
2015	Motor nominal cos φ	0,00	1,00	0,01	0,79		3
Extraction inverter reading parameters							
2100	Requested frequency	0	400			Hz	1
2101	Motor frequency	0	400			Hz	1
2102	Motor speed	0	9999			rpm	1
2104	Motor voltage	0	690			V	1
2105	Motor current	0,0	200,0			A	1
2106	Motor electrical power	0,00	200,00			kW	1
2107	Motor electrical consumption	0	65535			GWh	1
		0	1000			MWh	1
		0	1000			kWh	1
2110	Inverter fault summary	0	1				1
2111	Inverter alarm summary	0	1				1
2112	Communication status	0	1				1
2120	Control electronics temperature	-100	300			°C	1
2121	Power electronics load	-40	160			%	1
2147	Product code	0	4294967295				1
2149	Software version	0	65535				1

9.12 - EC motor parameters

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
Air intake FMA settings								
1200	Min. speed percentage		0	100	1	10	%	3
1201	Max. speed percentage		0	100	1	100	%	3
1202	Acceleration ramp-up		0	255	1	20	s	3
1203	Deceleration ramp-down		0	255	1	20	s	3
Air intake FMA 1 information								
1220	Calculated min. speed		0	9999	1		rpm	1
1221	Calculated max. speed		0	9999	1		rpm	1
1222	Speed requested		0	9999	1		rpm	1
1223	Current speed		0	9999	1		rpm	1
1224	Current consumed		0,00	9,99	0,01		A	1
1225	Power input		0	999	1		W	1
1226	Motor temperature		0	199	1		°C	1
1230	Fault summary	0 : inactive 1 : active	0	1	0			1
1231	Fault status	Bit 15 to 8 + code						3
1232	Warning summary	0 : inactive 1 : active	0	1	0			1
1233	Warning status	Bit 15 to 8 + code						3
1234	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1236	Communication state	0 : inactive 1 : active	0	1	0			1
1238	Product code							1
1239	Software version							1
Air intake FMA 2 information								
1240	Calculated min. speed		0	9999	1		rpm	1
1241	Calculated max. speed		0	9999	1		rpm	1
1242	Speed requested		0	9999	1		rpm	1
1243	Current speed		0	9999	1		rpm	1
1244	Current consumed		0,00	9,99	0,01		A	1
1245	Power input		0	999	1		W	1
1246	Motor temperature		0	199	1		°C	1
1250	Fault summary	0 : inactive 1 : active	0	1	0			1
1251	Fault status	Bit 15 to 8 + code						3
1252	Warning summary	0 : inactive 1 : active	0	1	0			1
1253	Warning status	Bit 15 to 8 + code						3
1254	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1256	Communication state	0 : inactive 1 : active	0	1	0			1
1258	Product code							1
1259	Software version							1
Air intake FMA 3 information								
1260	Calculated min. speed		0	9999	1		rpm	1
1261	Calculated max. speed		0	9999	1		rpm	1
1262	Speed requested		0	9999	1		rpm	1
1263	Current speed		0	9999	1		rpm	1
1264	Current consumed		0,00	9,99	0,01		A	1
1265	Power input		0	999	1		W	1
1266	Motor temperature		0	199	1		°C	1

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
1270	Fault summary	0 : inactive 1 : active	0	1	0			1
1271	Fault status	Bit 15 to 8 + code						3
1272	Warning summary	0 : inactive 1 : active	0	1	0			1
1273	Warning status	Bit 15 to 8 + code						3
1274	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1276	Communication state	0 : inactive 1 : active	0	1	0			1
1278	Product code							1
1279	Software version							1
Air intake FMA 4 information								
1280	Calculated min. speed		0	9999	1		rpm	1
1281	Calculated max. speed		0	9999	1		rpm	1
1282	Speed requested		0	9999	1		rpm	1
1283	Current speed		0	9999	1		rpm	1
1284	Current consumed		0,00	9,99	0,01		A	1
1285	Power input		0	999	1		W	1
1286	Motor temperature		0	199	1		°C	1
1290	Fault summary	0 : inactive 1 : active	0	1	0			1
1291	Fault status	Bit 15 to 8 + code						3
1292	Warning summary	0 : inactive 1 : active	0	1	0			1
1293	Warning status	Bit 15 to 8 + code						3
1294	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1296	Communication state	0 : inactive 1 : active	0	1	0			1
1298	Product code							1
1299	Software version							1
Air intake FMA 5 information								
1300	Calculated min. speed		0	9999	1		rpm	1
1301	Calculated max. speed		0	9999	1		rpm	1
1302	Speed requested		0	9999	1		rpm	1
1303	Current speed		0	9999	1		rpm	1
1304	Current input		0,00	9,99	0,01		A	1
1305	Power input		0	999	1		W	1
1306	Motor temperature		0	199	1		°C	1
1310	Fault summary	0 : inactive 1 : active	0	1	0			1
1311	Fault status	Bit 15 to 8 + code						3
1312	Warning summary	0 : inactive 1 : active	0	1	0			1
1313	Warning status	Bit 15 to 8 + code						3
1314	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1316	Communication state	0 : inactive 1 : active	0	1	0			1
1318	Product code							1
1319	Software version							1

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
Air intake FMA 6 information								
1320	Calculated min. speed		0	9999	1		rpm	1
1321	Calculated max. speed		0	9999	1		rpm	1
1322	Speed requested		0	9999	1		rpm	1
1323	Current speed		0	9999	1		rpm	1
1324	Current consumed		0,00	9,99	0,01		A	1
1325	Power input		0	999	1		W	1
1326	Motor temperature		0	199	1		°C	1
1330	Fault summary	0 : inactive 1 : active	0	1	0			1
1331	Fault status	Bit 15 to 8 + code						3
1332	Warning summary	0 : inactive 1 : active	0	1	0			1
1333	Warning status	Bit 15 to 8 + code						3
1334	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1336	Communication state	0 : inactive 1 : active	0	1	0			1
1338	Product code							1
1339	Software version							1
Air intake FMA 7 information								
1340	Calculated min. speed		0	9999	1		rpm	1
1341	Calculated max. speed		0	9999	1		rpm	1
1342	Speed requested		0	9999	1		rpm	1
1343	Current speed		0	9999	1		rpm	11
1344	Current consumed		0,00	9,99	0,01		A	1
1345	Power input		0	999	1		W	1
1346	Motor temperature		0	199	1		°C	1
1350	Fault summary	0 : inactive 1 : active	0	1	0			1
1351	Fault status	Bit 15 to 8 + code						3
1352	Warning summary	0 : inactive 1 : active	0	1	0			1
1353	Warning status	Bit 15 to 8 + code						3
1354	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1356	Communication state	0 : inactive 1 : active	0	1	0			1
1358	Product code							1
1359	Software version							1
Air intake FMA 8 information								
1360	Calculated min. speed		0	9999	1		rpm	1
1361	Calculated max. speed		0	9999	1		rpm	1
1362	Speed requested		0	9999	1		rpm	1
1363	Current speed		0,00	9999,00	1,00		rpm	1
1364	Current consumed		0	10	0		A	1
1365	Power input		0	999	1		W	1
1366	Motor temperature		0	199	1		°C	1
1370	Fault summary	0 : inactive 1 : active	0	1	0			1
1371	Fault status	Bit 15 to 8 + code						3
1372	Warning summary	0 : inactive 1 : active	0	1	0			1
1373	Warning status	Bit 15 to 8 + code						3

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
1374	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
1376	Communication state	0 : inactive 1 : active	0	1	0			1
1378	Product code							1
1379	Software version							1
Extraction FMA 1 settings								
2200	Min. speed percentage		0	100	1	10	%	3
2201	Max. speed percentage		0	100	1	100	%	3
2202	Acceleration ramp-up		0	240	1	20	s	3
2203	Deceleration ramp-down		0	240	1	20	s	3
Extraction FMA 1 information								
2220	Calculated min. speed		0	9999	1		rpm	1
2221	Calculated max. speed		0	9999	1		rpm	1
2222	Speed requested		0	9999	1		rpm	1
2223	Current speed		0	9999	1		rpm	1
2224	Current consumed		0,00	9,99	0,01		A	1
2225	Power input		0	999	1		W	1
2226	Motor temperature		0	199	1		°C	1
2230	Fault summary	0 : inactive 1 : active	0	1	0			1
2231	Fault status	Bit 15 to 8 + code						3
2232	Warning summary	0 : inactive 1 : active	0	1	0			1
2233	Warning status	Bit 15 to 8 + code						3
2234	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2236	Communication state	0 : inactive 1 : active	0	1	0			1
2238	Product code							1
2239	Software version							1
Extraction FMA 2 information								
2240	Calculated min. speed		0	9999	1		rpm	1
2241	Calculated max. speed		0	9999	1		rpm	1
2242	Speed requested		0	9999	1		rpm	1
2243	Current speed		0	9999	1		rpm	1
2244	Current consumed		0,00	9,99	0,01		A	1
2245	Power input		0	999	1		W	1
2246	Motor temperature						°C	1
2250	Fault summary	0 : inactive 1 : active	0	1	0			1
2251	Fault status	Bit 15 to 8 + code						3
2252	Warning summary	0 : inactive 1 : active	0	1	0			1
2253	Warning status	Bit 15 to 8 + code						3
2254	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2256	Communication state	0 : inactive 1 : active	0	1	0			1
2258	Product code							1
2259	Software version							1

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
Extraction FMA 3 information								
2260	Calculated min. speed		0	9999	1		rpm	1
2261	Calculated max. speed		0	9999	1		rpm	1
2262	Speed requested		0	9999	1		rpm	1
2263	Current speed		0	9999	1		rpm	1
2264	Current consumed		0,00	9,99	0,01		A	1
2265	Power input		0	999	1		W	1
2266	Motor temperature						°C	1
2270	Fault summary	0 : inactive 1 : active	0	1	0			1
2271	Fault status	Bit 15 to 8 + code						3
2272	Warning summary	0 : inactive 1 : active	0	1	0			1
2273	Warning status	Bit 15 to 8 + code						3
2274	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2276	Communication state	0 : inactive 1 : active	0	1	0			1
2278	Product code							1
2279	Software version							1
Extraction FMA 4 information								
2280	Calculated min. speed		0	9999	1		rpm	1
2281	Calculated max. speed		0	9999	1		rpm	1
2282	Speed requested		0	9999	1		rpm	1
2283	Current speed		0	9999	1		rpm	1
2284	Current consumed		0,00	9,99	0,01		A	1
2285	Power input		0	999	1		W	1
2286	Motor temperature						°C	1
2290	Fault summary	0 : inactive 1 : active	0	1	0			1
2291	Fault status	Bit 15 to 8 + code						3
2292	Warning summary	0 : inactive 1 : active	0	1	0			1
2293	Warning status	Bit 15 to 8 + code						3
2294	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2296	Communication state	0 : inactive 1 : active	0	1	0			1
2298	Product code							1
2299	Software version							1
Extraction FMA 5 information								
2300	Calculated min. speed		0	9999	1		rpm	1
2301	Calculated max. speed		0	9999	1		rpm	1
2302	Speed requested		0	9999	1		rpm	1
2303	Current speed		0	9999	1		rpm	1
2304	Current consumed		0,00	9,99	0,01		A	1
2305	Power input		0	999	1		W	1
2306	Motor temperature						°C	1
2310	Fault summary	0 : inactive 1 : active	0	1	0			1
2311	Fault status	Bit 15 to 8 + code						3
2312	Warning summary	0 : inactive 1 : active	0	1	0			1
2313	Warning status	Bit 15 to 8 + code						3

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
2314	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2316	Communication state	0 : inactive 1 : active	0	1	0			1
2318	Product code							1
2319	Software version							1
Extraction FMA 6 information								
2320	Calculated min. speed		0	9999	1		rpm	1
2321	Calculated max. speed		0	9999	1		rpm	1
2322	Speed requested		0	9999	1		rpm	1
2323	Current speed		0	9999	1		rpm	1
2324	Current consumed		0,00	9,99	0,01		A	1
2325	Power		0	999	1		W	1
2326	Motor temperature						°C	1
2330	Fault summary	0 : inactive 1 : active	0	1	0			1
2331	Fault status	Bit 15 to 8 + code						3
2332	Warning summary	0 : inactive 1 : active	0	1	0			1
2333	Warning status	Bit 15 to 8 + code						3
2334	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2336	Communication state	0 : inactive 1 : active	0	1	0			1
2338	Product code							1
2339	Software version							1
Extraction FMA 7 information								
2340	Calculated min. speed		0	9999	1		rpm	1
2341	Calculated max. speed		0	9999	1		rpm	1
2342	Speed requested		0	9999	1		rpm	1
2343	Current speed		0	9999	1		rpm	1
2344	Current consumed		0,00	9,99	0,01		A	1
2345	Power input		0	999	1		W	1
2346	Motor temperature						°C	1
2350	Fault summary	0 : inactive 1 : active	0	1	0			1
2351	Fault status	Bit 15 to 8 + code						3
2352	Warning summary	0 : inactive 1 : active	0	1	0			1
2353	Warning status	Bit 15 to 8 + code						3
2354	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2356	Communication state	0 : inactive 1 : active	0	1	0			1
2358	Product code							1
2359	Software version							1

No.	Description	Settings					Units	Access level
		Enumeration	Min.	Max.	Increment	By default		
Extraction FMA 8 information								
2360	Calculated min. speed		0	9999	1		rpm	1
2361	Calculated max. speed		0	9999	1		rpm	1
2362	Speed requested		0	9999	1		rpm	1
2363	Current speed		0,00	9999,00	1,00		rpm	1
2364	Current consumed		0	10	0		A	1
2365	Power input		0	999	1		W	1
2366	Motor temperature						°C	1
2370	Fault summary	0 : inactive 1 : active	0	1	0			1
2371	Fault status	Bit 15 to 8 + code						3
2372	Warning summary	0 : inactive 1 : active	0	1	0			1
2373	Warning status	Bit 15 to 8 + code						3
2374	Limitation	0: none 1: current 2: voltage 3: power 4: temperature 5: overload 6: unknown	0	1	0			1
2376	Communication state	0 : inactive 1 : active	0	1	0			1
2378	Product code							1
2379	Software version							1

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Manufacturer reserves the right to change any product specifications without notice.

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