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CLIMACIAT®

Control manual

EN

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Original text: French Version

1 PREAMBLE

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
- Handle heavy or bulky equipment with care when lifting, moving and setting down

In normal use this device is planned to work in conditions of site of :

- Maximal height: 1000 m
- Temperature minimal and maximal: -10 °C + 40 °C,
- Category of surge: III
- Degree of pollution: 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. It is particularly recommended that all the electrical supplies to the unit are switched off before any work is carried out. 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.
Important: this equipment has been found to comply with the essential requirements of the following directives:
- Electromagnetic compatibility: 2014/30/EU
- Low voltage directive: 2014/35/EU
- Machinery Directive 2006/42/EC
- Directive concerning the restriction of the use of hazardous substances in electrical and electronic equipment (RoHS): 2011/65/EU

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 must be supervised to ensure that they do not play on or with the appliance.

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 50HZ 400V three-phase power supply (with no neutral).
However, if the air handling unit includes:

- Lighting portholes
- Heater cables for safety dampers

then a separate 230V 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, one for communication and one for start-up authorisation.

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

- **Humidifier unit**

The humidifier unit is dedicated to the operation of the humidifier(s). It is controlled by the main unit for the air handling unit using one or two cables.
The humidifier unit requires an additional power supply to the main unit power supplies (50HZ 400V three-phase with no neutral).

- **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 to be secured to the corresponding fan unit.
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 can be attached anywhere on the unit or on another support, with a maximum cable length of 10 metres.
The standalone trigger sensor unit is powered from the main unit

Unit size: Lxhxd or hxLxd = 200x300x120mm

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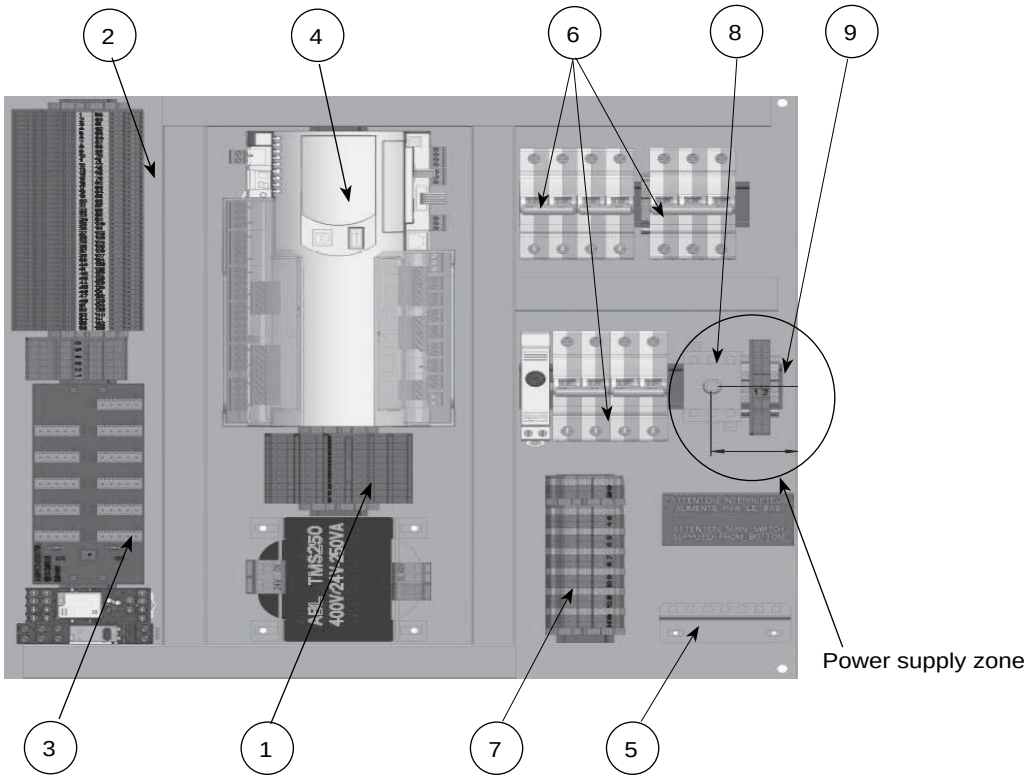
2.1.2 Presentation of the main electrics box board



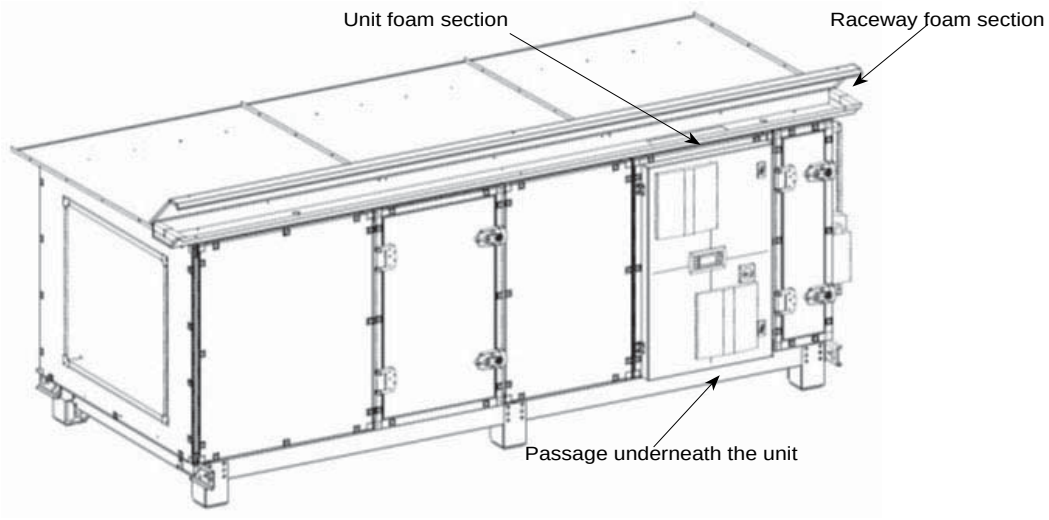
1. Connector
2. Connector terminal
3. RS485 board
4. PLC
5. Cable support comb
6. Switch (motor connection)
7. Orange disconnect terminals, 230V single-phase supply
8. Disconnect switch
9. Main earth terminal (PE)

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.



400V 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 linked in a permanent way with the network.
Characteristics of the disconnect switch terminals

Disconnect switch size	Current A		Terminal max cross section	Tightening torque
	In 40 °C	In 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	0.75 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 230V single-phase power supply (with lighting and heater cable option)

An equipment(casting off) of accessible(approachable) and identified manual severing, your supply must be installed(settled) upstream to the borders of food(supply) 230V (borders orange). 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 borders of connecting 230V are of the type(chap) " push - in '
Power cables are to fix to the comb support(medium) of cable planned for that purpose.

⚠ Earth connection

The earthing is imperative. Every casket is provided with a general earth terminal (PE) spot(locate) 9 indicated by the logo ⏚
All the lands are to be linked with borders green / yellow, planned for that purpose ⏚
Our responsibility could not be committed(hired), in case of accidents consecutive to an incorrect or non-existent earthing.
Always conform to the electric plan joined(contacted) to the device.

⚠ Orange terminals live

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

2.1.4 Other equipment

Frequency inverters

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 introduced into the building
Room: 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.

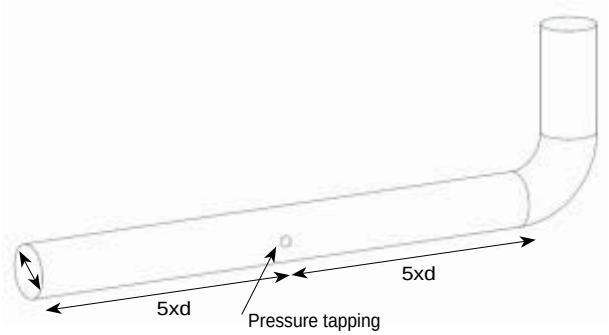
Recommended cable cross-section: 0.5 to 1.5 mm², with a maximum external diameter of 8mm.

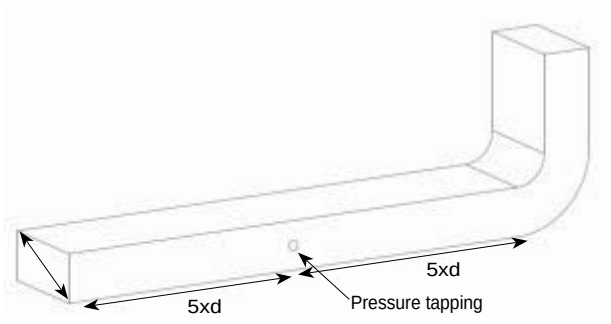
2.2.3 Positioning of the sensors

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.

CO2 sensor, temperature sensor and combined temperature + humidity duct sensor

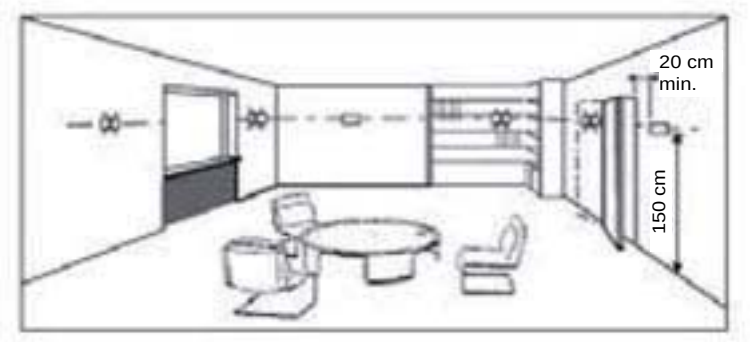
The CO2, temperature, and combined temperature + humidity sensors must be positioned in an air flow zone.

CO2 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

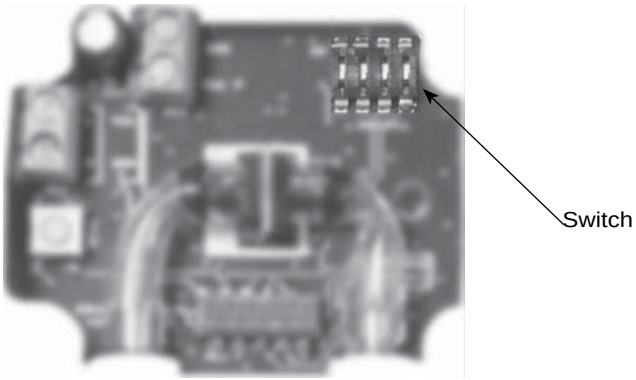
2.2.4 Electrical connections

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

2.2.5 Configuring the sensors

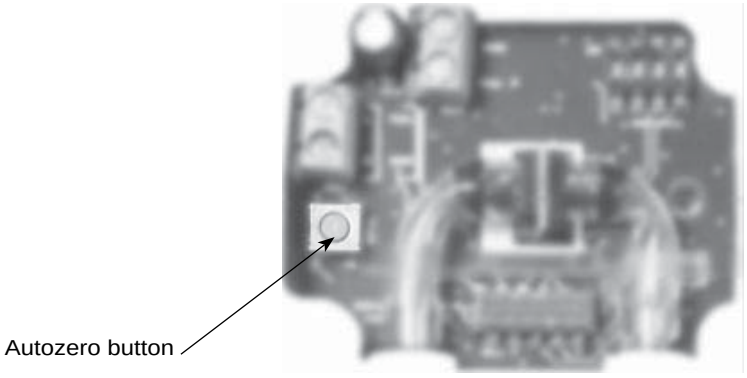
Switch for the pressure sensors (factory configuration)

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.



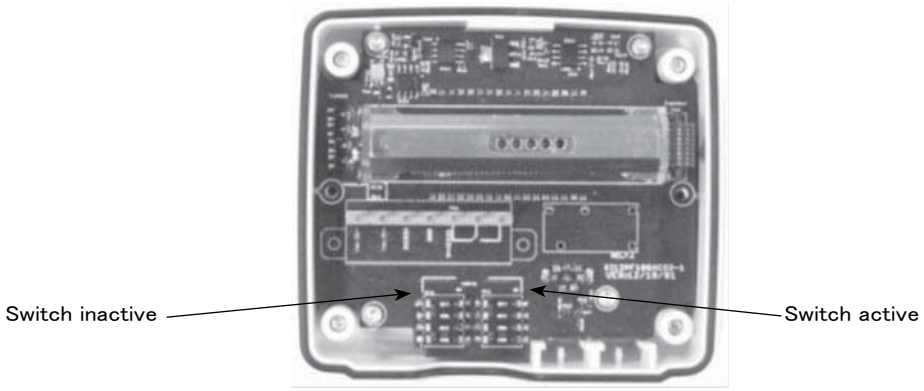
Pressure sensor autozero (to be performed on site)

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.



Switch for the CO2 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.



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 (0-10V)

±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

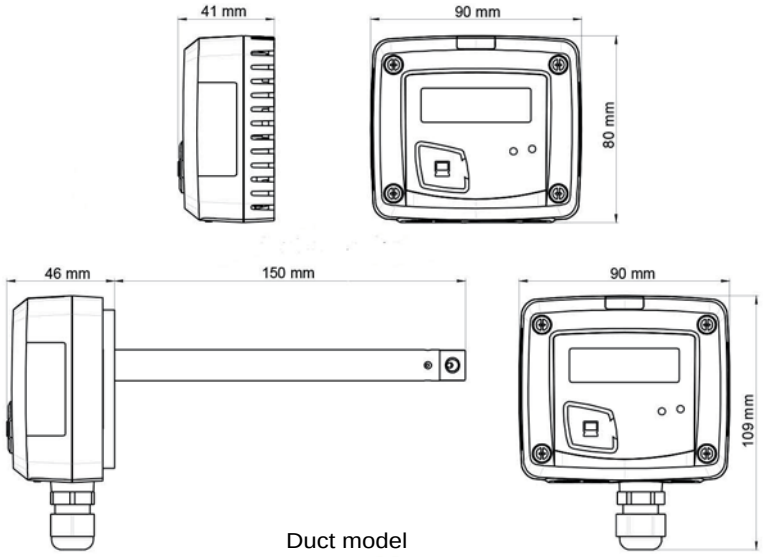
CO2 sensor

CO2 sensor with infrared cell
Measurement range from 0 to 5000 ppm

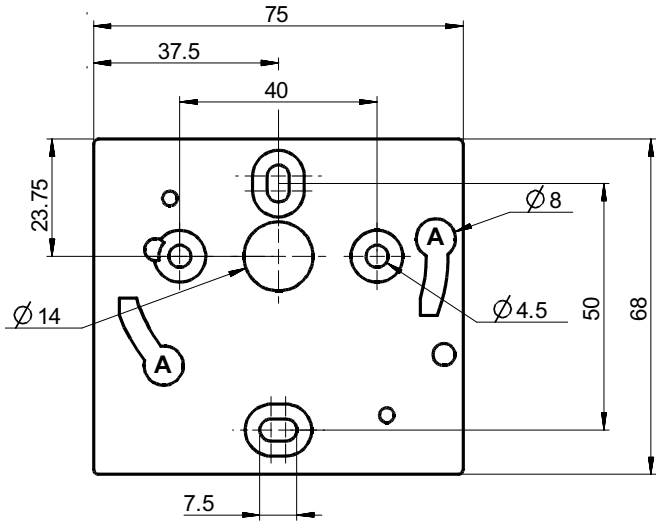
24 Vac/Vdc power supply ± 10%
Active 0-10 V output
Number of wires: 3
Minimum load: 1 K Ohms (0-10 V)
Consumption: 2 VA (0-10V)

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

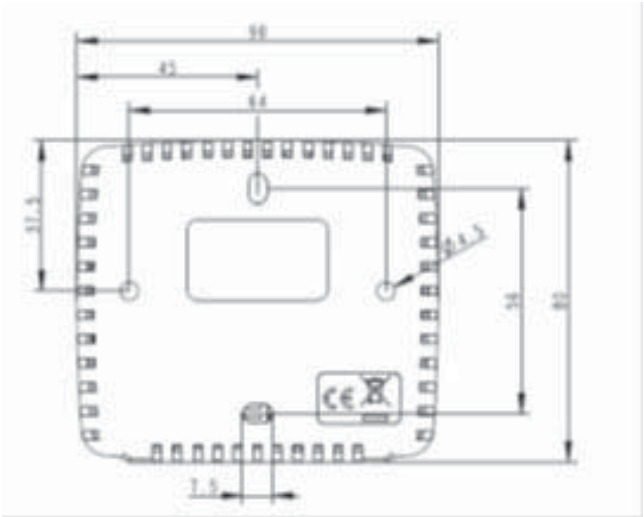
Mounting:



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

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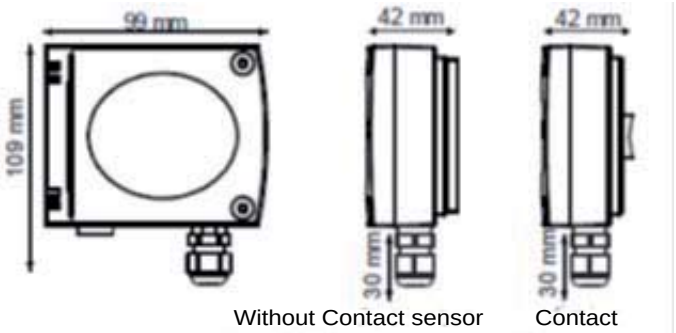
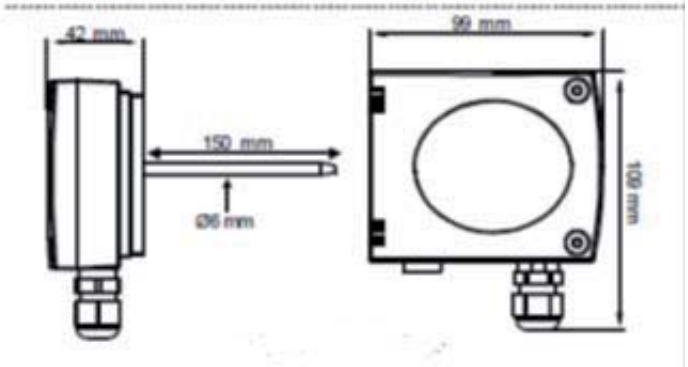
NTC temperature tolerances: ±0.3°C (from -40°C to 70°C); ±0.5°C outside of the previous range
Number of wires: 2
Response time: Humidity 1/e (63%) 4 s
Type of fluid, Air and neutral gas
Index of Protection IP20 room model
IP65 duct model
Operating temperature from 0 to 50°C, room model
from -20 to +80 °C duct model
Storage temperature of -10 to +70°C



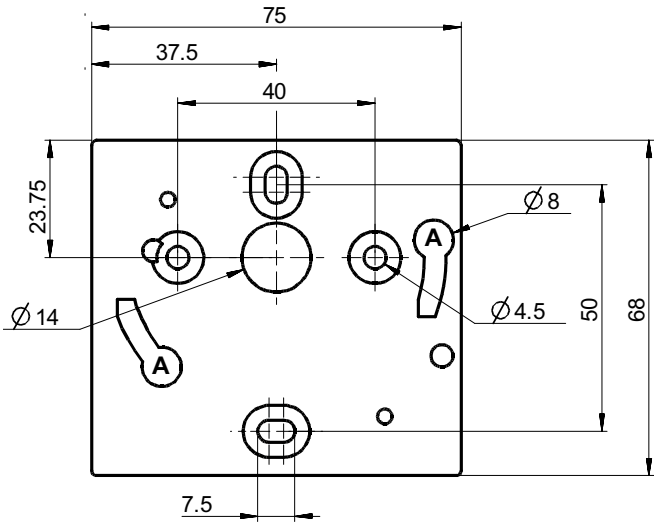
Without Contact sensor Contact

Room model, indoor AHU and contact



Duct model

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 (0-10V)

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

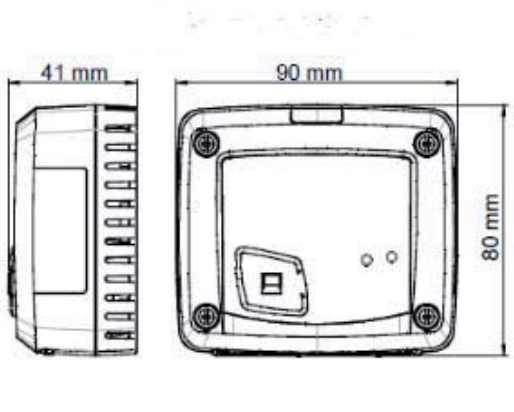
Humidity accuracy: ±1.5% RH (if 15°C ≤ T ≤ 25°C) on remote and duct models
±1.8% RH (if 15°C ≤ T ≤ 25°C) on room model

Response time: Temperature 1/e (63%) 15 s
Humidity 1/e (63%) 4 s

Type of fluid, Air and neutral gas

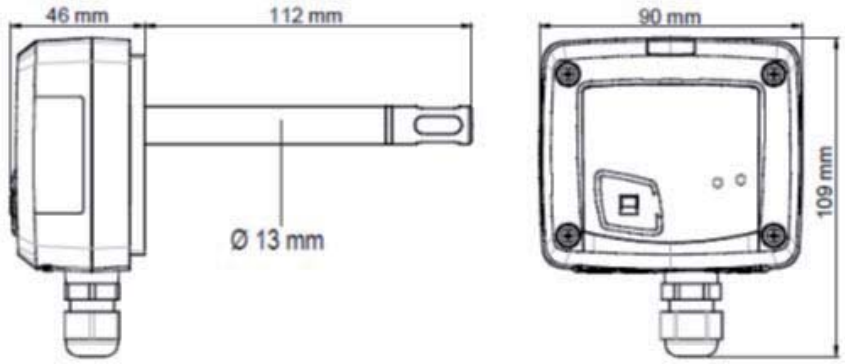
Index of Protection IP20 room model
IP65 duct model

Dimension: room model



Dimension: duct model

Duct model



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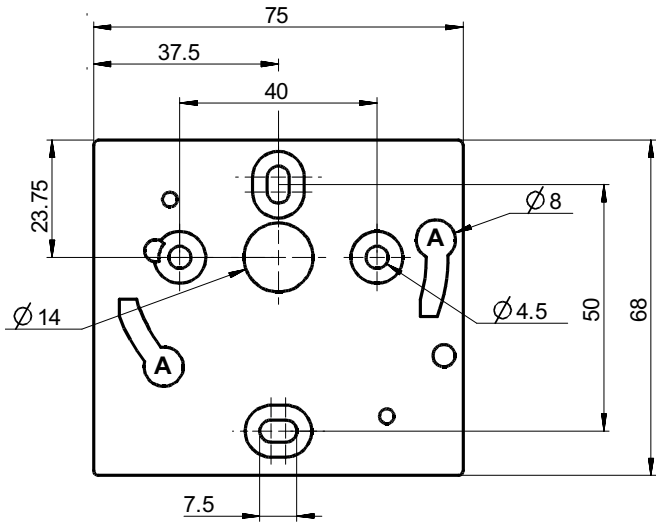
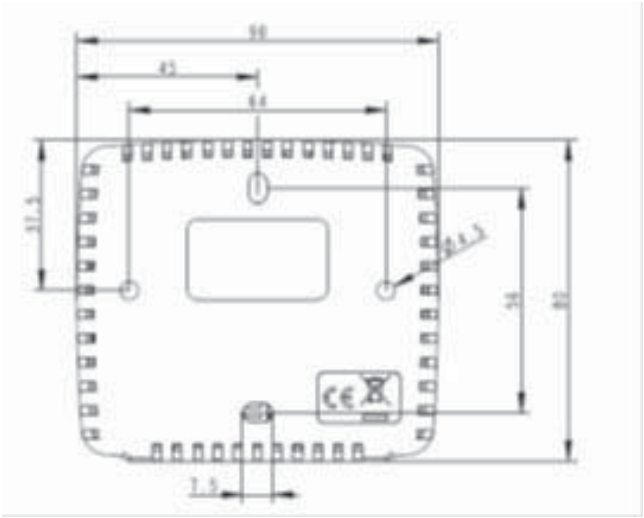
Mounting



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

24V power supply
Consumption: on standby 70 µA
in alarm mode 25 mA

2.3 Valves

2.3.1 Delivery

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 or flanges
- Valve servomotor and wiring bundle
- Cover (option for the outdoor units)
- 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 unit

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

- With the valve fitted inside of the unit

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

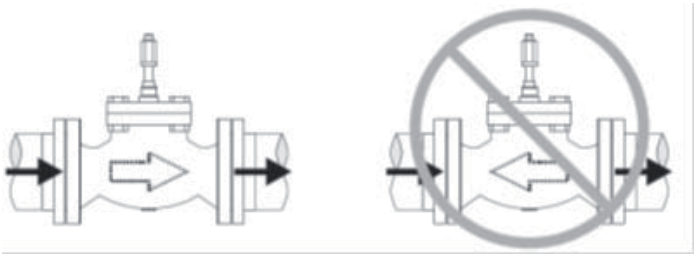
Air handling units installed outside of a building

- With the valve fitted outside of the unit
When hydraulic connections are ended, to insulate gates.
- With the valve fitted inside of the unit
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 Assembling the elements

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, ensuring that the force is always applied in the same direction as the water circulation.



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.

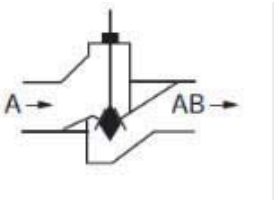
Max operating pressure = 16 bar

Two-way valve

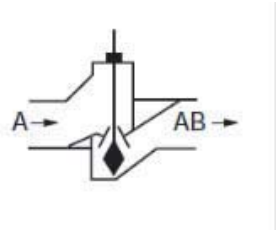
The only permissible flow rate is in the direction of the arrow A -> AB (arrow on the valve body)

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

Valves VSMF2 and V5832B

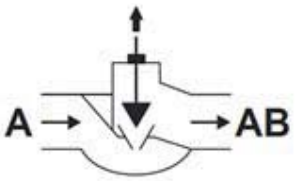


The valve rod extends: straight passage A → AB closes

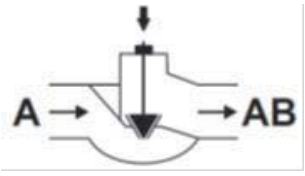


The valve rod retracts: straight passage A → AB opens

Valves V5011E and V5328A and V5832A



The valve rod extends: straight passage A → AB opens



The valve rod retracts: straight passage A → AB closes

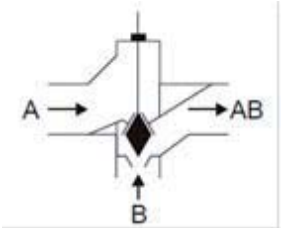
Three- or four-way valves with built-in T-shaped bypass

Mixing installation:

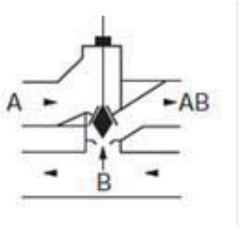
Flow from A and B -> AB

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:

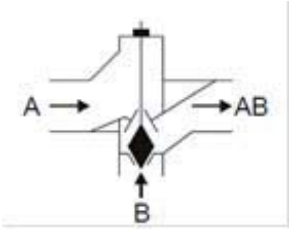


three-way valve

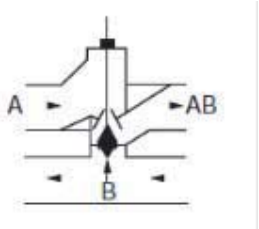


four-way valve

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



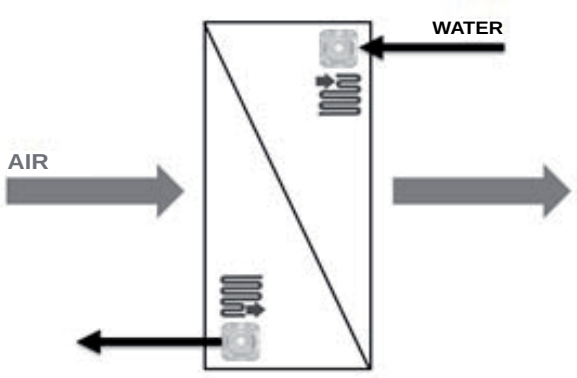
three-way valve

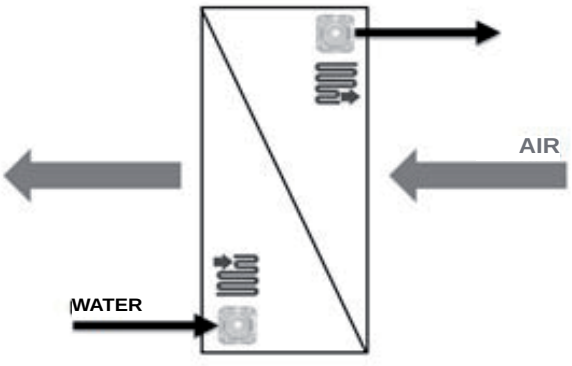


four-way valve

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

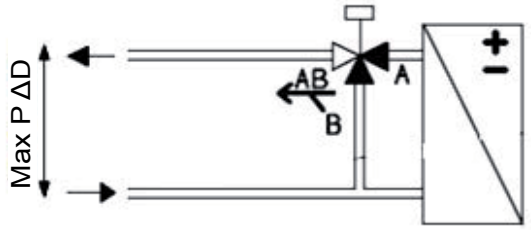
Until the temperature setpoint is reached, the servomotor actuates the valve rod.
This opens to allow water to circulate in the coil.
The coil water outlet and inlet depend on the air flow direction. The air/water counter-current must be respected.

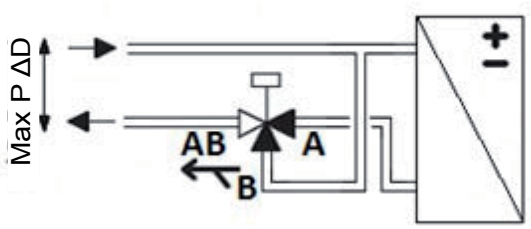




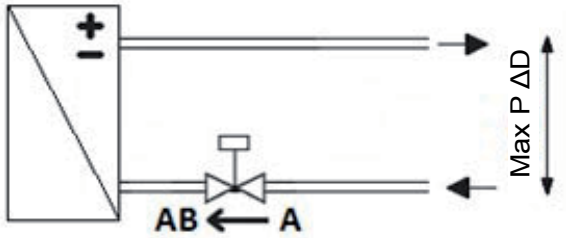
The connection of the valve depends on the direction of the water outlet/inlet on the coil

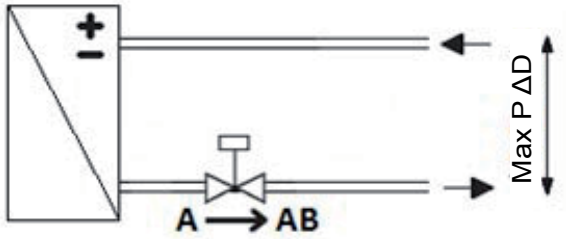
Three- or four-way valves





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

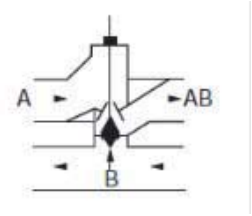
The positioning of the hydraulic networks is crucial to the correct operation of the system. Drain valves should therefore be placed at the appropriate points and in sufficient number. In addition, strainers should be fitted, as well as drains at circuit high points, balancing tees and shut-off valves 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.



Warning: 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 Filling
Drain 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
- Sulphate [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

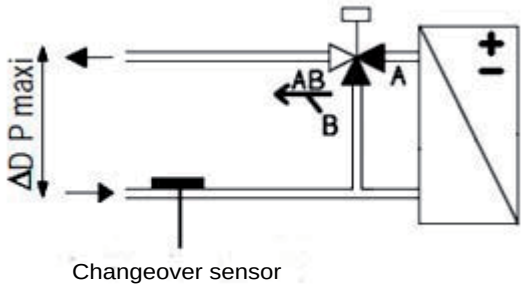
2.3.11 Operating recommendations:

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.

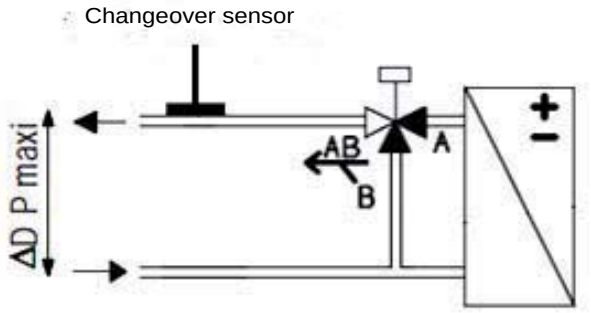
2.3.12 Changeover sensor (option)

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.
Warning: 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.

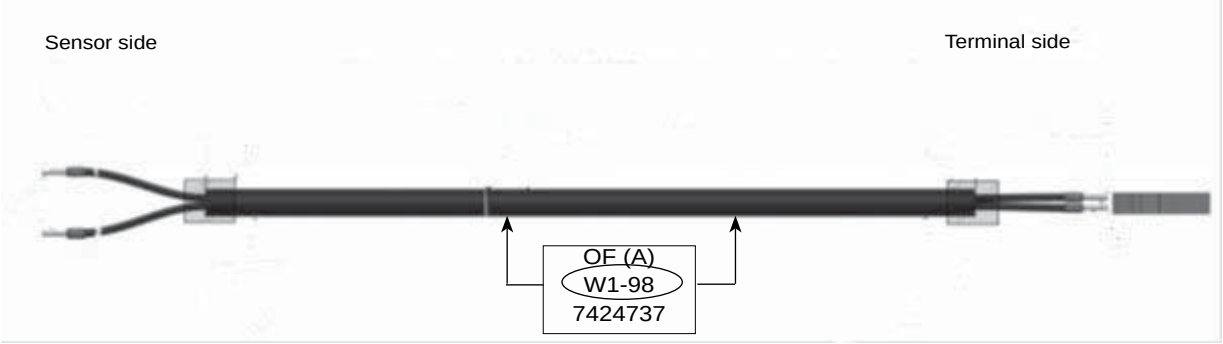
2.4 Control and power cables

2.4.1 Presentation of the wiring bundles

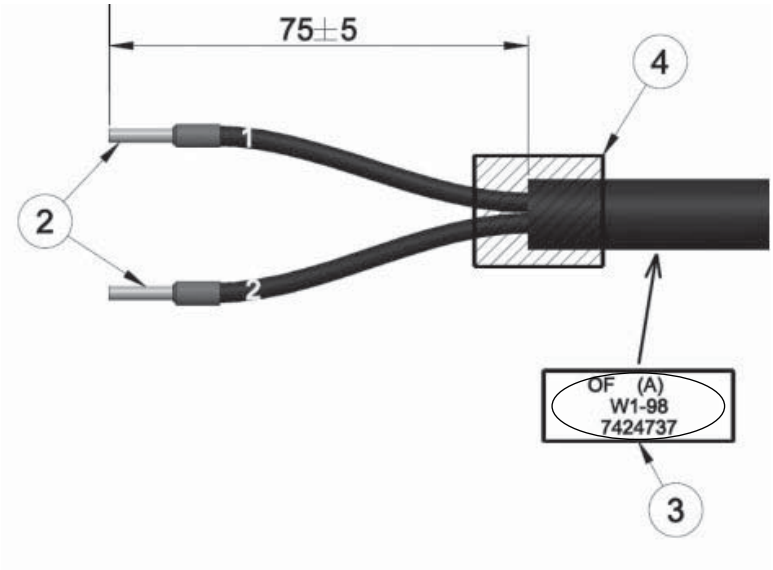
Each bundle is delivered the right length, and must be routed inside the cable passages provided and described below.
The bundles are supplied coiled around the units and must be laid on site.

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

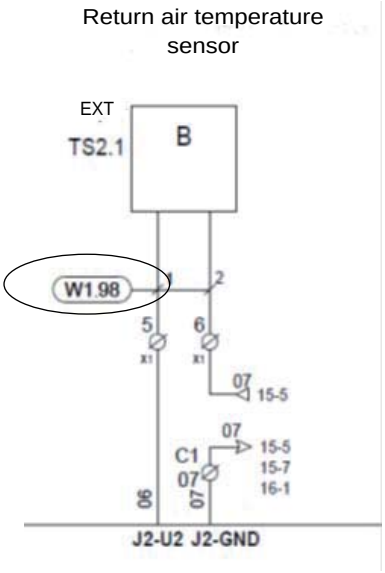
Example: Return air temperature sensor
The cable name is circled on each of these images.
Bundle:



Close-up of the label:



Extract from the wiring diagram:



Extract from the wiring dossier:

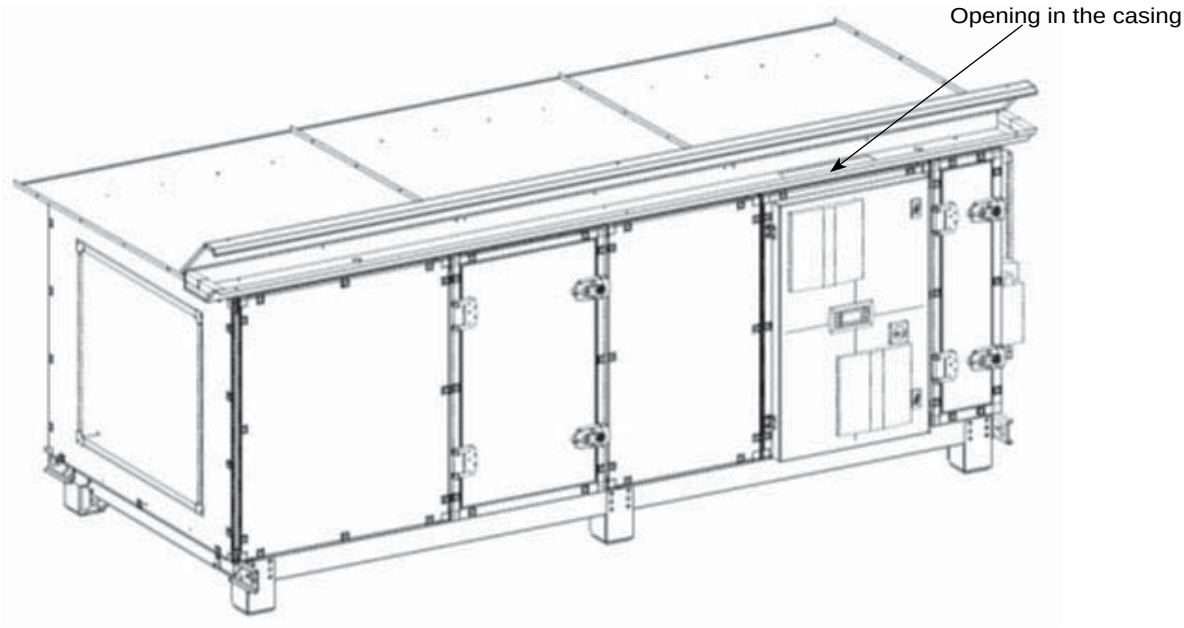
IDENTIFIER	TYPE/SECTION	FROM	TO	COMMENTS
W1.98		**CP**	**EXT**	

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.

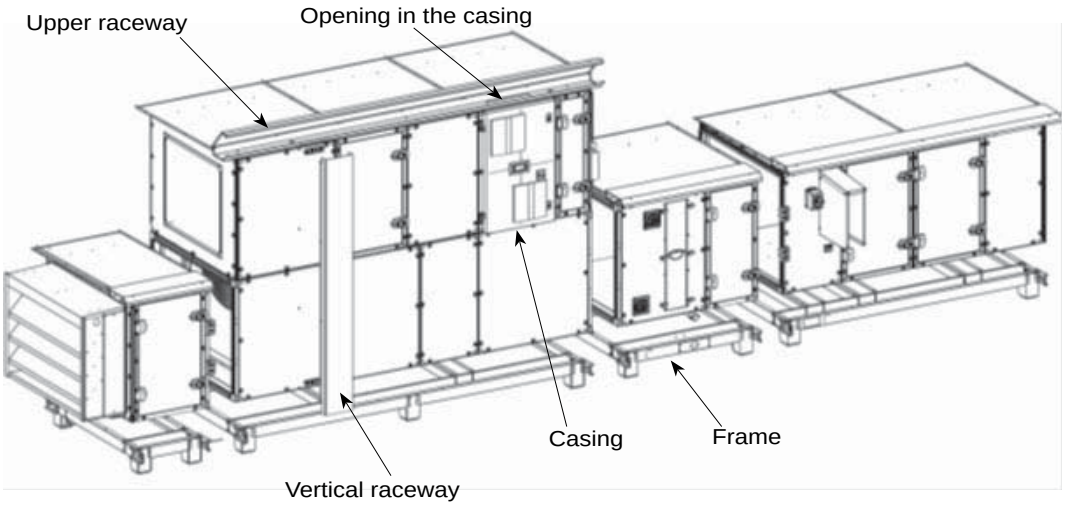
Note: Separate the power and control cables.

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**

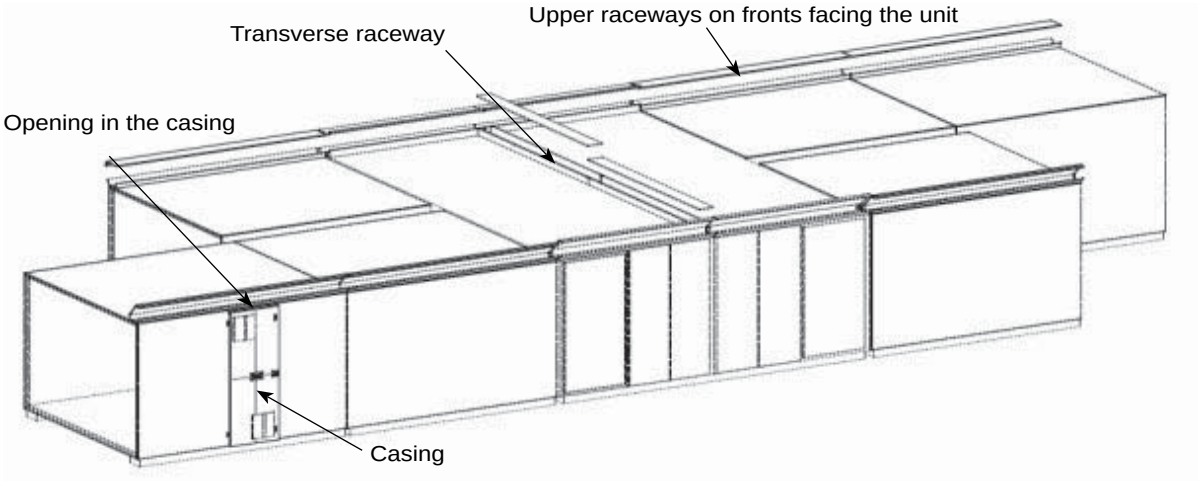
The cables are laid in the frame and meet in the vertical raceway to be routed inside the casing via the opening in the top.

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.

Stacked 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**

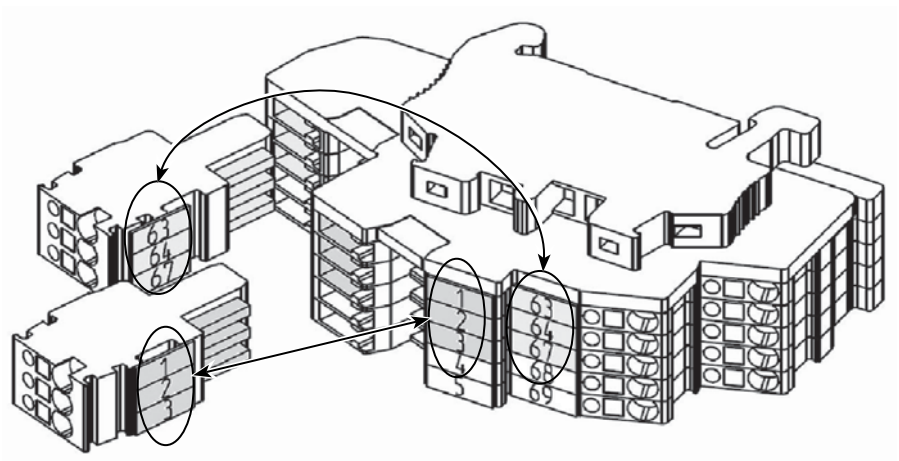
The power wiring bundles must be connected and screwed in to the torque recommended in the manufacturer's documentation. Refer to the wiring diagram for information on the cabling.

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

Disconnect switch size	Current	Terminal max cross section	Tightening torque
	A	mm²	Nm
OT16	16	0.75 to 10 mm²	0.8 Nm
OT25	25	0.75 to 10 mm²	0.8 Nm
OT40	40	0.75 to 10 mm²	0.8 Nm
OT63	63	1.5 to 35 mm²	2 Nm
OT80	80	1.5 to 35 mm²	2 Nm
OT100	100	10 to 70 mm²	6 Nm
OT125	125	10 to 70 mm²	6 Nm
OT160	160	M8x25	15-22Nm
OT200	200	M8x25	15-22Nm
OT250	250	M8x25	15-22Nm
OT315	315	M10x30	30-44Nm
OT400	400	M10x30	30-44Nm
OT630	630	M12x40	50-75Nm

◆ **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 THE CONTROL PLC

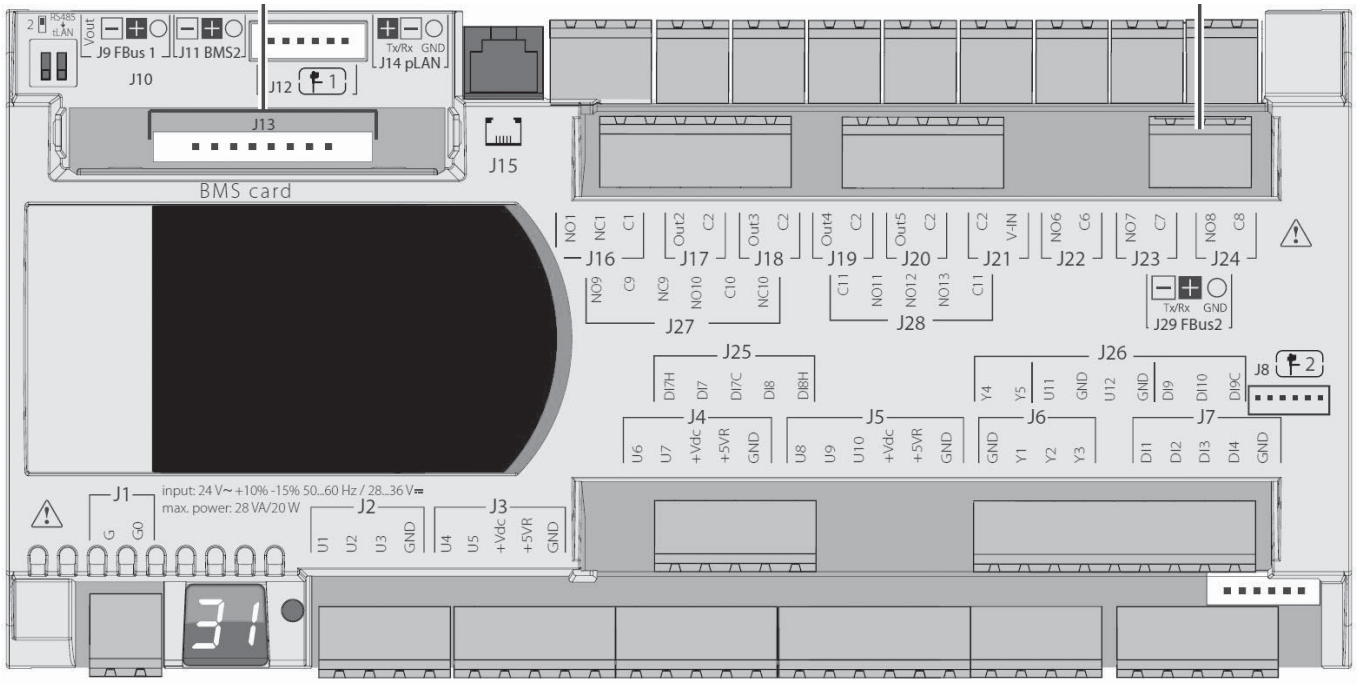
3.1 Introduction

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.

EN



Input designation	Type
U	On/off or analogue input
GND, C	Shared
DI	On/off input
Y	Analogue output
Out	Polarised 24 V on/off output
NO	Normally open potential-free on/off output
NC	Normally closed potential-free on/off output

Connector	Input	Type	Description
J1	G		+24 Vac power supply
	G0		Shared
J2	U1	0-10V	CO2 air quality measurement or supply air duct pressure sensor
	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 temperature sensor
	+Vdc		Not used
	+5VR		Not used
	GND		Shared

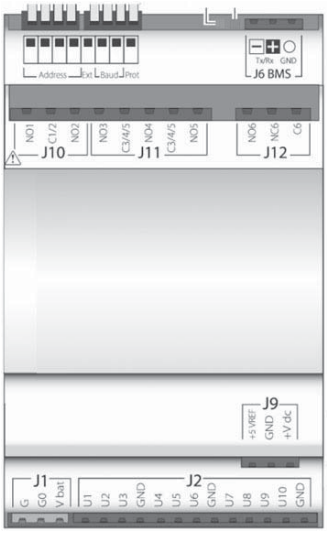
Connector	Input	Type	Description
	U6	0-10V	Filter 1 fouling measurement pressure sensor
	U7	0-10V	Filter 2 fouling measurement pressure sensor
J4	+Vdc		Not used
	+5VR		Not used
	GND		Not used
	U8	0-10V	Filter 3 fouling measurement pressure sensor
	U9	0-10V	Room or return air humidity measurement sensor
J5	U10		Setpoint selection or split unit operation monitoring
	+Vdc		Not used
	+5VR		Not used
	GND		Shared
	GND		Not used
J6	Y1	0-10V	Inverter split unit or hydraulic coil 1 valve control
	Y2	0-10V	Hydraulic coil 2 valve control
	Y3	0-10V	Hydraulic coil 3 valve control
	DI1	TOR	Door opening and/or air intake fan operation monitoring
	DI2	TOR	Remote control
J7	DI3	TOR	Antifreeze thermostat
	DI4	TOR	Isolation damper end of travel contact
	GND		Shared
J8			Not used
	Vout		Not used
J9	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			Housing for expansion board
J14	pLAN -		pLAN - Rx/Tx-
	pLAN +		pLAN - Rx/Tx+
	GND		pLAN - shared

Connector	Input	Type	Description
J15			pLAN connector for HMI
J16	NO1	TOR	Stage 1 control for a split unit
	NC1		Not used
	C1		Shared
J17	Out2	TOR	Air intake fan control
	C2		Not used
J18	Out3	TOR	Isolation damper opening control
	C2		Not used
J19	Out4	TOR	Mixing damper opening control
	C2		Not used
J20	Out5	TOR	Mixing damper closing control
	C2		Not used
J21	C2		Shared
	V-IN		+24 Vac power supply
J22	NO6	TOR	Stage 2 control for a split unit
	C6		Shared
J23	NO7	TOR	"Danger" fault summary relay
	C7		Shared
J24	NO8	TOR	"Maintenance" fault summary relay
	C8		Shared
J25	DI7H		Not used
	DI7		Door opening and/or extraction fan operation monitoring
	DI7C		Shared
	DI8		Rotary heat exchanger monitoring
	DI8H		Not used
J26	Y4	0-10V	Air intake humidifier control
	Y5	0-10V	Rotary heat recovery unit control
	U11	0-10V	Filter 4 fouling measurement pressure sensor
	GND		Shared
	U12	0-10V	Heat recovery unit fouling measurement pressure sensor
	GND		Shared
	D19		Humidifier operation monitoring
	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

Connector	Input	Type	Description
J28	C11		Shared
	NO11		Extraction fan control
	NO12		Glycol/water mix heat recovery unit pump or wheel heat recovery unit on control
	NO13		Adiabatic 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

3.3 Expansion 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



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	Input	Description
J1	G	+24 Vac power supply
	G0	Shared
	Vbat	Not used
J2	U1	Electric heater bypass
	U2	Choice of 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

Connector	Input	Description
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

EN

3.4 List of inverter inputs/outputs

Please refer to the inverter summary.

Input	Description
AI1	Flow rate measurement pressure sensor
DGND	Shared
+24V	24Vdc 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

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

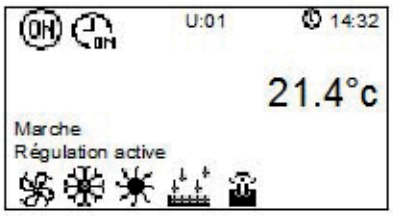
3.6 Terminal

The terminal is supplied equipped with an LCD 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 state

The terminal is used to view the machine state.



List of symbols and explanations

U:01 Indicates the unit's address on the pLAN bus

(ON) Indicates the request to switch the machine on or off

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

21.4°C Indicates the set temperature value (room, extraction or intake)

14:32 Indicates the time

On Indicates the unit state

State of the unit	Description
Off	The unit is off
Off due to a fault	The unit is stopped following a fault
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
Manual mode	Test mode is active

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 (for example, flow rate insufficient for the operation of the electric heater)
Fan delay	The unit is in the process of stopping but the ventilation remains active to cool the electric heaters or the gas burner

Indicates the state of the time schedule

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

Indicates the "Cooling" operating mode

Indicates the "Heating" operating mode

Indicates the "Dehumidification" operating mode

Indicates the "Humidification" operating mode

Indicates the operation of the fan(s)

EN

3.6.1 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 / Fault
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)
14 / Direction of the inputs/outputs (P850 to P899)
15 / Prioritisation (P900 to P999)
16 / Air 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

3.6.2 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

4 FUNCTIONS

4.1 Management of on and off modes

The unit can be started by the terminal or by the CMS. The parameters P706 and P716 are used to authorise or deny authorisation to the CMS to control 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)

99	Configuration locked
706	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 select between the setpoints 1/2 either via the time schedule or via the on/off input J5 U10 (only if there is no direct expansion coil) and via the CMS control.
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		

Note: this table takes the input as normally closed; it can be configured NO/NC.
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 stopped, 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 "on" mode and the damper will be kept open until the next unit stop 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 opening percentage, corresponding to a minimum fresh air rate, via the parameters P208 and P209.
The damper operates with 100% fresh air in night cooling mode. It is modulated when there is an air quality or free cooling request.

27	Mixing damper
166	Mixing damper opening time
208	Mixing opening minimum percentage 1
209	Mixing opening minimum percentage 2

P208 and P209 correspond to the set fresh air percentages.

4.5 Managing filters

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

EN

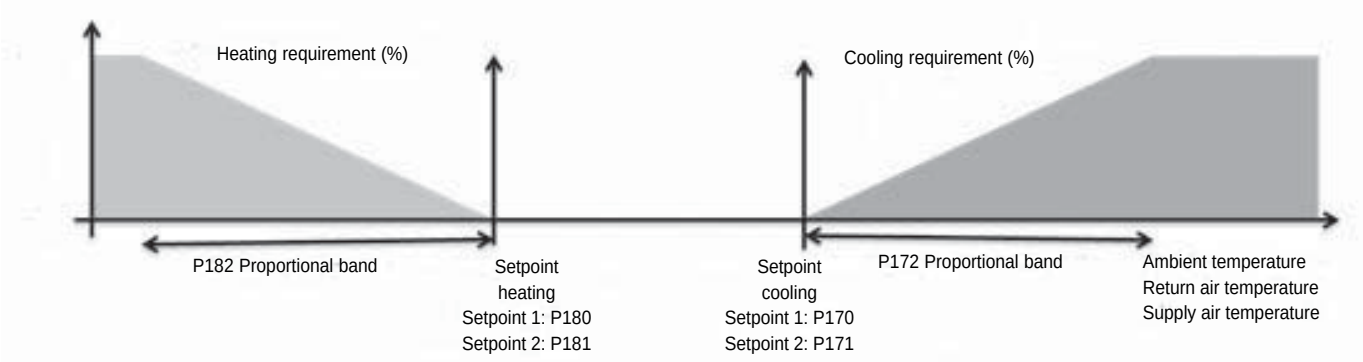
It is possible to view the pressure drop for each filter (P310 to P315).

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 regulated by a PID which calculates a need in heating (P395) or in cooling (P394). There is an instruction(deposit) in warmth (P180) and an instruction(deposit) in cold (P170), with the possibility of having a neutral zône between these two different instructions(deposits). The calculated need is then distributed on the elements of stoking(fire chamber) or cooling.



- 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:

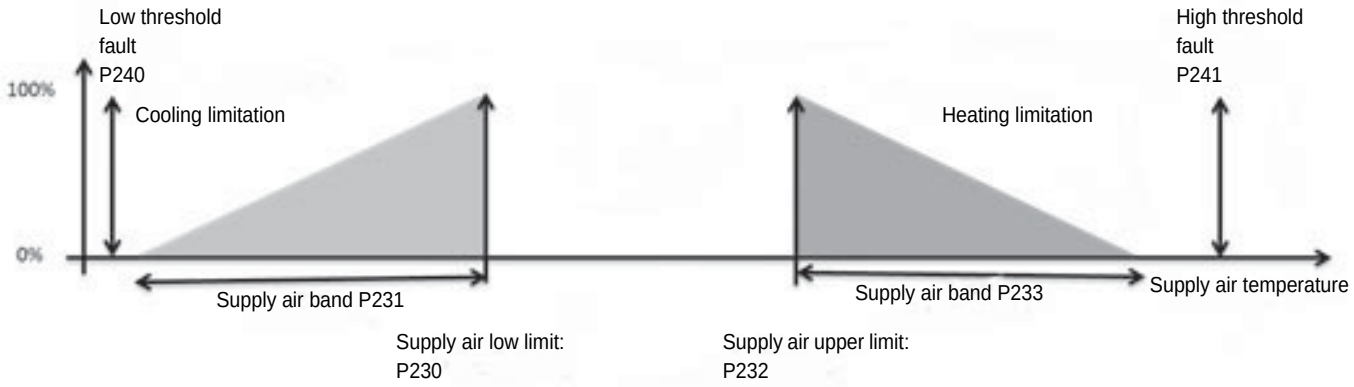
170	Temperature setpoint 1 in cooling mode
171	Temperature setpoint 2 in cooling mode
172	Temperature control PID proportional band (P) in cooling mode
173	Temperature control PID integral time (I) in cooling mode
174	Temperature control PID derivative time (D) in cooling mode

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

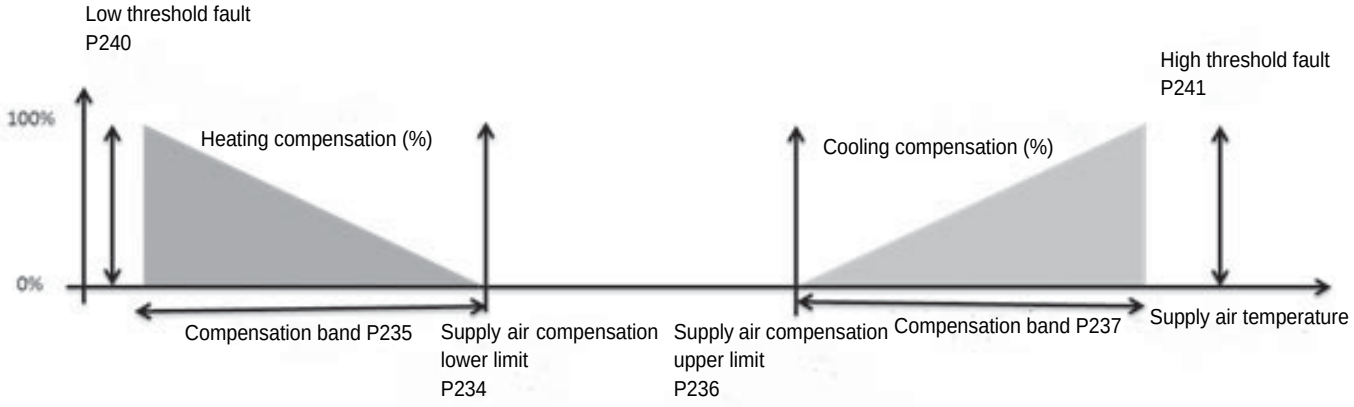
When control is being applied to the return air or room air, the supply air temperature can be limited. This limitation is used to avoid blowing air at too high a temperature in heating mode or too cold a temperature in cooling mode. This limitation is activated by parameter P156.



156	Supply air limitation = With or Without
230	Supply air temperature low limit setpoint
231	Supply air temperature low limit proportional band
232	Supply air temperature upper limit setpoint
233	Supply air temperature upper limit proportional band

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.



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157	Supply air compensation in deadband = With or Without
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

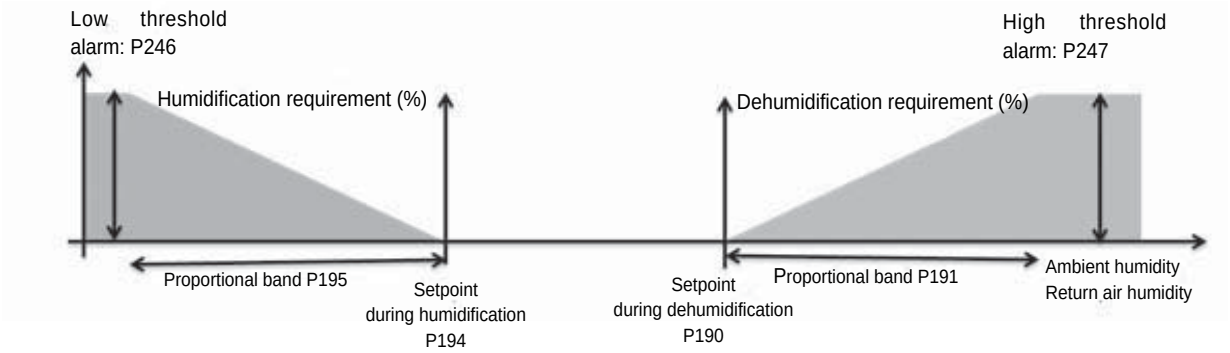
The presence of a humidifier at the intake must be configured (P39). The humidification requirement (P397) is calculated by a PID. The humidity sensor can be placed in the extracted air flow or in the room. It must be in the same location at the controlled temperature sensor.
The humidification setpoint (P194) and the PID parameters must then be set (P195 to P197).

39	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

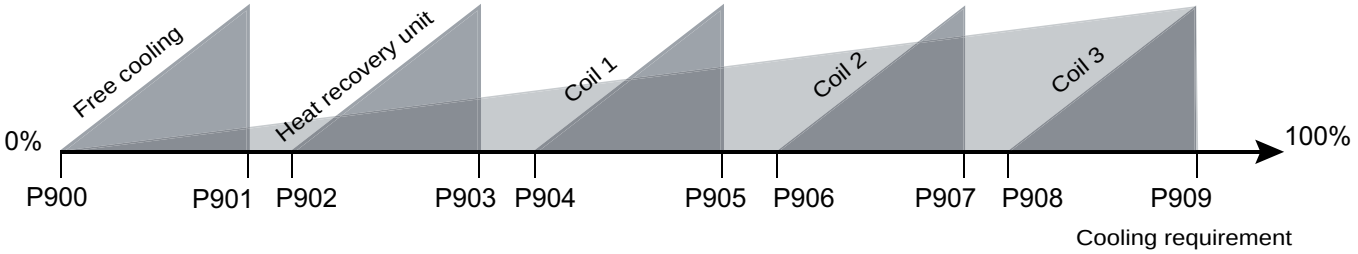


4.8 Distribution of requirements

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

The parameters P900 to P909 are used to define the percentages for the cooling requirement at the start and end of operation of the various elements.

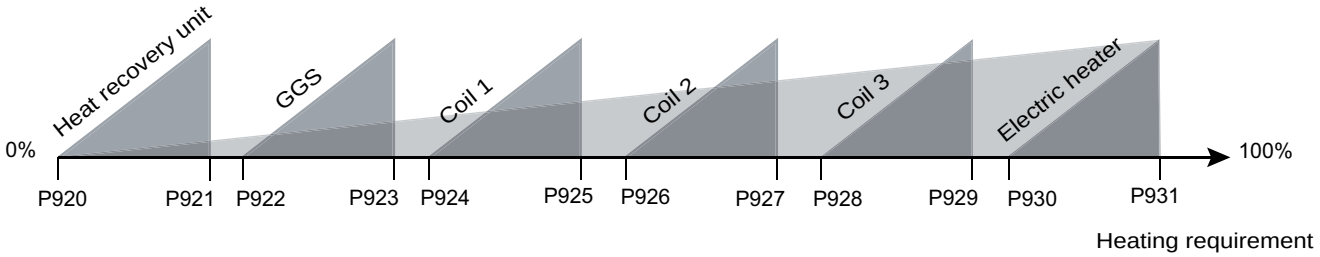


When free cooling and the heat recovery unit are present, they are counted as a single element and therefore have the same ranges for start and end of operation.

900	Free cooling 1 operation start cooling percentage
901	Free cooling 1 operation end cooling percentage
902	Heat recovery unit operation start cooling percentage
903	Heat recovery unit operation end cooling percentage
904	Coil 1 operation start cooling percentage
905	Coil 1 operation end cooling percentage
906	Hydraulic coil 2 operation start cooling percentage
907	Hydraulic coil 2 operation end cooling percentage
908	Hydraulic coil 3 operation start cooling percentage
909	Hydraulic 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):

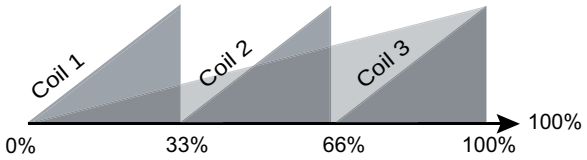


Heating requirement

920	Heat recovery unit operation start heating percentage
921	Heat recovery unit operation end heating percentage
922	Burner operation start heating percentage
923	Burner operation end heating percentage
924	Hydraulic coil 1 operation start heating percentage
925	Hydraulic coil 1 operation end heating percentage
926	Hydraulic coil 2 operation start heating percentage
927	Hydraulic coil 2 operation end heating percentage
928	Hydraulic coil 3 operation start heating percentage
929	Hydraulic coil 3 operation end heating percentage
930	Electric heater operation start heating percentage
931	Electric heater operation end heating percentage

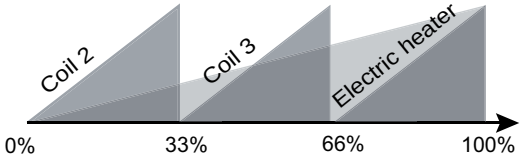
Dehumidification requirement

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).

For constant air flow or constant duct pressure control (P104), a pressure sensor able to measure the air flow is wired to the EC motor or to the frequency inverter. Its presence and measuring scale are given in P4 and P12.

If this sensor is present, the K coefficients for the intake and extraction fans (P5 and P13) must be entered to be able to calculate the flow rate. 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 Air intake motor control is managed via P114 to P116 and the Air extraction 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)

Constant duct pressure control (P104)

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 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

In this case, the extraction fans are operating (P105):

- either by copying the intake flow rate (default setting) with a multiplier factor (P106) to create an overpressure or depression at extraction
- or by copying the intake control with a multiplier factor (P106) to create an overpressure or depression at extraction

Duct pressure

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

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.

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

When present, the pressure sensors installed on the FMAs are used to detect the presence of the air flow (threshold P111). The PLC triggers a fault if the flow rate is greater or less than the fixed limits.
If there are no pressure sensors installed on the FMA, the pressure sensor installed on filter 1 is used instead (threshold P136 and P137).

Flow rate control

110	AHU max flow rate
111	AHU flow rate low limit threshold
136	Air presence threshold at intake
137	Air presence threshold at extraction

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
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
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 Heat recovery

A dual-flow unit may have a heat recovery unit (plate, fixed speed wheel, or gradual 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.

Wheel heat recovery unit

A wheel heat recovery unit (fixed speed or gradual speed) operates as follows:
• When the heat recovery unit heating requirement is greater than 0% and the return air temperature is greater than the fresh air temperature, 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 cooling requirement is greater than 0% and the return air temperature is less than the fresh air temperature, 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 stops.

Wheel 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 recovery unit

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		**Return air** > fresh air	
		Wheel	**Name**	**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

Plate heat recovery unit 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

The unit may include up to 3 hydraulic coils. These comprise a two- or three-way valve which enables the water flow rate to be varied, thereby varying the power emitted by the coil.

These coils are configured using parameters P28, P29 and P30.
Coil 1 may be a cooling coil, heating coil or mixed coil (heating or cooling according to the network temperature).
Coil 2 may be a cooling coil, heating coil or post-heating coil
Coil 3 may be a cooling coil or post-heating coil.

28	Coil no.1
29	Hydraulic coil no.2
30	Hydraulic coil no.3

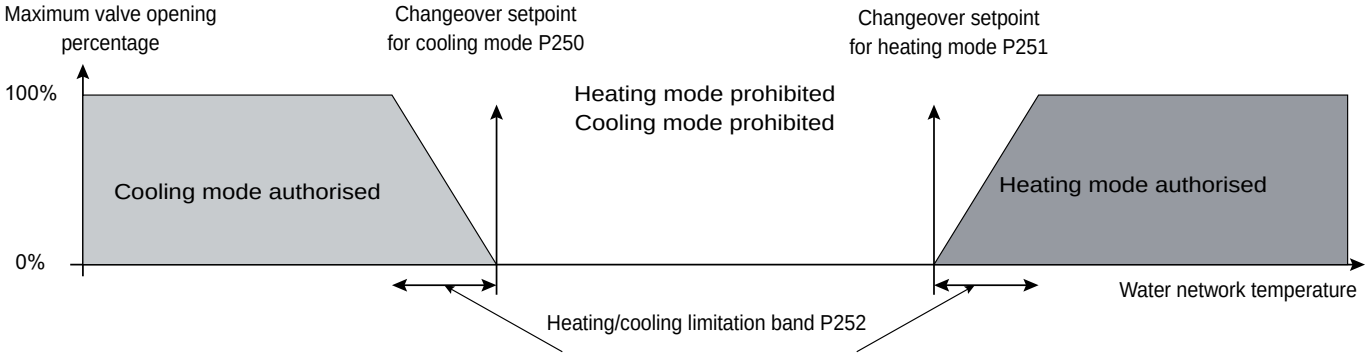
EN

4.11.1 Scenario with a mixed coil

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 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).

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

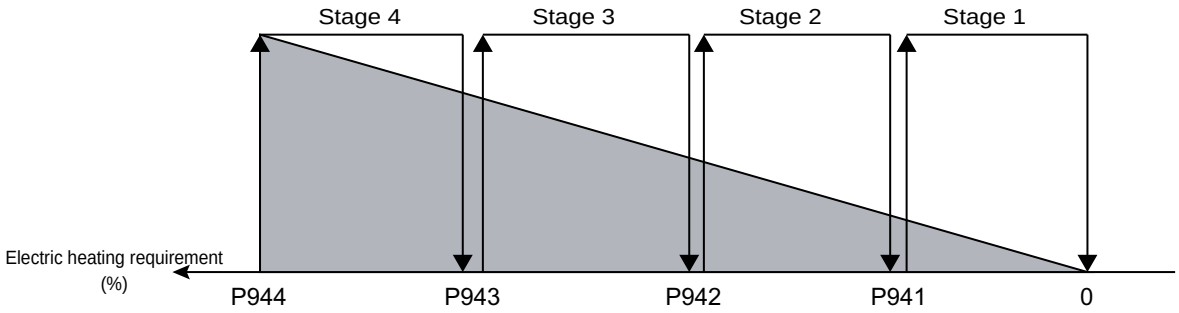
4.12 Electric heater

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.

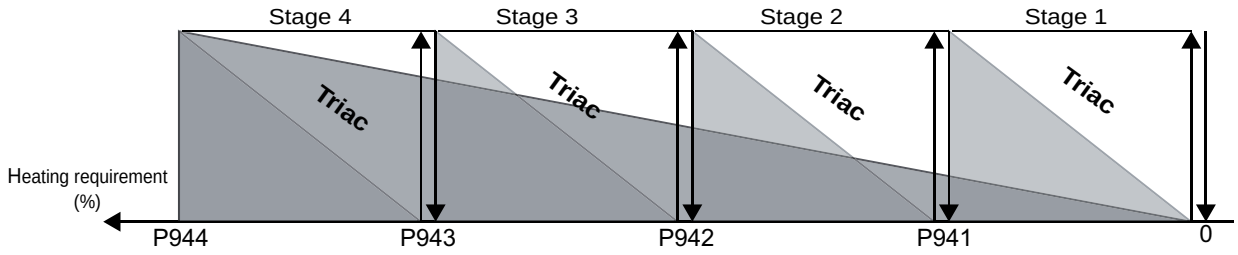
Electric heater configuration

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

When only on/off stages are present in the unit, the stages are triggered in turn. Parameters P941 to P944 correspond to the threshold (electric heating requirement) for start-up of stages 1, 2, 3 and 4.
To increase the efficiency of the control, the settings must be as follows:
• P941 corresponds to the power relating to stage 1 of the electric heater.
• P942 – P941 corresponds to the power relating to stage 2 of the electric heater.
• P943 – P942 corresponds to the power relating to stage 3 of the electric heater.
• P944 – P943 corresponds to the power relating to stage 4 of the electric heater.



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.



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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 drum kit works and when a demand(request) of stop(ruling) of the power plant appears, an adjustable post-ventilation(breakdown) (P164) allows to assure(insure) the cooling of electric drum kits

164	Fan delay time

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 parameters P150 (only if control takes place on the return air or room temperature).
- Cooling requirement: the PID outlet must be greater than 0%
- The difference between the controlled temperature (measured return 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 "temperature low limit for free cooling" (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 the parameter P151
- The controller is located in a "night cooling" time slot or this is overridden 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 "temperature low limit for night cooling" (P207)

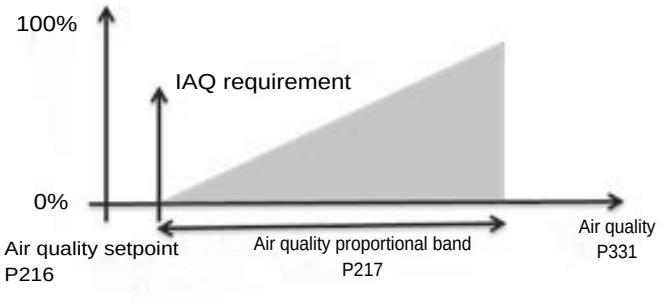
Periodic restarts: if one of the conditions for activation of night cooling is not verified (fresh air temperature, night cooling difference, or cooling requirement), the unit stops.

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.

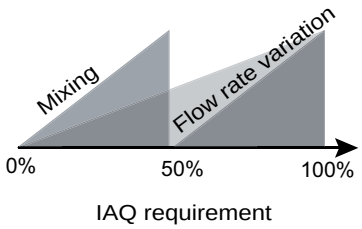
151	Night cooling control
206	Free cooling and night cooling operating differential compared to the controlled temperature
207	Temperature low limit for free cooling and night cooling
210	Control setpoint in night cooling mode
212	Air intake fan flow rate setpoint in night cooling mode
213	Air extraction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

4.15 CO2 air quality

When a CO2 sensor is present in the extracted air flow and a mixing damper is present or when the flow of the FMAs is being controlled, 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 CO2 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.



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

4.16 Managing the time

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 of approximately 10 years – varies according to ambient conditions).

102	Date
103	Time

4.17 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.

Requested state	Display condition
Off	
Frost protection	P154 Choix of the temperature to be regulated = ambient
Night cooling (programmed weekly only)	P151 Night cooling = with
On setpoint 1	P160 Setpoint 1/Setpoint 2 selection = terminal or CMS or on/off input
On setpoint 2	
On	P160 Setpoint 1/Setpoint 2 selection = without

When the ranges overlap, the priority, from least to most important, is as follows:

1. On
2. On setpoint 1
3. On setpoint 2
4. Night cooling
5. Frost protection
6. Off

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.

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

4.18 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.

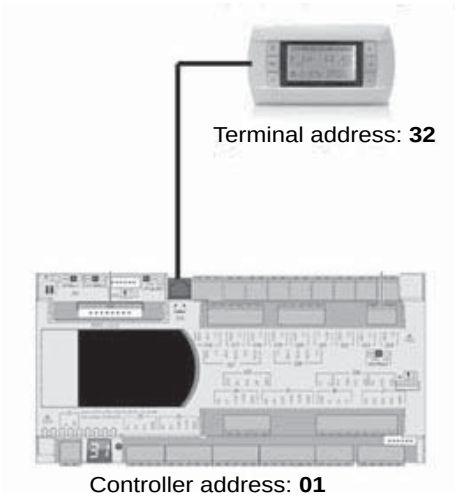
5 MANAGING A NETWORK OF CONTROLLERS AND HMI TERMINALS

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.

P**01**	: Adr	Priv/Shared
Trm1	: **32**	Pr
Trm2	: None	Sh
Trm3	: None	--OK?

5.1 One controller and one terminal:

The procedure for allocating an address to the Terminal is described in the following section paragraph 5.4.2. 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



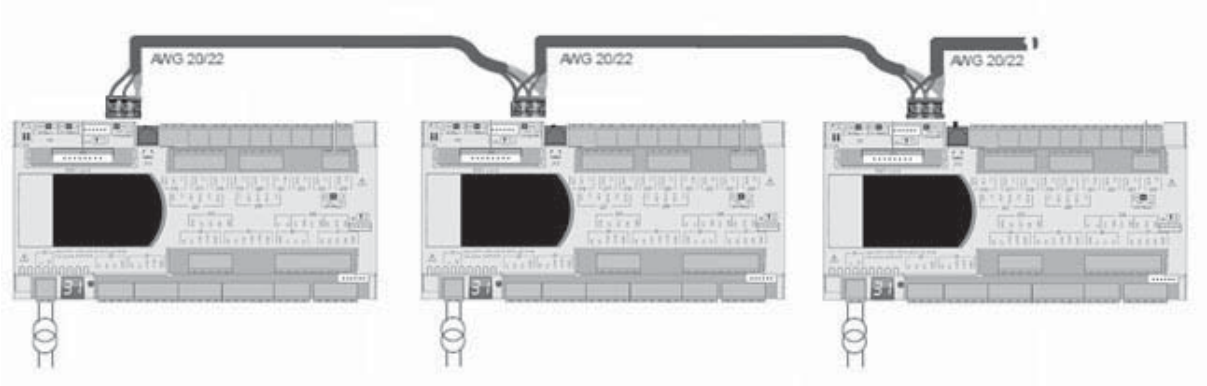
5.2 Several controllers and Terminals:

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)

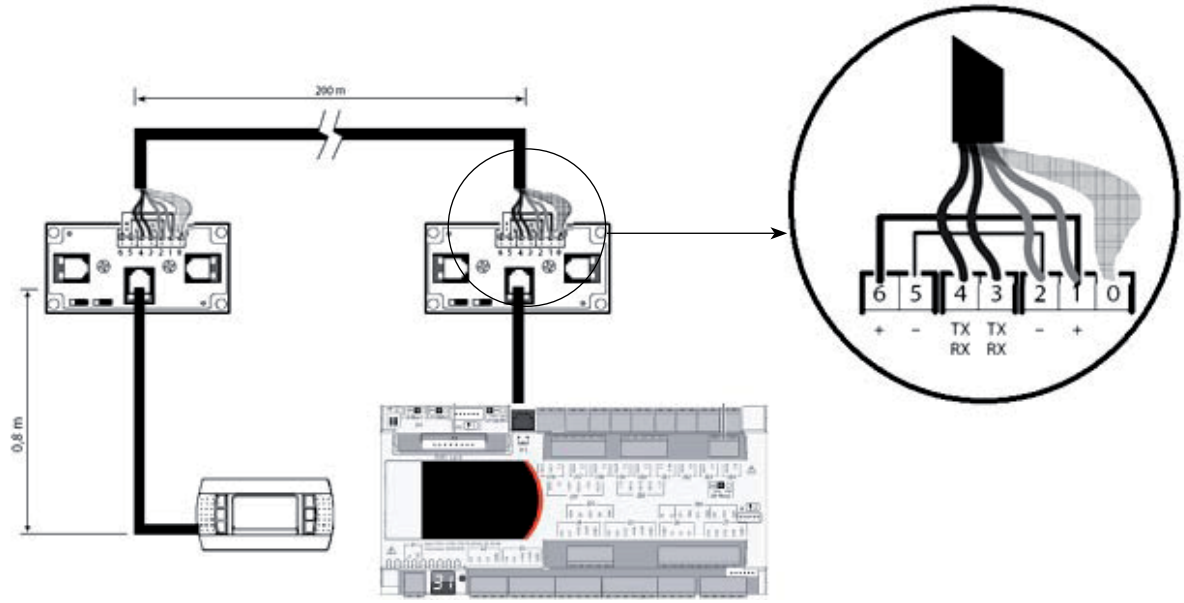
5.3.1 Connecting controllers to the pLAN

The electrical connection between the controllers under 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.



5.4 Addressing the pLAN

5.4.1 Operation

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

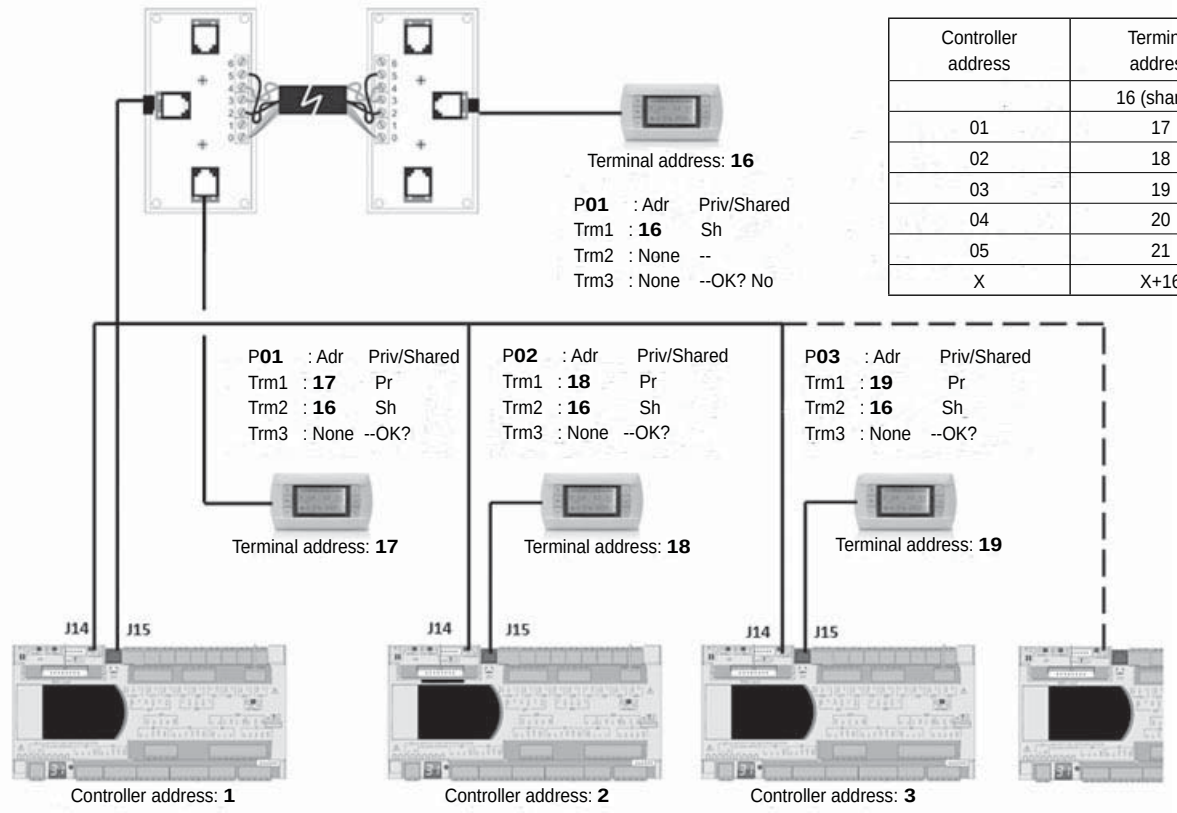
The range of addresses which can be used is from 1 to 32.
This means that a total of 32 controllers and terminals can be connected over the pLAN.
The pLAN will not work if the same address is shared by two components

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:



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

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

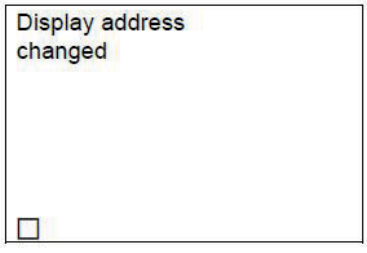
5.4.2 Modifying the addresses for the HMI terminals

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 pointer 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.

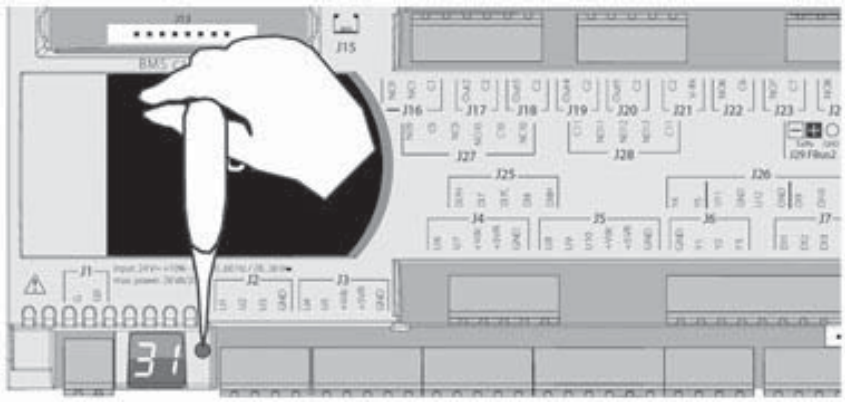
5.4.3 Modifying the addresses for the controllers

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:

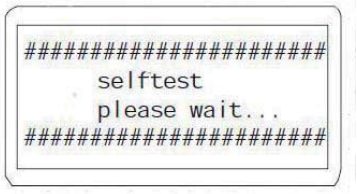
- Press the button for 5 seconds: the address should flash
- Press the button several times or press and hold until the desired address is obtained
- Wait for the address to flash rapidly
- The address is now saved.
- Disconnect then reconnect the controller (powering off confirms the change)



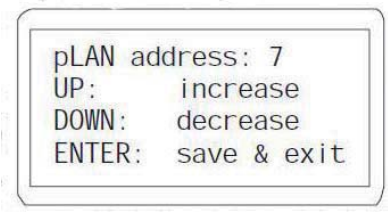
b - From a terminal

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 power is switched back on, press the + keys simultaneously until the screen below is displayed, then release.



- Select the controller address using the and keys and confirm with the key



5.4.4 Assigning private and shared HMI terminals

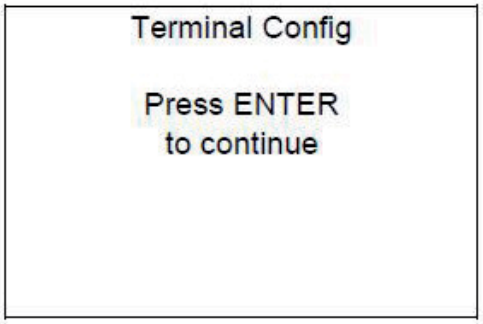
At this point, it is necessary to modify the list of terminals linked to each controller; to do so, follow the procedure below:

• 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 ↑↓ buttons, 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 no controllers are present, the field cannot be changed and will display "__";

• By resting(supporting) once again on the sideline ↵ The sequences of masks here to the right will be posted(shown)



a

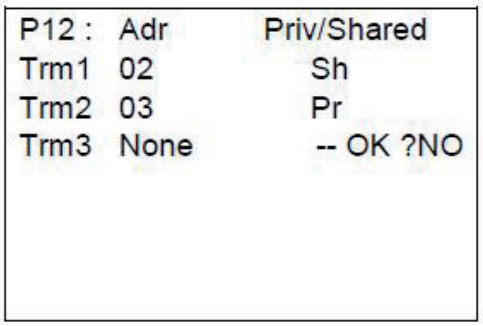
• as above, press the key ↵ to move the pointer from field to field. Press the ↑↓key to change the value of the current field. The P:xx field shows the address of the selected controller. In the example above, controller No. **12** is selected.

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 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



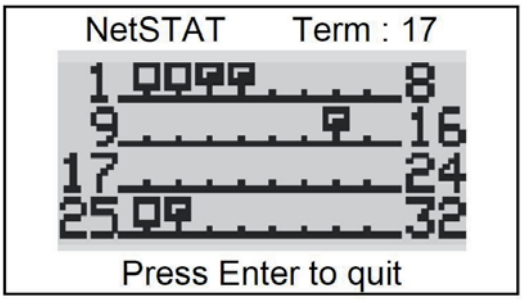
If the terminal remains inactive (no buttons pressed) for more than 30 seconds, it will automatically exit configuration mode without saving any changes made.

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 terminal on the network for at least 10 seconds. After the first 5 seconds, a page is displayed; after 5 more seconds, the next page appears:




Controllers

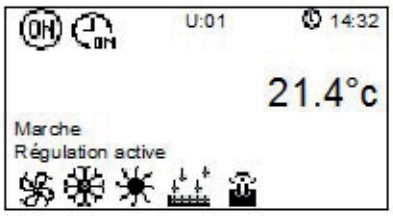

Terminals

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 turn the power back on.

5.4.6 Access to the different controllers on a network from a shared HMI terminal

When a terminal is shared so that it can be used with several controllers, simultaneously pressing the **Esc** + ↓ keys switches 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:



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6 CONNECTION 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.

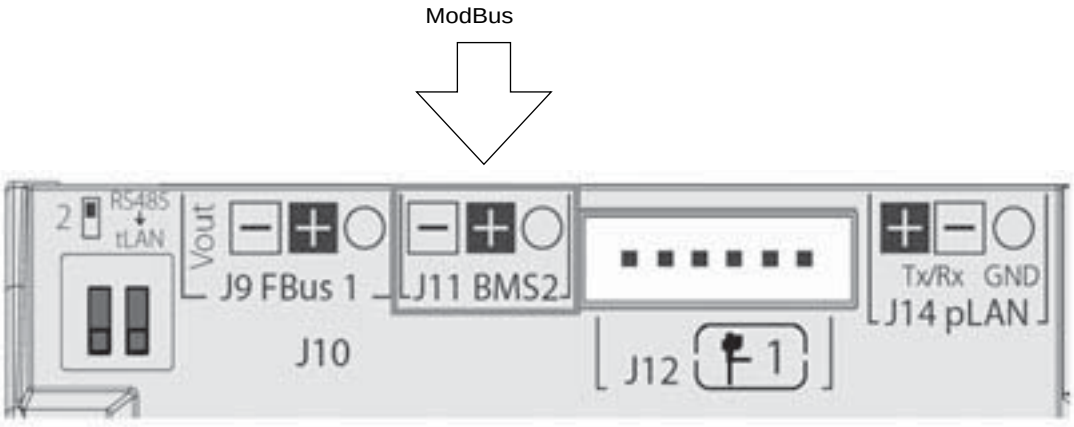
Parameters P706 and P716 indicate whether buses BMS1 and BMS2 are operating as read only (local control) or as read/write (remote control). These parameters must be identical.

706	Control type	0: local 1: Remote
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: without 1 : odd 2 : even
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 30 seconds.
Release the button when the LED switches back to red.

The board is now initialised to the address 172.16.0.1.

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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

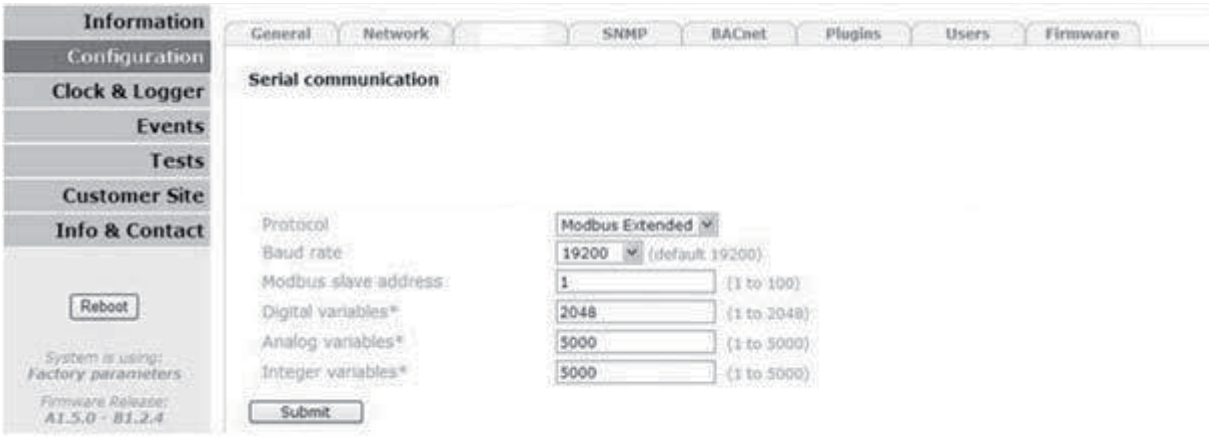
Once these elements have been edited, connect a crossover network cable between the PC and the board.
Open Internet Explorer and enter 172.16.0.1 in the address bar
You will now be connected to the web server for the board.

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 30 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.

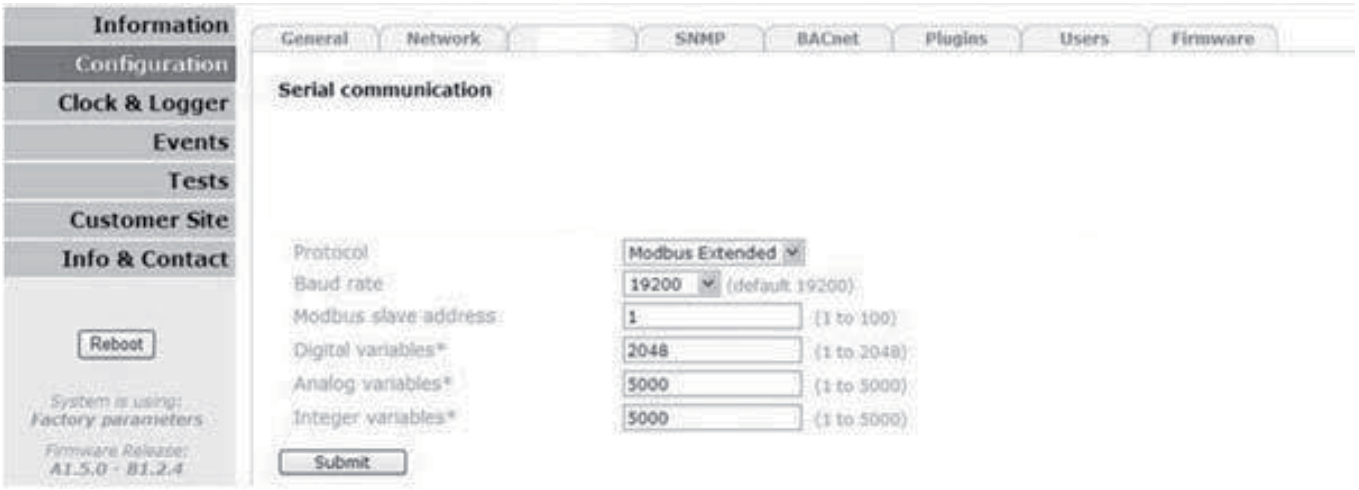
To do so, go into the start menu in the PC then Parameter>Network connection>Local network properties>Properties (TCP/IP).
Enter the IP address: 172.16.0.2.
Subnet mask: 255.255.0.0

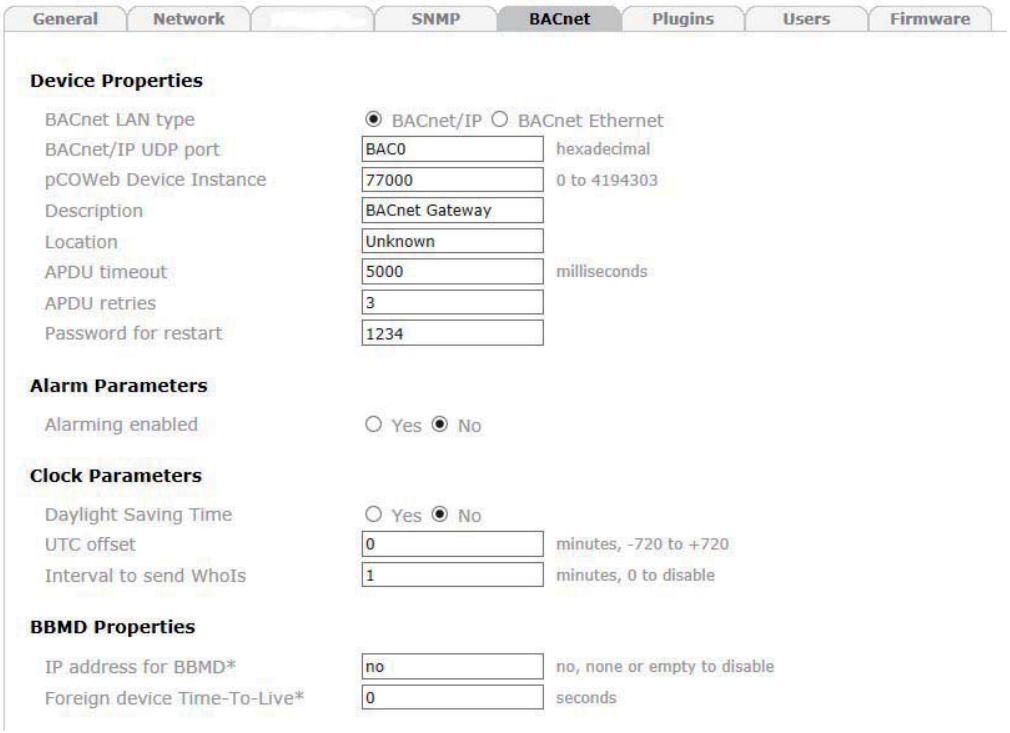
Once these elements have been edited, connect a crossover network cable between the PC and the board.
Open Internet Explorer and enter 172.16.0.1 in the address bar
You will now be connected to the web server for the board.

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.





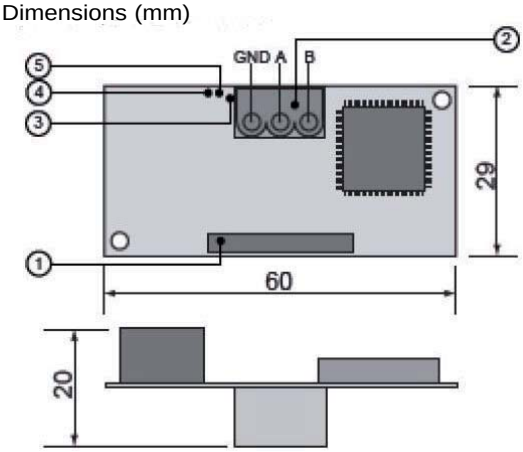
Our PLC only manages Bacnet datapoints in Digital (Dxxx type address) and analogue (Axxx type address) format

6.4 LON

Use of LON requires a board (type FTT-10A), 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. Disconnectable terminal for connection of the LonWorks® network (GND, A, B)
3. Service pin (create a temporary shunt between the two terminals to create a service PIN, disconnect this shunt afterwards)
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)

Dimensions (mm)



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	

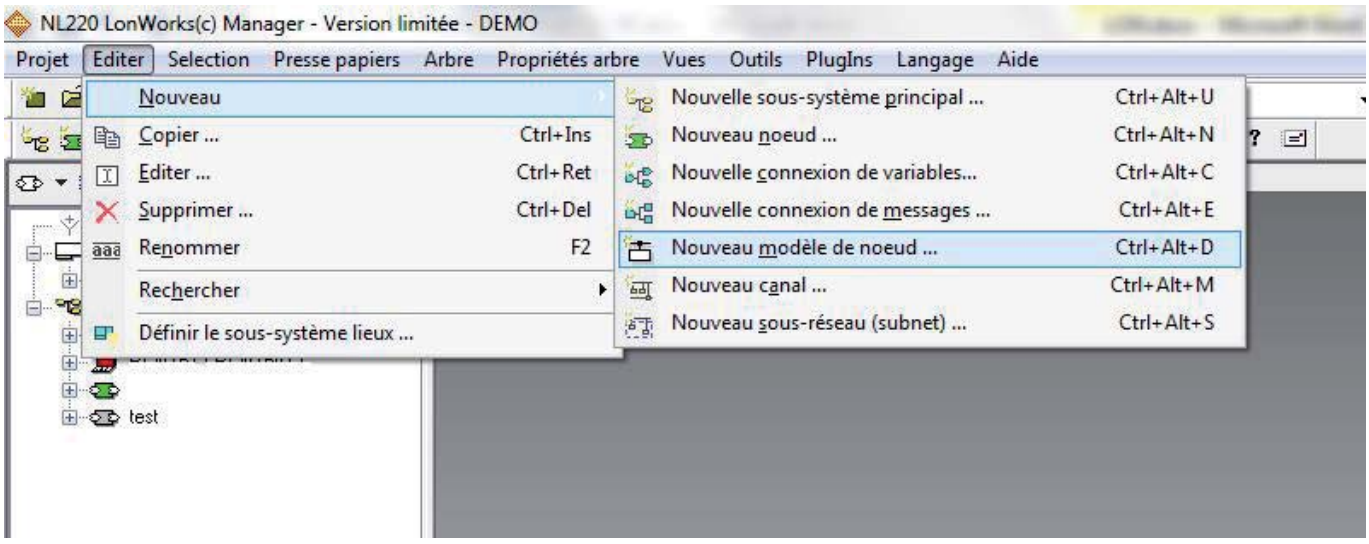
X* Method to be defined jointly by the integrator and installer.

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.

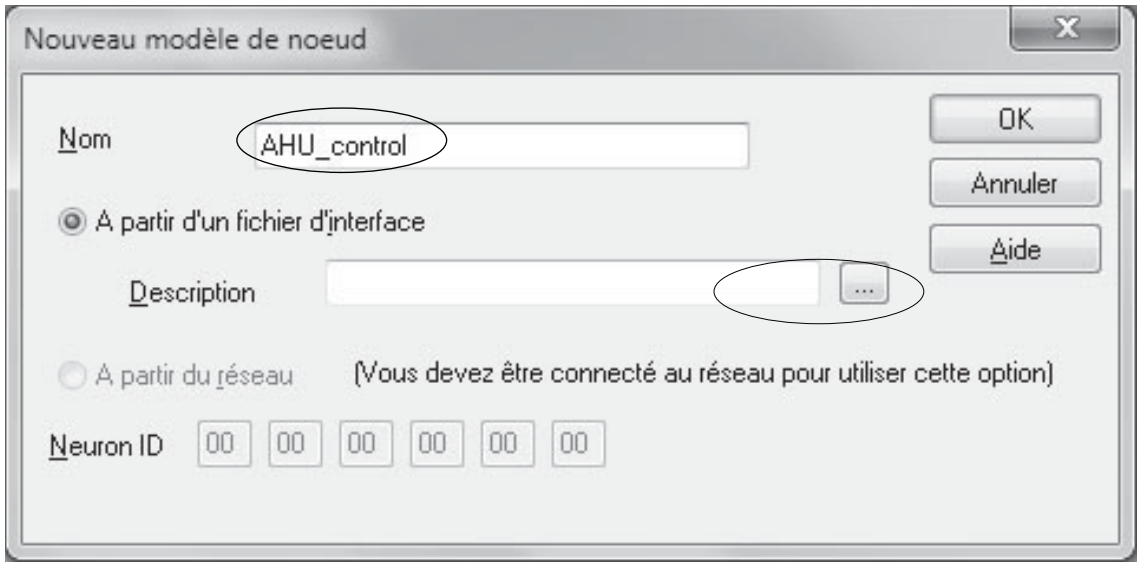
Configuration process

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.



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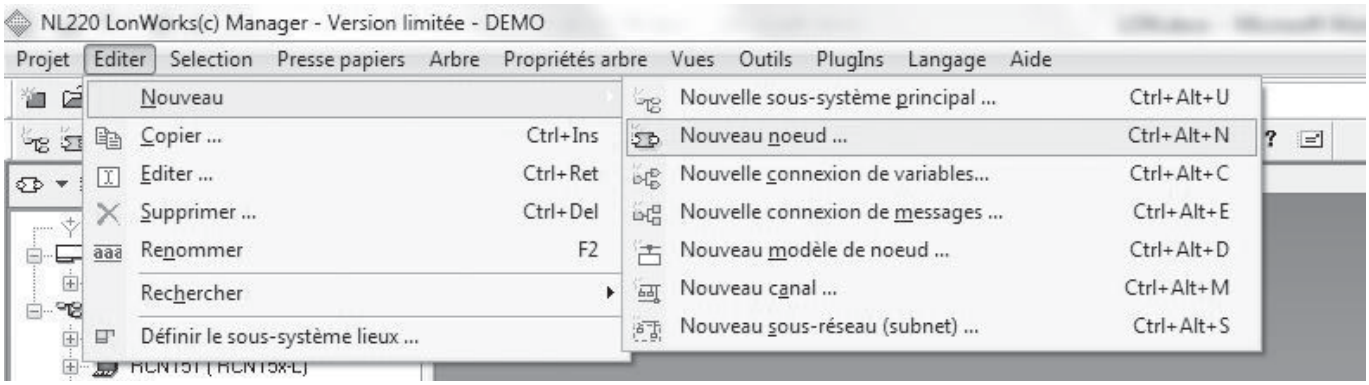
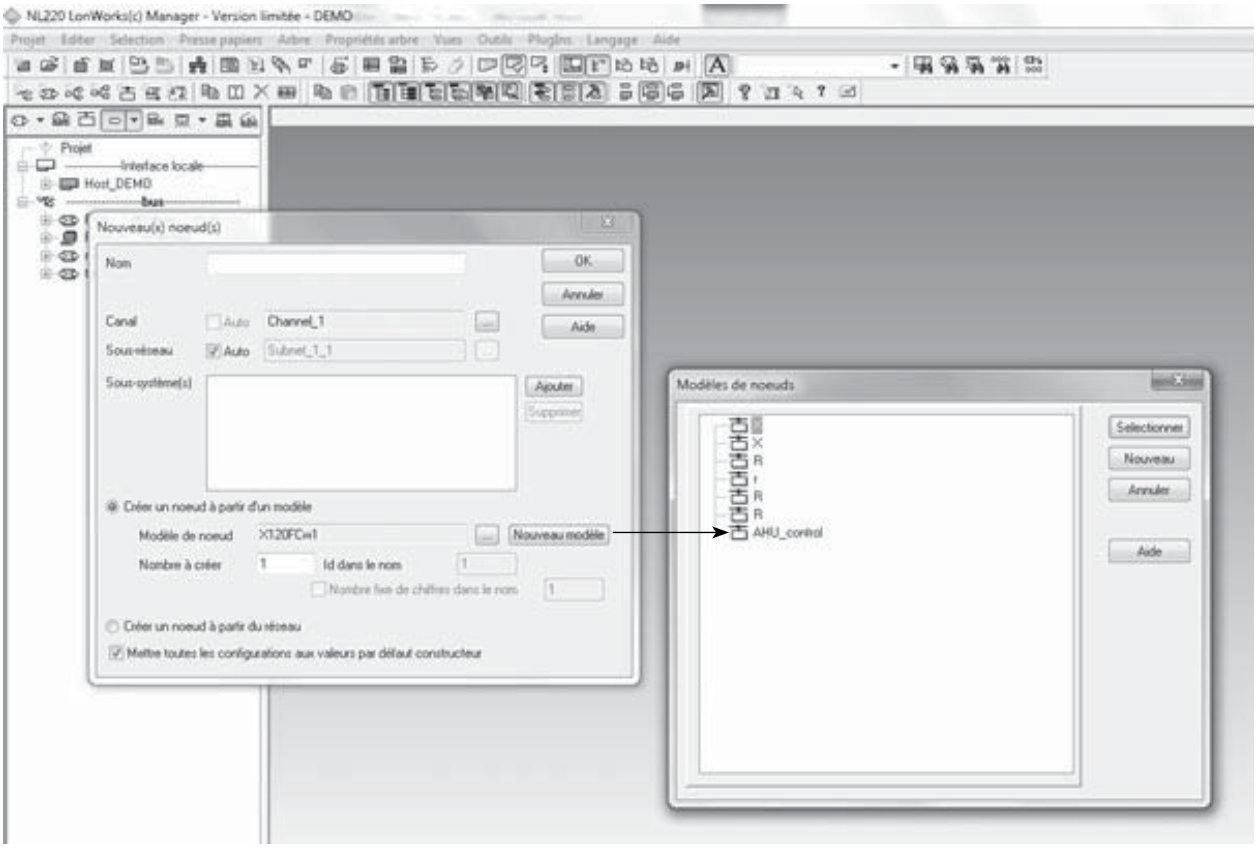
The air handling unit controller will now appear in the list of node models, which will enable as many controllers to be created in the database as there are controllers present on the network.

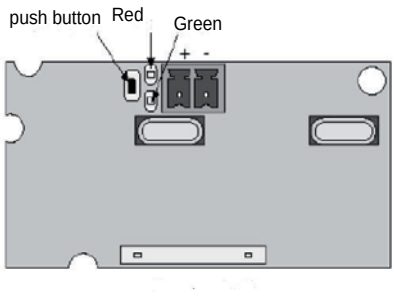


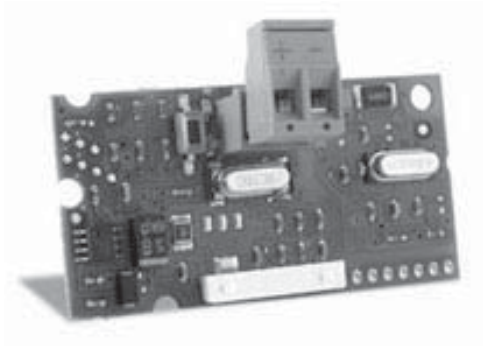


The rest of the configuration (creation of the bindings on the nvi/nvo type datapoints) is carried out normally, as it would be for any other LON product. Our PLC does not have any nci/SCPT/UCPT type datapoints. The configuration parameters are only accessible from the HMI terminal.

6.5 KNX

The use of KNX requires an optional board supplied by the manufacturer and placed on the BMS1 connector.
The bus used is a TP1, with a transmission speed of 9600 Bds.
This bus requires a special external power supply (supplied as an option)





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 XML file has not been downloaded A rapid flash indicates receipt of the address after the button has been pressed.	Proceed with configuration.
	Slow flashing	Configuration in progress: the XML file is being downloaded by ETS	
Green + Red	Both constantly lit	No power supply on KNX bus	Check: KNX bus power supply, 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 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.

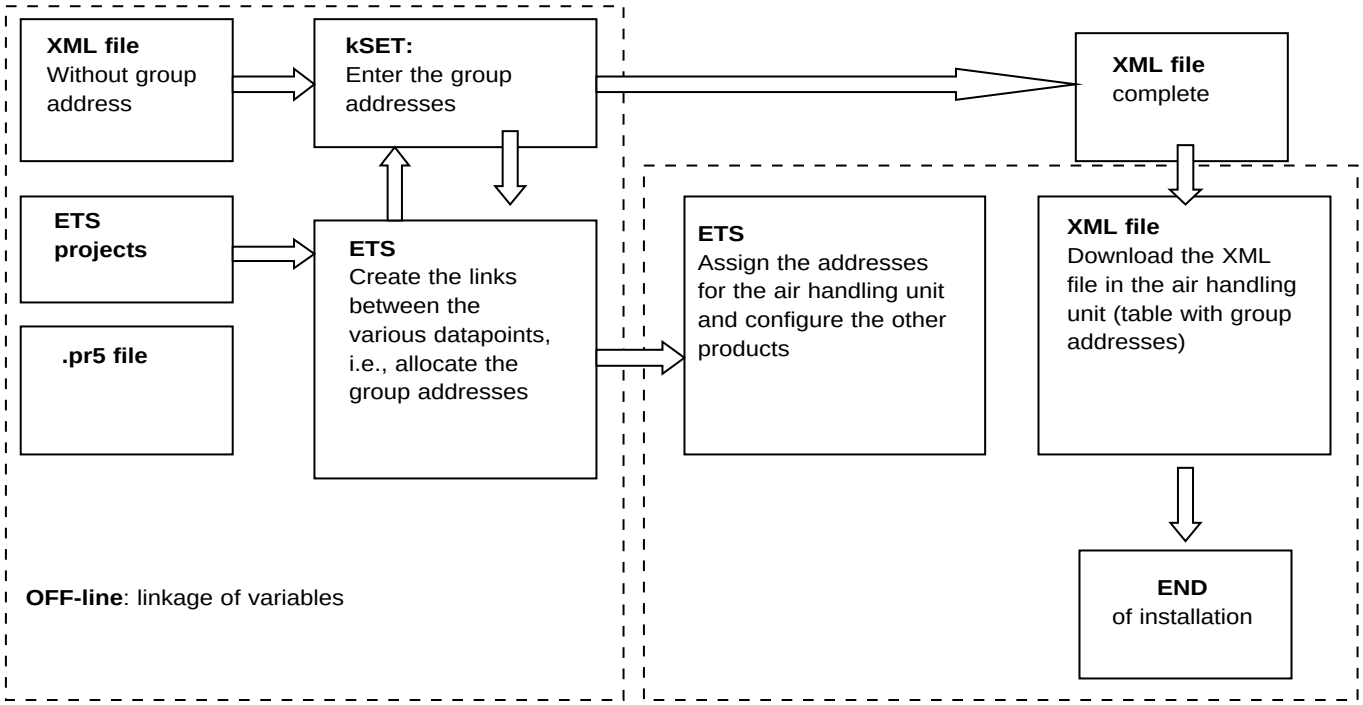
To ensure the KNX network is correctly configured, each party must undertake to adhere to the following roles.

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 diagram below illustrates the phases of the "configuration process" required for configuring the board correctly:



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).
The special feature of the KNX controller for air handling units is that the allocation of the group addresses is not performed from ETS but from the KSet software.

The creation of air handling controllers in the ETS project requires the use of a plug-in, which also enables the xml file generated with KSet to be imported and uploaded to the air handling unit controller.

KSet software

To allocate the group addresses OFFline, install and open the KSet software.
In the File menu, open the xml file provided.
The Group column has already been completed with the default group addresses. Delete the group addresses opposite the KNX datapoints which do not apply to the project, and edit the group addresses for the datapoints relevant to the project if the defaults do not apply.
Do not make any changes to the other columns.

	Group	Name	Datapoint type	IN/OUT	Index	COIL/REG	Conversion Rule	Conversion Value
1	1/1/1	Filtre 1	16-bit float	OUT	1112	Register	Multiply	10
2	1/1/2	PressionGaine	16-bit float	OUT	1110	Register	Multiply	10
3	1/1/3	Temperature Soufflage	16-bit float	OUT	1100	Register	None	
4	1/1/4	TemperatureReprise	16-bit float	OUT	1111	Register	None	
5	1/1/5	Filtre2	16-bit float	OUT	1113	Register	Multiply	10
6	1/1/6	EncrassRecuperateur	16-bit float	OUT	1117	Register	Multiply	10
7	1/1/7	TemperatureNeuf	16-bit float	OUT	1103	Register	None	
8	1/1/8	Temperatureambiante	16-bit float	OUT	1102	Register	None	
9	1/1/9	DebitVentilSoufflage	16-bit float	OUT	1108	Register	Multiply	10
10	1/1/10	DebitVentilReprise	16-bit float	OUT	1109	Register	Multiply	10
11	1/1/11	QualiteAir	16-bit float	OUT	1116	Register	Multiply	10
12	1/1/12	temperatureReseau	16-bit float	OUT	1104	Register	None	
13	1/1/13	Filtre3	16-bit float	OUT	1114	Register	Multiply	10
14	1/1/14	Humidite	16-bit float	OUT	1106	Register	None	
15	1/1/20	Batterie1	16-bit float	OUT	1142	Register	None	
16	1/1/21	vitesseRecupRotatif	16-bit float	OUT	1144	Register	None	
17	1/1/22	VitesseVentilSoufflage	16-bit float	OUT	1140	Register	None	
18	1/1/23	VitesseVentilReprise	16-bit float	OUT	1141	Register	None	
19	1/1/24	Batterie2	16-bit float	OUT	1143	Register	None	
20	1/1/25	BipasseRecup	16-bit float	OUT	1180	Register	None	
21	1/1/26	Triac	16-bit float	OUT	1159	Register	None	
22	1/1/27	Melange	16-bit float	OUT	1169	Register	None	
23	1/1/28	Bruleur	16-bit float	OUT	1178	Register	None	
24	1/1/29	Humidificateur	16-bit float	OUT	1145	Register	None	
25	1/1/40	WVentSConfort	16-bit float	IN	400	Register	None	
26	1/1/41	WVentSConfort	16-bit float	OUT	400	Register	None	
27	1/1/42	WVentRConfort	16-bit float	IN	401	Register	None	
28	1/1/43	WVentRConfort	16-bit float	OUT	401	Register	None	
29	1/1/44	WVentSEco	16-bit float	IN	402	Register	None	
30	1/1/45	WVentSEco	16-bit float	OUT	402	Register	None	
31	1/1/46	WVentREco	16-bit float	IN	403	Register	None	

When all the group addresses have been defined, save the xml file (File menu) with another name.

The types of KNX Datapoint available and the respective conversion methods are listed in the table below:

Type Name	Standard ID	Format	KNX range	Range available in the controller
Boolean (DPT_Switch)	1.001	1 bit	Off/On	Off / On
Unsigned 8 bit (DPT_Value_1_Ucount)	5.010	Unsigned 8 bits	0 to 255	0 to 255
Signed 8 bit (DPT_Value_1_Count)	6.010	Signed 8 bits	-128 to +127	-128 to +127
Unsigned 16 bits (DPT_Value_2_Ucount)	7.001	Unsigned 16 bits	0 to 65535	0 to 32767
Signed 16 bits (DPT_Value_2_Count)	8.001	Signed 16 bits	-32768 to +32767	-32768 to +32767

The plugin

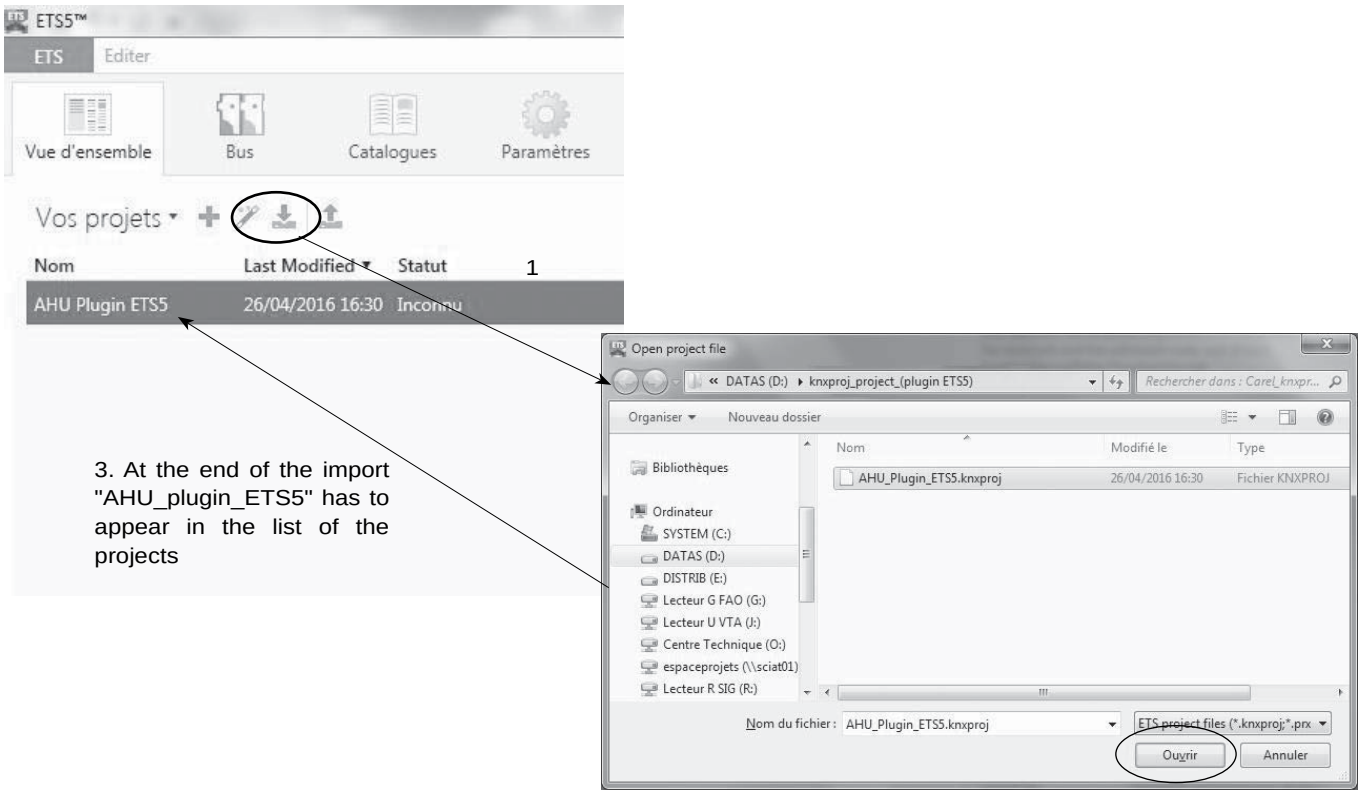
Declaring the air handling unit controller in the ETS project requires the use of a plug-in:
- AHU_plugin_21 for ETS3
- AHU_plugin_30 for ETS4
- AHU_Plugin_ETS5 for ETS5

This plug-in is used to allocated the individual addresses for the controllers and to download the table created by KSet, which is the XML file.

6.5.1. Installing the plugin with ETS5

Carry out installation of the plugin AHU_Plugin_30.knxproj provided.

Import "AHU_plugin_30.knxproj" via Files → Import as shown below:

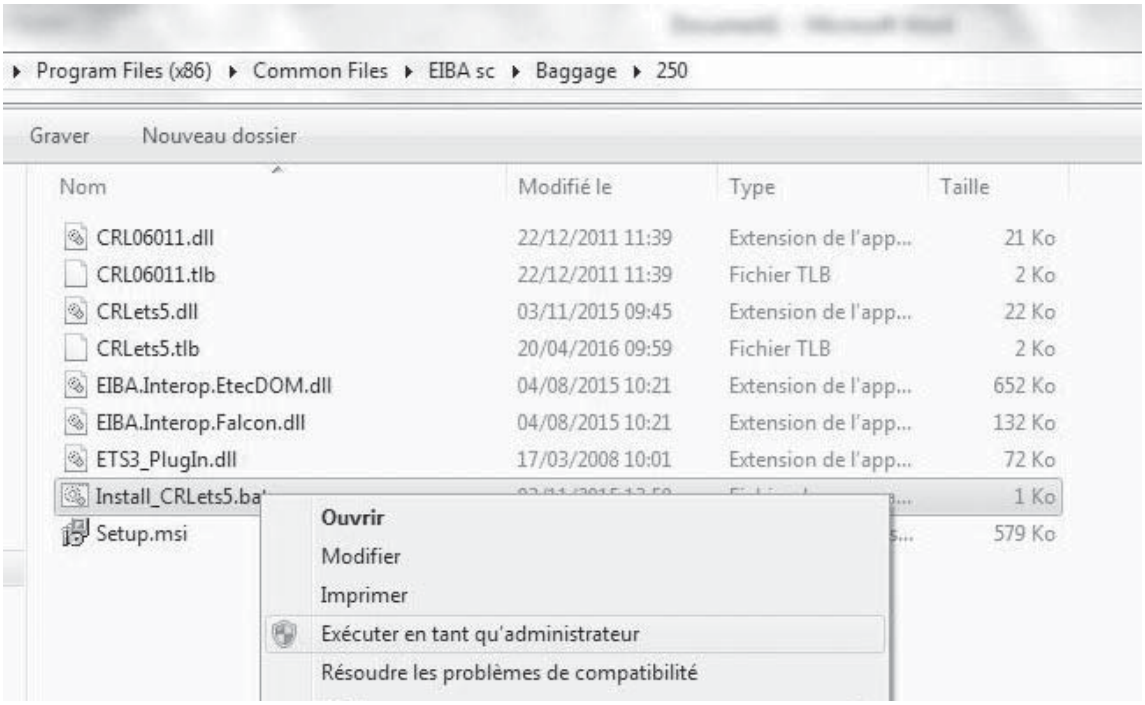


Close ETS

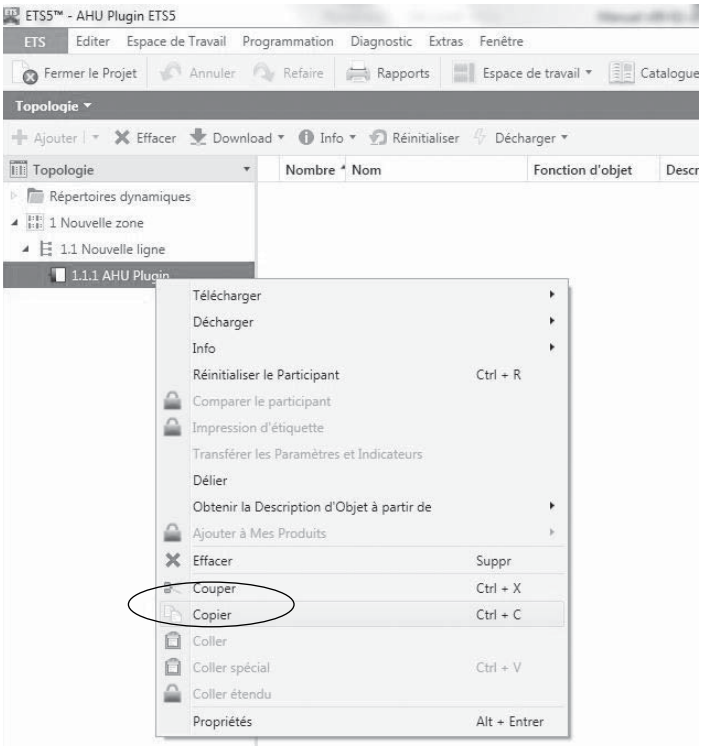
Execute at time(weather) that administrator(director) the batch file which is in the directory below:

For Windows 64 bits: C:\Program Files (x86) \Common Files\EIBA sc\Baggage\250\Install_CRLets5.bat

For Windows 32 bits: C:\Program Files\Common Files\EIBA sc\Baggage\250\Install_CRLets5.bat



Reopen ETS5 and open the project "AHU_plugin_ETS5"



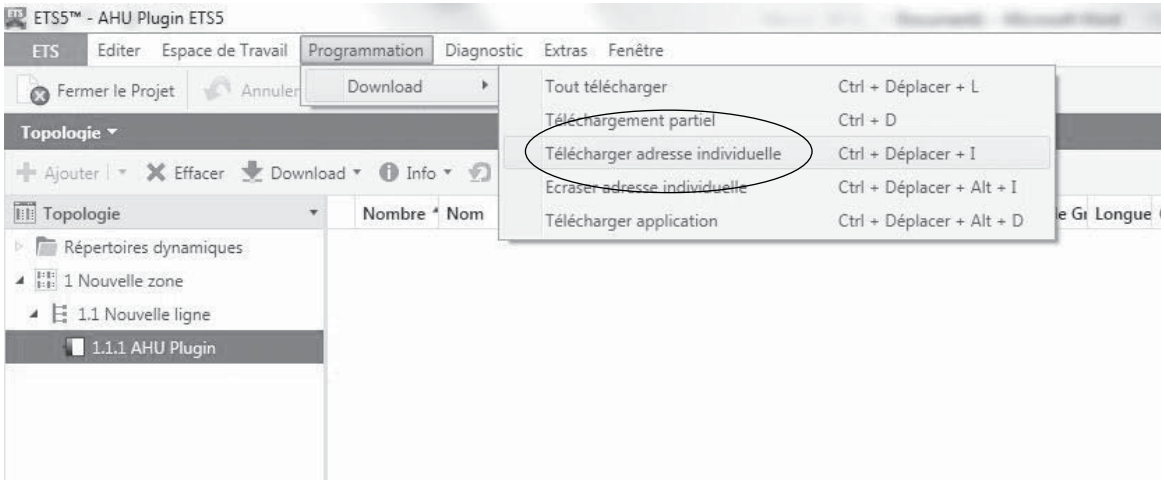
Copy and stick the model of the plugin as often as of devices to be integrated into your project. The address of every device increments automatically. If necessary, you can change manually the address of a device in "Properties".

6.5.2 Assigning the physical address

The physical address of the KNX board is assigned using the standard ETS procedure.
You must ensure that:

. the Bus wire network is drawn out and connected
. the Bus is energised
. the optional KNX board is connected to the network
. the controller is powered on

Use the mouse to select the regulator which must be configured, and by means of the right click to select "to Download" (or in the menu Programming, select "Download").
Select "to Download the individual address" to activate the procedure of configuration and press the button of the card. The green LED on the card goes out to indicate when the operation is ended. If the address of the card was configured already, the message "Tea address is already used by another device" is posted.

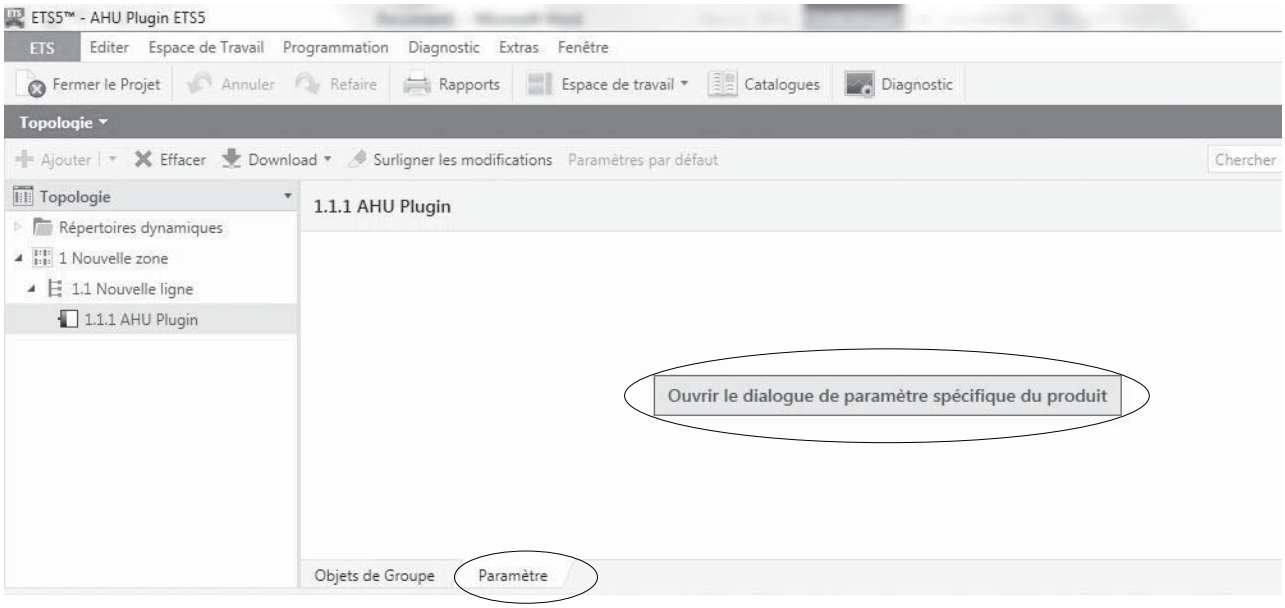


6.5.3 Downloading the XML file

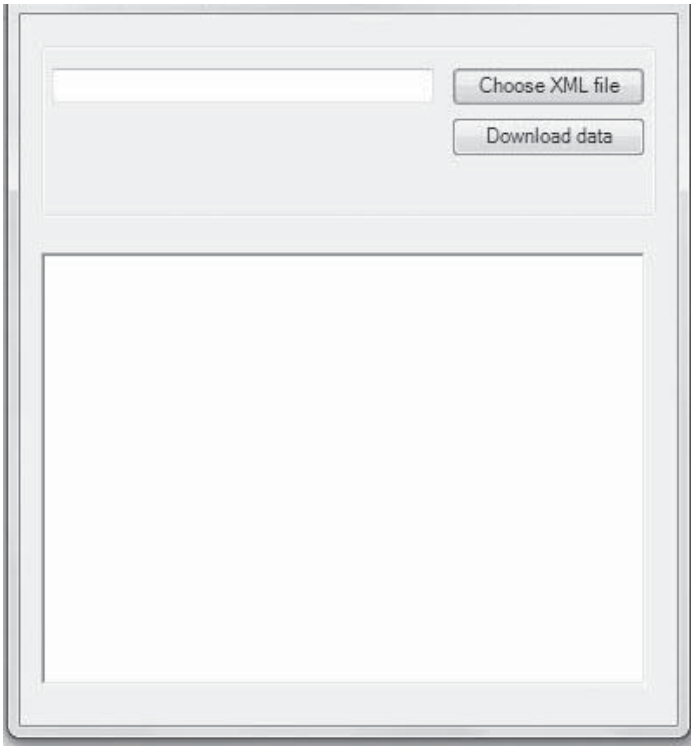
You must ensure that:

. the Bus wire network is drawn out and connected
. the Bus is energised
. the KNX board is connected to the network
. the controller is powered on

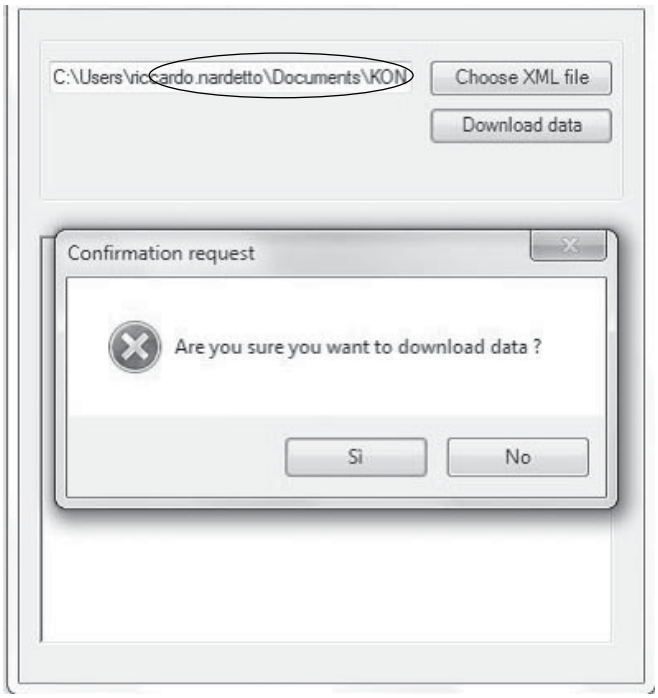
On ETS5, use the mouse to select the controller which needs to be configured, select the "parameters" tab and click "open the dialogue box for parameters specific to the product".

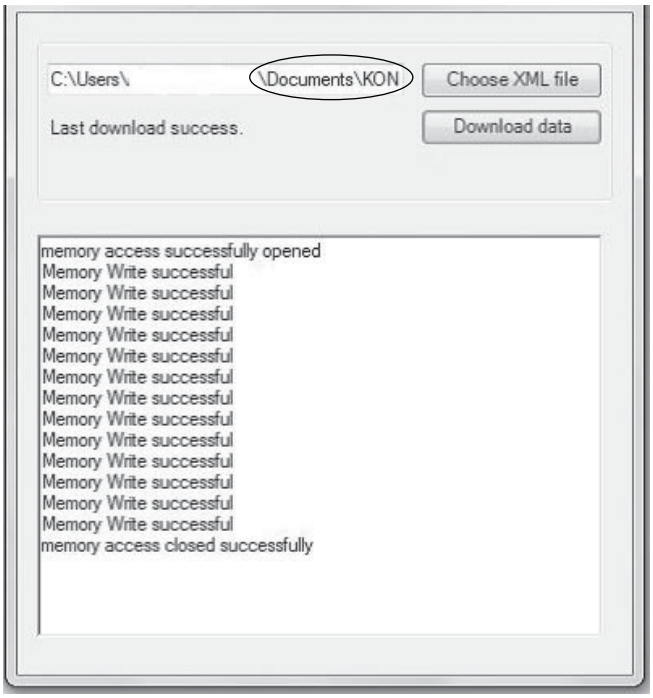


Use "Choose XML file " to open the required configuration XML file



Click on "Download data" and confirm the confirmation prompt .
Wait until the message "Memory Access closed successfully" is displayed. During the loading phase indicated by the control lines passing under ETS5 and the flashing green LED on the card, no other operations can be performed. The charging time can vary depending on the size of the XML file and network traffic ; to a maximum file size , this time can be 2 minutes.
In extreme cases , that is to say a high traffic and large XML files, the bus can disconnect and ETS5 indicate an error. In this case, simply repeat loading.





NOTE : This procedure is specific to the KNX card and is the only configuration operation , in addition to the allocation of the address, permitted by ETS5 program.
KNX variables loaded with this plug-in does not appear in the Group Objects tab. To check and / or edit your group addresses you must open your xml file from KSET , and once you are done, reload the plugin via the ETS .
Our controller has no configuration parameters accessible in KNX . They are only accessible from the HMI .

7 SYSTEM START-UP

7.1 Actions required prior to system start-up

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 system start-up should prove impossible due to a failure to comply with the instructions in the assembly completion notice, additional costs will be invoiced at the applicable rate.

EN

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

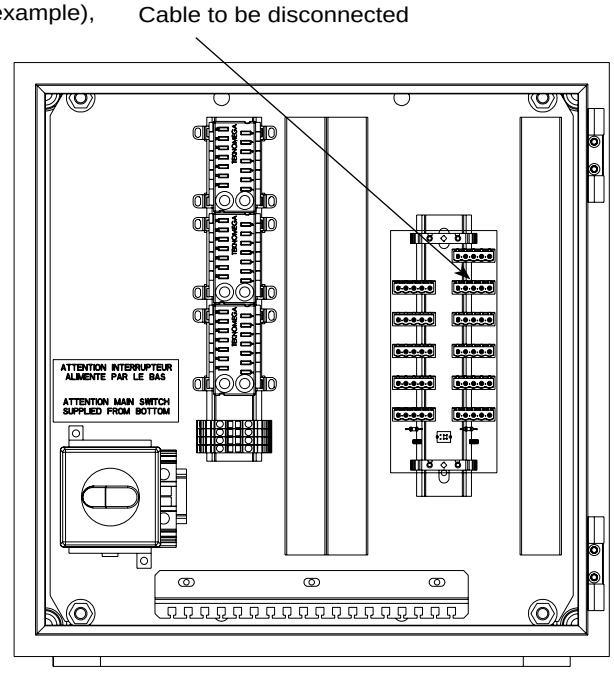
The inverter addressing is performed in the factory.
If you need to change the inverter address (following replacement, for example), proceed as follows:
start the start-up wizard. This starts up automatically as soon as the power is switched on.
It is possible to restart the start-up wizard from the 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 25 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 allocated an address.
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 lines "Start ad", "Config" and "State" will appear on the lower section of the screen.

In the "Start ad" field, select the current motor address. For a motor which has never been allocated an address, 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, P1351 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 "State" 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
- Check that just one non-addressed motor is connected to the ModBus connection
- Check 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 an offset 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 unit is stopped 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 250Vac / 6A 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 variable drive
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

No.	Factory level	Designation of faults
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	Humidifier
70	Maintenance	Electric heater automatic reset safety thermostat
71	Maintenance	Electric heater manual reset safety thermostat
72	Maintenance	Loss of communication with the electric heater expansion board
73	Maintenance	Split unit
80	Maintenance	Duct pressure too low
81	Maintenance	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
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 intake FMA7
108	Maintenance	Loss of communication with the intake FMA8
120	Danger	Loss of communication with the extraction 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

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.
Air intake fan motor	The operating contact for the on/off motor indicates a motor fault.	Overvoltage, motor overload, motor power supply problem, etc.	Check the condition of the motor
	The door contact indicates that the door is open	The 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 fan motor	The operating contact for the on/off motor indicates a motor fault.	Overvoltage, motor overload, motor power supply problem, etc.	Check the condition of the motor
	The door contact indicates that the door is open	The 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 air flow at the intake 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
		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 difference for the flow rate detection is less than the fixed 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 units
		The pressure measurement sensor is defective	Check the operation of the sensor
Exhaust airflow rate	The pressure difference for the flow rate detection is less than the fixed threshold P13	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

Default	Sources	Causes	Solutions
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			
Air extraction filter 1 fouled			
Air extraction filter 2 fouled			
Air intake filter 1 blocked	The pressure drop in the filter is greater than the "filter blocked" threshold	The filter is blocked	Replace the filter
Air intake filter 2 blocked			
Air intake filter 3 blocked			
Air extraction filter 1 blocked			
Air 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
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 is activated	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 is activated	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 cabling between the PLC and the expansion board is damaged	Check the cabling 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
Duct pressure too low	The duct pressure is below the fixed limit P124	Operating problem with the 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
Duct pressure too high	The duct pressure is above the fixed limit P125	Operating problem with the intake pressure sensor	Check the operation of the sensor
		Operating problem with the FMAs	Check the maximum frequency of the inverter/motor

Default	Sources	Causes	Solutions
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.
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 functioning 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 functioning correctly	Check the condition of the humidity sensor

Default	Sources	Causes	Solutions
Loss of communication with the intake inverter	The inverter for the intake FMA has stopped communicating with the PLC	The cabling between the PLC and the inverter is damaged	Check the cabling 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 cabling between the PLC and the EC motor is damaged	Check the cabling 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 cabling between the PLC and the inverter is damaged	Check the cabling 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 cabling between the PLC and the EC motor is damaged	Check the cabling between the PLC and the EC motor
		Communication with the PLC has not been configured	Check parameters P71 to P78

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 : 0-1000Pa 10V 2 : 0-2500Pa 10V 3 : 0-5000Pa 10V		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	23	(P02 Air intake fan = inverter ModBus and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or P02 Air intake fan = EC ModBus	3
6	Air intake fan door contact	0: None 1: With	0		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 = Without	3
		1 : 0-1000Pa 10V 2 : 0-2500Pa 10V 3 : 0-5000Pa 10V		P10 Extraction fan = Inverter ModBus or EC ModBus and P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa	

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
13	Coefficient value K for the exhaust fan	See values at the end of the table	23	(P10 Extraction fan = Inverter ModBus and (P12 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) 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
20	Number of intake filtration stage(s)	?	1		3
21	Number of extraction filter(s)	?	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
28	Coil no.1	0: None 1: Cold water 2: Direct expansion 3: Hot water 4: Mixed (water)	0		3
29	Hydraulic coil no.2	0: None 1: Cooling 2: Heating 3: Post-heating	0		3
30	Hydraulic coil no.3	0: None 1: Cooling 2: Post-heating	0		3
32	Electric heater	None 1: 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

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
35	Split unit	1 : 1 stage 2 : 2 stages 3 : Inverter	0	P28 Coil no.1 = Direct expansion	3
36	Heat recovery unit	0: None 1 : Plate 2 : Fixed speed heat recovery unit 3 : Gradual speed heat recovery unit 4 : Glycol/water mix	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	P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or Glycol/water mix	3
38	Dehumidification control	0: None 1: With	0	P28 Hydraulic coil no.1 = Cooling or Direct expansion or Mixed or P29 Hydraulic coil no.2 = Cooling or P30 Hydraulic coil no.3 = Cooling	2
39	Humidifier	0: None 1: With	0		3
40	Adiabatic humidifier	0: None 1: With	0	(P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus) and P36 Heat recovery unit = Plate	3
44	Main unit energy meter	0: None 1: With	0		3
45	Electric heater energy meter	0: None 1: With	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
46	Humidifier energy meter	0: None 1: With	0	P38 Humidification control = with	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

No.	Description	Settings			Access level
		Enumeration	By default	Display conditions	
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
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
NPA	31	40	49	60	74	100	139	178	218	268	349	455
NPL	-	-	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 Settings parameters

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
100	Language	0: French 1: English	0	1	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 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	
		2: Duct pressure	0	2	1	0		P02 Air intake fan = inverter ModBus or EC ModBus	
105	Air extraction ventilation control	0: Copy of the air intake fan control						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	0	1	1	0		((P10 Extraction fan = inverter ModBus and (P12 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or P10 Extraction fan = EC ModBus) and P104 Extraction ventilation control = Duct pressure	
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	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	m^3/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	3
111	AHU flow rate low limit threshold		0	100000	5	50% of P110	m^3/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	3
112	Air intake fan flow rate setpoint 1		P111	P110	10	10000	m^3/h	P104 Air intake ventilation control = Flow rate	1

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
113	Air intake fan flow rate setpoint 2		P111	P110	10	10000	m^3/h	P104 Air intake ventilation control = Flow rate and P160 Setpoint 1/Setpoint 2 selection = terminal/CMS or On/Off input and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	1
114	Air intake fan flow control PID proportional band (P)		0	30000	1	6000	m^3/h	P104 Air intake ventilation control = Flow rate	2
115	Air intake fan flow rate control PID integral time (I)		0	2000	1	150	s	P104 Air intake ventilation control = Flow rate	2
116	Air intake fan flow rate control PID derivative time (D)		0	2000	1	0	s	P104 Air intake ventilation control = Flow rate	2
118	Intake duct pressure setpoint 1		20	800	1	200	Pi	P104 Air intake ventilation control = Duct pressure	1
119	Air intake duct pressure setpoint 2		20	800	1	100	Pi	P104 Air intake ventilation control = Duct pressure and P160 Setpoint 1/Setpoint 2 selection = terminal/CMS or On/Off input and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	1
120	Air intake duct pressure control PID proportional band (P)		0	400	1	50	Pi	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	Duct pressure low limit threshold		0	P125	1	10	Pi	P104 Air intake ventilation control = Duct pressure	2
125	Duct pressure upper limit threshold		P124	1000	1	900	Pi	P104 Air intake ventilation control = Duct pressure	2
126	Minimum flow rate for electric heater operation		P111	P110	10	10000	m^3/h	((P02 Air intake fan = inverter ModBus) and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) 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 /Off stages or 1 gradual stage and 3 / Off stages)	3
128	Extraction fan flow rate setpoint 1		P111	P110	10	10000	m^3/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate)	1

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
129	Extraction fan flow rate setpoint 2		P111	P110	10	10000	m^3/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate) and P160 Setpoint 1/Setpoint 2 selection = terminal/CMS or On/Off input and P161 Application of the setpoint 1/setpoint 2 selection = ventilation or temperature + ventilation	1
130	Air extraction fan flow rate control PID proportional band (P)		0	30000	1	6000	m^3/h	(P10 Extraction fan = inverter ModBus or EC ModBus) and (P104 Air intake ventilation control = Flow rate 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 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	Pi	(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	Pi	(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	Pi		2
139	Intake filter 1 clogged fault threshold		0	1000	1	400	Pi		2
140	Intake filter 2 fouled fault threshold		0	1000	1	250	Pi	P20 Number of intake filters > 1	2
141	Intake filter 2 clogged fault threshold		0	1000	1	400	Pi	P20 Number of intake filters > 1	2
142	Intake filter 3 fouled fault threshold		0	1000	1	250	Pi	P20 Number of intake filters > 2	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
143	Intake filter 3 clogged fault threshold		0	1000	1	400	Pi	P20 Number of intake filters > 2	2
144	Extraction filter 1 fouled fault threshold		0	1000	1	250	Pi	P21 Number of extraction filters > 0	2
145	Extraction filter 1 clogged fault threshold		0	2000	1	400	Pi	P21 Number of extraction filters > 0	2
146	Extraction filter 2 fouled fault threshold		0	1000	1	250	Pi	P21 Number of extraction filters > 1	2
147	Extraction filter 2 clogged fault threshold		0	1000	1	400	Pi	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	2
152	Air quality control	0: None 1: With	0	1	1	0		P27 Mixing damper = With or P104 Air intake ventilation control = Flow rate	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
156	Supply air limitation	0: without 1: with	0	1	1	1		Regulatory T ° = with cooling or heating control T ° = with P154 and selection of the temperature regulating = recovery room or	2
157	Supply air compensation in deadband	0: without 1: with	0	1	1	1		Regulatory T ° = with cooling or heating control T ° = with P154 and selection of the temperature regulating = recovery room or	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

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
160	Setpoint 1/Setpoint 2 selection	0: None 1: 1 : Time prog or GTC	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		2				(P104 Air intake ventilation control = Flow rate or Temperature control in cooling mode = With or Temperature control in heating mode = With) and P28 Coil no.1 ≠ Direct expansion	
161	Application of setpoint 1/setpoint 2 selection	0: Temperature	0	2	1	0		P160 = prog schedule /CMS or On/Off input	2
		1: Ventilation 2 : Temperature and ventilation						P160 = prog schedule/CMS or On/Off input and P104 Air intake ventilation control = Duct pressure or flow rate	
164	Fan delay time		0	999	1	60	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 (hydraulic or electric)	0: None 1 : On/Off input 2: CMS	0	2	1	0		(P28 Hydraulic coil no.1 = heating 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
166	Mixing damper opening time		0	500	1	150	s	P27 Mixing damper = With	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
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 =prog schedule/CMS or on/off input 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
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 = prog schedule/CMS or On/Off input 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 Intake humidifier = With	1
195	Humidity control PID proportional band (P) in humidification mode		1	50	1	10	%	P39 Intake humidifier = With	2
196	Humidity control PID integral time (I) in humidification mode		0	2000	1	150	s	P39 Intake humidifier = With	2
197	Humidity control PID derivative time (D) in humidification mode		0	2000	1	0	s	P39 Intake humidifier = With	2

No.	Description	Settings					Unit	Display conditions	Access level
		Enumeration	Min.	Max.	Increment	By default			
Settings parameters									
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	Mixing opening minimum percentage 1		0	100	1	0	%	P27 Mixing damper = With	2
209	Mixing opening minimum percentage 2		0	100	1	0	%	P27 Mixing damper = With and P160 Setpoint 1/Setpoint 2 selection =prog schedule/CMS or On/Off input 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 control = With and P104 Air intake ventilation control = Flow rate	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 control = With and P104 Air intake ventilation control = Flow rate	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
220	Heat recovery unit pressure drop setpoint		0	1000	1	250	Pi	(P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit) and P37 Differential pressure sensor on the heat recovery unit = With	2
221	Heat recovery unit fouling control PID proportional band (P)		1	1000	1	50	Pi	P36 Heat recovery unit = Plate 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									
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	150	s	P36 Heat recovery unit = Plate	2
226	Adiabatic cooling authorisation differential in relation to the cooling temperature setpoint		-9.9	9,9	0,1	0,5	°C	P40 Adiabatic cooling = With	2
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 low limit proportional band		1,0	10,0	0,1	5,0	°C	P156 Supply air limitation = with	2
232	Supply air temperature upper limit setpoint		0,0	50,0	0,1	26,0	°C	P156 Supply air limitation = with	2
233	Supply air temperature upper limit proportional band		1,0	10,0	0,1	5,0	°C	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 Intake humidifier = With	2
247	Humidity upper limit threshold		40,0	100,0	1,0	80	%	P38 Dehumidification control = With or P39 Intake humidifier = With	2
250	Changeover setpoint for cooling mode (mixed coil)		0,0	50,0	0,1	10,0	°C	P28 Hydraulic coil no.1 = Mixed	2
251	Changeover setpoint for heating mode (mixed coil)		0,0	50,0	0,1	40,0	°C	P28 Hydraulic coil no.1 = Mixed	2
252	Network temperature cooling/ heating band limit (mixed coil)		0,0	10,0	0,1	2,0	°C	P28 Hydraulic coil no.1 = Mixed	2
260	Opening percentage for the coil 1 valve when unit stopped		0	100	1	0	%	P28 Hydraulic coil no.1 = Cooling or Heating or Mixed	2
261	Opening percentage for the coil 2 valve when unit stopped		0	100	1	0	%	P29 Hydraulic coil no.2 = Cooling or Heating or Post-heating	2
262	Opening percentage for the coil 3 valve when unit stopped		0	100	1	0	%	P30 Hydraulic coil no.3 = Cooling or Post-heating	2

9.3 Reading parameters

No.	Description	Enumeration	Settings		Increment	Unit	Display conditions	Access level
			Min.	Max.				
Reading parameters								
300	Calculated intake flow rate setpoint		0	150000		m3/h	P104 Air intake ventilation control = Flow rate	1
301	Air intake fan flow rate		0	320000		m3/h	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	1
302	Air intake fan differential pressure		0	5000 ?		Pi	(P02 Air intake fan = inverter ModBus) and (P04 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	1
304	Duct pressure calculated setpoint		0	5000 ?		Pi	P104 Air intake ventilation control = Duct pressure	
305	Duct pressure		0	5000 ?		Pi	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 (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 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa) or P10 Extraction fan = EC ModBus	1
308	Extraction fan differential pressure		0	5000		Pi	(P10 Extraction fan = inverter ModBus and P12 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa) or P10 Extraction fan = EC ModBus	1
310	Intake filter 1 differential pressure		0	1000		Pi		1
311	Intake filter 2 differential pressure		0	1000		Pi	P20 Number of intake filters >= 2	1
312	Intake filter 3 differential pressure		0	1000		Pi	P20 Number of intake filters >= 3	1
314	Extraction filter 1 differential pressure		0	1000		Pi	P21 Number of extraction filters >= 1	1
315	Extraction filter 2 differential pressure		0	1000		Pi	P21 Number of extraction filters >= 2	1
316	Extraction differential pressure		0	1000		Pi	P22 Extraction differential pressure sensor = With	1
320	Calculated cooling setpoint		0,0	50,0		°C	Temperature control in cooling mode = with	?
321	Calculated heating setpoint		0,0	50,0		°C	Temperature control in heating mode = with	
322	Supply air temperature		-99.0	99,9		°C		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 heat recovery unit or Fixed speed heat recovery unit or glycol/water mix or fresh air sensor present	1

No.	Description	Enumeration	Settings		Increment	Unit	Display conditions	Access level
			Min.	Max.				
Reading parameters								
324	Return air temperature		-99.0	99,9	0,1	°C	regulatory T ° in cooling = with or regulating T ° in heating = with and P154 choice of temperature regulating = recovery or P36 recuperator = plate or recuperator fixed speed or recovery increasing speed or brine and P154 choice of temperature regulating = blow	1
325	Return air humidity		0	100		%	P154 Target temperature selection = Return air and (P38 Dehumidification control = With or P39 Intake humidifier = With)	1
326	Ambient temperature		-99.0	99,9		°C	P154 Target temperature selection = Room	1
327	Ambient humidity		0	100		%	P154 Target temperature selection = Room and (P38 Dehumidification control = With or P39 Intake humidifier = With)	1
328	Mixed coil network temperature		-99.0	99,9		°C	P28 Hydraulic coil no.1 = Mixed	1
330	Heat recovery unit ΔP		0	1000		Pi	P37 Differential pressure sensor on the heat recovery unit = With	1
331	CO2 air quality		0	2000		ppm	P152 Air quality control = With	1
340	Remote control	0 : O (open) 1 : F (closed)	0	1				1
341	Setpoint 1/Setpoint 2	0 : O (open) 1 : F (closed)	0	1			P160 Setpoint 1/Setpoint 2 selection = On/Off input	1
342	Fire	0 : O (open) 1 : F (closed)	0	1			P24 Fire detection = With	1
343	Antifreeze thermostat	0 : O (open) 1 : F (closed)	0	1			P25 Antifreeze thermostat = With	1
344	Isolation damper end of travel	0 : O (open) 1 : F (closed)	0	1			P26 = register with isolation = / 1	
346	Air intake fan control	0 : O (open) 1 : F (closed)	0	1			P02 Air intake fan = On/Off control	1
347	Intake FMA access door contact	0 : O (open) 1 : F (closed)	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 : O (open) 1 : F (closed)	0	1			P10 Extraction fan = On/Off control	1
349	Extraction FMA access door contact	0 : O (open) 1 : F (closed)	0	1			(P10 Extraction fan = On/Off control or inverter ModBus or EC ModBus) and P14 Extraction fan door contact = with	1
350	Split unit control	0 : O (open) 1 : F (closed)	0	1			P28 Coil no.1 = Direct expansion	1
351	Rotary heat recovery unit control	0 : O (open) 1 : F (closed)	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 : O (open) 1 : F (closed)	0	1			P39 RH humidification control = With	1
354	Bypass	0 : O (open) 1 : F (closed)	0	1			P32 electric battery = 1 digital floor or 2 discrete stages or three discrete stages or 4 digital stories or 1 Progressive floor or 1 Progressive floor and 1 digital floor or 1 Progressive floor and 2 digital stories or 1 Progressive floor and 3 floors TOR and P159 Selection shedding electric	1

No.	Description	Enumeration	Settings		Unit	Display conditions	Access level
			Min.	Max.			
Reading parameters							
355	Heating coil selection (water/heater)	0 : O (open) 1 : F (closed)	0	1	1	(P28 Hydraulic coil no.1 = heating 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
356	Electric heater auto safety thermostat	0 : O (open) 1 : F (closed)	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 : O (open) 1 : F (closed)	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				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	
384	Mixing damper opening	0 : off 1 : on	0	1		P27 Mixing damper = With	1
385	Mixing damper closing	0 : off 1 : on	0	1		P27 Mixing damper = With	1
386	Mixing damper opening 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 selection 1/ 2 = setpoint prog schedule / GTC or digital input	1
394	Calculated cooling demand		0	100	%	Temperature control in cooling mode = With	
395	Calculated heating demand		0	100	%	Temperature control in heating mode = With	
396	Calculated dehumidification demand		0	100	%	P38 Dehumidification control = With	
397	Calculated humidification demand		0	100	%	P39 Air intake humidifier	
398	Cooling block	0 : off 1 : on	0	1		Temperature control in cooling mode = With and Temperature control in heating mode = With	
399	Heating block	0 : off 1 : on	0	1		Temperature control in cooling mode = With and Temperature control in heating mode = With	
400	Coil 1 Cooling		0	100	%	P28 Coil no.1 = mixed or cold water	1
401	Coil 1 Heating		0	100	%	P28 Coil no.1 = mixed or hot water	1
404	Coil 2 Cooling		0	100	%	P29 Hydraulic coil no.2 = cooling	1
405	Coil 2 Heating		0	100	%	P29 Hydraulic coil no.2 = heating	1
406	Coil 2 Post-heating		0	100	%	P29 Hydraulic coil no.2 = post-heating	1
408	Coil 3 Cooling		0	100	%	P30 Hydraulic coil no.3 = cooling	1
409	Coil 3 Post-heating		0	100	%	P30 Hydraulic coil no.3 = post-heating	1

No.	Description	Enumeration	Settings		Unit	Display conditions	Access level
			Min.	Max.			
Reading parameters							
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	
415	Stage 2 electric heater operating-hour meter		0	999999,0	h	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
416	Stage 3 electric heater	0 : off 1 : on	0	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	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
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	
421	Heating coil selection state	0 : electric heater 1 : hot water coil	0	1	1	(P28 Hydraulic coil no.1 = heating 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 and 1 On/Off stage or 1 gradual stage and 2 On/Off stages or 1 gradual stage and 3 On/Off stages)	
440	Stage 1 Split unit	0 : off 1 : on	0	1		P28 Hydraulic coil no.1 = direct expansion	1
441	Stage 1 Split unit operating-hour meter		0	999999	h	P28 Hydraulic coil no.1 = direct expansion	1
442	Split unit coil 1 percentage		0	100	%	P28 Hydraulic coil no.1 = direct expansion and P35 Split unit = Inverter	1

No.	Description		Settings		Unit	Display conditions	Access level
			Min.	Max.			
Reading parameters							
444	Stage 2 Split unit	0 : off 1 : on	0	1		P28 Hydraulic coil no.1 = direct expansion and P35 Split unit = 2-stage	1
445	Stage 2 Split unit operating-hour meter		0	999999,0	h	P28 Hydraulic coil no.1 = direct expansion and P35 Split unit = 2-stage	1
450	Heat recovery unit	0 : off 1 : on	0	1		P36 Heat recovery unit = Gradual speed heat recovery unit or Fixed speed heat recovery unit	1
451	Heat recovery unit operating-hour meter		0	999999,0	h	P36 Heat recovery unit = Gradual speed heat recovery unit or Fixed speed heat recovery unit	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	1
455	Heat recovery unit bypass closing	0 : off 1 : on	0	1		P36 Heat recovery unit = Plate	1
456	Heat recovery unit bypass opening percentage		0	100	%	P36 Heat recovery unit = Plate	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	Air intake humidifier		0	100	%	P39 Air intake humidifier = With	1
461	Air intake humidifier operating-hour meter		0	999999	h	P39 Air intake humidifier = With	1
464	Adiabatic cooling	0 : off 1 : on	0	1		P40 Adiabatic humidifier= With	1
465	Adiabatic cooling operating-hour meter		0	999999,0	h	P40 Adiabatic humidifier= 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 5: On	0	5			1
492	Annual programming request	0 : inactive 1 : active	0	1			1
493	State requested by the annual programming	0 : Off 1: Frost protection 2 : Night cooling 3 : Setpoint 2 on 4 : Setpoint 1 on 5: On	0	5			1

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	
113	Air intake fan flow rate setpoint 2	P111	P112	10	10000	m3/h	P104 control ventilation introductory rate and P160sélection = setpoint 1 / 2 = setpoint prog schedule / GTC or digital input and P161 application of the selection consigne1 / 2 = ventilation setpoint temperature or	1
118	Air intake duct pressure setpoint 1	20	800	1	200	Pi	P104 Air intake ventilation control = Duct pressure	1
119	Air intake duct pressure setpoint 2	20	P118	1	100	Pi	P104 control ventilation introductory = duct pressure and P160 setpoint selection 1/ 2 = setpoint prog schedule / GTC or digital input and P161 application of the selection set 1/ 2 = ventilation setpoint temperature or ventilation +	1
128	Air extraction fan flow rate setpoint 1	P111	P110	10	10000	m3/h	P10 Extraction fan = inverter ModBus or EC ModBus	1
129	Air extraction fan flow rate setpoint 2	P111	P110	10	10000	m3/h	P10 exhaust fan = Modbus or Modbus controller P104 and EC regulation introducing ventilation and P160 = speed setpoint selection 1/ 2 = setpoint prog schedule / GTC or digital input and P161 application of the selection set 1 / set 2 = ventilation or ventilation temperature+	1
170	Temperature setpoint 1 in cooling mode	0,0	50,0	0,1	25,0	°C	P30 Temperature control in cooling mode = With	1
171	Temperature setpoint 2 in cooling mode	0,0	50,0	0,1	30,0	°C	regulatory T ° = with cooling and P160 setpoint selection 1/ 2 = setpoint prog schedule / GTC or digital input and application of P161 setpoint 1 / 2 = setpoint temperature or temperature + ventilation	1
180	Temperature setpoint 1 in heating mode	0,0	50,0	0,1	23,0	°C	P31 Temperature control in heating mode = With	1
181	Temperature setpoint 2 in heating mode	0,0	50,0	0,1	18,0	°C	Regulatory T ° heating = With P160 setpoint selection 1/ 2 = setpoint prog schedule / GTC or digital input and P161 application of the selection set 1/ 2 = setpoint 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	%	04 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

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
610	Burner	0 : Maintenance 1 : Danger	0	P34 Burner = 2-stage or modulating	2
611	Overheating of the combustion chamber thermostat	0 : Maintenance 1 : Danger	0	P34 Burner = 2-stage or modulating	2
612	Humidifier	0 : Maintenance 1 : Danger	0	P38 Intake humidifier = with	2
613	Heat pump module	0 : Maintenance 1 : Danger	0	P28 Coil no.1 = Direct expansion	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 heat recovery unit or Gradual speed heat recovery unit or Glycol/water mix	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		2
621	Supply air temperature too low	0 : Maintenance 1 : Danger	0		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	P148 Dehumidification control = With or P38 Intake humidifier = with	2
627	Humidity too low	0 : Maintenance 1 : Danger	0	P148 Dehumidification control = With or P38 Intake humidifier = With	2

No.	Description	Setting		Display conditions	Access level
		Enumeration	By default		
628	Duct pressure too high	0 : Maintenance 1 : Danger	0	P104 Air intake ventilation control = Duct pressure	2
629	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
632	Loss of communication with the main unit energy meter	0 : Maintenance 1 : Danger	0	P44 Main unit energy meter = With	2
633	Loss of communication with the electric heater energy meter	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 and P41 Electric heater energy meter= With	2
634	Loss of communication with the humidifier energy meter	0 : Maintenance 1 : Danger	0	P38 Intake humidifier = with and P42 Humidifier energy meter = With	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	7	0		2
701	Selection of the transmission speed on the BMS1 port	0 : 1200 1 : 2400 2 : 4800 3 : 9600 4 : 19200	0	4	3 if P700=1 or 3 2 if P700=2 4 if P700=4, 5 or 6	P700 = 1	2
702	Parity on the BMS1 port	0: without 1 : odd 2 : even	0	2	0	P700 = 1	
703	Number of stop bits on the BMS1 port		1	2	1	P700 = 1	
705	Selection of the controller address on the BMS1 bus		0	207	1	P700 = 1	2
706	Control type	0: Local 1: Remote	0	1	0		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: without 1 : odd 2 : even	0	2	0		
713	Number of stop bits on the BMS2 port		1	2	1		
715	Selection of the controller address on the BMS2 bus		0	207	1	P710 = 3	2
716	Control type	0: Local 1: Remote	0	1	0		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 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa)) or EC ModBus	2
801	Calibration of the air extraction fan flow rate sensor						P10 Extraction fan = Inverter ModBus and P12 = 0-1000Pa 10V or 0-2500Pa 10V or 0-5000Pa) or P10 Extraction fan = EC ModBus	2
802	Calibration of the supply air duct pressure sensor						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 heat recovery unit or Fixed speed heat recovery unit or glycol/water mix 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 Target temperature selection = Return air and (144 Dehumidification control = With or P38 Intake humidifier = 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 (P39 Dehumidification control = With or P38 Intake humidifier = With)	2
815	Calibration of the mixed coil network temperature sensor	-5.0	5,0	0,1	0,0	°C	P28 Hydraulic coil no.1 = Mixed	2
816	Calibration of CO2 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

9.9 Input/Output directions

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 1 : Normally closed	0 (NO)	P160 Setpoint 1/Setpoint 2 selection	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	0 (NO)	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
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)	P38 Humidification control = with	3
863	Wheel heat recovery unit control input direction	0 : Normally open 1 : Normally closed	1 (NC)	P36 Heat recovery unit = Gradual speed heat recovery unit or Fixed speed heat recovery unit	3
864	Heat pump check input direction	0 : Normally open 1 : Normally closed	1 (NC)	P28 Coil no.1 = Direct expansion	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	
871	Hot water/electric heater selection input direction	0 : Normally open 1 : Normally closed	0 (NO)	(P28 Hydraulic coil no.1 = heating or mixed or P29 Hydraulic coil no.2 = Heating or Post-heating or P30 Hydraulic coil no.3 = post-heating) 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
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

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 heat recovery unit or Fixed speed heat recovery unit or Glycol/water mix)	2
903	Heat recovery unit operation end cooling percentage	P902	100	1		%	(P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or Glycol/water mix)	2
904	Coil 1 operation start cooling percentage	0	P905	1		%	P28 Hydraulic coil no.1 = Cooling or Direct expansion or Mixed	2
905	Coil 1 operation end cooling percentage	P904	100	1		%	P28 Hydraulic coil no.1 = Cooling or Direct expansion or Mixed	2
906	Hydraulic coil 2 operation start cooling percentage	0	P907	1		%	P29 Hydraulic coil no.2 = Cooling	2
907	Hydraulic coil 2 operation end cooling percentage	P906	100	1		%	P29 Hydraulic coil no.2 = Cooling	2
908	Hydraulic coil 3 operation start cooling percentage	0	P909	1		%	P30 Hydraulic coil no.3 = Cooling	2
909	Hydraulic coil 3 operation end cooling percentage	P908	100	1		%	P30 Hydraulic coil no.3 = Cooling	2
920	Heat recovery unit operation start heating percentage	0	P921	1		%	P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or Glycol/water mix	2
921	Heat recovery unit operation end heating percentage	P920	100	1		%	P36 Heat recovery unit = Plate or Gradual speed heat recovery unit or Fixed speed heat recovery unit or Glycol/water mix	2
924	Hydraulic coil 1 operation start heating percentage	0	P925	1		%	P28 Hydraulic coil no.1 = Heating or Mixed	2

No.	Description	Settings				Unit	Display conditions	Access level
		Min.	Max.	Increment	By default			
Prioritisation for thermal elements								
925	Hydraulic coil 1 operation end heating percentage	P924	100	1		%	P28 Hydraulic coil no.1 = Heating or Mixed	2
926	Hydraulic coil 2 operation start heating percentage	0	P927	1		%	P29 Hydraulic coil no.2 = Heating or Post-heating	2
927	Hydraulic coil 2 operation end heating percentage	P926	100	1	Calculated automatically based on the number of thermal elements	%	P29 Hydraulic coil no.2 = Heating or Post-heating	2
928	Hydraulic coil 3 operation start heating percentage	0	P929	1		%	P30 Hydraulic coil no.3 = Post-heating	2
929	Hydraulic coil 3 operation end heating percentage	P928	100	1		%	P30 Hydraulic coil no.3 = Post-heating	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
		Min.	Max.	Increment	By default	
Extraction inverter settings parameters						
2000	Number of motors	1	2	1	1	
2002	Min. frequency	0	400	1	0	Hz
2003	Max. frequency	0	400	1	50	Hz
2004	Acceleration time	0	1800	1	200	s
2005	Deceleration time	0	1800	1	200	s
2010	Nominal motor voltage	110	690	1	400	V
2011	Nominal motor current	0.5	100.0	0.1	6,3	A
2012	Nominal motor frequency	0	400	1	50	Hz
2013	Nominal motor speed	0	3000	1	1445	rpm
2014	Nominal motor capacity	0.25	55.0	0.05	3.00	kW
2015	Motor nominal cos φ	0.00	1.00	0.01	0.79	
Extraction inverter reading parameters						
2100	Requested frequency	0	400			Hz
2101	Motor frequency	0	400			Hz
2102	Motor speed	0	9999			rpm
2104	Motor voltage	0	690			V
2105	Motor current	0.0	200.0			A
2106	Motor electrical power	0.00	200.0			kw
2107	Motor electrical consumption	0	65535			GWh
		0	1000			MWh
		0	1000			kWh
2110	Inverter fault summary	0	1			
2111	Inverter alarm summary	0	1			
2112						
2120	Control electronics temperature	-100	300			°C
2121	Power electronics load	-40	160			%
2147	Product code	0	4294967295			
2149	Software version	0	65535			
Air intake inverter settings parameters						
1000	Number of motors	1	2	1	1	
1002	Min. frequency	0	400	1	0	Hz
1003	Max. frequency	0	400	1	50	Hz
1004	Acceleration time	0	1800	1	200	s
1005	Deceleration time	0	1800	1	200	s
1010	Nominal motor voltage	110	690	1	400	V
1011	Nominal current	0.5	100.0	0.1	6.3	A
1012	Nominal motor frequency	0	400	1	50	Hz
1013	Nominal motor speed	0	3000	1	1445	rpm
1014	Nominal motor capacity	0.25	55.0	0.05	3.00	kW
1015	Motor nominal cos φ	0.00	1.00	0.01	0.79	

No.	Description	Settings				Unit
		Min.	Max.	Increment	By default	
Air intake inverter reading parameters						
1100	Requested frequency	0	400			Hz
1101	Motor frequency	0	400			Hz
1102	Motor speed	0	9999			rpm
1104	Motor voltage	0	690			V
1105	Motor current	0.0	200.0			A
1106	Motor electrical power	0.00	200.00			kW
1107	Motor electrical consumption	0	65535			GWh
		0	1000			MWh
		0	1000			kWh
1110	Inverter fault summary	0	1			
1111	Inverter alarm summary	0	1			
1112	Communication status	0	1			
1120	Control electronics temperature	-100	300			°C
1121	Power electronics load	-40	160			%
1147	Product code	0	4294967295			
1149	Software version	0	65535			

9.12 EC motor parameters

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
Air intake FMA settings							
1200	Min. speed percentage		0	100	1	0	%
1201	Max. speed percentage		0	100	1	100	%
1202	Acceleration ramp-up		0	255	1	20	s
1203	Deceleration ramp-down		0	255	1	20	s
Air intake FMA 1 information							
1220	Calculated min. speed		0	9999	1		rpm
1221	Calculated max. speed		0	9999	1		rpm
1222	speed requested		0	9999	1		rpm
1223	Current speed		0	9999	1		rpm
1224	Current consumed		0.00	9.99	0.01		A
1225	Power input		0	999	1		W
1226	Motor temperature		0	199	1		°C
1230	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1231	Communication state	0 : offline 1 : online	0	1	0		
1232	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1233	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1238	Product code						
1239	Software version						

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
Air intake FMA 2 information							
1240	Calculated min. speed		0	9999	1		rpm
1241	Calculated max. speed		0	9999	1		rpm
1242	Speed requested		0	9999	1		rpm
1243	Current speed		0	9999	1		rpm
1244	Current consumed		0.00	9.99	0.01		A
1245	Power input		0	999	1		W
1246	Motor temperature		0	199	1		°C
1250	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1251	Communication state	0 : offline 1 : online	0	1	0		
1252	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1253	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1258	Product code						
1259	Software version						
Air intake FMA 3 information							
1260	Calculated min. speed		0	9999	1		rpm
1261	Calculated max. speed		0	9999	1		rpm
1262	Speed requested		0	9999	1		rpm
1263	Current speed		0	9999	1		rpm
1264	Current consumed		0.00	9.99	0.01		A
1265	Power input		0	999	1		W
1266	Motor temperature		0	199	1		°C
1270	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1271	Communication state	0 : offline 1 : online	0	1	0		
1272	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1273	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1278	Product code						
1279	Software version						
Air intake FMA 4 information							
1280	Calculated min. speed		0	9999	1		rpm
1281	Calculated max. speed		0	9999	1		rpm
1282	Speed requested		0	9999	1		rpm
1283	Current speed		0	9999	1		rpm
1284	Current consumed		0.00	9.99	0.01		A
1285	Power input		0	999	1		W
1286	Motor temperature		0	199	1		°C

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
1290	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1291	Communication state	0 : offline 1 : online	0	1	0		
1292	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1293	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1298	Product code						
1299	Software version						
Air intake FMA 5 information							
1300	Calculated min. speed		0	9999	1		rpm
1301	Calculated max. speed		0	9999	1		rpm
1302	Speed requested		0	9999	1		rpm
1303	Current speed		0	9999	1		rpm
1304	Input current		0.00	9.99	0.01		A
1305	Power input		0	999	1		W
1306	Motor temperature		0	199	1		°C
1310	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1311	Communication state	0 : offline 1 : online	0	1	0		
1312	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1313	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1318	Product code						
1319	Software version						
Air intake FMA 6 information							
1320	Calculated min. speed		0	9999	1		rpm
1321	Calculated max. speed		0	9999	1		rpm
1322	Speed requested		0	9999	1		rpm
1323	Current speed		0	9999	1		rpm
1324	Current consumed		0.00	9.99	0.01		A
1325	Power input		0	999	1		W
1326	Motor temperature		0	199	1		°C
1330	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1331	Communication state	0 : offline 1 : online	0	1	0		
1332	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1333	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1338	Product code						
1339	Software version						

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
Air intake FMA 7 information							
1340	Calculated min. speed		0	9999	1		rpm
1341	Calculated max. speed		0	9999	1		rpm
1342	Speed requested		0	9999	1		rpm
1343	Current speed		0	9999	1		rpm
1344	Current consumed		0.00	9.99	0.01		A
1345	Power input		0	999	1		W
1346	Motor temperature		0	199	1		°C
1350	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1351	Communication state	0 : offline 1 : online	0	1	0		
1352	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1353	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1358	Product code						
1359	Software version						
Air intake FMA 8 information							
1360	Calculated min. speed		0	9999	1		rpm
1361	Calculated max. speed		0	9999	1		rpm
1362	Speed requested		0	9999	1		rpm
1363	Current speed		0.00	9999.00	1.00		rpm
1364	Current consumed		0	10	0		A
1365	Power input		0	999	1		W
1366	Motor temperature		0	199	1		°C
1370	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
1371	Communication state	0 : offline 1 : online	0	1	0		
1372	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
1373	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
1378	Product code						
1379	Software version						

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
Extraction FMA 1 settings							
2200	Min. speed percentage		0	100	1	0	%
2201	Max. speed percentage		0	100	1	100	%
2202	Acceleration ramp-up		0	240	1	20	s
2203	Deceleration ramp-down		0	240	1	20	s
Extraction FMA 1 information							
2220	Calculated min. speed		0	9999	1		rpm
2221	Calculated max. speed		0	9999	1		rpm
2222	Speed requested		0	9999	1		rpm
2223	Current speed		0	9999	1		rpm
2224	Current consumed		0.00	9.99	0.01		A
2225	Power input		0	999	1		W
2226	Motor temperature		0	199	1		°C
2230	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2231	Communication state	0 : offline 1 : online	0	1	0		
2232	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2233	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
2238	Product code						
2239	Software version						
Extraction FMA 2 information							
2240	Calculated min. speed		0	9999	1		rpm
2241	Calculated max. speed		0	9999	1		rpm
2242	Speed requested		0	9999	1		rpm
2243	Current speed		0	9999	1		rpm
2244	Current consumed		0.00	9.99	0.01		A
2245	Power input		0	999	1		W
2246	Motor temperature						°C
2250	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2251	Communication state	0 : offline 1 : online	0	1	0		
2252	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2253	Temperature limitation	0 : limiter not active	0	1	0		
2258	Product code						
2259	Software version						
Extraction FMA 3 information							
2260	Calculated min. speed		0	9999	1		rpm
2261	Calculated max. speed		0	9999	1		rpm
2262	Speed requested		0	9999	1		rpm
2263	Current speed		0	9999	1		rpm
2264	Current consumed		0.00	9.99	0.01		A
2265	Power input		0	999	1		W
2266	Motor temperature						°C

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
2270	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2271	Communication state	0 : offline 1 : online	0	1	0		
2272	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2273	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
2278	Product code						
2279	Software version						
Extraction FMA 4 information							
2280	Calculated min. speed		0	9999	1		rpm
2281	Calculated max. speed		0	9999	1		rpm
2282	Speed requested		0	9999	1		rpm
2283	Current speed		0	9999	1		rpm
2284	Current consumed		0.00	9.99	0.01		A
2285	Power input		0	999	1		W
2286	Motor temperature						°C
2290	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2291	Communication state	0 : offline 1 : online	0	1	0		
2292	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2293	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
2298	Product code						
2299	Software version						
Extraction FMA 5 information							
2300	Calculated min. speed		0	9999	1		rpm
2301	Calculated max. speed		0	9999	1		rpm
2302	Speed requested		0	9999	1		rpm
2303	Current speed		0	9999	1		rpm
2304	Current consumed		0.00	9.99	0.01		A
2305	Power input		0	999	1		W
2306	Motor temperature						°C
2310	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2311	Communication state	0 : offline 1 : online	0	1	0		
2312	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2313	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
2318	Product code						
2319	Software version						

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
Extraction FMA 6 information							
2320	Calculated min. speed		0	9999	1		rpm
2321	Calculated max. speed		0	9999	1		rpm
2322	Speed requested		0	9999	1		rpm
2323	Current speed		0	9999	1		rpm
2324	Current consumed		0.00	9.99	0.01		A
2325	Power		0	999	1		W
2326	Motor temperature						°C
2330	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2331	Communication state	0 : offline 1 : online	0	1	0		
2332	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2333	Temperature limitation	0 : limiter not active 1 : limiter active	.0	1	0		
2338	Product code						
2339	Software version						
Air intake FMA 7 information							
2340	Calculated min. speed		0	9999	1		rpm
2341	Calculated max. speed		0	9999	1		rpm
2342	Speed requested		0	9999	1		rpm
2343	Current speed		0	9999	1		rpm
2344	Current consumed		0.00	9.99	0.01		A
2345	Power input		0	999	1		W
2346	Motor temperature						°C
2350	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2351	Communication state	0 : offline 1 : online	0	1	0		
2352	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2353	Temperature limitation	0 : limiter not active 1 : limiter active	0	1	0		
2358	Product code						
2359	Software version						
Extraction FMA 8 information							
2360	Calculated min. speed		0	9999	1		rpm
2361	Calculated max. speed		0	9999	1		rpm
2362	Speed requested		0	9999	1		rpm
2363	Current speed		0.00	9999.00	1.00		rpm
2364	Current consumed		0	10	0		A
2365	Power input		0	999	1		W
2366	Motor temperature						°C

No.	Description	Settings					Units
		Enumeration	Min.	Max.	Increment	By default	
2370	Fault summary	0 : Fault not present 1 : Fault present	0	1	0		
2371	Communication state	0 : offline 1 : online	0	1	0		
2372	Current limitation	0 : limiter not active 1 : limiter active	0	1	0		
2373	Temperature limiter	0 : limiter not active 1 : limiter active	0	1	0		
2378	Product code						
2379	Software version						

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