

Dehumidification units

CONTROL BROCHURE

NA 14.66 A 11 - 2014

**Electronic control**

**CIATpool**





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## 1. GENERAL DESCRIPTION

**CIATpool** is an electronic module designed to control and supervise swimming pool dehumidification units through a microprocessor.

This control is basically composed of a  $\mu$ PC MEDIUM control board, a pGD1 graphical terminal, a TCO user terminal (optional) and sensors.

It has an RS485 field-bus that makes it possible to manage components such as: pCOe expansion modules, plug-fans, ambient temperature or humidity probes, leak detectors, energy meters, frequency variators, etc.

The control can connect to a centralised technical management system through a BMS communication card by using any of the following protocols: Carel, Modbus, LonWorks®, BACnet™ MSTP, Konnex, Modbus TCP/IP, BACnet™ Ethernet, TCP/IP, SNMP V1-2-3, FTP and HTTP.

The control also manages a local connection between units through a pLAN ( $\mu$ PC MEDIUM Local Area Network), thus allowing for a maximum of 15 units to communicate data and information. This makes it possible to reduce the number of pGD1 terminals, since a single common terminal can monitor all  $\mu$ PC MEDIUM plates.

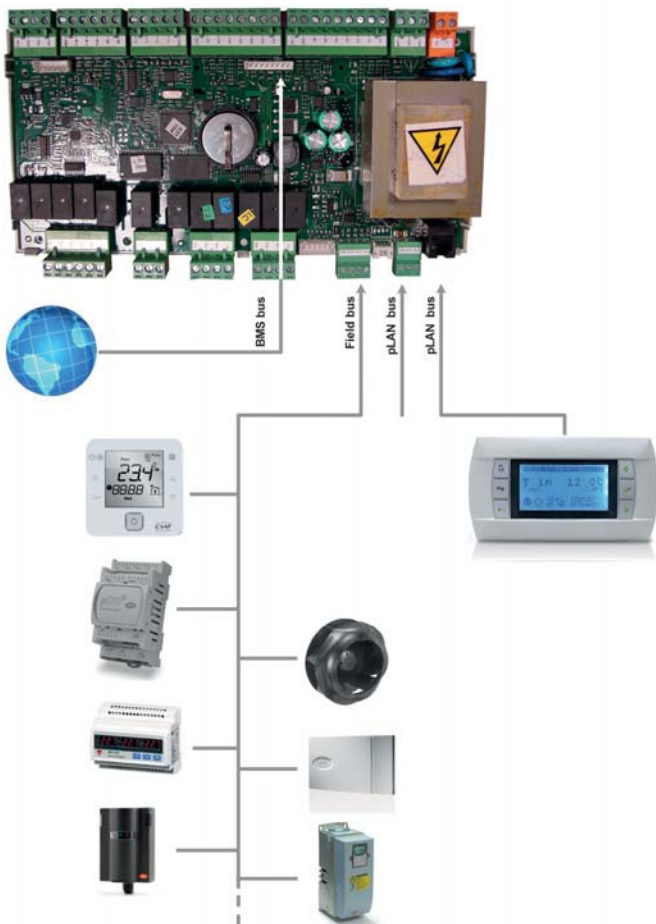
### Main functions:

- Dehumidification control during operating modes: COOLING / HEATING / AUTO.
- Selection of the setpoints.
- Permanent control of the operating parameters.
- View of the values measured by the sensors.
- Timing of the compressors.
- Control of the outlet temperature.
- Daily and weekly programming.
- Anti-fire safety device.
- Operating fault diagnosis and main alarm.

### Optional functions:

This control allows controlling optional elements such as:

- Reversible cooling circuit to recover heat from extraction air.
- Boiler water plates exchanger (PWA).
- Outdoor air damper for refreshing air.
- Mixing box for thermal or thermoenthalpic free-cooling.
- Overpressure control.
- Outlet and return plug-fans.
- Outlet fans and centrifugal return fans with frequency variator.
- Auxiliary electrical heaters: one or two stages with On/Off control or a stage with proportional control.
- Hot water auxiliary coil with three-way valve with a proportional or On/Off control.
- Activation signal for a possible plate recuperator outside of the unit.
- Air-cooled condenser for DUAL operation.
- Management of the AERO version.
- Air flow controller.
- Clogged filter detector.
- Smoke detection station.
- Refrigerant leak detector.
- Air quality probe for measuring CO<sub>2</sub> and/or volatile compounds.
- Energy meter.

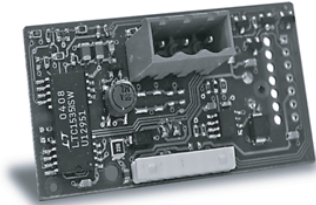


## 1.1. Communications

This control allows the connection to a centralised technical management system by using a specific BMS card for some of the following communication protocols:

### Carel y Modbus

One RS485 serial card is connected for the supervisory network with both Carel and Modbus protocol.



### LonWorks®

To establish communication with a network with the LonWorks® protocol, is needed a FTT RS485 serial card.

The supervisory program is stored in flash memory and can be programmed directly from the LonWorks® network by using tools such as LonMaker®.



### BACnet™

To establish communication with a network with the BACnet™ MSTP protocol is needed a BACnet™ RS485 serial card.

This open standard, developed by ASHRAE, enables air conditioning and heating systems for homes and buildings to be connected for the sole purpose of performing intelligent energy management.

*Configuration by the integrator.*

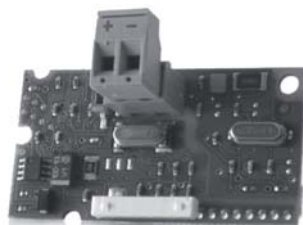


### Konnex (KNX)

A network with the Konnex protocol needs a Konnex serial card.

This open standard enables the connection and integration of devices in building automation applications both at the commercial and at the residential level.

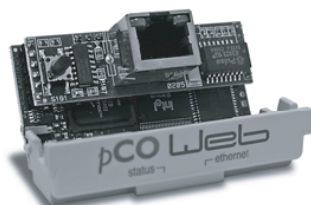
*Configuration by the integrator.*



### Ethernet pCO Web

The Ethernet pCO Web card allows the network communication with the protocols Modbus TCP/IP, BACnet™ Ethernet, TCP/IP, SNMP V1-2-3, FTP y HTTP.

BACnet™ Ethernet: *Configuration by the integrator.*



## 1.2. Supervision solutions

### pCO Web

It is the solution for the management and supervision of a single unit if it incorporates the Ethernet pCO Web card.

### PlantWatchPRO

It is a solution designed for the monitoring of installations of medium - small dimensions, with ability to manage up to 10 units. Suitable for technical environments, it has no parts in movement.

Includes: 5.7" touch display, buzzer for notifications and 2 USB ports for downloading reports, charge devices models and applying service packs.

In this case, each unit needs one RS485 Carel / Modbus board.

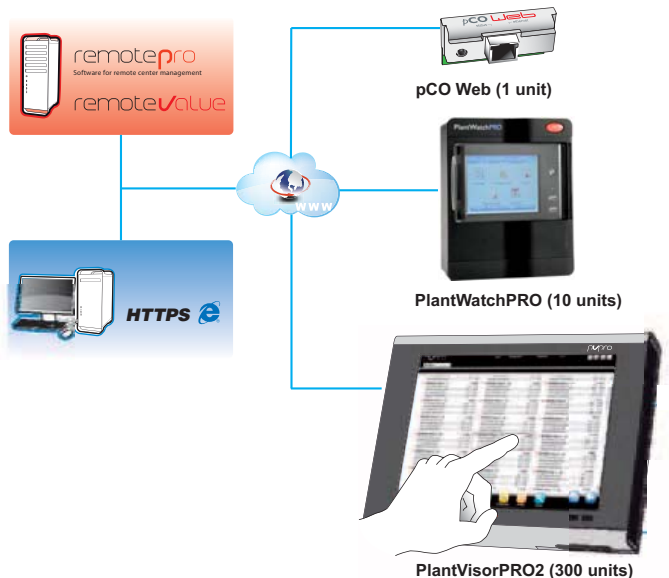
### PlantVisorPRO2

This is the solution for the management and supervision of air-conditioning installations with up to 300 units. It performs advanced monitoring and maintenance functions and enables creating areas and groups which simplify the management of the installation.

PlantVisorPRO2 is available in two versions:

- **Box:** comprised of the CPU unit and, optionally, by monitor and keyboard.
- **Touch:** this includes the CPU and the touchscreen in the one device.

In this case, each unit needs one RS485 Carel / Modbus board.



These systems allow the installation in remote management. Through a single connection to the Internet is accessed the information system. The Web interface, which is available for the local user, allows the monitoring and the complete configuration of the installation: from the office or any other user's current location.

For remote control of multiple sites, there are dedicated tools for centralized management as RemotePRO and RemoteValue.

## 2. SET-UP

The **CIATrtc** control is basically comprised of:

- A  $\mu$ PC MEDIUM control board.
- A pGD1 graphic terminal connected to the pLAN bus.
- Probes connected to the control board and the RS485 field-bus.

The system can be completed with:

- Additional sensors.
- A TCO user terminal connected to the field-bus RS485.
- Elements connected to the field-bus RS485, as the pCOe expansion cards, plug-fans, probes of temperature or relative humidity of the ambient air, leak detectors, energy meters, variable frequency drives, etc.
- A BMS card that allows the connection of the  $\mu$ PC MEDIUM board to a centralised technical management system.

### 2.1. $\mu$ PC MEDIUM control board

Main CPU board installed in the unit's electric panel, which allows data to be input, treated by the microcontroller and the operation of the unit to be managed completely.

The program and the parameters are stored in non-volatile memory, there by ensuring their storage even in the case of a power failure (without needing an auxiliary coil). The program can be loaded through the PC or from a program key.

This board has the following main characteristics:

- Removable connectors.
- Built-in clock.
- Power supply voltage 230 Vac.
- Connection to a TCO user terminal.
- Connection to a pGD1 maintenance terminal.
- RS485 serial supervisory through an optional card.
- Plastic base for installation on a DIN rack.

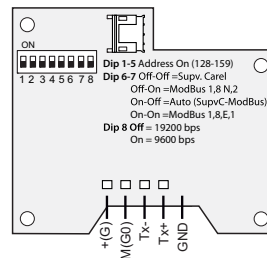
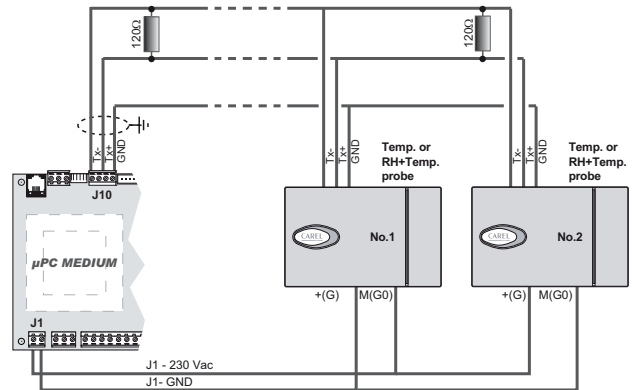
### 2.2. Sensors

The probes that the control can incorporate on the  $\mu$ PC MEDIUM board are:

- Return air temperature.
- Outlet air temperature.
- Mixing air temperature.
- Return water temperature of the pool.
- Outlet water temperature of the pool.
- Outlet water temperature of the PWA plate exchange for boiler (optional).
- Air quality probe for measuring the CO<sub>2</sub> and/or volatile compounds (optional).

Probes connected to the RS485 field-bus are :

- RS485 probe of ambient air temperature + humidity. One or two ambient probes can be connected, with address 128 for the probe No.1 and address 129 for the probe No.2.



#### Ambient probe configuration:

Power supply : 12...24 Vac, 8...32 Vdc (máx. 100mA)

Speed: 9600 bps (\*)

Modbus: 1, 8, N, 2

N.1 probe address: 128

N.2 probe address: 129



- RS485 probe of outdoor air temperature + humidity. Configured with address 130.

*Note: If the unit is integrated in a pLAN network it can read the value of the ambient temperature, outdoor temperature and the air quality probes of the master unit.*

### 2.3. pGD1 graphic terminal

This terminal, installed on the electric panel, allows:

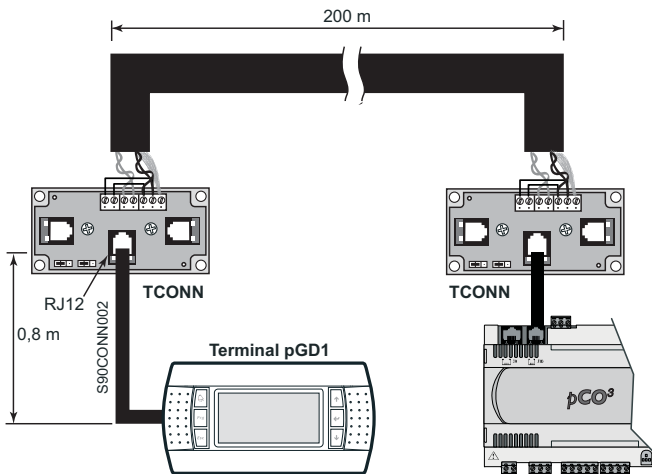
- The initial programming of the unit.
- The modification of operating parameters.
- Unit ON / OFF.
- The selection of the operating mode.
- The setting of setpoints.
- On-screen display of controlled variables and sensor values measured.
- On-screen display of active alarms and historical record of alarms.



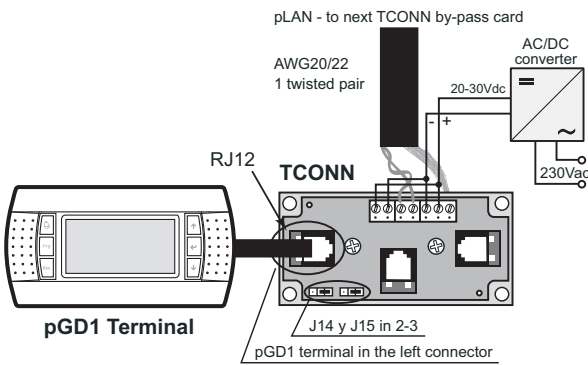
## Remote connection of the terminal:

This terminal is installed on the electric panel, although it can also be installed at a maximum distance of 500 metres from the microPC control board. Or alternatively have an additional PGD1 terminal for maintenance or remote control, regardless of whether a PGD1 (standard) or TCO (optional) is installed on the electric panel.

- Up to 50 metres, it can be connected directly with telephone wire.
- From 50 to 200 metres, it is necessary to use the TCONN bypass cards and AWG 20/22 shielded cable with 2 twisted pairs.



- From 200 to 500 metres, it is necessary to use the TCONN bypass cards, AWG 20/22 shielded cable with 1 twisted pair and external 20...30Vdc (150 mA) power supply.



## Configuration

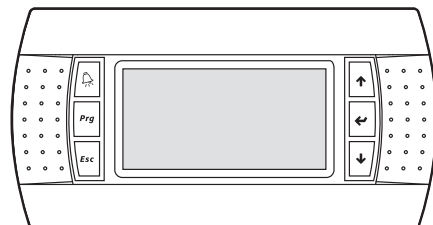
To ensure communication between the pGD1 terminal and the µPC MEDIUM board, the terminal must be configured with address 16. In the event of a terminal supplied separately, this is not sent addressed and the following procedure must be carried out:

- 1) Simultaneously press the + + keys.
- 2) On the display accessed, set address 16 in "Display address setting".

Note: If the terminal is going to be integrated into the pLAN, refer to the communications brochure of the CIATrtc control, which explains the configuration of the terminals in the network.

## Keys and combinations (quick guide)

Key	Function
	<b>Alarm</b> There is/are active alarm(s) if the key is illuminated red. By pressing the key once, the description of the first alarm will be shown. By using the up/down keys, the other alarms stored in the memory can be consulted. By pressing this key for a second time, the alarm(s) will be reset. If no alarm is active, the message "No alarm active" appears.
	<b>Prg</b> This allows the MAIN MENU display to be accessed to select the operating mode, setpoints, off/on, inputs/outputs and schedule programming (no password required). The key will light up in orange.
	<b>Esc</b> To exit any display, pressing this key returns the user to the start display of the previous menu. From the main display, if keeping this key pressed for a few seconds, access is given to a group of help displays with information on the key or key combination that enable performing the most important control functions.
	<b>Esc + Down</b> By pressing both keys simultaneously for a few seconds, it's possible to change of unit in the pLAN network.
	<b>Up / Down</b> These keys enable consulting the information displayed on-display by going forward or back. They can also modify values. By pressing both keys at the same time, direct access is gained to the group of input/output displays (belonging to the MAIN MENU).
	<b>Enter</b> This enables confirming the modified values. By pressing the key once, the cursor is placed on the first display parameter. Pressing the key again confirms the adjusted parameter value and it then proceeds to the next parameter.
	<b>Prg + Esc</b> By pressing both keys simultaneously for a few seconds on the main display of the MAIN MENU, access is given to the TECHNICAL MENU for the parametrisation and maintenance displays of the unit, to which only the fitter and/or engineer should have access (password required).
	<b>Prg + Enter</b> The unit is switched off/on by pressing both these keys at the same time for a few seconds. This action is equivalent to off/on from the MAIN MENU display.
	<b>Prg + Up</b> HEATING mode (winter) is selected by pressing both these keys at the same time for a few seconds.
	<b>Prg + Down</b> COOLING mode (summer) is selected by pressing both these keys at the same time for a few seconds.
	<b>Alarm + Prg</b> The display contrast (LCD with a resolution of 133 x 64 pixels) can be set by pressing these keys at the same time + up or down.
	<b>Alarm + Down</b> The language of the displays is selected by pressing both these keys at the same time for a few seconds.
	<b>Alarm + Enter</b> By pressing both keys simultaneously it is possible to access to information about the firmware and software of the board.



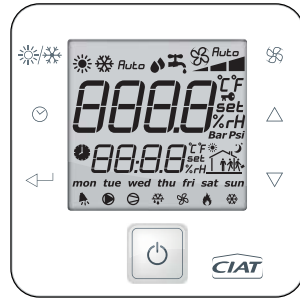


## 2.4. TCO user terminal (optional)

This terminal can be installed on the electric panel, instead of pGD1 terminal. Although it can also be installed remote, at a maximum distance of 100 metres from the microPC control board.

### Features:

- LCD display, backlit in blue, used to present the unit information and to interact with the user.



### Functions:

The TCO user terminal allows:

- Unit ON / OFF.
- Regulation of the setpoints.
- The selection of the operating mode.
- The display of temperatures and humidity of the installation, outdoor air temperature, water temperature of the pool, CO<sub>2</sub> probe and opening of the outdoor damper.
- On-screen display of alarms codes.

### Display

Symbol	Meaning
	Selection of HEATING mode (winter)
	Selection of COOLING mode (summer)
Auto	Selection of AUTOMATIC mode
	Unit in dehumidification
	Indoor fan in operation
 0000.0 °C/F set %rH	Main indicator of: - Temperature (°C or °F) - Activated block key (key) - Setpoint (set) - Relative humidity (%RH)
 00:00 °C/F set %rH	Secondary indicator of: - Temperature (°C or °F) - Setpoint (set) - Hour and minute - Relative humidity (%RH)
	Alarm indicator
	Water circuit pump in operation
	Compressor(s) in operation
	Remote air condenser
	Active support in HEATING mode
	Operation in COOLING mode
	Indicator of the scheduled programming activation
mon tue wed thu fri sat sun	Indicators of the days of the week (Monday to Sunday)

### Keys and combinations (quick guide)

Key	Function
	<b>Mode of operation</b> Allows the operating mode to be selected: HEATING / COOLING or AUTO (only if selection by panel is activated on the display CU12a)
	<b>Fan</b> Unused
	<b>Program schedule</b> Short press: allows to activate the programme schedule stored in the TCO terminal. Long press (3 secs): allows the time and the program schedule to be modified.
	<b>Up / down</b> These keys allow the user to go forward and backward to consult the information found on the display. They can also modify values
	<b>Enter</b> This enables confirming the modified values. It also allows the set of values and alarms to be seen on the display.
	<b>Off / On</b> Allows the unit to be turned OFF/ON

### View in succession of the values measured

In addition to view in the ambient (or return) air temperature on the main display, it is possible to view other values through the set that is activated by pressing the key.

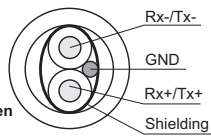
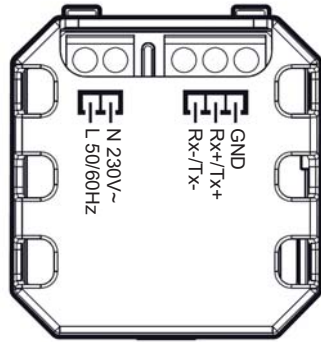
The following values will be shown with each press:

<b>1) Ambient temp.</b> 	<b>2) Active temp. setpoint</b> 	<b>3) Ambient RH</b> 
<b>4) RH setpoint</b> 	<b>5) Outdoor temp.</b> 	<b>6) Water T of the pool</b> 
<b>7) Water temp. setpoint</b> 	<b>8) Active alarms</b> 	<b>9) CO<sub>2</sub> measure (opt.)</b> 
<b>10) Outd. damper (opt)</b> 	<b>1) Ambient temp.</b> 	<b>2) Active T setpoint</b> 

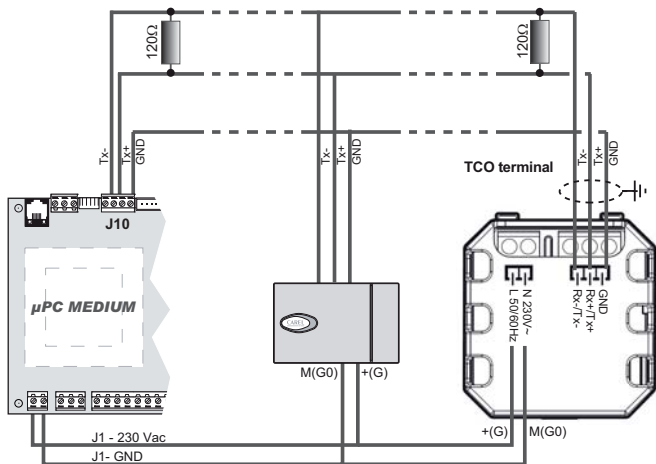
### Terminal connection:

The terminal can be installed at a maximum distance of 100 metres from the microPC control board. The connection requires the following:

- Power supply (the same as the control board) at 230Vac 50/60Hz (L&N): 2 wires (section 0.5 at 1.5 mm<sup>2</sup>).
- Communication with the board (RX+/TX+ & RX-/TX-): shielded cable type AWG20 or AWG22 with 1 braided pair + drainwire + shielding (e.g., model BELDEN 7703NH).



Cable of Belden 7703NH type



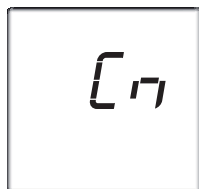
**Important:** It is recommended to insert an electrical resistance of 120Ω, between connectors TX+ and TX- of the μPC MEDIUM output (connector J10) and on the final component of the RS485 network, to avoid potential problems of communication.

### Configuration:

To ensure communication between the TCO terminal and the μPC MEDIUM board, the terminal must be configured with address 10 and speed 9600 bps.

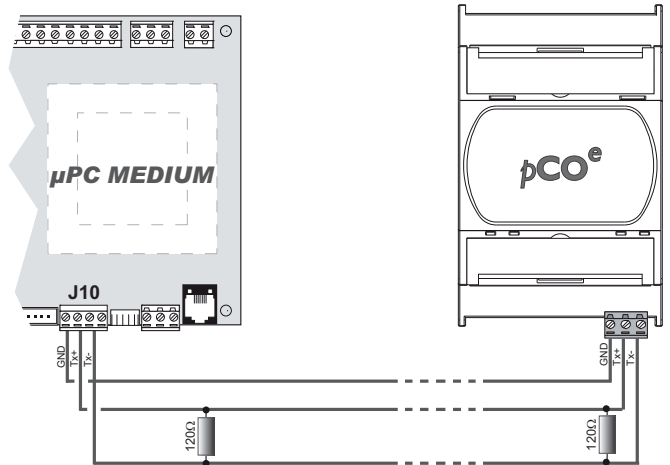
The terminal is sent addressed, and on the power up, the screen should display the firmware version "1.1" on the power up and, then, the "init" symbol. The terminal will be fully operational after a few seconds.

In the unlikely event of a communications failure the screen will display "Cm". Please make sure to check connections and the firmware version.

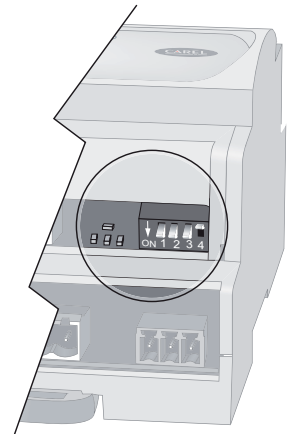


### 2.5. pCOe expansion cards (optional)

For options: "DEEP FREEZE" and "mechanical disconnection of stages" there are needed more inputs and outputs of which incorporates the μPC MEDIUM card. The solution to this is the inclusion of a pCOe expansion card connected to the field-bus on the μPC MEDIUM board (see diagram). This card also is necessary with the overpressure control (optional).



**Important:** This RS485 serial expansion card must be configured with address 7 in order to enable communication with the μPC MEDIUM board as shown in the adjacent diagram.

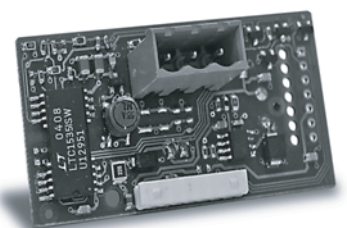


### 2.6. BMS communication card (optional)

The BMS card allows connecting the μPC MEDIUM board to a centralised technical management system.

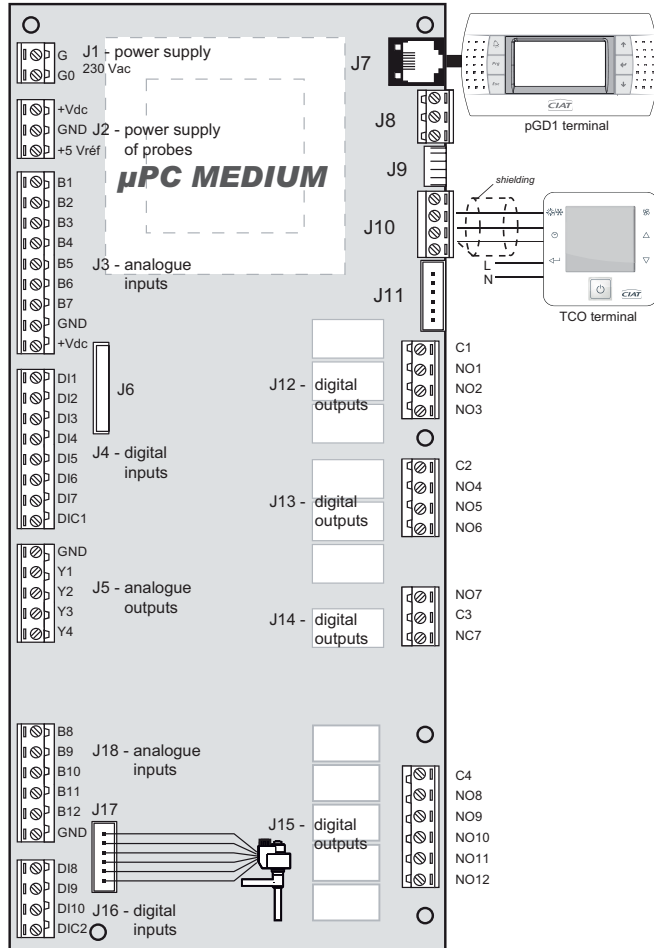
For the Carel or Modbus communication protocol an RS485 serial card must be installed in each of the units.

For a more detailed description on the available supervision systems please consult the control Communications Brochure.



## 3. INPUT / OUTPUT OF THE MAIN CONTROL BOARD

### µPC MEDIUM control board



#### Analogue inputs

Temperature, pressure and humidity reading sensors:

- B1: return air temperature probe (J3)
- B2: exchanger return water temperature probe (J3)
- B3: outlet air temperature probe (J3)
- B4: mixed air temperature probe (J3)
- B5: exchanger outlet water temperature probe (J3)
- B10: air quality probe (opt.) (J8)
- B12: PWA exchanger outlet temperature probe (opt.) (J8)

#### Digital inputs

Safety devices and operating fault indication using traditional electromechanical components:

- B6: pressostat for low-pressure circuit 1 (J3)
- B7: pressostat for low-pressure water circuit (J3)
- B8: hot water coil anti-freeze safety (J18)
- B9: recovery circuit safety (J18)
- B11: pressostat for low-pressure circuit 2 (J18)
- D11: indoor fan protection and air flow control (J4)
- D12: pressostat for high-pressure circuit 1 (J4)
- D13: compressor circuit protection 1 (J4)
- D14: pressostat for high-pressure water circuit (J4)
- D15: water compressor circuit protection (J4)
- D16: control of clogged filters (J4)
- D17: remote On/Off (J4)
- D18: smoke detector / fire-fighting thermostat (J16)

#### Digital inputs (...continued)

- D19: pressostat for high-pressure circuit 2 (J16)
- D110: compressor circuit protection 2 (J16)

#### Analogue outputs

Proportional control of optional elements:

- Y1: control of the opening of the outdoor air damper (J5)
- Y2: 3-way valve for the auxiliary water coil with proport. or On/Off control (J5)
- Y3: 3-way valve for the PWA boiler water plate exchanger (J5)
- Y4: control of the opening of the extraction air damper (J5)

#### Digital outputs

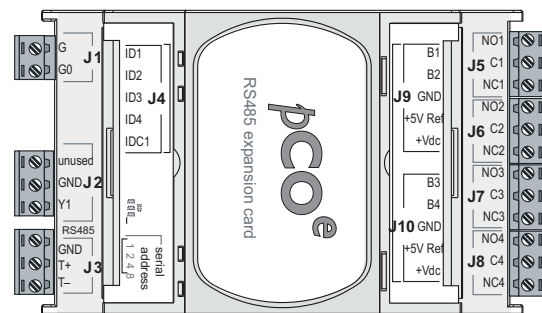
On/Off control of the unit components and options:

- NO1: compressor for circuit 1 (J12)
- NO2: compressor for water circuit (J12)
- NO3: output for water circuit pump in STANDARD version or output for outdoor fan in AERO version (J12)
- NO4: indoor fan (J13)
- NO5: 4-way valve for the remote condenser in DUAL version (J13)
- NO6: output for hot water coil pump (J13)
- NO7: alarm signal / dehumidification signal (J14)
- NO8: compressor for circuit 2 (J15)
- NO9: recovery compressor (J15)
- NO10: recovery circuit cycle reversing valve (J15)
- NO11: 1st stage electrical heater (J15)
- NO12: 2nd stage electrical heater (J15)

#### RS485 analogue inputs

- RS485 ambient temperature + humidity (J10)
- RS485 outdoor temperature + humidity (J10)

#### pCOe expansion card (optional)



#### Analogue inputs

- B3: temperature probe for water inlet HWC with DEEP FREEZE option (J10)
- B4: temperature probe for water outlet HWC with DEEP FREEZE option (J10)

#### Digital inputs

- D11: disconnection of the air compressor circuits (J4)
- D12: disconnection of the water compressor circuit (J4)
- D13: disconnection of the compressor recovery circuit (J4)
- D14: disconnection of the electrical heaters (J4)

#### Analogue output

- Y1: extraction damper (J2)

#### Digital outputs

- NO1: hot water coil piping heater (J5)
- NO2: double compressor crankcase heater and electrical panel heater (1st stage) (J6)
- NO3: heater in outdoor dampers (J7)
- NO4: electrical panel heater (2nd stage) (J8)

## 4. UNIT ON/OFF

There are different ON/OFF operations for:



- **Access panel:**

This operation is always valid. If the unit is stopped from the terminal, it cannot be started using any of the other operations.

If the unit has stopped, all the functions and the different variables are disabled.

On/Off can be done:

- \* **In the pGD1 terminal:**

From the PM01 display in the MAIN MENU or by pressing the   keys simultaneously for a few seconds.

- \* **In the TCO terminal (optional):**

Pressing the  key.

When the unit is off, the display will only show the date, time and the OFF symbol.



- **Remote On/Off:**

This procedure must be enabled on the U18a1 display (protected by user password). On the PM01 display, the "on" option should be selected.

In the digital input DI7 of connector J4:

- \* Open contact: unit ON
- \* Closed contact: unit OFF

Note: To activate the remote On/Off, the bridge made in this input must be eliminated (see wiring diagram).

- **By schedule stage:**

With the time scheduling the unit can be stopped outside the schedule (on the PH03 display of the group of schedule displays). The "on" option should be selected from the terminal.

Note: If both the "remote On/Off" and "schedule stage" procedures are active at the same time, the unit will only start if both coincide.

## 5. SELECTION OF OPERATING MODE





The selection of the type of switching for the change in operating mode is carried out on the CU12a display (protected by the manufacturer's password). There are four options:

- **Control panel mode:**


The selection of the operating mode can be done:



- \* **In the pGD1 terminal:**

From the FC01 display in the MAIN MENU or by pressing the following buttons simultaneously for a few seconds:

- the   keys: HEATING dehumidification mode
- the   keys: COOLING dehumidification mode

- \* **In the TCO terminal (optional):**

By pressing the  key, the operating mode of the unit can be selected. With each press, the icon corresponding to the selected operating mode will light up:

-  HEATING dehumidification mode
-  COOLING dehumidification mode

- **Remote mode:**

The selection of the operating mode is performed via a switch connected to digital input DI8 of connector J16:

- open contact: COOLING dehumidification mode
- closed contact: HEATING dehumidification mode

- **Automatic mode:**

Two options can be configured on the FC01 display:

- \* **For outdoor temperature (default):**

The unit changes from operation in COOLING mode to HEATING mode or vice-versa depending on the temperature measured by the outdoor air probe.

- \* **For indoor temperature:**

The unit changes from COOLING mode to HEATING mode or vice-versa depending on the temperature measured by the ambient air probe and the active setpoints for COOLING and HEATING.


## 6. SELECTION OF THE SETPOINTS

Control of the dehumidification is carried out by starting up the unit, the compressor(s) and/or the available components (electrical heater, water coil, etc.). To do so, the control compares the reading of the probes with the values established as setpoints.

The setpoint values that the control uses are: relative humidity of the air, temperature of the air in cooling (summer) mode and heating (winter) mode, as well as the temperature of the return water in the swimming pool.


The selection of these parameters can be done:

- \* **In the pGD1 terminal:**

From the MAIN MENU, which is accessed by pressing the  key.

- S01 display: humidity setpoint and control bands in COOLING and HEATING modes.
- S02 display: setpoints and control bands for the air temperature in COOLING and HEATING modes.
- S03 display: setpoint and control band for the temperature of the swimming pool's return water.

- \* **In the TCO terminal (optional):**

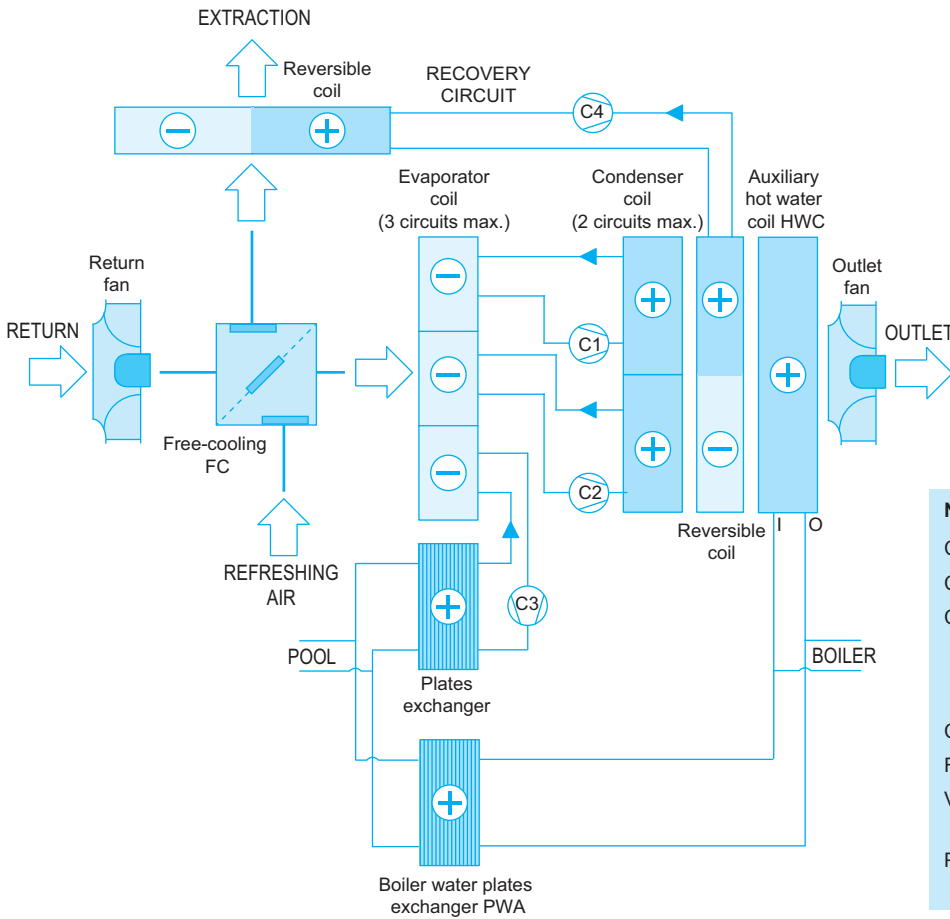
Through the set that is activated by pressing the  key.

At that time, the display will light up and the current setpoint value will appear next to the text **set**.



## 7. CONFIGURATIONS AVAILABLE

This is the complete starting diagram for a BCP dehumidification unit with all available options.

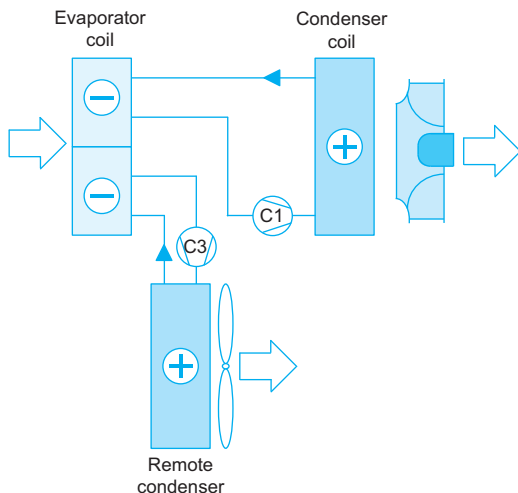


Nomenclature	
C1:	air-air circuit no. 1 (mandatory)
C2:	air-air circuit no. 2 (optional)
C3:	air-water circuit in STANDARD or DUAL versions (optional) and circuit for condensation in outdoor air cooler in AERO version (optional)
C4:	active recovery circuit (optional)
FC:	free-cooling (optional)
V3V:	3-way valve, hot water auxiliary coil (optional)
PWA:	plate exchanger for boiler water (optional)

### AERO option

This option replaces the water recovery circuit that condenses over the plate exchanger with an air split-system in which the condensation is done on the outside in a remote air condenser.

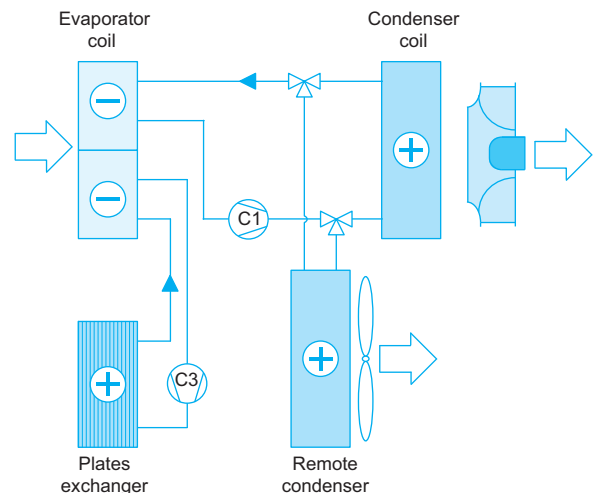
Solution for covered swimming pools that do not need heat recovery over the pool's vessel.



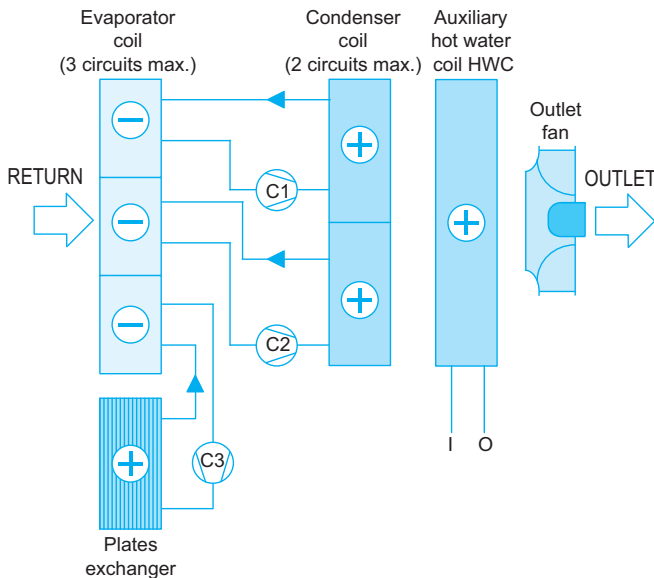
### DUAL option

This option makes it possible to select, based on needs for comfort, for the condensation to be done in the indoor air circuit or in the remote outdoor condenser. In those models with two air circuits, the one with the higher power is the one that may be switched with the air condenser.

The condenser exchange is done by the electronic control based on the ambient temperature through the NO5 digital output.



## 8. CONTROL LOGIC



\* C1 or C2 will or will not be authorised based on a parameter (U18a1 display) that allows these compressors to be disabled in cooling mode. Default = 1.

### Operation limits

- Minimum mixing temperature to enable the operation of compressors C1, C2 = 20°C
- Minimum mixing temperature to enable the operation of compressors C3 = 15°C

### Definition of priorities

- **For recovery of condensation heat:** in air or in water. By default in water, except in the AERO version.

- Detail if the priority is water:

There is a change in the activation priority for air and water compressors in dehumidification in winter mode.

This also establishes an offset to enable C3 at 10°C.

Condition	$T_w < T_{wc} + 10$	$T_w > T_{wc} + 10$
Authorised compressors	C1, C2, C3	C1, C2

Example: If this priority is marked, in addition to the exchange of compressor C1 for compressor C3 in winter mode, if the  $T_{wc} = 26^\circ\text{C}$ , this compressor is authorised to function until the  $T_w$  (water return) probe shows  $36^\circ\text{C}$ .

### Nomenclature

C1, C2: air-air circuit

C3: air-water circuit in STANDARD or DUAL versions (optional) and circuit for condensation in outdoor air cooler in AERO version (optional)

V3V: 3-way valve, hot water auxiliary coil (optional)

### Definition of control parameters

HRc = Relative humidity of ambient setpoint

→ 65% by default

Tcclf = Ambient setpoint temperature in HEATING mode (winter)

→ 28°C by default

Tcref = Ambient setpoint temperature in COOLING mode (summer)

→ 31°C by default

Twc = Setpoint temperature for the swimming pool water

→ 26°C by default

### Definition of probe reading

T + RH = Ambient temperature and relative humidity

$T_w$  = Temperature of the swimming pool water

$T_{mez}$  = Mixing air temperature

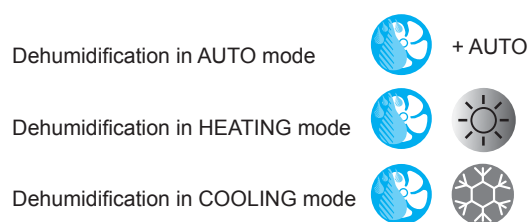
$T_{imp}$  = Outlet temperature

$T_{ext}$  = Outdoor temperature (outdoor temperature and relative humidity if the unit has new air inlet for FC or FDH)

### Authorisation of compressors

Condition	$T > T_{cref}$	$T < T_{cclf}$	$T_w > T_{wc}$
Authorised compressors	C3, C1* or C2*	C1, C2, C3	C1, C2

### 8.1. Operating mode



In automatic mode, the change in mode occurs based on the temperature conditions of the premises

For example, if we have a temperature lower than the heating setpoint ( $T_{cclf}$ ) and the temperature begins to rise, the change from dehumidification in HEATING (winter) mode to dehumidification in COOLING (summer) mode occurs when it rises above the cooling setpoint ( $T_{cref}$ ).

There is also a **PROTECTION MODE** that is very useful for unattended operation at nights. In this mode, the unit starts up only with values outside of the range of setpoints associated with this PROTECTION MODE.

In this mode, the associated parameters are as follows:

- Without refreshing.
- Without the possibility that compressors start up (neither in COOLING mode nor in HEATING mode). In this case, the flow is from ventilation.

## Operation in dehumidification mode in HEATING (winter)

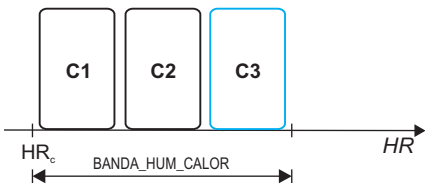
The unit will be in this operating mode if the “dehumidification in HEATING mode” has been selected in the terminal or if, based on the temperature conditions, “dehumidification in AUTO mode” has been selected. To do so, the control will compare the temperature and humidity readings from the ambient air probe with the values established for the setpoint and with the value of the control bands.

It will activate one set of elements or another based on how far away the reading is from the setpoint. The input command of the stages is the one featured in the chart.

For the input of the compressor stages of the main circuits for dehumidification, the control will use the humidity control band value, whilst for the input of the electrical heaters and of the water coil (optional), it will take their respective differentials into account.

The unit will stop when the ambient humidity descends below the setpoint value and the air temperature ascends above the setpoint value.

### • Humidity control



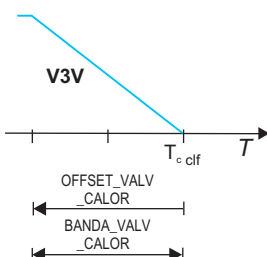
Mask index	Variable	Description	Default value	UOM
U02	BANDA_HUM_CALOR	Winter humidity differential	3.0	%rH

If it is necessary to give priority to the water circuit (C3) over the air circuits (C1 and C2), this change can be realized by means of the U5b display.

Mask index	Variable	Description	Default value	Possible values
U05b	HAB_PRIORIDAD_COMP_AGUA_CALOR	Enable priority to the water compressor	1	0: No 1: Yes

### • Temperature control

As support to maintain the temperature, the units can incorporate two electrical heater stages (R) and/or a hot water coil (V3V). For the regulation of the hot water coil, the control has a Y2 output that controls the three-way valve (On/Off or proportional), and for the regulation of the electrical heaters, there are two On/Off outputs NO11-NO12.



Mask index	Variable	Description	Default value	UOM
U28	OFFSET_VALV_CALOR	Offset of 3-way valve control in winter	-2.0	°C
U28	BANDA_VALV_CALOR	Band of 3-way valve control in winter	2.0	°C

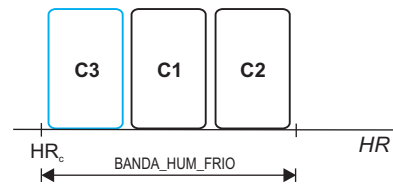
## Operation in dehumidification mode in COOLING (summer)

The unit will be in this operating mode if the “dehumidification in COOLING mode” mode has been selected in the terminal or if, based on the temperature conditions, “dehumidification in AUTO mode” has been selected. To do so, the control will compare the temperature and humidity readings from the ambient air probe with the values established for the setpoint and with the value of the control band.

It will activate one set of elements or another based on how far away the reading is from the setpoint. The input command of the stages is the one featured in the chart.

The unit will stop when the ambient humidity and the temperature descend below the setpoint value.

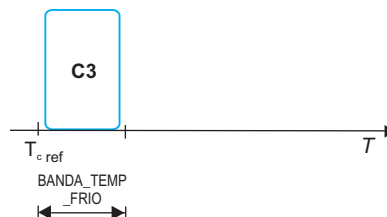
### • Humidity control



The main function of these units is to dehumidify the air of the premises, which is why even though C1 and C2 can overheat the air of the premises, they will be activated if necessary. If it is desired that this overheating be limited, it is possible to disable the operation of one or two of the air condensation heat recovery compressors in COOLING (summer) mode.

Mask index	Variable	Description	Default value	UOM
U02	BANDA_HUM_FRÍO	Winter humidity differential	4.0	%rH
U36	DESCONEXION_NUM_COMP_AIRE_FRIO	Number of air compressor stages to disconnect	1	---

### • Temperature control

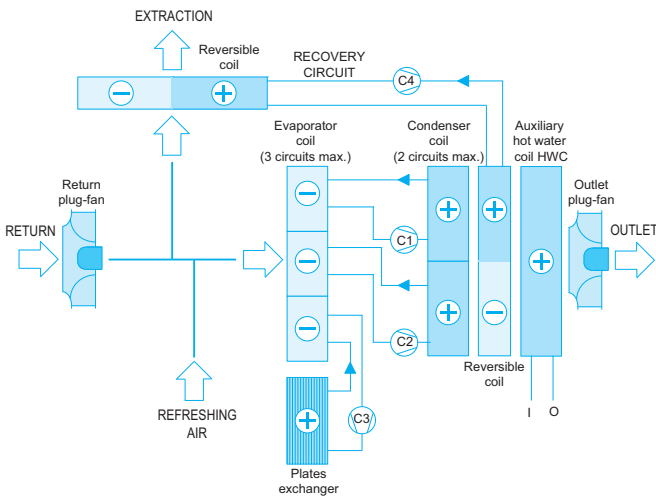


Mask index	Variable	Description	Default value	UOM
U04	BANDA_TEMP_FRIO	Summer temperature control band	2.0	°C

## 8.2. Active recovery

In units with cooling recovery through a reversible cooling circuit, the compressor will be authorised based on the temperature of the premises and as long as some conditions are met, namely minimum mixing temperature of 10°C and a minimum opening of the outdoor air damper of 30%.

The operating mode authorised for this circuit will be cooling if the ambient temperature is above  $T_{c\text{ref}}$  and heating if the ambient temperature is below  $T_{c\text{clf}}$ .



### Nomenclature

- C1, C2: air-air circuit
- C3: air-water circuit
- C4: active recovery circuit:
  - C4clf: HEATING mode (heating in winter)
  - C4ref: COOLING mode (cooling in summer)
- V3V: 3-way valve, hot water auxiliary coil (optional)

### Authorisation of compressors

Condition	$T > T_{c\text{ref}}$	$T < T_{c\text{clf}}$	$T_w > T_{w\text{c}}$
Authorised compressors	C3, C4ref, C1* or C2*	C1, C2, C3, C4clf	C1, C2, C4

### Definition of priorities

- **For recovery of condensation heat:** in air or in water. By default in water (due to the existence of C4). Highly recommended when an intermediary exchanger is installed.

Condition	$T_w < T_{w\text{c}} + 10$	$T_w > T_{w\text{c}} + 10$
Authorised compressors	C1, C2, C4, C3	C1, C2, C4

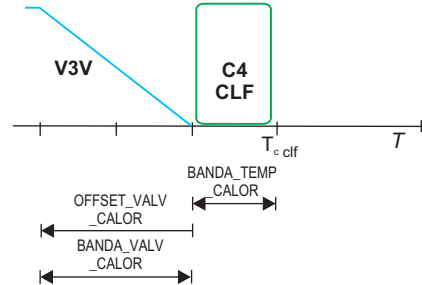
### Operation in dehumidification mode in HEATING (winter)

In this case, the C4 compressor is activated only based on the ambient temperature control.

#### • Temperature control

The previous configuration includes the extraction air recovery circuit (C4) and a proportional hot water coil (V3V).

Their respective differentials will be taken into account for the input of the stages.

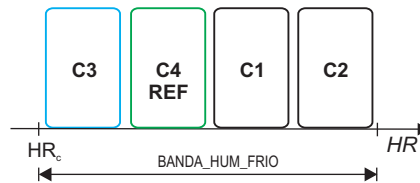


Mask index	Variable	Description	Default value	UOM
U28	OFFSET_VALV_CALOR	Offset of 3-way valve control in winter	-2.0	°C
U28	BANDA_VALV_CALOR	Band of 3-way valve control in winter	2.0	°C
U04	BANDA_TEMP_CALOR	Winter temperature control band	1.0	°C

### Operation in dehumidification mode in COOLING (summer)

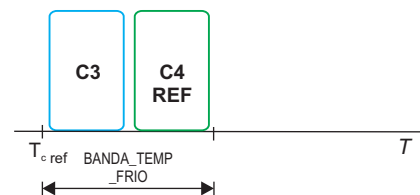
In this case, the C4 compressor is activated based on the comparison of the reading of the ambient temperature and humidity and the established setpoint values. The input order is the one featured in the charts.

#### • Humidity control



Mask index	Variable	Description	Default value	UOM
U02	BANDA_HUM_FRIO	Winter humidity differential	4.0	%rH
U36	DESCONEXION_NUM_COMP_AIRE_FRIO	Number of air compressor stages to disconnect	1	---

#### • Temperature control



The input command of the stages is the one featured in the chart. And the activation signal for C3 and C4 will be the maximum that the temperature or humidity control imposes.

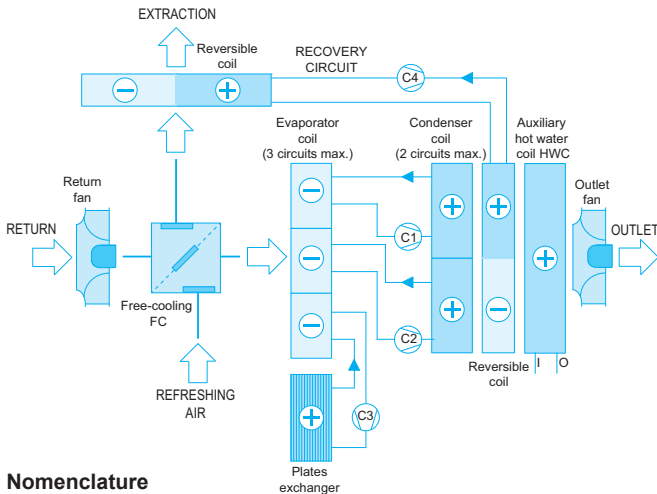
Mask index	Variable	Description	Default value	UOM
U04	BANDA_TEMP_FRIO	Summer temperature control band	2.0	°C



### 8.3. Outdoor air damper (optional)

For control of the outdoor air damper (optional), the control has a proportional output 0/10V (Y1).

In DEHUMIDIFICATION IN HEATING mode, as well as in DEHUMIDIFICATION IN COOLING mode, the signal will be the maximum between what *free-dehumidification* and *free-cooling* impose.



#### Nomenclature

- C1, C2: air-air circuit
- C3: air-water circuit
- C4: active recovery circuit (optional)
- V3V: 3-way valve, hot water auxiliary coil (optional)
- FDH: free-dehumidification
- FC: free-cooling: thermal or thermoenthalpic

#### Free-dehumidification

The operation of the unit in *free-dehumidification* allows for the conditions of the outdoor air to be used when they are favourable in order to dehumidify the ambient air. This allows the dehumidification power of the unit to be increased if the outdoor air has less absolute humidity.

To verify that the conditions of the outdoor air are more favourable than those of the ambient air, an evaluation is made in the absolute humidity and enthalpy.

Note: the *free-dehumidification* function is compatible with the activation of the heat recovery circuit of the C4 extraction air (optional), providing heating in the winter and cooling in the summer. Its activation in HEATING (winter) mode depends on the ambient temperature, and its activation in COOLING (summer) mode depends on the ambient temperature and humidity.

Mask index	Variable	Description	Default value	Possible values
CU14	HAB_FREEDESH_INV	Enabling of free-dehumidification winter	1	0: No 1: Yes
CU14	HAB_FREEDESH_VER	Enabling of free-dehumidification summer	1	0: No 1: Yes

#### In dehumidification mode in HEATING mode (winter)

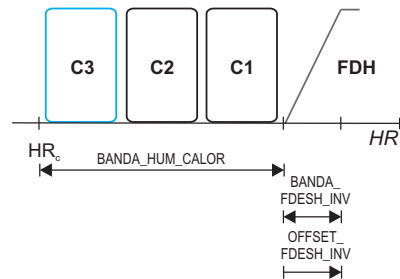
The *free-dehumidification* function will be active as long as the following conditions are met:

- The unit is operating in HEATING mode.
- The *free-dehumidification* in winter function is authorised.

- The absolute outdoor humidity is less than the absolute ambient humidity minus a differential and the outdoor enthalpy is less than the ambient enthalpy minus a differential.

The *free-dehumidification* function depends on two parameters:

- Offset: Defines the difference between the setpoint humidity value plus the humidity band, where the outdoor air damper starts to open.
- Differential: Defines the degree of the opening of the outdoor air damper in accordance with the ambient air temperature.



Its operation is permitted only as a final stage after the compression circuits with condensation heat recovery in HEATING (winter) mode.

Mask index	Variable	Description	Default value	UOM
U09c	OFFSET_FDESH_INV	Winter free-dehumidification ramp: Offset	0.0	%rH
U09c	BANDA_FDESH_INV	Winter free-dehumidification ramp: Differential	1.0	%rH

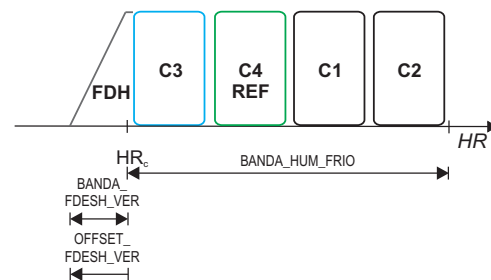
#### In dehumidification mode in COOLING mode (summer)

The *free-dehumidification* function will be active as long as the following conditions are met:

- The unit is operating in COOLING mode.
- The *free-cooling* in summer function is authorised.
- The absolute outdoor humidity is less than the absolute ambient humidity minus a differential and the outdoor enthalpy is less than the ambient enthalpy minus a differential.

The *free-dehumidification* function depends on two parameters:

- Offset: Defines the difference between the setpoint humidity value and that at which the outdoor air damper starts to open.
- Differential: Defines the degree of the opening of the outdoor air damper in accordance with the ambient air temperature.



Mask index	Variable	Description	Default value	UOM
U09b	OFFSET_FDESH_VER	Summer free-dehumidification ramp: Offset	-2.0	%rH
U09b	BANDA_FDESH_VER	Summer free-dehumidification ramp: Differential	2.0	%rH

## Free-cooling

The operation of the unit in *free-cooling* allows the outdoor air conditions to be taken advantage of when these are more favourable than those of the ambient air. As such, this allows the cooling capacity to be reduced under these circumstances.

Note: The *free-cooling* function is compatible with the activation of the heat recovery circuit from the extraction air providing cooling. After *free-cooling*, if necessary, the compressors of the optional circuits will turn on, which will make it possible to cool the air (compressors with condensation heat recovery in the swimming pool water and compressor for the C4 extraction air recovery circuit operating in COOLING mode).

To check whether or not the conditions of the outdoor air are more favourable than those for the ambient air, two procedures can be used:

- For *thermal free-cooling*, the opening of the outdoor air damper is ordered when the temperature of the outdoor air is lower than that of the return air plus a differential. In this case, the control uses the outdoor and return air temperature probes.
- For *thermoenthalpic free-cooling*, the opening of the outdoor air damper is performed when the enthalpy of the outdoor air is lower than that of the return air plus a differential and it also meets the condition that the outdoor temperature is lower than that of the return air by 1°C, which allows the outdoor conditions to be taken advantage of in a warm and humid environment.

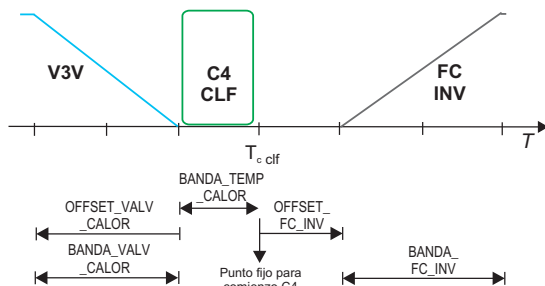
Mask index	Variable	Description	Default value	Possible values
CU14	HAB_FREECOOL_INV	Enable FC winter	1	0: No / 1: Yes
CU14	HAB_FREECOOL_VER	Enable FC summer	1	0: No / 1: Yes

### Free-cooling in HEATING (winter)

*Free-cooling* in winter is useful, for example, in swimming pools, where during operation in winter the temperature of the air increases above the heating setpoint due to overheating, making it necessary to cool instead of heat.

This function will be active as long as the following conditions are met:

- The unit is operating in HEATING mode.
- The winter *free-cooling* function is authorised.
- The outdoor temperature is below the ambient temperature minus the *free-cooling* differential (if using *thermal free-cooling*). The unit also takes into account that the enthalpy of the outdoor air is less than that of the ambient air minus a differential (if using *thermoenthalpic free-cooling*).



Mask index	Variable	Description	Default value	UOM
U09a	OFFSET_FCOOL_INV	Winter FC ramp: Offset	1.0	°C
U09a	BANDA_FCOOL_INV	Winter FC ramp: Differ.	2.0	°C

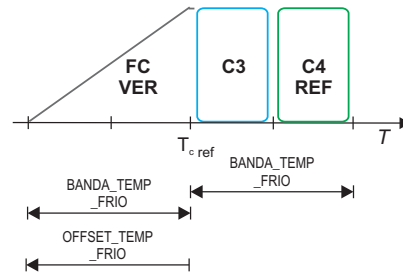
### Free-cooling in COOLING mode (summer)

The *free-cooling* function will be active as long as the following conditions are met:

- The unit is operating in COOLING mode.
- The summer *free-cooling* function is authorised.
- The outdoor temperature is less than the return temperature minus the free-cooling differential.

The *free-cooling* function depends on two parameters:

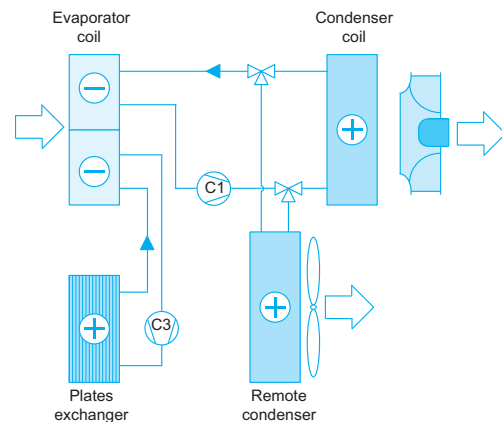
- Offset: Defines the difference between the setpoint and the temperature of the return air, at which the outdoor air damper starts to open.
- Differential: Defines the degree of the opening of the outdoor air damper in accordance with the ambient air temperature.



Mask index	Variable	Description	Default value	UOM
U09	OFFSET_FCOOL_VER	Summer FC ramp: Offset	-2.0	°C
U09	BANDA_FCOOL_VER	Summer FC ramp: Differ.	2.0	°C

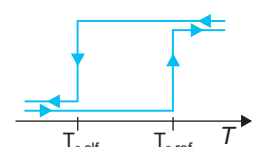
## 8.4. DUAL remote condensation (optional)

This option makes it possible to select, based on needs for comfort, for the condensation to be done in the indoor air circuit or in the remote outdoor condenser. This option is available only for those units without cooling recovery, which already have DUAL operation without needing remote condensation.



The condenser exchange is done by the electronic control based on the ambient temperature through the NO5 digital output.

The signal to change heat dissipation occurs when the ambient temperature surpasses the  $T_{c ref}$  value, and it does not return to the recovery position when that temperature is below  $T_{c clf}$ .



## 9. TIME SCHEDULING

Time scheduling is possible only from the pGD1 terminal.

Pressing the **Prg** key grants access to the main display of the **Main menu**. By using the **↑** **↓** keys, the cursor will move through the menu and access granted to the **Time scheduling**.

Main menu	
1. Setpoints	:
2. Inputs/outputs	:
3. On/Off	:
4. Winter/summer	:
5. TIME SCHEDULING	:→
6. Gas Burner	:

### Creation of a time scheduling

The pGD1 terminal has a schedule programmer that makes it possible to choose from among 3 different programmes for each day of the week. Each of the 3 daily programmes establishes the time periods (slots) in which the unit will be in the programme and outside of it. The maximum number of slots permitted per programme is 3. These programmes will be created on the PH04, PH05 and PH06 displays.

For example:

- Morning: 08:00 to 14:00
- Afternoon: 17:00 to 20:30

The unit will be outside of the time scheduling for the remaining hours.

PH05	
TIME SCHEDULING No. 2	
Slot1	> 08:00 to 14:00
Slot2	> 17:00 to 20:30
Slot3	> 00:00 to 00:00

### Start type

The start type and the condition of the unit outside of the time scheduling will be selected on the PH03 display:

#### • Schedule ON/OFF:

Within the programme, the unit will function with the setpoints established for the air temperature in COOLING and HEATING mode, the humidity and the temperature of the swimming pool water, and outside of the schedule it will remain stopped (PH07, PH08, PH08a, and PH08b displays).

#### • Schedule only setpoint change:

Two different control setpoints will be established for the air temperature in COOLING and HEATING mode, humidity and the temperature of the swimming pool water: one, during the programme slots and another outside the programme (PH07, PH08, PH08a and PH08b displays).

#### • ON/OFF schedule with ON limit SET:

The unit is stopped outside of the time scheduling, but a start safety is established when some parameter, e.g., air or water temperature or humidity, goes above or below the limit setpoints introduced (PH09, PH10, PH11, PH11a, PH11b and PH11c displays).

#### • 3 setpoints + OFF schedule for the unit:

The unit is stopped outside of the time scheduling; within the programme, 3 setpoints may be established: COMFORT: standard setpoint, ECONOMY: setpoint more removed from the comfort point, used in times when the building has low occupancy, and PROTECTION: protection setpoint for the building, normally used at night, when the building is empty. This schedule is programmed on the PH13, PH14, PH15, PH15a and PH15b displays.

#### • Forced schedule:

For an occasional start or stop of the unit without modifying the set schedule. When it ends, the unit goes back to the start-up type that was set.

## 10. MAINTENANCE

### 10.1. Time counter setting

By pressing simultaneously the **Prg** **Esc** keys for several seconds from any display, access is granted to the start display of the **Technical menu**, within which may be found the **Maintenance menu**.

Technical Menu	
User	:
MAINTENANCE	: →
Manufacturer	:

These displays can be found in the **Counters** group of the **Maintenance menu**. This menu is password-protected. If access is needed: consult.

MAINTENANCE MENU	
Inputs/outputs:	
COUNTERS:	→
Alarm history:	

The control has the total hours of operation of the unit for each of the compressors (including the recuperation option), indoor fan, free-cooling and the optional support elements: water auxiliary coil, electrical heaters, rotational recuperator. These values are stored in the permanent memory (EPROM).

When the number of hours of operation reach the value of the setpoint, the corresponding alarm is activated. These alarms are only for indicating, and in order to reset, it is necessary to access the counter reset of the corresponding display.

### 10.2. Input / output test

During maintenance operations, the **Inputs / Outputs test (Maintenance menu)** allows rapid verification of the status of the input and output signals. In order to carry out this control, the unit must be stopped.

MAINTENANCE MENU	
INPUTS/OUTPUTS:	→
Counters:	
Alarm history:	

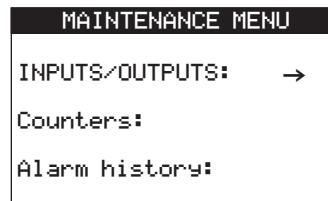
- The A08, A08a and A08b displays allow the inputs to be displayed as read by the control without calibration or conversion.
- The A09 and A09a displays enable verification of the operation of the corresponding digital outputs by manual activation of the output relays.
- The A10 display enables verification of the operation of the analogue outputs by acting on the opening percentage.

## 11. PROBES

By pressing simultaneously the keys for several seconds from any display, access is granted to the start display of the **Technical menu**, within which may be found the **Maintenance menu**.



The displays for configuring the probes are found in the **Inputs/Outputs** group of the **Maintenance menu**. This menu is password-protected. If access is needed: consult.



### 11.1. Calibration

The calibration of the probe is done by giving a value to each probe. The value given to the parameter is added to the value read by the probe. This modified value will be the one that appears on the displays and is considered valid in all of the control processes.

- Humidity and temperature of the ambient air (A04 display).
- Humidity and temperature of the outdoor air (A04a display).
- Temperature in the optional TCO terminal probe (A04b display).
- Temperature of the return, mixed and outlet air (A05 display).
- Optional CO<sub>2</sub> air quality (A05a display).
- Inlet and outlet temperature of the hot water auxiliary coil with the DEEP FREEZE option (A05b display).
- Inlet and outlet temperature of the swimming pool water plates exchanger (A05c display).
- Outlet temperature of the optional PWA boiler water plates exchanger (A05c display).
- RS485 ambient temperature and RH no. 1 (A06e display).
- RS485 ambient temperature and RH no. 2 (A06g display).
- RS485 outdoor temperature and RH no. 1 (A06i display).

### 11.2. Probe filters

The probe filter is used to eliminate readings of incorrect values produced by a high electromagnetic noise level (A07h and A07i displays).

If this function is authorised, before accepting the probe reading value as valid, the following is verified:

- The difference between the value of the current and previous reading. If it is less than the differential set, the reading is considered as accepted.
- If the reading carried out is not accepted, the value of the previous reading is kept thus momentarily blocking the reading.
- The blocking is removed when an accepted reading is carried out or when the established blocking time has elapsed.

### 11.3. Probe configuration

A scale is assigned (start of scale - end of scale) on the A07c and A07d displays related to the maximum and minimum calibration values of the active air quality and humidity probes.

## 12. ALARMS

### 12.1. View of the alarms

The alarms can be viewed:

#### View of the alarms in the pGD1 terminal:

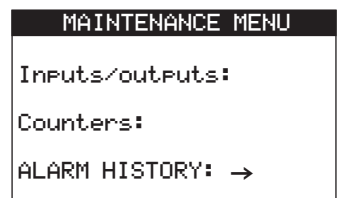
There is/are active alarm(s) if the key is illuminated red. By pressing the key once the description of the first alarm will be shown. By using the keys, the other alarms stored in the memory can be consulted.

By pressing this key for a second time, they will be reset.

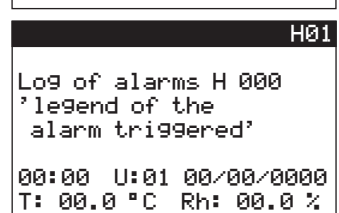
If no alarm is active, the message "No alarm active" appears on the display.



The last 100 alarms produced can be viewed on the **Alarm history** display of the **Maintenance menu**.



The description of the alarm, its date and time and the ambient temperature and humidity at alarm time appear on the display.



Any operating faults in the electrical power are also recorded.

#### In the TCO terminal (optional):

There are active alarms if the display shows the icon .

By pressing the key, the display will show a series of values (in succession). One of these values may be an alarm code. If there is more than one alarm, the alarm with the greatest importance is shown under the symbol AL.



The value "0" can be written onto the display instead of the alarm code by pressing the key.



All alarms that are not active can be reset by pressing the key. The icon will disappear from the display if there is no remaining active alarm.

## 12.2. Alarms list

Controlled alarms	Unit shutdown	Shutdown affected circ.	Type of reset	Timing	Actuation	pGD1	TCO	Addr.
Thermal of compressor of circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit No.1	AL01	AL1	27
Thermal of compressor of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit No.2	AL02	AL2	28
Thermal of compressor of water circuit	No	Yes	Auto (*)	No	Shutdown of water circuit	AL02a	AL201	151
High pressure circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit No.1	AL05	AL5	29
High pressure circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit No.2	AL06	AL6	30
High pressure of water circuit and/or open flow switch	No	Yes	Auto (*)	No	Shutdown of circuit of water	AL06a	AL601	153
High and low pressure recovery circuit	No	No	Auto (*)	No	Shutdown of the recovery compressor	AL07	AL7	118
Maintenance of the recovery compressor	No	No	Manual	No	Only indication	AL08	AL8	119
Anti-freeze alarm of hot water coil	Yes (in COOLING mode)	Yes (in COOLING mode)	Manual	Yes (2 seconds)	HEATING mode: this closes outdoor air damper and opens HWC valve COOLING mode: this stops compressors and closes outdoor damper	AL09	AL9	31
High ambient temperature	No	No	Manual	Yes, programmable	Only indication	AL10	AL10	34
Low ambient temperature	No	No	Manual	Yes, programmable	Only indication	AL11	AL11	35
Low pressure circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit 1	AL12	AL12	38
Low pressure circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	AL13	AL13	39
Low pressure water circuit	No	Yes	Auto (*)	No	Shutdown of circuit of water	AL13a	AL1301	155
Compressor of circuit 1 maintenance	No	No	Manual	No	Only indication	AL16	AL16	36
Compressor of circuit 2 maintenance	No	No	Manual	No	Only indication	AL17	AL17	37
Compressor of water circuit maintenance	No	No	Manual	No	Only indication	AL18	AL18	122
Thermal indoor fan and/or air flow switch	Yes	Yes	Manual	0 s (thermal relay) 30 s (flow switch)	Serious alarm, unit shutdown	AL20	AL20	40
Clogged filters	No	No	Manual	Yes (5 seconds)	Only indication	AL23	AL23	43
Thermal electrical heaters stages 1 & 2	No	No	Auto (*)	No	El. heaters shutdown	AL24	AL24	44
Failure Eprom memory	No	No	Manual	No	Serious alarm, but only indication	AL26	AL26	32
Clock	No	No	Manual	No	Only indication	AL27	AL27	33
Unit maintenance	No	No	Manual	No	Only indication	AL28	AL28	108
Return temperature probe	Yes	Yes	Manual	No	Serious alarm, unit shutdown	AL29	AL29	109
Ambient humidity probe No.1	No	No	Manual	No	Only indication	AL30a	AL3001	165
RS485 probe No.1 without communication	No	No	Auto	No	Only indication	AL30b	AL3002	163
Ambient temperature probe No.1	No	No	Manual	No	Only indication	AL30c	AL3003	164
Ambient humidity probe No.2	No	No	Manual	No	Only indication	AL30d	AL3004	177
RS485 probe No.2 without communication	No	No	Auto	No	Only indication	AL30e	AL3005	175
Ambient temperature probe No.2	No	No	Manual	No	Only indication	AL30f	AL3006	176
Outdoor humidity RS485 probe	No	No	Manual	No	Only indication	AL30g	AL3007	193
RS485 outdoor probe without communication	No	No	Auto	No	Only indication	AL30h	AL3008	194
Outdoor temperature RS485 probe	No	No	Manual	No	Only indication	AL30i	AL3009	195
pLAN network probe: T, RH or CO <sub>2</sub> without communication	No	No	Manual	No	Only indication	AL31	AL31	110
Outdoor temperature probe	No	No	Manual	No	Only indication	AL32	AL32	111
Indoor humidity probe	No	No	Manual	No	Only indication	AL33	AL33	112



Controlled alarms	Unit shutdown	Shutdown affected circ.	Type of reset	Timing	Actuation	pGD1	TCO	Addr.
Outdoor humidity probe	No	No	Manual	No	Only indication	AL34	AL34	113
Outlet temperature probe	No	No	Manual	No	Only indication	AL35	AL35	114
Mixing temperature or air quality probe	No	No	Manual	No	Only indication	AL35a	AL3501	130
COOLING setpoint < HEATING setpoint	Yes	Yes	Manual	No	Serious alarm, unit shutdown	AL36	AL36	115
Compressor discharge T of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	AL37	AL37	126
Compressor discharge T of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	AL38	AL38	127
Compressor discharge T of water circuit	No	Yes	Auto	No	Shutdown of circuit of water	AL38a	AL3801	159
Anti-fire safety device / smoke detection	Yes	Yes	Manual	No	Serious alarm, shut-down of the unit and open /closed of the outdoor damper (according to configuration of display CS01)	AL39	AL39	136
Outlet temperature limit exceeded	No	No	Manual	No	Shutdown electrical heaters or burner	AL40	AL40	166
Unit blocking due to anti-freeze alarm	Yes	Yes	Manual	No	HEATING mode: unit shutdown	AL43	AL43	197
Expansion board I/O pCOe without communication	No	Sí	Auto	No	Only indication	AL45g	AL4507	162
Expansion board I/O pCOe fault alarm	No	No	Auto	No	Only indication	AL45l	AL4509	161
Energy meter without communication	No	No	Auto	No	Only indication	AL46	AL46	192
Outlet plug-fan without communication	No	No	Auto	No	Only indication	AL47	AL47	201
Pressure sensor for air flow control (outlet plug-fan)	No	No	Auto	No	Only indication	AL48	AL48	202
Return plug-fan without communication	No	No	Auto	No	Only indication	AL49	AL49	205
Pressure sensor for air flow control (return plug-fan)	No	No	Auto	No	Only indication	AL50	AL50	206
Leak detector sensor	Yes	Yes	Manual	Yes (60 seconds)	Unit shutdown	AL51a	AL5101	83
Gas leak detected	Yes	Yes	Manual	Yes (60 seconds)	Unit shutdown	AL51b	AL5102	82
Leak detector without communication	Yes	Yes	Manual	Yes (30 seconds)	Unit shutdown	AL51c	AL5103	81
Leak detector: perform maintenance	No	No	Auto	No	Only indication	AL51d	AL5104	
Variable frequency drive (VFD) of outlet fan without communication	Yes	Yes	Manual	No	Unit shutdown	AL61	AL61	51
Variable frequency drive (VFD) of return fan without communication	Yes	Yes	Manual	No	Unit shutdown	AL62	AL62	97
Water inlet T probe on the hot water coil (expansion board I/O pCOe)	No	No	Auto	No	Only indication	AL64	AL64	68
Water outlet T probe on the hot water coil (expansion board I/O pCOe)	Yes (in COOLING mode)	Yes (in COOLING mode)	Auto	No	The pump is activated and the hot water coil valve open to 100%	AL65	AL65	69
Anti-freeze alarm on the hot water coil (expansion board I/O pCOe)	Yes (in COOLING mode)	Yes (in COOLING mode)	Manual	No	Serious alarm, the pump is activated and the hot water coil valve open to 100%	AL66	AL66	70
Ambient air temperature probe	No	No	Auto	No	Only indication	AL67	AL67	41
Water temperature probe on the exchanger input	No	Yes	Auto	No	Shutdown of circuit of water	AL68	AL68	42
Water temperature probe on the exchanger output	No	Yes	Auto	No	Shutdown of circuit of water	AL69	AL69	78
Water temperature probe on the PWA output	No	Yes	Auto	No	Valve closed to 0%	AL70	AL70	79
Low water temperature on the exchanger output	No	Yes	Manual	No	Shutdown of circuit of water	AL71	AL71	99
Low water temperature on the PWA output	No	No	Manual	No	Valve open to 100%	AL72	AL72	93
High ambient air humidity	No	No	Manual	Yes, programmable	Only indication	AL73	AL73	45
Low ambient air humidity	No	No	Manual	Yes, programmable	Only indication	AL74	AL74	47



## 13. LIST OF FACTORY-SET PARAMETERS

### 13.1. Parameters of the MAIN MENU

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>SETPOINTS</b>									
S01	SET_POINT_HUM	Humidity setpoint	65,0	%rH	LIM_INF_HUM	LIM_SUP_HUM	Analog	R/W	18
S02	SET_POINT_TEMP_FRIO	Summer air setpoint	31,0	°C	SET_POINT_TEMP_CALOR	LIM_SUP_TEMP	Analog	R/W	15
S02	SET_POINT_TEMP_CALOR	Winter air setpoint	28,0	°C	LIM_INF_TEMP	SET_POINT_TEMP_FRIO	Analog	R/W	16
S02a	SET_POINT_TEMP_AGUA	Water setpoint	26,0	°C	LIM_INF_TEMP_AGUA	LIM_SUP_TEMP_AGUA	Analog	R/W	64
<b>INPUTS / OUTPUTS</b>									
I20	VER_SOFT	Current version of the program	5.0	---	0	99,9	Analog	R	75
<b>OFF / ON</b>									
PM01	SYS_ON	OFF/ ON of the unit via the keyboard	0: OFF	---	0: OFF 1: ON		Digital	R/W	65
<b>WINTER / SUMMER</b>									
FC01	SEL_FRIO_CALOR	Selection of winter/summer mode	2: AUTO	---	1: Pannel 2: auto		Integer	R/W	59
FC01	CALOR_FRIO_PANEL	Winter / summer by keyboard	1: Summer	---	0: Winter 1: Summer		Digital	R/W	66
<b>SCHEDULE PROGRAMMING</b>									
PH03	TIPO_ARR	Type of start-up	3: Manual	---	0: ON/OFF program 1: Program with setpoint change 2: ON/OFF program (set ON limit) 3: Manual 4: 3 setpoints schedule + OFF unit 5: Forced		Integer	R/W	71
PH03	TIME_F_MAN	ON time with forced start-up	2	h	1	999	Integer	R/W	73
PH03	HAB_BLOQ_COMP_ON_FASE_LIM_FRIO	Disable the compressors in summer with scheduling and setpoint limit in summer (free-cooling night)	0: No	---	0: No ; 1: Yes		Digital	R/W	72
PH03	HAB_BLOQ_RENOVACION_ON_FASE_LIM	Disable the outdoor air exchange and scheduling limit setpoint (night)	0: No	---	0: No ; 1: Yes		Digital	R/W	73
PH04	H_ARR_1A	Start-up hour of slot 1- program 1	6	h	0	23	Integer	R/W	74
PH04	M_ARR_1A	Start-up minute of slot 1-program 1	30	min	0	59	Integer	R/W	75
PH04	H_PAR_1A	Stop hour of slot 1 - program 1	11	h	0	23	Integer	R/W	76
PH04	M_PAR_1A	Stop minute of slot 1 - program 1	0	min	0	59	Integer	R/W	77
PH04	H_ARR_1B	Start-up hour of slot 2 - program 1	11	h	0	23	Integer	R/W	78
PH04	M_ARR_1B	Start-up minute of slot 2 - program 1	30	min	0	59	Integer	R/W	79
PH04	H_PAR_1B	Stop hour of slot 2 - program 1	13	h	0	23	Integer	R/W	80
PH04	M_PAR_1B	Stop minute of slot 2 - program 1	30	min	0	59	Integer	R/W	81
PH04	H_ARR_1C	Start-up hour of slot 3 - program 1	15	h	0	23	Integer	R/W	82
PH04	M_ARR_1C	Start-up minute of slot 3 - program 1	0	min	0	59	Integer	R/W	83
PH04	H_PAR_1C	Stop hour of slot 3 - program 1	19	h	0	23	Integer	R/W	84
PH04	M_PAR_1C	Stop minute of slot 3 - program 1	0	min	0	59	Integer	R/W	85
PH05	H_ARR_2A	Start-up hour of slot1 - program 2	8	h	0	23	Integer	R/W	86
PH05	M_ARR_2A	Start-up minute of slot 1 - program 2	0	min	0	59	Integer	R/W	87
PH05	H_PAR_2A	Stop hour of slot 1 - program 2	14	h	0	23	Integer	R/W	88
PH05	M_PAR_2A	Stop minute of slot 1 - program 2	0	min	0	59	Integer	R/W	89
PH05	H_ARR_2B	Start-up hour of slot 2 - program 2	17	h	0	23	Integer	R/W	90
PH05	M_ARR_2B	Start-up minute of slot 2 - program 2	0	min	0	59	Integer	R/W	91
PH05	H_PAR_2B	Stop hour of slot 2 - program 2	20	h	0	23	Integer	R/W	92
PH05	M_PAR_2B	Stop minute of slot 2 - program 2	30	min	0	59	Integer	R/W	93
PH05	H_ARR_2C	Start-up hour of slot 3 - program 2	0	h	0	23	Integer	R/W	94
PH05	M_ARR_2C	Start-up minute of slot 3 - program 2	0	min	0	59	Integer	R/W	95
PH05	H_PAR_2C	Stop hour of slot 3 - program 2	0	h	0	23	Integer	R/W	96

## Parameters of the MAIN MENU (continued)

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>SCHEDULE PROGRAMMING (...continued)</b>									
PH05	M_PAR_2C	Stop minute of slot 3 - program 2	0	min	0	59	Integer	R/W	97
PH06	H_ARR_3A	Start-up hour of slot 1 - program 3	7	h	0	23	Integer	R/W	98
PH06	M_ARR_3A	Start-up minute of slot 1 - program 3	0	min	0	59	Integer	R/W	99
PH06	H_PAR_3A	Stop hour of slot 1 - program 3	15	h	0	23	Integer	R/W	100
PH06	M_PAR_3A	Stop minute of slot 1 - program 3	0	min	0	59	Integer	R/W	101
PH06	H_ARR_3B	Start-up hour of slot 2 - program 3	0	h	0	23	Integer	R/W	102
PH06	M_ARR_3B	Start-up minute of slot 2 - program 3	0	min	0	59	Integer	R/W	103
PH06	H_PAR_3B	Stop hour of slot 2 - program 3	0	h	0	23	Integer	R/W	104
PH06	M_PAR_3B	Stop minute of slot 2 - program 3	0	min	0	59	Integer	R/W	105
PH06	H_ARR_3C	Start-up hour of slot 3 - program 3	0	h	0	23	Integer	R/W	106
PH06	M_ARR_3C	Start-up minute of slot 3 - program 3	0	min	0	59	Integer	R/W	107
PH06	H_PAR_3C	Stop hour of slot 3 - program 3	0	h	0	23	Integer	R/W	108
PH06	M_PAR_3C	Stop minute of slot 3 - program 3	0	min	0	59	Integer	R/W	109
PH07	SET_INT_FRIO	Setpoint for time slots in summer	26	°C	-99,9	99,9	Analog	R/W	61
PH07	SET_EXT_FRIO	Setpoint out of time slots in summer	28	°C	-99,9	99,9	Analog	R/W	59
PH08	SET_INT_CALOR	Setpoint for time slots in winter	21	°C	-99,9	99,9	Analog	R/W	60
PH08	SET_EXT_CALOR	Setpoint out of time slots in winter	19	°C	-99,9	99,9	Analog	R/W	58
PH09	SET_INT_LIM_FRIO	Setpoint for time slots in summer with "ON-OFF with SET limit of ON"	26	°C	-99,9	99,9	Analog	R/W	79
PH09	SET_EXT_LIM_FRIO	Safety setpoint out of time slots in summer	34	°C	-99,9	99,9	Analog	R/W	77
PH10	SET_INT_LIM_CALOR	Setpoint for time slots in winter with "ON-OFF with SET limit of ON"	21	°C	-99,9	99,9	Analog	R/W	78
PH10	SET_EXT_LIM_CALOR	Safety setpoint out of time slots in winter	13	°C	-99,9	99,9	Analog	R/W	76
PH11	DIF_LIM_CALOR	Differential for Set.Limit in winter with "ON-OFF with SET limit of ON"	1	°C	0	99,9	Analog	R/W	81
PH11	DIF_LIM_FRIO	Differential for Set.Limit in summer with "ON-OFF with SET limit of ON"	2	°C	0	99,9	Analog	R/W	80
PH12	LUN_A	Monday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	---	0	3	Integer	R/W	110
PH12	MAR_A	Tuesday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	---	0	3	Integer	R/W	111
PH12	MIE_A	Wednesday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	---	0	3	Integer	R/W	112
PH12	JUE_A	Thursday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	---	0	3	Integer	R/W	113
PH12	VIE_A	Friday schedule (0=off; 1=program1; 2=program2; 3=program3)	3	---	0	3	Integer	R/W	114
PH12	SAB_A	Saturday schedule (0=off; 1=program1; 2=program2; 3=program3)	0	---	0	3	Integer	R/W	115
PH12	DOM_A	Sunday schedule (0=off; 1=program1; 2=program2; 3=program3)	0	---	0	3	Integer	R/W	116
PH13	MOD_SCHED_GRAHP_CIAT	Selection for each day of the week of setpoint CONFORT, ECONOMY, BUILDING PROTECTION and OFF mode for each half-hour.	---	---	---	---	---	---	---
PH14	SET_INT_FRIO	Setpoint for CONFORT time slots in summer	31,0	°C	-99,9	99,9	Analog	R/W	61
PH14	SET_EXT_FRIO	Setpoint for ECONOMY time slots in summer	33,0	°C	-99,9	99,9	Analog	R/W	59
PH14	SET_EXT_LIM_FRIO	Setpoint for BUILDING PROTECTION time slots in summer	39,0	°C	-99,9	99,9	Analog	R/W	77
PH14	DIF_LIM_FRIO	Differential for the setpoint of BUILDING PROTECTION in summer	2,0	°C	0,0	99,9	Analog	R/W	80
PH15	SET_INT_CALOR	Setpoint for CONFORT time slots in winter	28,0	°C	-99,9	99,9	Analog	R/W	60
PH15	SET_EXT_CALOR	Setpoint for ECONOMY time slots in winter	26,0	°C	-99,9	99,9	Analog	R/W	58
PH15	SET_EXT_LIM_CALOR	Setpoint for BUILDING PROTECTION time slots in winter	20,0	°C	-99,9	99,9	Analog	R/W	76
PH15	DIF_LIM_CALOR	Differential for the setpoint of BUILDING PROTECTION in winter	2,0	°C	0,0	99,9	Analog	R/W	81
PH15a	SET_INT_HUM	Setpoint for CONFORT time slots in humidity	65,0	%rH	-99,9	99,9	Analog	R/W	86
PH15a	SET_EXT_HUM	Setpoint for ECONOMY time slots in humidity	70,0	%rH	-99,9	99,9	Analog	R/W	90
PH15a	SET_EXT_LIM_HUM	Setpoint for BUILDING PROTECTION time slots in humidity	75,0	%rH	-99,9	99,9	Analog	R/W	93
PH15a	DIF_LIM_HUM	Differential for the setpoint of BUILDING PROTECTION in humidity	5,0	%rH	0,0	99,9	Analog	R/W	95
PH15b	SET_INT_AGUA	Setpoint for CONFORT time slots in water	26,0	°C	-99,9	99,9	Analog	R/W	85
PH15b	SET_EXT_AGUA	Setpoint for ECONOMY time slots in water	24,0	°C	-99,9	99,9	Analog	R/W	89
PH15b	SET_EXT_LIM_AGUA	Setpoint for BUILDING PROTECTION time slots in water	18,0	°C	-99,9	99,9	Analog	R/W	92
PH15b	DIF_LIM_AGUA	Differential for the setpoint of BUILDING PROTECTION in water	2,0	°C	0,0	99,9	Analog	R/W	94





## 13.2. Parameters of the TECHNICAL MENU

### USER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>USER: CONTROL</b>									
U01	LIM_SUP_HUM	Upper limit of humidity setpoint	80,0	%rH	LIM_INF_HUM	99,9	Analog	R/W	23
U01	LIM_INF_HUM	Lower limit of humidity setpoint	50,0	%rH	0	LIM_SUP_HUM	Analog	R/W	24
U02	BANDA_HUM_FRIO	Humidity control band in COOLING mode	4,0	%rH	0	10	Analog	R/W	17
U02	BANDA_HUM_CALOR	Humidity control band in HEATING mode	3,0	%rH	0	10	Analog	R/W	96
U02a	ZONA_MUERTA_HUM	Dead zone of humidity control	4,0	%rH	0	50	Analog	R/W	40
U03	LIM_SUP_TEMP_FRIO	Upper limit of temperature setpoint in COOLING mode	33,0	°C	20	50	Analog	R/W	19
U03	LIM_INF_TEMP_FRIO	Lower limit of temperature setpoint in COOLING mode	28,0	°C	0	30	Analog	R/W	20
U03a	LIM_SUP_TEMP_CALOR	Upper limit of temperature setpoint in HEATING mode	31,0	°C	20	50	Analog	R/W	148
U03a	LIM_INF_TEMP_CALOR	Lower limit of temperature setpoint in HEATING mode	26,0	°C	0	30	Analog	R/W	149
U04	BANDA_TEMP_FRIO	Control band of temperature in COOLING mode (summer)	2,0	°C	0	15	Analog	R/W	21
U04	BANDA_TEMP_CALOR	Control band of temperature in HEATING mode (winter)	1,0	°C	0	15	Analog	R/W	22
U04a	ZONA_MUERTA_TEMP	Dead zone of temperature control	0,0	°C	0	3	Analog	R/W	39
U05	LIM_SUP_TEMP_AGUA	Upper limit of water temperature setpoint	33,0	°C	20	50	Analog	R/W	65
U05	LIM_INF_TEMP_AGUA	Lower limit of water temperature setpoint	24,0	°C	0	30	Analog	R/W	66
U05a	BANDA_TEMP_AGUA	Control band of water temperature	2,0	°C	0	15	Analog	R/W	67
U05b	HAB_PRIORIDAD_COMP_AGUA_CALOR	Enable the priority of the water compressor in HEATING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	125
U05b	OFFSET_TEMP_AGUA_CON_PRIORIDAD	Offset of water temperature control in case of priority of the water compressor	10,0	°C	0	15	Analog	R/W	73
U07	DELTA_FREE_COOL	Delta of temperature to enable free-cooling	3,0	°C	0	15	Analog	R/W	27
U07	MAX_APERTURA_COMPUERTA_FREE	Maximum opening of the outdoor air damper with free-cooling or freeheating	100	%	0	100	Integer	R/W	132
U08	DELTA_PR_DIF	Delta of enthalpy to enable free-cooling (whole part)	1	kc/kg	0	30	Integer	R/W	20
U08	DELTA_SEC_DIF	Delta of enthalpy to enable free-cooling (decimal part)	0	kc/kg	0	999	Integer	R/W	21
U08	MAX_APERTURA_COMPUERTA_FREE	Maximum opening of the outdoor air damper with free-cooling or free-heating	100	%	0	100	Integer	R/W	132
U08a	DELTA_HUM_ABS	Delta of absolute outdoor humidity in g/Kg of dry air	0,5	g/Kg	0	10	Analog	R/W	36
U08a	MAX_APERTURA_COMPUERTA_FREE	Maximum opening of the outdoor air damper with free-cooling or freeheating	100	%	0	100	Integer	R/W	132
U09	OFFSET_FCOOL_VER	Offset of free-cooling damper according to summer setpoint	-2,0	°C	-5	5	Analog	R/W	28
U09	BANDA_FCOOL_VER	Differential of free-cooling damper according to the previous offset	2,0	°C	0	5	Analog	R/W	29
U09a	OFFSET_FCOOL_INV	Offset of free-cooling damper according to winter setpoint	1,0	°C	-5	5	Analog	R/W	98
U09a	BANDA_FCOOL_INV	Differential of free-cooling damper according to the previous offset	2,0	°C	0	5	Analog	R/W	97
U09	OFFSET_FDESH_VER	Offset of free-dehumidificacion damper according to summer setpoint	-2,0	%rH	-5	5	Analog	R/W	30
U09	BANDA_FDESH_VER	Differential of free-dehumidificacion damper according to the previous offset	2,0	%rH	0	5	Analog	R/W	31
U09a	OFFSET_FDESH_INV	Offset of free-dehumidificacion damper according to winter setpoint	0,0	%rH	-5	5	Analog	R/W	100
U09a	BANDA_FDESH_INV	Differential of free-dehumidificacion damper according to the previous offset	1,0	%rH	0	5	Analog	R/W	99
U11	SET_RENOVACION	% Outdoor air for refreshing	30%	%	0	99	Integer	R/W	36
U11b	POS_COMPUERTA_AL_INICIO	Outdoor damper in the start-up in winter	0: Normal	---	0: Normal 1: Closed		Digital	R/W	54
U11b	MIN_APERTURA_COMPUERTA	Minimum opening of the outdoor air damper	0	%	0	100	Integer	R/W	165
U11b	MAX_APERTURA_COMPUERTA	Maximum opening of the outdoor air damper	100	%	0	100	Integer	R/W	131
U12b	OFFSET_CAL_IMP_FRIO	Compensation of the ambient temperature in order to calculate the outlet setpoint (SET) in COOLING mode	15,0	°C	0	30	Analog	R/W	114



## USER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>USER: CONTROL (...continued)</b>									
U12-U12b	SET_IMPULSION_FRIO_MIN	Minimum outlet temperature limit setpoint	10,0	°C	0	SET_IMPULSION_FRIO_MAX	Analog	R/W	32
U12b	SET_IMPULSION_FRIO_MAX	Maximum outlet temperature limit setpoint	22,0	°C	SET_IMPULSION_FRIO_MIN	30	Analog	R/W	115
U12-U12b	BANDA_IMP_FRIO	Limit of differential of minimum discharge temperature	5,0	°C	0	20	Analog	R/W	33
U12c	OFFSET_CAL_IMP_CALOR	Compensation of the ambient temperature in order to calculate the outlet setpoint (SET) in HEATING mode	22,0	°C	0	30	Analog	R/W	112
U12c	SET_IMPULSION_CALOR_MIN	Minimum outlet temperature limit setpoint	30,0	°C	25	SET_IMPULSION_CALOR_MAX	Analog	R/W	113
U12a-U12c	SET_IMPULSION_CALOR_MAX	Maximum outlet temperature limit setpoint	45,0	°C	SET_IMPULSION_CALOR_MIN	55	Analog	R/W	83
U12a-U12c	BANDA_IMP_CALOR	Limit of differential of maximum discharge temperature	5,0	°C	0	20	Analog	R/W	84
U12d	SP_CO2	Setpoint of air quality control	1000	ppm	0	2000	Integer	R/W	4
U12d	DIF_CO2	Differential of air quality control	500	ppm	0	1000	Integer	R/W	5
U20	OFFSET_RES	Offset of electrical heaters control or gas burner in winter	-2,0	°C	-5	5	Analog	R/W	52
U20	BANDA_RES	Differential of electrical heaters control or gas burner in winter	2,0	°C	0	5	Analog	R/W	53
U20	SET_HAB_RES_TEMP_EXT	Setpoint for enabling the electrical heaters by the outside temperature	20,0	°C	-20	40	Analog	R/W	129
U28	OFFSET_VALV_CALOR	Offset of 3-way valve control in winter	-2,0	°C	-10	0	Analog	R/W	62
U28	BANDA_VALV_CALOR	Band of 3-way valve control in winter	2,0	°C	0	5	Analog	R/W	63
U28	HAB_PRIORIDAD_BAC_CALOR	Priority of 3-way valve control to the compressor	1: Yes	---	0: No ; 1: Yes		Digital	R/W	132
U36	DESCONEXION_NUM_COMP_AIRE_FRIO	Number of compressor stages to disconnect.	0	---	0	NUM_ETAPAS_COMPRESOR	Integer	R/W	128
U36	DESCONEXION_NUM_COMP_AIRE_CALOR	Number of compressor stages to disconnect.	0	---	0	NUM_ETAPAS_COMPRESOR	Integer	R/W	63
U36	HAB_OFF_ETAPAS_POR_DIN	Enabling OFF of compressor stages or resistances stages by digital inputs of expansion module	0: No	---	0: No ; 1: Yes		Digital		
U37a	DESCONEXION_NUM_COMP_AGUA	Number of compressor stages to disconnect	0	---	0	1	Integer	R/W	55
U37a	DESCONEXION_NUM_COMP_REC	Number of compressor stages to disconnect	0	---	0	1	Integer	R/W	56
U37a	HAB_OFF_ETAPAS_POR_DIN	Enabling OFF of compressor stages or resistances stages by digital inputs of expansion module	0: No	---	0: No ; 1: Yes		Digital		
U37b	DESCONEXION_NUM_RESISTENCIAS	Number of elec. heaters stages to disconnect	0	---	0	NUM_RES	Integer	R/W	129
U37b	HAB_OFF_ETAPAS_POR_DIN	Enabling OFF of compressor stages or resistances stages by digital inputs of expansion module	0: No	---	0: No ; 1: Yes		Digital		
U39	NEW_PASS_UT	New password of USER	****	---	0	9999	Integer	R/W	28
<b>USER: COMUNICATION</b>									
U36a	TIPO_PROT_COM	Type of protocol in supervision network	0: Carel	---	0: Carel 1: LonWorks 2: Modbus 3: Commissioning 4: Modbus Extended		Integer		
U36b	BMS_ADDRESS	Address of supervisory network	1	---	0	207	Integer		
U36b	BAUD_RATE	Baudrate for the supervisory connection	4: 19200	---	0: 1200 1: 2400 2: 4800 3: 9600 4: 19200		Integer		
U36b	Stop_bits_Number_MB	Number of stop bits for the MODBUS protocol	0: 2 bits	---	0: 2 bits # 1: 1 bit		Digital		
U36b	Parity_Type_MB	Type of parity for the MODBUS protocol	0: NO	---	0: no 1: couple 2: odd		Integer		



# Electronic dehumidification control

## USER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>USER: OTHER</b>									
U18a	AUTOSTART	Automatic start after blocking	1: Yes	---	0: No ; 1: Yes		Digital	R/W	58
U18a	TIME_ON_AUTOSTART	Timing for the automatic start after a power failure	5	s	5	999	Integer	R/W	166
U18a1	HAB_ON_OFF_REMOTO	Enabling of remote ON/OFF	1: Yes	---	0: No ; 1: Yes		Digital	R/W	59
U18a1	HAB_OFF_REMOTO_CON_PROTECCION	Enabling of building protection when the unit is turned OFF by the remote input ON / OFF	0: No	---	0: No ; 1: Yes		Digital		
U18a1	HAB_BLOQ_COMP_ON_FASE_LIM_FRIO	Disable the compressors in summer with scheduling and setpoint limit in summer (free-cooling night)	0: No	---	0: No ; 1: Yes		Digital	R/W	72
U18a1	HAB_BLOQ_RENOVACION_ON_FASE_LIM	Disable the outdoor air exchange and scheduling limit setpoint (night)	0: No	---	0: No ; 1: Yes		Digital	R/W	73
U18a2	SET_EXT_LIM_FRIO	Setpoint for BUILDING PROTECTION time slots in summer	39,0	°C	-99,9	99,9	Analog	R/W	77
U18a2	DIF_LIM_FRIO	Differential for the setpoint of BUILDING PROTECTION in summer	2,0	°C	0	99,9	Analog	R/W	80
U18a2	SET_EXT_LIM_CALOR	Setpoint for BUILDING PROTECTION time slots in winter	20,0	°C	-99,9	99,9	Analog	R/W	76
U18a2	DIF_LIM_CALOR	Differential for the setpoint of BUILDING PROTECTION in winter	2,0	°C	0	99,9	Analog	R/W	81
U18a3	SET_EXT_LIM_HUM	Setpoint for BUILDING PROTECTION time slots	75,0	%rH	-99,9	99,9	Analog	R/W	93
U18a3	DIF_LIM_HUM	Differential for the setpoint of BUILDING PROTECTION	5,0	%rH	0	99,9	Analog	R/W	95
U18a3	SET_EXT_LIM_AGUA	Setpoint for BUILDING PROTECTION time slots	18,0	°C	-99,9	99,9	Analog	R/W	92
U18a3	DIF_LIM_AGUA	Differential for the setpoint of BUILDING PROTECTION	2,0	°C	0	99,9	Analog	R/W	94
U18b	TIME_PANT	pGD1 control led switch on time	30	s	0	999	Integer	R/W	58
U18c	HAB_G_PRINC	Enable automatic back function to menu page	0: No	---	0: No ; 1: Yes		Digital		
U18c	TIME_RETURN_MENU	Time without operation on the terminal for automatic return	120	s	0	999	Integer		

## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MANUFACTURER: UNIT SETTINGS</b>									
CU01	TIPO_EQUIPO	Unit type	2: dehumidifier	---	2: dehumidifier		Integer	R/W	182
CU01	NUM_WO_DIG_1	Work Order Number of unit - DIGIT 1	0	---	0	9	Analog	R/W	185
CU01	NUM_WO_DIG_2	Work Order Number of unit - DIGIT 2	0	---	0	9	Analog	R/W	186
CU01	NUM_WO_DIG_3	Work Order Number of unit - DIGIT 3	0	---	0	9	Analog	R/W	187
CU01	NUM_WO_DIG_4	Work Order Number of unit - DIGIT 4	0	---	0	9	Analog	R/W	188
CU01	NUM_WO_DIG_5	Work Order Number of unit - DIGIT 5	0	---	0	9	Analog	R/W	189
CU01	NUM_WO_DIG_6	Work Order Number of unit - DIGIT 6	0	---	0	9	Analog	R/W	190
CU01	NUM_WO_DIG_7	Work Order Number of unit - DIGIT 7	0	---	0	9	Analog	R/W	191
CU01	NUM_WO_DIG_8	Work Order Number of unit - DIGIT 8	0	---	0	9	Analog	R/W	192
CU02	NUM_COMP_CIRC_AIRE	Number of air compressors	3: 2 compr./ 2 circ	---	0: --- 1: 1 compr./ 1 circ. 2: 2 compr./ 1 circ. 3: 2 compr./ 2 circ.		Integer	R/W	60
CU02	NUM_COMP_CIRC_AGUA	Number of water compressors	1: 1 compr./ 1 circ	---	0: --- 1: 1 compr./ 1 circ		Integer	R/W	34
CU02a	OFFSET_TEMP_AGUA	Offset from the setpoint of water temperature for the operation of the water compressor	0,0	°C	0	5	Analog	R/W	101
CU03	CONF_OUT09	Digital output configuration OUT09	2: recovery compr.	---	0: No 1: Rotary recupeator 2: Rec. compressor		Integer	R/W	117
CU03	MIN_APERTURA_ON_REC	Minimum opening of outdoor damper for ON recovery compressor	10	%	0	99	Integer	R/W	68
CU03	TIME_MIN_APERTURA_ON_REC	Time with minimum opening of outdoor damper for ON recovery compressor	90	s	0	999	Integer	R/W	9
CU03	HAB_BOMBA_CALOR_COMP_REC	Recovery compressor - Heat pump	1: rec. comp heat pump	---	0: rec. comp cooling only 1: rec. comp heat pump		Digital	R/W	203
CU03	CONF_VIC	4-way valve of the recovery circuit	0: N. Open	---	0: N.Open ; 1: N.Closed		Digital		



### MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MANUFACTURER: UNIT SETTINGS (...continued)</b>									
CU03a	CONF_OUT07	Digital output configuration OUT07	0: Alarm	---	0: Alarm ; 1: Dehumidification		Integer	R/W	22
CU04	TIPO_VENT_INT	Type of indoor fan	1: centrif.	---	1: centrifugal 2: radial 3: radial plug-fan 4: centrifugal + VFD		Integer	R/W	196
CU04	NUM_VINT_PLUG_FAN	Number of indoor plug-fan	2	---	0	9	Integer		
CU04	CTE_CALCULO_CAUDAL_VINT	Constant calculation for the indoor plug-fan	260	---	0	999	Integer		
CU04	CAUDAL_VINT_NOMINAL	Nominal flow indoor plug-fan	1200	x10 m3/h	0	9999	Integer		
CU04	PORC_CAUDAL_VINT_MIN	Minimum flow rate for indoor plug-fan	-20	%	-99	0	Integer		
CU04	PORC_CAUDAL_VINT_MAX	Maximum flow rate for indoor plug-fan	20	%	0	99	Integer		
CU04	Polea_MOTOR_INT	Diameter in mm of the pulley installed on the indoor motor	170	---	0	999	Integer		
CU04	Polea_VENT_INT	Diameter in mm of the pulley installed on the indoor fan	260	---	0	999	Integer		
CU04	Pda_VENT_INT_min	Point differential pressure minimum of indoor fan	125	Pa	0	9999	Integer	R/W	155
CU04	Rpm_VENT_INT_min	Point rpm minimum of indoor fan	592	rpm	0	9999	Integer	R/W	156
CU04	Pda_VENT_INT_max	Point differential pressure maximum of indoor fan	600	Pa	0	9999	Integer	R/W	157
CU04	Rpm_VENT_INT_max	Point rpm maximum of indoor fan	962	rpm	0	9999	Integer	R/W	158
CU04a	MOD_MB_VFD_CIAT_1.Sel_Scale_Current	Frequency inverter type for indoor motor	0	---	0	1	Digital		
CU04a	MOD_MB_VFD_CIAT_1.Nominal_Volt	Nominal voltage of indoor motor	400	V	180	690	Integer		
CU04a	MOD_MB_VFD_CIAT_1.Motor_Cosfi	Cos phi of indoor motor	85	---	30	99	Integer		
CU04a	MOD_MB_VFD_CIAT_1.Nominal_Frequency	Nominal frequency of indoor motor	50.0	Hz	30.0	320.0	Analog		
CU04a	MOD_MB_VFD_CIAT_1.Nominal_Speed	Nominal speed of indoor motor	1440	rpm	300	20000	Integer		
CU04a	MOD_MB_VFD_CIAT_1.Nominal_Current	Nominal current of indoor motor	0	A	0	999.9	Analog		
CU04a	MOD_MB_VFD_CIAT_1.Current_Limit	Current limit of indoor motor	0	A	0	999.9	Analog		
CU04c	HAB_COMP_REG_PRES_U_INT	Enable damper for controlling the pressure of the indoor unit	0: No	---	0: No ; 1: Yes		Digital		
CU04c	MAX_AOUT_VENT_INT_FRIO	Maximum analogue output for the indoor fan in COOLING mode	100	%	30	100	Integer		
CU04c	MAX_AOUT_VENT_INT_CALOR	Maximum analogue output for the indoor fan in HEATING mode	100	%	30	100	Integer		
CU04c	MIN_AOUT_VENT_INT	Minimum analogue output for the indoor fan	0	%	0	100	Integer		
CU041	TIPO_VENT_RET	Type of return fan	0: ninguno	---	0: no 1: centrifugal 2: axial / radial 3: radial plug-fan 4: centrifugal + VFD		Integer	R/W	202
CU041	HAB_CONTROL_SOBREPRESION	Enabling of OVERPRESSURE control	0: NO	---	0: No ; 1: Yes		Digital	R/W	71
CU041	NUM_VRET_PLUG_FAN	Number of return plug-fan	2	---	0	9	Integer		
CU041	CTE_CALCULO_CAUDAL_VRET	Constant calculation for the return plug-fan	260	---	0	999	Integer		
CU041	CAUDAL_VRET_NOMINAL	Nominal flow return plug-fan	1200	x10 m3/h	0	9999	Integer		
CU041	PORC_CAUDAL_VRET_MIN	Minimum flow rate for return plug-fan	-30	%	-99	0	Integer		
CU041	PORC_CAUDAL_VRET_MAX	Maximum flow rate for return plug-fan	0	%	0	99	Integer		
CU041	Polea_MOTOR_RET	Diameter in mm of the pulley installed on the return motor	170	---	0	999	Integer		



# Electronic dehumidification control

## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MANUFACTURER: UNIT SETTINGS (...continued)</b>									
CU041	Polea_VENT_RET	Diameter in mm of the pulley installed on the return fan	260	---	0	999	Integer		
CU041	Pda_VENT_RET_min	Point differential pressure minimum of return fan	125	Pa	0	9999	Integer	R/W	170
CU041	Rpm_VENT_RET_min	Point rpm minimum of return fan	592	rpm	0	9999	Integer	R/W	171
CU041	Pda_VENT_RET_max	Point differential pressure maximum of return fan	600	Pa	0	9999	Integer	R/W	172
CU041	Rpm_VENT_RET_max	Point rpm maximum of return fan	962	rpm	0	9999	Integer	R/W	173
CU04b	MOD_MB_VFD_CIAT_2_Sel_Scale_Current	Frequency inverter type for return motor	0	---	0	1	Digital		
CU04b	MOD_MB_VFD_CIAT_2_Nominal_Volt	Nominal voltage of return motor	400	V	180	690	Integer		
CU04b	MOD_MB_VFD_CIAT_2_Motor_Cosphi	Cos phi of return motor	85	---	30	99	Integer		
CU04b	MOD_MB_VFD_CIAT_2_Nominal_Frequency	Nominal frequency of return motor	50.0	Hz	30.0	320.0	Analog		
CU04b	MOD_MB_VFD_CIAT_2_Nominal_Speed	Nominal speed of return motor	1440	rpm	300	20000	Integer		
CU04b	MOD_MB_VFD_CIAT_2_Nominal_Current	Nominal current of return motor	0	A	0	999.9	Analog		
CU04b	MOD_MB_VFD_CIAT_2_Current_Limit	Current limit of return motor	0	A	0	999.9	Analog		
CU07	NUM_RES	Number of elec. heaters	0: -----	---	0: ----- 1: 1 electrical heater 2: 2 electrical heaters 3: 2 el. heaters (3 st.) 4: proportional		Integer	R/W	41
CU08	HAB_VALVULA_CALOR	Heating valve	0: No	---	0: No ; 1: Yes		Digital	R/W	103
CU08	HAB_VALVULA_ON_OFF	Enable hot water coil valve on-off	0: Prop.	---	0: Prop. ; 1: on/off		Digital		
CU08	HAB_PROT_ANTIHIELO_BAC_GF	Enabling of the antifreeze protection of the hot water coil with low outdoor temperatures	0: No	---	0: No ; 1: Yes		Digital	R/W	128
CU081	SET_ON_VALV_CALOR_POR_BAJA_TEXT	Setpoint by start-up pump and heat valve of H.W.C. for low outdoor temperature	4,0	°C	-10	10	Analog	R/W	82
CU081	MIN_APERTURA_VALV_CALOR	Minimum opening of heat valve with low outdoor temperature and unit ON.	10	%	0	100	Integer	R/W	133
CU081	TIME_RET_OFF_BOMBA_BAC	Delay time to stop of the H.W.C. pump	60	s	0	999	Integer	R/W	183
CU08a	SET_ANTIHIELO_AGUA_BAC	Water antifreeze setpoint of the hot water coil	4,0	°C	-20,0	10,0	Analog	R/W	143
CU08a	DIF_ANTIHIELO_AGUA_BAC	Differential for reset of the water antifreeze of the hot water coil	3,0	°C	0,0	10,0	Analog	R/W	144
CU08b	SET_TEMP_AGUA_BAC	Water temperature setpoint of the hot water coil	10,0	°C	0,0	20,0	Analog	R/W	56
CU08b	OFFSET_TEMP_AGUA_BAC	Water temperature offset of the hot water coil with OFF unit	5,0	°C	0,0	10,0	Analog	R/W	51
CU08b	BANDA_TEMP_AGUA_BAC	Band of the water temperature setpoint of the hot water coil	2,0	°C	0,0	5,0	Analog	R/W	57
CU082	HAB_INTERCAMBIADOR_PWA	Enable the PWA exchanger for pool heating	0: Non installed	---	0: Non installed; 1: Installed		Digital	R/W	67
CU09	TIPO_SONDA_AMB	Type of ambient probe	1: 1 probe RS485	---	1: 1 probe RS485 2: 2 probes RS485 3: shared in pLAN		Integer	R/W	46
CU09	SEL_TEMP_2_SOND_AMB	Selection of temperature value with 2 ambient probes (0 = average, 1 = minimal, 2 = maximum)	1	---	0: average 1: minimal 2: maximum		Analog	R/W	199
CU09	SEL_HUM_2_SOND_AMB	Selection of humidity value with 2 ambient probes (0 = average, 1 = minimal, 2 = maximum)	1	---	0: average 1: minimal 2: maximum		Analog	R/W	200
CU10	TIPO_SONDA_EXT	Type of outdoor probe	1	---	0: ----- 1: 1 probe RS485 2: shared in pLAN		Integer	R/W	1
CU10	HAB_SONDA_TEMP_IMP	Discharge probe	1: Yes	---	0: No ; 1: Yes		Digital	R/W	48

## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MANUFACTURER: UNIT SETTINGS (...continued)</b>									
CU10b	HAB_VALV_CALOR_POR_IMP_MIN_FRIO	Supply minimum control with hot water coil with unit in COOLING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	100
CU10b	HAB_COMP_CALOR_POR_IMP_MIN_FRIO	Supply minimum control with compressors in heating with unit in COOLING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	101
CU10b	HAB_RES_POR_IMP_MIN_FRIO	Supply minimum control with electrical heaters with unit in COOLING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	102
CU10c	HAB_VALV_CALOR_POR_IMP_MIN_CALOR	Supply minimum control with hot water coil with unit in HEATING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	85
CU10c	HAB_COMP_CALOR_POR_IMP_MIN_CALOR	Supply minimum control with compressors in heating with unit in HEATING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	86
CU10c	HAB_RES_POR_IMP_MIN_CALOR	Supply minimum control with electrical heaters with unit in HEATING mode	1: Yes	---	0: No ; 1: Yes		Digital	R/W	87
CU11	TIPO_SONDA_RENOVACION	Probe type of renovation	1: Mixed air temperature	---	0: None 1: Mixed air temperature 2: Actual air quality probe 3: pLAN air quality probe		Integer	R/W	127
CU11	HAB_LIM_CO2	Activate air quality control	1: Yes	---	0: No ; 1: Yes		Digital	R/W	84
CU11	TIPO_CO2	CO2 control type	1: ppm	---	0: % ; 1: ppm		Digital		
CU12	HAB_MB_ENERGY_METER	Enabling power meter	0: No	---	0: No ; 1: Yes		Digital	R/W	190
CU12	TIPO_RELOJ	Clock card	1: Yes	---	0: No ; 1: Yes; 2: pLAN		Integer	R/W	57
CU12	TIPO_REFRIGERANTE	Type of refrigerant	4: R410A	---	0: R22 1: R134A 2: R404A 3: R407C 4: R410A		Integer	R/W	43
CU12	HAB_MB_GAS_LEAKAGE_DETECTOR	Enabling gas leakage detector	0: No	---	0: No ; 1: Yes		Digital	R/W	80
CU12a	SEL_FRIO_CALOR	Selection of winter/summer mode	2: Auto	---	0: Pannel 1: Remote (digital input) 2: Auto		Integer	R/W	59
CU12a	HAB_PROT_BAJA_TEMP_EXTERIOR	Enabling the protection of outdoor temperature low by digital outputs of expansion module	0: No	---	0: No ; 1: Yes		Digital		
CU12a	HAB_MB_TERMOSTATO_TCO	Enabling of the TCO thermostat by MODBUS	0: No	---	0: No ; 1: Yes		Digital	R/W	88
CU13	CONTROL_TCO_SONDA	Selection of the control probe with TCO thermostat (0=TCO, 1=ambient, 2=return)	1: Ambient T	---	0: TCO 1: Ambient temperature 2: Return temperature		Integer	R/W	217
CU13	ThTune_bloqueado	Keypad lock of the TCO thermostat	0: No	---	0: No ; 1: Yes		Digital	R/W	230
CU13	Clock_Source_THTune_or_uPC	Selection of clock source for TCO thermostat or uPC	1: uPC		0: TCO; 1: uPC		Digital		
CU13	uPC_ThTune_Scheduler	Selection of scheduler for uPC or TCO thermostat	0: uPC		0: uPC; 1: TCO		Digital		
CU14	HAB_SUPERVISION	Supervisor	1: Yes	---	0: No ; 1: Yes		Digital	R	50
CU14	HAB_RENOVACION_AIRE	Enabling the air renewal	1: Yes	---	0: No ; 1: Yes		Digital	R/W	56
CU14	HAB_FREECOOL_VER	Summer free-cooling	1: Yes	---	0: No ; 1: Yes		Digital	R/W	52
CU14	HAB_FREECOOL_INV	Winter free-cooling	1: Yes	---	0: No ; 1: Yes		Digital	R/W	62
CU14	HAB_FREEDESH_VER	Summer free-dehumidification	1: Yes	---	0: No ; 1: Yes		Digital	R/W	53
CU14	HAB_FREEDESH_INV	Winter free-dehumidification	1: Yes	---	0: No ; 1: Yes		Digital	R/W	55
CU14a	TIPO_FREE_COOLING	Winter/ summer free-cooling control	1: Temperature	---	1: Temperature 2: Termoenthalpic		Integer	R/W	118
CU14b	TIPO_FREE_COOLING	Winter/ summer free-dehumidification cooling control	1: Abs. hum. + Enthalpic	---	1: Abs. hum. + Enthalpic		Integer	R/W	54
CU14c	SET_OFF_COMPUERTA_POR_BAJA_TEXT	Setpoint to close the outdoor air damper with low outdoor temperature	-10,0	°C	-20,0	10,0	Analog	R/W	111



# Electronic dehumidification control

## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Max.	Min.	Type	R/W	Addr.
<b>MANUFACTURER: COMPRESSORS SETTINGS</b>									
CC01	TIME_MIN_OFF_COMP	Minimum compressor stop time	180	s	0	9999	Integer	R/W	27
CC01	TIME_MIN_ON_COMP	Minimum compressor operating time	120	s	0	9999	Integer	R/W	33
CC02	TIME_MIN_ON_ON_COMP	Time between start-ups of the same compressor	300	s	0	9999	Integer	R/W	31
CC02	TIME_MIN_ON_ON_COMP_DIST	Time between start-ups of different compressors	60	s	0	9999	Integer	R/W	32
CC03	TIME_RET_AL_BP	Low pressure alarm delay	15	s	0	9999	Integer	R/W	19
CC03	HAB_ROT_COMP	Compressors rotation enabling	1: Yes	---	0: No ; 1: Yes		Digital	R/W	64
CC03	EQUALIZED_CIRC_POWER	Type of rotation of the compressors	1	---	0: grouped 1: equalized		Digital		
CC04b	TIME_CAMBIO_V4V	4 ways valve: time before change and after compressor stop	30	s	0	9999	Integer		
CC04c	HAB_OFF_COMP_CAMBIO_F_C	Compressors stop in change summer / winter	1: Yes	---	0: No ; 1: Yes		Digital	R/W	91
CC04c	TIME_OFF_COMP_CAMBIO_F_C	Compressors stop time in change summer / winter	60	s	0	9999	Integer		
CU05	SET_TEMP_MEZCLA_COMP_AIRE	Value of mixed temperature for stopping the compressors of the air circuits	20,0	°C	10,0	30,0	Analog	R/W	91
CU05	SET_TEMP_MEZCLA_COMP_AGUA	Value of mixed temperature for stopping the compressor of the water circuit	15,0	°C	10,0	30,0	Analog	R/W	74
CU05	SET_TEMP_MEZCLA_COMP_REC	Value of mixed temperature for stopping the compressor of the recovery circuit	10,0	°C	10,0	30,0	Analog	R/W	38
<b>MANUFACTURER: CONTROL SETTINGS</b>									
CR01	CONTROL_P_PI_TEMP	Temperature control type	1: P+I	---	0: P ; 1: P+I		Digital	R/W	63
CR01	TIME_INTEGRACION_TEMP	Integral time in P+I control	120	s	0	999	Integer	R/W	42
CR01a	CONTROL_P_PI_IMP	Temperature control type of discharge	1: P+I	---	0: P ; 1: P+I		Digital	R/W	77
CR01a	TIME_INTEGRACION_IMP	Integral time in P+I control for discharge	120	s	0	999	Integer	R/W	184
CR01b	CONTROL_P_PI_HUM	Humidity control type	1: P+I	---	0: P ; 1: P+I		Digital	R/W	75
CR01b	TIME_INTEGRACION_HUM	Integral time in P+I control of humidity	120	s	0	999	Integer	R/W	40
CR01c	CONTROL_P_PI_PWA	Temperature control type	0: P	---	0: P ; 1: P+I		Digital	R/W	57
CR01c	TIME_INTEGRACION_PWA	Integral time in P+I control of PWA	120	s	0	999	Integer	R/W	35
CR01d	BANDA_VALV_PWA	Differential for the PWA valve	6,0	°C	1,0	9,9	Analog	R/W	68
CR01d	SET_LIM_TEMP_IMP_AGUA_PWA	Setpoint to limit the water discharge temperature of the PWA	45,0	°C	20,0	60,0	Analog	R/W	70
CR01d	RATIO_PWA_REGIMEN	Diferential ratio of the PWA valve to reach the operating temperature	2,0	°C	2,0	9,9	Analog	R/W	69
CR03	HAB_OFF_VINT_FRIO	Indoor fan stop at summer compressor stop	0: No	---	0: No ; 1: Yes		Digital	R/W	94
CR03	HAB_OFF_VINT_CALOR	Indoor fan stop at winter compressor stop	0: No	---	0: No ; 1: Yes		Digital	R/W	95
CR03	HAB_OFF_VINT_POR_CO2	Indoor fan stop when compressor stops if there is not demand for air exchange of CO2 sensor	0: No	---	0: No ; 1: Yes		Digital	R/W	204
CR03a	TIME_VINT_ON_ANTIESTRATIF	Antistratification: start time	0	min	0	999	Integer	R/W	186
CR03a	TIME_VINT_OFF_ANTIESTRATIF	Antistratification: stop time	0	min	0	999	Integer	R/W	187
CR04	TIME_RET_OFF_VINT_FRIO	Summer internal fan stop delay	60	s	0	999	Integer	R/W	23
CR04	TIME_RET_OFF_VINT_CALOR	Winter internal fan stop delay	60	s	0	999	Integer	R/W	24
CR05	TIME_RET_ON_COMP_ON_VINT	Compressors start delay on the indoor fan	30	s	0	999	Integer	R/W	25
CR05a	TIME_RET_ON_VINT	Indoor fan start delay with unit "ON"	30	s	0	999	Integer	R/W	64
CR05a	TIME_RET_ON_VINT_CALOR	Indoor fan start delay with heating mode	0	s	0	999	Integer		
CR05b	TIME_RET_ON_COMP_ON_BOMBA	Compressors start delay on the pump	30	s	0	120	Integer		
CR05b	TIME_RET_OFF_BOMBA_COMPRESOR	Delay with the compressor for stopping the pump of the exchanger	30	s	0	999	Integer	R/W	2
CR09	NEW_PASS_COS	New MANUFACTURER password	*****	---	0	9999	Integer	R/W	30



## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Max.	Min.	Type	R/W	Addr.
<b>MANUFACTURER: SAFETY SETTINGS</b>									
CS01	SET_AL_INCENDIO	Fire alarm setpoint (with probe of return)	60,0	°C	40	80	Analog	R/W	116
CS01	DIF_AL_INCENDIO	Fire alarm differential (with probe of return)	20,0	°C	10	50	Analog	R/W	117
CS01	COMP_OFF_ALL_INCENDIO	Damper status during the fire alarm	0:open	---	0: open ; 1: closed		Digital	R/W	170
CS02	SET_ANTIHIELO_AGUA_INT_COMP	Initial value of the anti-freeze alarm	4,0	°C	-20,0	10,0	Analog	R/W	48
CS02	DIF_ANTIHIELO_AGUA_INT_COMP	Differential value of the anti-freeze alarm	3,0	°C	0,0	10,0	Analog	R/W	49
CS02a	SET_ANTIHIELO_AGUA_PWA	Initial value of the anti-freeze alarm of PWA	4,0	°C	-20,0	10,0	Analog	R/W	102
CS02a	DIF_ANTIHIELO_AGUA_PWA	Differential value of the anti-freeze alarm of PWA	3,0	°C	0,0	10,0	Analog	R/W	103
CS03	OFFSET_AL_IMPULSION_ALTA	Offset for activation of the high outlet T safety device in winter	10,0	°C	0,0	20,0	Analog	R/W	118
CS03	DIF_AL_IMPULSION_ALTA	Differential for deactivation of the high outlet T alarm	2,0	°C	1,0	10,0	Analog	R/W	119
CS04	SET_ALTA_TEMP_AMB	Set high ambient temperature	50,0	°C	0,0	60,0	Analog	R/W	41
CS04	SET_BAJA_TEMP_AMB	Set low ambient temperature	10,0	°C	0,0	60,0	Analog	R/W	42
CS05	SET_ALTA_HUM_AMB	Set high ambient humidity	90,0	%rH	0,0	99,0	Analog	R/W	43
CS05	SET_BAJA_HUM_AMB	Set low ambient humidity	30,0	%rH	0,0	99,0	Analog	R/W	44
CS06	TIME_RET_AL_TEMP_HUM	High/low ambient T+H alarm delay	30	min	0	999	Integer	R/W	18
CS07	TIME_AL_VIRT	pLAN and/or RH probe disconnection alarm delay	30	s	0	9999	Integer	R	65
CS08	TIME_RET_AL_TERM_VENT_INT	Time delay for alarm for indoor fan thermal	0 sec 30s (air flow switch)	s	0	999	Integer	R/W	26
CS09	GAS_LEAKAGE_ALARM_SETP_PPM	Alarm limit in ppm for gas leakage detector	200	ppm	0	32767	Integer	R/W	8
CS09	GAS_LEAKAGE_AL_GAS_LEAKAGE_DELAY	Alarm gas leakage delay	1	min	0	59	Analog		
CS10	GAS_LEAKAGE_BUZZER_DELAY	Buzzer delay during gas leakage detection	5	min	0	59	Analog		
CS10	GAS_LEAKAGE_DEL_AL_OFFLINE	Alarm delay gas leakage detector disconnected	30	s	0	300	Analog		
CS11	SET_RES_CALEFACTORA_TUBERIA_BAC	Activation setpoint of electrical heating in hot water coil pipe	4,0	°C	-10,0	10,0	Analog		
CS11	SET_RES_CARTER_DOBLE_COMPRESOR	Activation setpoint of dual compressor crankcase and the first stage of electrical heating in electrical box	-8,0	°C	-20,0	0,0	Analog		
CS11	SET_RES_CALEFACTORA_COMPUERTA	Activation setpoint of electrical heating in outdoor dampers	-12,0	°C	-20,0	0,0	Analog		
CS11	SET_RES_CALEFACTORA_CUADRO_2	Activation setpoint of the second stage of electrical heating in electrical box	-16,0	°C	-20,0	0,0	Analog		
<b>MANUFACTURER: ALARM SETTINGS</b>									
CA01	TIME_RS_SIR	Alarm management: audio alarm reset	2	s	0	9999	Integer		
CA01	RL_AL	Alarm relay	0: Normal	---	0: Normal; 1: buzzer		Digital		
CA01	SEL_ALARMA_POR_MASK	Relay activation with selected active alarm in display	1: Yes	---	0: No ; 1: Yes		Digital	R/W	180
CA02	HAB_TER	For remote output, selection of thermal prot. alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_HP	For remote output, selection of high pressure alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_LP	For remote output, selection of low pressure alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_HT	For remote output, selection of high temperature alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_LT	For remote output, selection of low temperature alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_CON	For remote output, selection of counter alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA02	HAB_SD	For remote output, selection of alarm by disconnected probes	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_HIE	For remote output, selection of antifrost alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_INT	For remote output, selection of interlock alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_FIL	For remote output, selection of fouled filter alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_EPR	For remote output, selection of EPROM failure alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_KLD	For remote output, selection of compressor discharge alarm	1: Yes	---	0: No ; 1: Yes		Digital		





# Electronic dehumidification control

## MANUFACTURER displays

Display	Parameter	Description of the parameter	Value	Unit	Max.	Min.	Type	R/W	Addr.
<b>MANUFACTURER: ALARM SETTINGS (...continued)</b>									
CA03	HAB_REL	For remote output, selection of clock alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA03	HAB_SP	For remote output, selection of W/S setpoint alarm	1: Yes	---	0: No ; 1: Yes		Digital		
CA04	HAB_BQ_AL_AP	Enable high pressure alarm blocking	1: Yes	---	0: No ; 1: Yes		Digital		
CA04	NUM_VECES_BQ_AL_AP	Number of times to block the unit due to high pressure alarm	4	---	0	20	Integer		
CA04	TIME_BQ_AL_AP	Time in minutes to count the number of times an alarm occurs for blocking due to high pressure	30	min	0	1440	Integer		
CA05	HAB_BQ_AL_BP	Enable low pressure alarm blocking	1: Yes	---	0: No ; 1: Yes		Digital		
CA05	NUM_VECES_BQ_AL_BP	Number of times to block the unit due to low pressure alarm	4	---	0	20	Integer		
CA05	TIME_BQ_AL_BP	Time in minutes to count the number of times an alarm occurs for blocking due to low pressure	30	min	0	1440	Integer		
CA06	HAB_BQ_AL_TERM	Enable thermal alarm blocking	1: Yes	---	0: No ; 1: Yes		Digital		
CA06	NUM_VECES_BQ_AL_TERM	Number of times to block the unit due to thermal alarm	4	---	0	20	Integer		
CA06	TIME_BQ_AL_TERM	Time in minutes to count the number of times an alarm occurs for blocking due to thermal	30	min	0	1440	Integer		
CA07	HAB_BQ_AL_TERM_RES	Enable electrical heating thermal Alarm Blocking	1: Yes	---	0: No ; 1: Yes		Digital		
CA07	NUM_VECES_BQ_AL_TERM_RES	Number of times to block the unit due to electrical heating thermal alarm	4	---	0	20	Integer		
CA07	TIME_BQ_AL_TERM_RES	Time in minutes to count the number of times an alarm occurs for blocking due to electrical heating thermal	30	min	0	1440	Integer		
<b>MANUFACTURER: UNIT INITIALISATION</b>									
IU02	logo_bool	Logo on the first display: CIATESA or CIAT	0: CIAT ; 1: CIATESA	---	0: CIAT ; 1: CIATESA		Digital		
IU03	Msk_Default_Init	Manual activation by loading the default values	0: No	---	0: No ; 1: Yes		Integer		
IU04	VIRT_VAL_ENSAYO	Manual activation by loading the default test values	0: No	---	0: No ; 1: Yes		Digital		
IU04	VIRT_VAL_NORMAL	Manual activation by loading the normal values	0: No	---	0: No ; 1: Yes		Digital		
IU05	RESET_EVENTS	Reset the alarms log	0: No	---	0: No ; 1: Yes		Digital		
IU06	NEW_PASS_UT	New USER password	*****	---	0	9999	Integer	R/W	28
IU06	NEW_PASS_ASS	New MAINTENANCE password	*****	---	0	9999	Integer	R/W	29
IU06	NEW_PASS_COS	New MANUFACTURER password	*****	---	0	9999	Integer	R/W	30

## MAINTENANCE displays

Display	Parameter	Description of the parameter	Value	Unit	Max.	Min.	Type	R/W	Addr.
<b>MAINTENANCE: COUNTERS</b>									
A01	SET_HOR_ON_EQUIPO	Unit time set for alarm	20000	h	0	32000	Integer	R/W	37
A01	RESET_ON_HORAS_MAQUINA	Reset the counter for number of hours of unit operation	0: No	---	0: No ; 1: Yes		Digital	R/W	107
A01b	RESET_TIME_COMPRESOR	Reset the timings of compressors for maintenance	0: No	---	0: No ; 1: Yes		Digital	R/W	182
A02	SET_HOR_COMP1	Compressor 1 / circuit 1 time set for alarm	10000	h	0	32000	Integer	R/W	38
A02	RESET_ON_HORAS_COMP1	Reset the counter for number of hours of compressor 1 / circuit 1	0: No	---	0: No ; 1: Yes		Digital	R/W	105
A03	SET_HOR_COMP2	Compressor 1 / circuit 2 time set for alarm	10000	h	0	32000	Integer	R/W	39
A03	RESET_ON_HORAS_COMP2	Reset the counter for number of hours of compressor 1 / circuit 2	0: No	---	0: No ; 1: Yes		Digital	R/W	106
A03a	SET_HOR_COMP_AGUA	Compressor 1 / water circuit time set for alarm	10000	h	0	32000	Integer	R/W	67
A03a	RESET_ON_HORAS_COMP_AGUA	Reset the counter for number of hours of compressor 1 / water circuit	0: No	---	0: No ; 1: Yes		Digital	R/W	124
A03b	SET_HOR_CR	Recovery compressor time set for alarm	10000	h	0	32000	Integer	R/W	13
A03b	RESET_ON_HORAS_CR	Reset the counter for number of hours of recovery compr. operation	0: No	---	0: No ; 1: Yes		Digital	R/W	133
A12i	GAS_LEAKAGE RESET_HOURS_COUNTER	Reset sensor timer of gas leakage detector	0: No	---	0: No ; 1: Yes		Digital		
A13	RESET_ON_CONT	Reset the counter of starts of motors and heaters	0: No	---	0: No ; 1: Yes		Digital		
A13	RESET_ON_CONT_AL	Reset the counter of alarms	0: No	---	0: No ; 1: Yes		Digital		

## Pantallas de MANTENIMIENTO

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MAINTENANCE: INPUTS / OUTPUTS</b>									
A00	Control_mode_SET1_Fan1	Type of flow control of indoor plug-fan	1	---	1: constant flow control 2: PWM control (0..100%)		Integer		
A00	SET_CAUDAL_VINT_VENTILACION	Setpoint of flow in VENTILATION mode with indoor plug-fan	1200	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Integer	R/W	197
A00	SET_CAUDAL_VINT_FRIO	Setpoint of flow in COOLING mode with indoor plug-fan	1200	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Integer	R/W	200
A00	SET_CAUDAL_VINT_CALOR	Setpoint of flow in HEATING mode with indoor plug-fan	1200	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Integer	R/W	201
A00	Speed_Input_perc_VENTILACION_Fan1	Percentage of speed modulation in VENTILATION mode with indoor plug-fan	50	%	0	100	Integer/ Analog	R/W	159
A00	Speed_Input_perc_FRIO_Fan1	Percentage of speed modulation in COOLING mode with indoor plug-fan	50	%	0	100	Integer/ Analog	R/W	160
A00	Speed_Input_perc_CALOR_Fan1	Percentage of speed modulation in HEATING mode with indoor plug-fan	50	%	0	100	Integer/ Analog	R/W	161
A00a	SET_CAUDAL_VINT	Setpoint of flow selected with indoor plug-fan (it can be the COOLING, HEATING or VENTILATION setpoint)	1200	x10 m3/h	0	9999	Integer		
A00a	Speed_Input_perc_Fan1	Percentage of speed modulation selected with indoor plug-fan (it can be the COOLING, HEATING or VENTILATION setpoint)	50	%	0	100	Integer		
A00a	CAUDAL_VINT_MEDIDO_AJUSTE	Current flow with indoor plug-fan		x10 m3/h	0	9999	Integer	R	198
A00a	CurrModLev_msk_Fan1	Current percentage of speed modulation with indoor plug-fan		%	0	9999	Integer		
A00a	actual_speed_msk_Fan1	Current speed with indoor plug-fan	0	rpm	0	9999	Integer	R	199
A00f	Maximal_Speed_Fan1	Maximum speed allowed with indoor plug-fan	0	rpm	0	9999	Integer		
A00f	Ramp_up_TIME_Fan1	Ramp-up time with indoor plug-fan	5	s	0	625	Integer		
A00f	Ramp_dwn_TIME_Fan1	Ramp down time with indoor plug-fan	5	s	0	625	Integer		
A00e	VALUE_AI_sensor_pda_Fan1	Voltage minimum value of the air pressure differential sensor to signal its alarm.	0.1	V	0.0	10.0	Integer		
A00e	TIME_RET_AI_sensor_pda_Fan1	Delay time to start the fan for alarm signaling of the air pressure differential sensor	30	s	10	120	Integer		
A00g	AIN2_Min_Value_Ebm_Fan1	Minimum limit of the air pressure differential sensor with indoor plug-fan	0	Pa	0	5000	Integer		
A00g	AIN2_Max_Value_Ebm_Fan1	Maximum limit of the air pressure differential sensor with indoor plug-fan	1000	Pa	0	5000	Integer		
A20	MOD_MB_VFD_CIAT_1.Type_Switch	Control type of frequency inverter of indoor motor	1	---	1: constant flow control 2: PWM control (0..100%)		Integer		
A20	Pda_VENT_INT_min	Point differential pressure minimum of indoor fan	125	Pa	0	9999	Integer/ Analog	R/W	155
A20	Rpm_VENT_INT_min	Point rpm minimum of indoor fan	592	rpm	0	9999	Integer/ Analog	R/W	156
A20	Pda_VENT_INT_max	Point differential pressure maximum of indoor fan	600	Pa	0	9999	Integer/ Analog	R/W	157
A20	Rpm_VENT_INT_max	Point rpm maximum of indoor fan	962	rpm	0	9999	Integer/ Analog	R/W	158
A20	Speed_Input_perc_VENTILACION_Fan1	Percentage of speed modulation in VENTILATION mode with indoor fan	50	%	0	100	Integer/ Analog	R/W	159
A20	Speed_Input_perc_FRIO_Fan1	Percentage of speed modulation in COOLING mode with indoor fan	50	%	0	100	Integer/ Analog	R/W	160
A20	Speed_Input_perc_CALOR_Fan1	Percentage of speed modulation in HEATING mode with indoor fan	50	%	0	100	Integer/ Analog	R/W	161
A20a	Speed_Input_perc_Fan1	Percentage of speed modulation with indoor fan	50	%	0	100	Integer		
A20a	Speed_Hz_VFD_INT	Frequency read on the indoor motor	---	Hz	0	99.9	Analog	R	162
A20a	Analog_IN1_Ebm_Fan1	Pressure differential read on the indoor fan	---	Pa	0	32767	Integer/ Analog	R	163
A20a	Speed_rpm_VFD_INT	Speed read on the indoor motor	---	rpm	0	9999	Integer/ Analog	R	164



# Electronic dehumidification control

## Pantallas de MANTENIMIENTO

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MAINTENANCE: INPUTS / OUTPUTS (...continued)</b>									
A20a	Rpm_VENT_INT_calculado	Speed calculated on the indoor fan	---	rpm	0	32767	Integer/Analog	R	165
A20f	MOD_MB_VFD_CIAT_1.Min_Setting_A1	Minimum value of the analog input A1 of indoor motor VFD	0	%	0	1000.0	Analog	R	166
A20f	MOD_MB_VFD_CIAT_1.Max_Setting_A1	Maximum value of the analog input A1 of indoor motor VFD	1000.0	%	0	1000.0	Analog	R	167
A20f	MOD_MB_VFD_CIAT_1.Min_Frequency	Minimum frequency value of indoor motor VFD	25.0	Hz	0	320.0	Analog	R	168
A20f	MOD_MB_VFD_CIAT_1.Max_Frequency	Maximum frequency value of indoor motor VFD	50.0	Hz	0	320.0	Analog	R	169
A20f	MOD_MB_VFD_CIAT_1.Acceler_Time	Ramp-up time with frequency inverter of indoor motor	5	s	0	3000	Analog		
A20f	MOD_MB_VFD_CIAT_1.Deceler_Time	Ramp down time with frequency inverter of indoor motor	5	s	0	3000	Analog		
A20e	VALUE_AI_sensor_pda_Fan1	Voltage minimum value of the air pressure differential sensor to signal its alarm.	0.1	V	0.0	10.0	Integer		
A20e	TIME_RET_AI_sensor_pda_Fan1	Delay time to start the fan for alarm signaling of the air pressure differential sensor	30	s	10	120	Integer		
A20g	AIN2_Min_Value_Ebm_Fan1	Minimum limit of the air pressure differential sensor with indoor fan	0	Pa	0	5000	Integer		
A20g	AIN2_Max_Value_Ebm_Fan1	Maximum limit of the air pressure differential sensor with indoor fan	1000	Pa	0	5000	Integer		
A001	Control_mode_SET1_Fan2	Type of flow control of return plug-fan	1	---	1: Control caudal cte. 2: Control PWM (0..100%)		Integer		
A001	SET_CAUDAL_VRET_VENTILACION	Setpoint of flow in VENTILATION mode with return plug-fan	1200	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Integer	R/W	203
A001	SET_CAUDAL_VRET_FRIO	Setpoint of flow in COOLING mode with return plug-fan	1200	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Integer	R/W	206
A001	SET_CAUDAL_VRET_CALOR	Setpoint of flow in HEATING mode with return plug-fan	1200	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Integer	R/W	207
A001	Speed_Input_perc_VENTILACION_Fan2	Percentage of speed modulation in VENTILATION mode with return plug-fan	50	%	0	100	Integer/Analog	R/W	174
A001	Speed_Input_perc_FRIO_Fan2	Percentage of speed modulation in COOLING mode with return plug-fan	50	%	0	100	Integer/Analog	R/W	175
A001	Speed_Input_perc_CALOR_Fan2	Percentage of speed modulation in HEATING mode with return plug-fan	50	%	0	100	Integer/Analog	R/W	176
A001a	SET_CAUDAL_VRET	Setpoint of flow selected with return plug-fan (it can be the COOLING, HEATING or VENTILATION setpoint)	1200	x10 m3/h	0	9999	Integer		
A001a	Speed_Input_perc_Fan2	Percentage of speed modulation selected with return plug-fan (it can be the COOLING, HEATING or VENTILATION setpoint)	50	%	0	100	Integer		
A001a	CAUDAL_VRET_MEDIDO_AJUSTE	Current flow with return plug-fan		x10 m3/h	0	9999	Integer	R	204
A001a	CurrModLev_msk_Fan2	Current percentage of speed modulation with return plug-fan		%	0	9999	Integer		
A001a	actual_speed_msk_Fan2	Current speed with return plug-fan	0	rpm	0	9999	Integer	R	205
A001f	Maximal_Speed_Fan2	Maximum speed allowed with return plug-fan	0	rpm	0	9999	Integer		
A001f	Ramp_up_TIME_Fan2	Ramp-up time with return plug-fan	5	s	0	625	Integer		
A001f	Ramp_dwn_TIME_Fan2	Ramp down time with return plug-fan	5	s	0	625	Integer		
A001e	VALUE_AI_sensor_pda_Fan2	Voltage minimum value of the air pressure differential sensor to signal its alarm.	0.1	V	0.0	10.0	Integer		
A001e	TIME_RET_AI_sensor_pda_Fan2	Delay time to start the fan for alarm signaling of the air pressure differential sensor	30	s	10	120	Integer		
A001g	AIN2_Min_Value_Ebm_Fan2	Minimum limit of the air pressure differential sensor with return plug-fan	0	Pa	0	5000	Integer		
A001g	AIN2_Max_Value_Ebm_Fan2	Maximum limit of the air pressure differential sensor with return plug-fan	1000	Pa	0	5000	Integer		
A201	MOD_MB_VFD_CIAT_2.Type_Switch	Control type of frequency inverter of return motor	1	---	1: Control caudal cte. 2: Control panel 3: Control PWM (0..100%)		Integer		
A201	Pda_VENT_RET_min	Point differential pressure minimum of return fan	125	Pa	0	9999	Integer/Analog	R/W	170

## Pantallas de MANTENIMIENTO

Display	Parameter	Description of the parameter	Value	Unit	Max.	Min.	Type	R/W	Addr.
<b>MAINTENANCE: INPUTS / OUTPUTS (...continued)</b>									
A201	Rpm_VENT_RET_min	Point rpm minimum of return fan	592	rpm	0	9999	Integer/ Analog	R/W	171
A201	Pda_VENT_RET_max	Point differential pressure maximum of return fan	600	Pa	0	9999	Integer/ Analog	R/W	172
A201	Rpm_VENT_RET_max	Point rpm maximum of return fan	962	rpm	0	9999	Integer/ Analog	R/W	173
A201	Speed_Input_perc_VENTILACION_Fan2	Percentage of speed modulation in VENTILATION mode with return fan	50	%	0	100	Integer/ Analog	R/W	174
A201	Speed_Input_perc_FRIO_Fan2	Percentage of speed modulation in COOLING mode with return fan	50	%	0	100	Integer/ Analog	R/W	175
A201	Speed_Input_perc_CALOR_Fan2	Percentage of speed modulation in HEATING mode with return fan	50	%	0	100	Integer/ Analog	R/W	176
A201a	Speed_Input_perc_Fan2	Percentage of speed modulation with return fan	50	%	0	100	Integer		
A201a	Speed_Hz_VFD_RET	Frequency read on the return motor	---	Hz	0	99.9	Analog	R	177
A201a	Analog_IN1_Ebm_Fan2	Pressure differential read on the return fan	---	Pa	0	32767	Integer/ Analog	R	178
A201a	Speed_rpm_VFD_RET	Speed read on the return motor	---	rpm	0	9999	Integer/ Analog	R	179
A201a	Rpm_VENT_RET_calculado	Speed calculated on the return fan	---	rpm	0	32767	Integer/ Analog	R	180
A201f	MOD_MB_VFD_CIAT_2.Min_Setting_A1	Minimum value of the analog input A1 of return motor VFD	0	%	0	1000.0	Analog	R	181
A201f	MOD_MB_VFD_CIAT_2.Max_Setting_A1	Maximum value of the analog input A1 of return motor VFD	1000.0	%	0	1000.0	Analog	R	182
A201f	MOD_MB_VFD_CIAT_2.Min_Frequency	Minimum frequency value of return motor VFD	25.0	Hz	0	320.0	Analog	R	183
A201f	MOD_MB_VFD_CIAT_2.Max_Frequency	Maximum frequency value of return motor VFD	50.0	Hz	0	320.0	Analog	R	184
A201f	MOD_MB_VFD_CIAT_2.Acceler_Time	Ramp-up time with frequency inverter of return motor	5	s	0	3000	Analog		
A201f	MOD_MB_VFD_CIAT_2.Deceler_Time	Ramp down time with frequency inverter of return motor	5	s	0	3000	Analog		
A201e	VALUE_AI_sensor_pda_Fan2	Voltage minimum value of the air pressure differential sensor to signal its alarm.	0.1	V	0.0	10.0	Integer		
A201e	TIME_RET_AI_sensor_pda_Fan2	Delay time to start the fan for alarm signaling of the air pressure differential sensor	30	s	10	120	Integer		
A201g	AIN2_Min_Value_Ebm_Fan2	Minimum limit of the air pressure differential sensor with return fan	0	Pa	0	5000	Integer		
A201g	AIN2_Max_Value_Ebm_Fan2	Maximum limit of the air pressure differential sensor with return fan	1000	Pa	0	5000	Integer		
A002b	HAB_RED_CAUDAL_CONDUCTO_TEXTIL	Enable flow reduction to fan start with textile duct	1: Yes	---	0: No ; 1: Yes		Digital		
A002b	PORC_CAUDAL_CONDUCTO_TEXTIL	Percentage of flow to fan start with textile duct	35.0	%	20.0	75.0	Analog		
A002b	TIME_RED_CAUDAL_CONDUCTO_TEXTIL	Reduced flow timing to fan start with textile duct	20	s	0	999	Integer		
A002	CAUDAL_IMPULSION_MSK	Discharge flow (measured value or value set by parameter)	0	x10 m3/h	0	9999	Integer		
A002	CAUDAL_RETORNO_MSK	Return flow (measured value or value set by parameter)	0	x10 m3/h	0	9999	Integer		
A002	Sobrepresion	Calculation of overpressure	only viewable	%	0	99,9	Analog	R	151
A002	Cte_Ajuste_Sobrepresion	Constant adjustment of the calculation of overpressure	1	%	0	10	Analog	R/W	152
A002	AOUT_COMPUERTA	Output outdoor air damper	only viewable	%	0	999,9	Analog	R	10
A002	AOUT_COMPUERTA_EXTRACCION	Output extraction air damper	only viewable	%	0	999,9	Analog	R	153
A002a	CAUDAL_IMPULSION_MSK	Discharge flow (measured value or value set by parameter)	only viewable	x10 m3/h	0	9999	Integer		
A002a	CAUDAL_RETORNO_MSK	Return flow (measured value or value set by parameter)	only viewable	x10 m3/h	0	9999	Integer		
A002a	RENOVACION_CAL	% air refreshing with mixing probe	only viewable	%	0	0	Integer	R	124



# Electronic dehumidification control

## Pantallas de MANTENIMIENTO

Display	Parameter	Description of the parameter	Value	Unit	Maximum	Minimum	Type	R/W	Addr.
<b>MANTENIMIENTO: ENTRADAS / SALIDAS (...continuación)</b>									
A002a	CAUDAL_RENOVACION_MSK	Renovation air flow	only viewable	x10 m3/h	0	9999	Analog	R	201
A002a	CAUDAL_EXTRACCION_MSK	Exhaust air flow	only viewable	x10 m3/h	0	9999	Integer		
A04	TAR_HUM_AMB	Ambient air humidity set	0,0	%rH	-9,9	9,9	Analog	R/W	54
A04	TAR_TEMP_AMB	Ambient air temperature set	0,0	°C	-9,9	9,9	Analog	R/W	108
A04a	TAR_HUM_EXT	Outdoor air humidity set	0,0	%rH	-9,9	9,9	Analog	R/W	55
A04a	TAR_TEMP_EXT	Outdoor air temperature set	0,0	°C	-9,9	9,9	Analog	R/W	46
A04b	TAR_TEMP_TCO	Air temperature set of TCO thermostat	0,0	°C	-9,9	9,9	Analog		
A05	TAR_TEMP_RET	Return air temperature set	0,0	°C	-9,9	9,9	Analog	R/W	45
A05	TAR_TEMP_MEZCLA	Mixing air temperature set	0,0	°C	-9,9	9,9	Analog	R/W	50
A05	TAR_TEMP_IMP	Discharge air temperature set	0,0	°C	-9,9	9,9	Analog	R/W	47
A05a	TAR_CO2	Air quality probe set	0,0	°C	-999	999	Integer	R/W	61
A05b	TAR_TEMP_ENTRADA_BAC	Adjust of water inlet temperature of the hot water coil	0,0	°C	-9,9	9,9	Analog	R/W	109
A05b	TAR_TEMP_SALIDA_BAC	Adjust of water outlet temperature of the hot water coil	0,0	°C	-9,9	9,9	Analog	R/W	110
A05c	TAR_TEMP_RET_PISCINA	Adjust of water inlet temperature of the compressor exchanger or PWA	0,0	°C	-9,9	9,9	Analog	R/W	105
A05c	TAR_TEMP_IMP_AGUA_INT_COMPRESOR	Adjust of water outlet temperature of the compressor exchanger	0,0	°C	-9,9	9,9	Analog	R/W	106
A05c	TAR_TEMP_IMP_AGUA_PWA	Adjust of water outlet temperature of the PWA	0,0	°C	-9,9	9,9	Analog	R/W	107
A06d	MOD_MB_SERIAL_PROBE_CIAT2_1.Offset_Temp	Adjust ambiente air temperature with serial probe No.1	0,0	°C	Min_Diff_Temp_AAA	Max_Diff_Temp_AAA	Analog		
A06d	MOD_MB_SERIAL_PROBE_CIAT2_1.Offset_Humi	Adjust ambiente air humidity with serial probe No.1	0,0	%rH	-10	10	Analog		
A06e	MOD_MB_SERIAL_PROBE_CIAT2_2.Offset_Temp	Adjust ambiente air temperature with serial probe No.2	0,0	°C	Min_Diff_Temp_AAA	Max_Diff_Temp_AAA	Analog		
A06e	MOD_MB_SERIAL_PROBE_CIAT2_2.Offset_Humi	Adjust ambiente air humidity with serial probe No.2	0,0	%rH	-10	10	Analog		
A07c	IS_CO2	Lower threshold of air quality probe	0	ppm	-32767	32767	Integer		
A07c	FS_CO2	Upper threshold of air quality probe	2000	ppm	-32767	32767	Integer		
A07d	LIM_MAX_HUM	Maximum limit of the humidity probe	90	%rH	0	100	Analog	R/W	71
A07d	LIM_MIN_HUM	Minimum limit of the humidity probe	10	%rH	0	100	Analog	R/W	72
A07d	LIM_MAX_HUM_ALARMA	Maximum limit indicated by the humidity probe alarm	100	%rH	0	110	Analog	R/W	147
A07d	LIM_MIN_HUM_ALARMA	Minimum limit indicated by the humidity probe alarm	0	%rH	0	110	Analog	R/W	146
A07h	HAB_FILTRO1	Enabling of probe software filter	0: NO	---	0:No ; 1:Yes		Digital	R/W	98
A07h	TIME_FILTRO1	Filter time	30	s	0	99	Integer		
A07h	GRADI_FILTRO1	Filter differential	10,0	°C	0	99,9	Analog		
A07i	HAB_FILTRO_CAL_IMP	Enabling of filter	1: SI	---	0:No ; 1:Yes		Digital	R/W	168
A07i	TIME_FILTRO_CAL_IMP	Filter time	60	s	0	99	Integer		
A07i	GRADI_FILTRO_CAL_IMP	Filter differential	1,0	°C	0	99,9	Analog		
A11	SET_RENOVACION_CAL	% Outdoor air for refreshing	only viewable	%	0	0	Integer	R	126
A11	RENOVACION_CAL	% air refreshing with mixing probe	only viewable	%	0	0	Integer	R	124
A11	CAL_APER_RENOV_2	% real opening of outdoor damper	only viewable	%	0	0	Integer	R	125
A11	TIME_CAL	Calculation time	60	s	0	99	Integer	R/W	194
A11	V_CAL	Calculation constant	3	%	0	99	Integer	R/W	195
A11	DIF_TEMP_RENOVACION_CAL	Difference between mixing and return temp. and between mixing and outdoor temp. for refreshing calculation	3,0	°C	0	9,9	Analog	R/W	145
A12	NEW_PASS_ASS	New MAINTENANCE password	*****	---	0	9999	Integer	R/W	29

## 14. CAREL AND MODBUS SUPERVISORY VARIABLES

### 14.1. Equivalence between the Carel and Modbus protocols

Carel		Modbus			TCP/IP Modbus	
Variable type	Maximum No. addresses	Type of variable	Maximum No. addresses	Conversion	Maximum No. addresses	Conversion
Digital	1 ... 207	Digital	1 ... 207	Modbus record = Carel address	1 ... 207	TCP/IP address = Carel address
Analogue	1 ... 207	Word record	1 ... 207	Modbus record = Carel address	1 ... 207	TCP/IP address = Carel address
Integer	1 ... 207	Word record	208 ... 415	Modbus record = Carel address +128	5001 ... 5207	TCP/IP address = Carel address +5000

Note: Carel peripherals do not allow the 0 address.

### 14.2. Digital variables

Carel Address	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	Min. value	Max. value	Description
1	1	1	R	IN_DIG02_AP1	Digital input	0	1	HP pressure switch of circuit 1
2	2	2	R	IN_DIG09_AP2	Digital input	0	1	HP pressure switch of circuit 2
3	3	3	R	IN_DIG11_BP1	Digital input	0	1	LP pressure switch of circuit 1
4	4	4	R	IN_DIG15_BP2	Digital input	0	1	LP pressure switch of circuit 2
5	5	5	R	IN_DIG03_TC1	Digital input	0	1	Thermal of compressor 1 of circuit 1
6	6	6	R	IN_DIG10_TC2	Digital input	0	1	Thermal of compressor 1 of circuit 2
7	7	7	R	IN_DIG04_AP_AGUA	Digital input	0	1	HP pressure switch of water circuit
8	8	8	R	IN_DIG07_ON_OFF	Digital input	0	1	Remote ON/OFF selection
9	9	9	R	IN_DIG05_TC_AGUA	Digital input	0	1	Thermal of compressor of water circuit
10	10	10	R	IN_DIG13_AH_BAC	Digital input	0	1	Anti-freeze thermostat signal
11	11	11	R	IN_DIG06_FS	Digital input	0	1	Clogged filter pressure switch signal
12	12	12	R	IN_DIG01_RTVI	Digital input	0	1	Indoor fan overload/general interlock signal (RTVi)
13	13	13	R	MODO_CALOR	Status	0	1	HEATING (winter) operating mode
14	14	14	R	MODO_FRIO	Status	0	1	COOLING (summer) operating mode
15	15	15	R	VENTILADOR_INT	Digital output	0	1	Indoor fan
16	16	16	R	COMPRESOR_1	Digital output	0	1	Switch of compressor 1 of circuit 1
17	17	17	R	COMPRESOR_2	Digital output	0	1	Switch of compressor 1 of circuit 2
18	18	18	R	OUT_VIC_REC	Digital output	0	1	Cycle reversing valve recovery circuit
20	20	20	R	RES_ELECTRICA_1_O_VALV	Digital output	0	1	Switch of the 1st heater
21	21	21	R	RES_ELECTRICA_2	Digital output	0	1	Switch of the 2nd heater
22	22	22	R	BOMBA_COMP_AGUA	Digital output	0	1	Water circuit pump
23	23	23	R	BOMBA_BAC	Digital output	0	1	H.W.C. pump
25	25	25	R/W OEM	RESET_ALARMS	Alarm	0	1	Alarm reset
26	26	26	R	GLOBAL_ALARM	Alarm	0	1	General alarm
27	27	27	R	mAL_TERM_COMP_1	Alarm	0	1	Alarm for thermal compressor 1 circuit 1
28	28	28	R	mAL_TERM_COMP_2	Alarm	0	1	Alarm for thermal compressor 1 of circuit 2
29	29	29	R	mAL_AP1	Alarm	0	1	Alarm due to high pressure of circuit 1
30	30	30	R	mAL_AP2	Alarm	0	1	Alarm due to high pressure of circuit 2
31	31	31	R	mAL_ANTIHIELO_BAC	Alarm	0	1	Anti-freeze alarm
32	32	32	R	mPERM_MEM_ERROR	Alarm	0	1	Damaged EPROM
33	33	33	R	mAL_RELOJ	Alarm	0	1	Timer broken or disconnected
34	34	34	R	mAL_ALT_TEMP_REG	Alarm	0	1	Overly high return air temperature
35	35	35	R	mAL_BAJ_TEMP_REG	Alarm	0	1	Overly low return air temperature
36	36	36	R	mAL_SET_HOR_COMP1	Alarm	0	1	Maintenance of compressor 1 of circuit 1

## Digital variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	Min. value	Max. value	Description
37	37	37	R	mAL_SET_HOR_COMP2	Alarm	0	1	Maintenance of compressor 1 of circuit 2 (units 2 circ.) or compressor 3 (units 4 circ.)
38	38	38	R	mAL_BP1	Alarm	0	1	Alarm due to low pressure of circuit 1
39	39	39	R	mAL_BP2	Alarm	0	1	Alarm due to low pressure of circuit 2
40	40	40	R	mAL_TERM_VENT_INT	Alarm	0	1	General interlock alarm (RTVi)
41	41	41	R	mAL_TEMP_AMB	Alarm	0	1	Alarm of ambient air temperature sensor
42	42	42	R	mAL_TEMP_RET_PISCINA	Alarm	0	1	Alarm of return temperature sensor of the water pool
43	43	43	R	mAL_FILTRO_SUCIO	Alarm	0	1	Clogged filter alarm
44	44	44	R	mAL_TERM_RES_ELECTRICA	Alarm	0	1	Electrical heater(s) thermal protection alarm
45	45	45	R	mAL_ALT_HUM_REG	Alarm	0	1	Overly high return air humidity
46	46	46	R	HAB_RELOJ	Status	0:No ; 1:Yes		Enable timer board
47	47	47	R	mAL_BAJ_HUM_REG	Alarm	0	1	Overly low return air humidity
48	48	48	R/W OEM	HAB_SONDA_TEMP_IMP	Configuration	0:No ; 1:Yes		Enable discharge sensor
49	49	49	R	SEL_FREE_COOLING_TERMO_ENTALPICO	Status	0:No ; 1:Yes		Enable enthalpic-thermal free-cooling
50	50	50	R/W OEM	HAB_SUPERVISION	Configuration	0:No ; 1:Yes		Enable the supervisory serial board
51	51	51	R	MOD_MB_VFD_CIAT_1. mAl_Offline_VFD	Alarm	0	1	Communication fault with the frequency inverter of indoor motor
52	52	52	R/W OEM	HAB_FREECOOL_VER	Configuration	0:No ; 1:Yes		Enable free-cooling in COOLING mode (summer)
53	53	53	R/W OEM	HAB_FREEDESH_VER	Configuration	0:No ; 1:Yes		Enable free-dehumidification in COOLING mode (summer)
54	54	54	R/W	POS_COMPUERTA_AL_INICIO	Regulation	0: normal 1: closed		Select fresh air damper position at start-up
55	55	55	R/W OEM	HAB_FREEDESH_INV	Configuration	0:No ; 1:Yes		Enable free-dehumidification in HEATING mode (winter)
56	56	56	R/W OEM	HAB_RENOVACION_AIRE	Configuration	0:No ; 1:Yes		Enable refreshing
57	57	57	R/W OEM	CONTROL_P_PI_PWA	Fans	0: P ; 1: P+I		Type of control: proportional or proportional + integral for PWA control
58	58	58	R/W	AUTOSTART	Regulation	0:No ; 1:Yes		Enable automatic start-up after blocking/power cut
59	59	59	R/W	HAB_ONOFF_REMOTO	Regulation	0:No ; 1:Yes		Enable remote ON/OFF
60	60	60	R	HAB_ON_OFF_HOR	Status	0:No ; 1:Yes		Enable ON-OFF time schedule
61	61	61	R	HAB_CAMBIO_MODO_HOR	Status	0:No ; 1:Yes		Enable setpoint change time schedule
62	62	62	R/W OEM	HAB_FREECOOL_INV	Configuration	0:No ; 1:Yes		Enable free-cooling in HEATING mode (winter)
63	63	63	R/W OEM	CONTROL_P_PI_TEMP	Fans	0: P ; 1: P+I		Temperature control type: proportional (P) or proportional + integral (P+I)
64	64	64	R/W OEM	HAB_ROT_COMP	Compressors	0:No ; 1:Yes		Enable rotation of compressors
65	65	65	R/W	SYS_ON	Commands	0: off 1: on		Unit ON/OFF
66	66	66	R/W	CALOR_FRIO_PANEL	Commands	0: winter 1: summer		Select HEATING/COOLING mode via the panel
67	67	67	R/W OEM	HAB_INTERCAMBIADOR_PWA	Configuration	0:No ; 1:Yes		Enable the PWA exchanger for pool heating
68	68	68	R	mAL_TEMP_ENTRADA_BAC	Alarm	0	1	Alarm of water inlet temperature of the hot water coil probe
69	69	69	R	mAL_TEMP_SALIDA_BAC	Alarm	0	1	Alarm of water outlet temperature of the hot water coil probe
70	70	70	R	mAL_ANTIHIELO_AGUA_BAC	Alarm	0	1	Water anti-freeze alarm of hot water coil
71	71	71	R/W OEM	HAB_CONTROL_SOBREPRESION	Configuration	0:No ; 1:Yes		Enable OVERPRESSURE control

## Digital variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	Min. value	Max. value	Description
72	72	72	R/W	HAB_BLOQ_COMP_ON_FASE_LIM_FRIO	RTC	0:No ; 1:Yes		Disable the compressors in summer with scheduling and setpoint limit in summer (free-cooling night)
73	73	73	R/W	HAB_BLOQ_RENOVACION_ON_FASE_LIM	RTC	0:No ; 1:Yes		Disable the outdoor air exchange and scheduling limit setpoint (night)
74	74	74	R	SYS_ON1	Status	0: off 1: on		Display of unit status
75	75	75	R/W OEM	CONTROL_P_PI_HUM	Fans	0: P ; 1: P+I		Type of control: proportional or proportional + integral for humidity control
76	76	76	R	COMPRESOR_AGUA	Digital output	0	1	Switch of compressor of water circuit
77	77	77	R/W OEM	CONTROL_P_PI_IMP	Fans	0: P ; 1: P+I		Type of control: proportional or proportional + integral for supply control
78	78	78	R	mAL_TEMP_IMP_AGUA_INT_COMP	Alarm	0	1	Alarm of the outlet temperature probe of the water plate exchanger
79	79	79	R	mAL_TEMP_IMP_AGUA_PWA	Alarm	0	1	Alarm of the outlet temperature probe of the PWA exchanger
80	80	80	R/W OEM	HAB_MB_GAS_LEAKEAGE_DETECTOR	Configuration	0:No ; 1:Yes		Enabling gas leakage detector
81	81	81	R	MOD_MOB_GAS_LEAKAGE_CCIAT_1.mAl_Offline_ModBus	Alarm	0	1	Communication fault with the gas leakage detector
82	82	82	R	MOD_MOB_GAS_LEAKAGE_CCIAT_1.mRelay_Status	Alarm	0	1	Alarm of gas leakage detected
83	83	83	R	MOD_MOB_GAS_LEAKAGE_CCIAT_1.mSensor_Fault	Alarm	0	1	Alarm of broken or disconnected sensor of gas leakage detector
84	84	84	R/W OEM	HAB_LIM_CO2	Configuration	0:No ; 1:Yes		CO2 limit enabled
85	85	85	R/W OEM	HAB_VALV_CALOR_POR_IMP_MIN_CALOR	Configuration	0:No ; 1:Yes		Supply minimum control with hot water coil with unit in HEATING mode
86	86	86	R/W OEM	HAB_COMP_CALOR_POR_IMP_MIN_CALOR	Configuration	0:No ; 1:Yes		Supply minimum control with compressors in heating with unit in HEATING mode
87	87	87	R/W OEM	HAB_RES_POR_IMP_MIN_CALOR	Configuration	0:No ; 1:Yes		Supply minimum control with electrical heaters with unit in HEATING mode
88	88	88	R/W OEM	HAB_BM_TERMOSTATO_TCO	Configuration	0:No ; 1:Yes		Enabling of the TCO thermostat by MODBUS
89	89	89	R/W OEM	ThTune_bloqueado	Configuration	0:No ; 1:Yes		Keypad lock of the TCO thermostat
91	91	91	R/W OEM	HAB_OFF_COMP_CAMBIO_F_C	Compressor	0:No ; 1:Yes		Compressors stop before HEATING/COOLING operating mode change
93	93	93	R	mAL_ANTIHIELO_AGUA_PWA	Alarm	0	1	Antifreeze alarm of the PWA exchanger
94	94	94	R/W OEM	HAB_OFF_VINT_FRIO	Fans	0:No ; 1:Yes		Stop indoor fan when stopping the compressors in COOLING mode (summer)
95	95	95	R/W OEM	HAB_OFF_VINT_CALOR	Fans	0:No ; 1:Yes		Stop indoor fan when stopping the compressors in HEATING mode (winter)
96	96	96	R/W OEM	SONDA_HUM_4_20	Service	0: 0-1V; 1: 4-20mA		Type of humidity sensor
97	97	97	R	MOD_MB_VFD_CCIAT_2.mAl_Offline_VFD	Alarm	0	1	Communication fault with the frequency inverter of return motor
98	98	98	R/W OEM	HAB_FILTRO1	Service	0:No ; 1:Yes		Enable sensor filter
99	99	99	R	mAL_ANTIHIELO_AGUA_INT_COMP	Alarm	0	1	Antifreeze alarm of the water plate exchanger
100	100	100	R/W OEM	ACC_IMP_VLV	Configuration	0:No ; 1:Yes		Supply air temperature control with auxiliary hot water coil
101	101	101	R/W OEM	ACC_IMP_BC	Configuration	0:No ; 1:Yes		Supply air temperature control with compressors
102	102	102	R/W OEM	ACC_IMP_RES	Configuration	0:No ; 1:Yes		Supply air temperature control with electrical heaters
103	103	103	R/W OEM	HAB_VALVULA_CALOR	Configuration	0:No ; 1:Yes		Enable auxiliary hot water coil (3-way valve)
104	104	104	R	HAB_CO2	Status	0:No ; 1:Yes		CO2 sensor installed
105	105	105	R/W OEM	RESET_ON_HORAS_COMP1	Service	0:No ; 1:Yes		Reset operating hours of compressor 1 of circuit 1





# Electronic dehumidification control

## Digital variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	Min. value	Max. value	Description
106	106	106	R/W OEM	RESET_ON_HORAS_COMP2	Service	0:No ; 1:Yes		Reset operating hours of compressor 1 of circuit 2 (units 2 circ.) or compressor 3 (units 4 circ.)
107	107	107	R/W OEM	RESET_ON_HORAS_MAQUINA	Service	0:No ; 1:Yes		Reset operating hours of the unit
108	108	108	R	mAL_SET_HOR_ON_EQUIPO	Alarm	0	1	Alarm due to cumulative unit operating hours
109	109	109	R	mAL_TEMP_RET	Alarm	0	1	Return air temperature sensor alarm
110	110	110	R	mAL_S_VIRTUAL	Alarm	0	1	Virtual pLAN sensor alarm
111	111	111	R	mAL_TEMP_EXT	Alarm	0	1	Outdoor temperature sensor alarm
112	112	112	R	mAL_HUM_RET	Alarm	0	1	Return humidity sensor alarm
113	113	113	R	mAL_HUM_EXT	Alarm	0	1	Outdoor humidity sensor alarm
114	114	114	R	mAL_TEMP_IMP	Alarm	0	1	Discharge air temperature sensor alarm
115	115	115	R	mAL_SETPOINT	Alarm	0	1	Alarm setpoint HEATING mode (winter) > COOLING mode (summer)
116	116	116	R	IN_DIG11_CR	Digital input	0	1	HP and LP pressure switch recovery circuit (only with cooling recovery)
117	117	117	R	COMPRESOR_REC	Digital output	0	1	Recovery compressor switch (only with cooling recovery)
118	118	118	R	mAL_AP_BP_CR	Alarm	0	1	HP and LP pressure switch recovery circuit alarm (only with cooling recovery)
119	119	119	R	mAL_SET_HOR_CR	Alarm	0	1	Recovery compressor maintenance (only with cooling recovery)
120	120	120	R/W	FORZADO	RTC	0:No ; 1:Yes		Forced start-up
121	121	121	R/W	NEW_DATE	RTC	0:No ; 1:Yes		Activate time and date change
122	122	122	R	mAL_SET_HOR_COMP_AGUA	Alarm	0	1	Maintenance of compressor 1 of circuit 1
124	124	124	R/W OEM	RESET_ON_HORAS_COMP_AGUA	Service	0:No ; 1:Yes		Reset operating hours of compressor
125	125	125	R/W	HAB_PRIORIDAD_COMP_AGUA_CALOR	Regulation	0:No ; 1:Yes		Enable water compressor priority in heating mode
126	126	126	R	mAL_KLD1	Alarm	0	1	Discharge temperature limit of compressor(s) of circ. 1 exceeded
127	127	127	R	mAL_KLD2	Alarm	0	1	Discharge temperature limit of compressor(s) of circ. 2 exceeded
128	128	128	R/W	HAB_PROT_ANTIHIELO_BAC_GF	Configuration	0:No ; 1:Yes		Enabling of the antifreeze protection of the hot water coil with low outdoor temperatures
129	129	129	R/W OEM	HAB_BAC_DESESCARCHE	Configuration	0:No ; 1:Yes		Enable auxiliary hot water coil during defrosting
130	130	130	R	mAL_TEMP_MEZCLA	Alarm	0	1	Mixed air temperature sensor alarm
131	131	131	R/W OEM	TIPO_BLOQ_COMP_CALOR	Compressor	0:No ; 1:Yes		Disable compressors in HEATING mode (winter) according to outdoor temperature
132	132	132	R/W	HAB_PRIORIDAD_BAC	Regulation	0:No ; 1:Yes		Enable hot water coil priority with respect to compressors
133	133	133	R/W OEM	RESET_ON_HORAS_CR	Service	0:No ; 1:Yes		Reset operating hours of the recovery compressor
134	134	134	R/W OEM	HAB_PRES_BEXT	Configuration	0:Temp. 1:Pressure		Enable pressure sensors in the outdoor coil
135	135	135	R	IN_DIG12_INC	Digital input	0:No ; 1:Yes		Digital input detection of smoke or fire
136	136	136	R	mAL_INCENDIO	Alarm	0	1	Smoke detector alarm
143	143	143	R	IN_DIG12_BP_AGUA	Digital input	0	1	LP pressure switch of water circuit
151	151	151	R	mAL_TERM_COMP_AGUA	Alarm	0	1	Alarm for thermal of compressor of water circuit
153	153	153	R	mAL_AP_AGUA	Alarm	0	1	Alarm due to high pressure of water circuit
159	159	159	R	mAL_KLD_AGUA	Alarm	0	1	Discharge temperature limit of water compressor
161	161	161	R	mAI_I_O_Mismatch	Alarm	0	1	Alarm expansion card pCOe inputs/outputs malfunction n.1
162	162	162	R	mAI_Offline	Alarm	0	1	Alarm no communication with expansion card pCOe n.1
163	163	163	R	mAI_Offline	Alarm	0	1	Alarm no communication with ambient sensor RS485 No.1

## Digital variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	Min. value	Max. value	Description
164	164	164	R	mAI_Broken_Temp_Probe	Alarm	0	1	Alarm ambient temperature sensor No.1 broken or disconnected
165	165	165	R	mAI_Broken_Humid_Probe	Alarm	0	1	Alarm ambient humidity sensor No.1 broken or disconnected
166	166	166	R	mAL_IMPULSION_ALTA	Alarm	0	1	High supply air temperature alarm
167	167	167	R	HAB_MB_SOND_AMB	Configuration	0:No ; 1:Yes		Enable ambient sensor
168	168	168	R/W OEM	HAB_FILTRO_CAL_IMP	Service	0:No ; 1:Yes		Enable supply air STP calculation with ambient sensor
170	170	170	R/W OEM	COMP_OFF_ALL_INCENDIO	Alarm	0: Open 1: Closed		Outdoor damper status with fire alarm (0=open, 1=closed)
173	173	173	R/W	VAR_DIGITAL_AUX_PVPRO_1	Special	0	1	Digital variable No.1 saved for the PVPRO
174	174	174	R/W	VAR_DIGITAL_AUX_PVPRO_2	Special	0	1	Digital variable No.2 saved for the PVPRO
175	175	175	R	mAI_Offline	Alarm	0	1	Alarm no communication with ambient sensor RS485 No.2
176	176	176	R	mAI_Broken_Temp_Probe	Alarm	0	1	Alarm ambient temperature sensor No.2 broken or disconnected
177	177	177	R	mAI_Broken_Humid_Probe	Alarm	0	1	Alarm ambient humidity sensor No.2 broken or disconnected
180	180	180	R/W OEM	SEL_ALARMA_POR_MASK	Alarm	0:No ; 1:Yes		Relay activation with selected active alarms on display
182	182	182	R/W OEM	RESET_TIME_COMPRESOR	Service	0:No ; 1:Yes		Compressor timers reset
183	183	183	R	ON_FCOOL_FDESH	Status	0	1	Display of the free-cooling or free-dehumidification operation
184	184	184	R	ON_FREE_COOL	Status	0	1	Display of the free-cooling operation
185	185	185	R	ON_FREE_DESH	Status	0	1	Display of the free-dehumidification operation
186	186	186	R	ON_COMPRESOR	Status	0	1	Display of the compressors status
187	187	187	R	ON_RESISTENCIA	Status	0	1	Display of the electrical heaters operation
188	188	188	R	NOT_SYSON1	Status	0	1	Display of the unit OFF
190	190	190	R/W OEM	HAB_MB_ENERGY_METER	Configuration	0:No ; 1:Yes		Enable energy meter connected as Modbus slave
191	191	191	R/W OEM	Reset_Energy	Configuration	0:No ; 1:Yes		Reset of energy meter counter
192	192	192	R	mAI_Offline	Alarm			Alarm no communication with energy meter
193	193	193	R	mAI_Offline	Alarm	0	1	Alarm no communication with ambient sensor RS485 No.1
194	194	194	R	mAI_Broken_Temp_Probe	Alarm	0	1	Alarm ambient temperature sensor No.1 broken or disconnected
195	195	195	R	mAI_Broken_Humid_Probe	Alarm	0	1	Alarm ambient humidity sensor No.1 broken or disconnected
197	197	197	R	mAL_BQ_ANTIHIELO	Alarm	0	1	Unit blocking due to anti-freeze alarm
198	198	198	R/W OEM	RESET_AL_BQ_ANTIHIELO	Alarm	0:No ; 1:Yes		Reset of unit blocking due to anti-freeze refrigerant alarm
201	201	201	R	mAI_Offline_MB_Ebm_Fan1	Alarm	0	1	Alarm no communication plug-fan indoor fan
202	202	202	R	mAI_sensor_pres_dif_aire	Alarm	0	1	Differential pressure sensor alarm for flow control
203	203	203	R/W OEM	HAB_BOMBA_CALOR_COMP_REC	Configuration	0: Rec. comp. cooling only 1: Rec. comp. heat pump		Recovery compressor - Heat pump
204	204	204	R/W OEM	HAB_OFF_VINT_POR_CO2	Service	0:No ; 1:Yes		Indoor fan stop when compressor stops if there is no demand for air renewal by CO2 sensor
205	205	205	R	mAI_Offline_MB_Ebm_Fan2	Alarm	0	1	Plug-fan return fan alarm no communication
206	206	206	R	mAI_sensor_pres_dif_aire_Fan2	Alarm	0	1	Differential pressure sensor alarm for return flow control

## 14.3. Analogue variables

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
1	1	1	R	TEMP_RET	Analog input	°C	-99.9	99.9	Return air temperature
2	2	2	R	TEMP_SONDA_EXT	Analog input	°C	-99.9	99.9	Outdoor air temperature
3	3	3	R	TEM_RET_PISCINA	Analog input	°C	-99.9	99.9	Return water temperature of the pool
4	4	4	R	TEMP_IMP_AGUA_INT_COMPRESOR	Analog input	°C	-99.9	99.9	Discharge water temperature of the water circuit exchanger
5	5	5	R	HUM_SONDA_AMB	Analog input	%rH	-999.9	999.9	Return air relative humidity
6	6	6	R	HUM_SONDA_EXT	Analog input	%rH	-999.9	999.9	Outdoor air relative humidity
7	7	7	R	TEMP_IMP	Analog input	°C	-99.9	99.9	Supply air temperature
8	8	8	R	TEMP_MEZCLA	Analog input	°C	-99.9	99.9	Mixing air temperature
9	9	9	R	TEMP_SONDA_AMB	Analog input	°C	-99.9	99.9	Ambient air temperature
10	10	10	R	AOUT_COMPUERTA	Analog output	---	0	32767	Outdoor air damper outlet
11	11	11	R	AOUT_VALV_O_RES_PROP	Analog output	---	0	32767	Modulating output for auxiliary hot water coil valve
12	12	12	R	AOUT_VALVULA_PWA	Analog output	---	0	32767	Modulating output for PWA exchanger valve
13	13	13	R	AOUT_COMPUERTA_EXTRACCION	Analog output	---	0	32767	Opening of the extraction air damper
14	14	14	R	TEMP_TCO	Analog input	°C	-99.9	99.9	Air temperature of the TCO thermostat
15	15	15	R/W	SET_POINT_TEMP_FRIO	Commands	°C	LIM_INF_TEMP	LIM_SUP_TEMP	Return air temperature setpoint in COOLING mode (summer)
16	16	16	R/W	SET_POINT_TEMP_CALOR	Commands	°C	LIM_INF_TEMP	LIM_SUP_TEMP	Return air temperature setpoint in HEATING mode (winter)
17	17	17	R/W	BANDA_HUM_FRIO	Regulation	%rH	0	10.0	Humidity control differential in COOLING mode (summer)
18	18	18	R/W	SET_POINT_HUM	Commands	%rH	LIM_INF_HUM	LIM_SUP_HUM	Humidity control setpoint in COOLING mode (summer)
19	19	19	R/W	LIM_SUP_TEMP_FRIO	Regulation	°C	LIM_INF_TEMP	50.0	Upper limit of temperature setpoint on COLD
20	20	20	R/W	LIM_INF_TEMP_FRIO	Regulation	°C	0	LIM_SUP_TEMP	Lower limit of temperature setpoint on COLD
21	21	21	R/W	BANDA_TEMP_FRIO	Regulation	°C	0	15.0	COOLING mode (summer) temperature control band
22	22	22	R/W	BANDA_TEMP_CALOR	Regulation	°C	0	15.0	HEATING mode (winter) temperature control band
23	23	23	R/W	LIM_SUP_HUM	Regulation	%rH	LIM_INF_HUM	99.9	Humidity setpoint upper limit
24	24	24	R/W	LIM_INF_HUM	Regulation	%rH	-99.9	LIM_SUP_HUM	Humidity setpoint lower limit
25	25	25	R	TEMP_ENTRADA_BAC	Analog input	°C	-99.9	99.9	Water inlet temperature of the hot water coil
26	26	26	R	TEMP_SALIDA_BAC	Analog input	°C	-99.9	99.9	Water outlet temperature of the hot water coil
27	27	27	R/W	DELTA_FREE_COOL	Regulation	°C	-5.0	5.0	Temperature differential for free-cooling
28	28	28	R/W	OFFSET_FCOOL_VER	Regulation	°C	-5.0	5.0	Free-cooling ramp in COOLING mode (summer): Offset
29	29	29	R/W	BANDA_FCOOL_VER	Regulation	°C	0	5.0	Free-cooling ramp in COOLING mode (summer): Differential
30	30	30	R/W	OFFSET_FDESH_VER	Regulation	%rH	-5.0	5.0	Free-dehumidification ramp in COOLING mode (summer): Offset
31	31	31	R/W	BANDA_FDESH_VER	Regulation	%rH	0	5.0	Free-dehumidification ramp in COOLING mode (summer): Differential
32	32	32	R/W	SET_IMPULSION_FRIO_MIN	Regulation	°C	0	SET_IMPULSION_FRIO_MAX	Setpoint for minimum supply air temperature control in COOLING mode (summer)
33	33	33	R/W	BANDA_IMP_FRIO	Regulation	°C	0	20.0	Minimum supply air temperature control differential in COOLING mode (summer)
34	34	34	R	HUM_ABS_SONDA_EXT	Analog input	g/Kg	0	99.9	Absolute outdoor humidity in g/Kg of dry air
35	35	35	R	HUM_ABS_SONDA_AMB	Analog input	g/Kg	0	99.9	Absolute ambient humidity in g/Kg of dry air
36	36	36	R/W	DELTA_HUM_ABS	Regulation	g/Kg	0	10.0	Delta of absolute humidity in g/Kg of dry air
37	37	37	R	TEMP_IMP_AGUA_PWA	Analog input	°C	-99.9	99.9	Discharge water temperature of the PWA plate exchanger

## Analogue variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
38	38	38	R/W OEM	SET_TEMP_MEZCLA_COMP_REC	Configuration	°C	10.0	30.0	Setpoint of mixed air temperature for stopping the air compressors
39	39	39	R/W	ZONA_MUERTA_TEMP	Regulation	°C	0	3.0	Dead zone of temperature control
40	40	40	R/W	ZONA_MUERTA_HUM	Regulation	%rH	0	50.0	Dead zone of humidity control
41	41	41	R/W OEM	SET_ALTA_TEMP_AMB	Alarm	°C	0	60.0	Setpoint of high temperature of ambient air
42	42	42	R/W OEM	SET_BAJA_TEMP_AMB	Alarm	°C	0	60.0	Setpoint of low temperature of ambient air
43	43	43	R/W OEM	SET_ALTA_HUM_AMB	Alarm	%rH	0	99.0	Setpoint of high humidity of the ambient air
44	44	44	R/W OEM	SET_BAJA_HUM_AMB	Alarm	%rH	0	99.9	Setpoint of low humidity of the ambient air
45	45	45	R/W OEM	TAR_TEMP_RET	Service	°C	-9.9	9.9	Calibration of return air sensor
46	46	46	R/W OEM	TAR_TEMP_EXT	Service	°C	-9.9	9.9	Calibration of outdoor air sensor
47	47	47	R/W OEM	TAR_TEMP_IMP	Service	°C	-9.9	9.9	Calibration of discharge air sensor
48	48	48	R/W OEM	SET_ANTIHIELO_AGUA_INT_COMP	Alarm	°C	-20.0	10.0	Anti-freeze alarm setpoint of the water circuit exchanger
49	49	49	R/W OEM	DIF_ANTIHIELO_AGUA_INT_COMP	Alarm	°C	0.0	10.0	Anti-freeze alarm differential of the water circuit exchanger
50	50	50	R/W OEM	TAR_TEMP_MEZCLA	Service	°C	-9.9	9.9	Calibration of mixing air sensor
51	51	51	R/W OEM	OFFSET_TEMP_AGUA_BAC	Configuration	°C	0	10.0	Water temperature offset of the hot water coil with OFF unit
52	52	52	R/W	OFFSET_RES	Regulation	°C	-5.0	5.0	Offset for the control of electrical heaters
53	53	53	R/W	BANDA_RES	Regulation	°C	0	5.0	Differential control for electrical heaters
54	54	54	R/W OEM	TAR_HUM_AMB	Service	%rH	-9.9	9.9	Calibration of return humidity sensor
55	55	55	R/W OEM	TAR_HUM_EXT	Service	%rH	-9.9	9.9	Calibration of outdoor humidity sensor
56	56	56	R/W OEM	SET_TEMP_AGUA_BAC	Configuration	°C	0	20.0	Water temperature setpoint of the hot water coil
57	57	57	R/W OEM	BANDA_TEMP_AGUA_BAC	Configuration	°C	0	5.0	Band of the water temperature setpoint of the hot water coil
58	58	58	R/W	SET_EXT_CALOR	RTC	°C	-99.9	99.9	Time schedule with setpoint change: HEATING mode (winter) outdoor setpoint
59	59	59	R/W	SET_EXT_FRIO	RTC	°C	-99.9	99.9	Time schedule with setpoint change: COOLING mode (summer) outdoor setpoint
60	60	60	R/W	SET_INT_CALOR	RTC	°C	-99.9	99.9	Time schedule with setpoint change: HEATING mode (winter) indoor setpoint
61	61	61	R/W	SET_INT_FRIO	RTC	°C	-99.9	99.9	Time schedule with setpoint change: COOLING mode (summer) indoor setpoint
62	62	62	R/W	OFFSET_VALV_CALOR	Regulation	°C	-10.0	0	Auxiliary hot water coil offset (heat valve)
63	63	63	R/W	DIF_VALV_CALOR	Regulation	°C	0	5.0	Auxiliary hot water coil differential (heat valve)
64	64	64	R/W	SET_POINT_TEMP_AGUA	Commands	°C	0	99.9	Setpoint of temperature of the pool water
65	65	65	R/W	LIM_SUP_TEMP_AGUA	Regulation	°C	20.0	50.0	Upper limit of the water set point
66	66	66	R/W	LIM_INF_TEMP_AGUA	Regulation	°C	0	30.0	Lower limit of the water set point
67	67	67	R/W	BANDA_COMP_AGUA	Regulation	°C	0,0	15,0	Control band of the water circuit temperature
68	68	68	R/W	BANDA_VALV_PWA	Regulation	°C	1,0	9,9	Control band of the PWA exchanger valve
69	69	69	R/W	RATIO_PWA_REGIMEN	Regulation	°C	2,0	9,9	Power ratio of PWA (maintenance/regime)
70	70	70	R/W OEM	SET_LIM_TEMP_IMP_AGUA_PWA	Alarm	°C	20.0	60.0	Value to limit the water discharge temperature for the PWA
71	71	71	R/W OEM	LIM_MAX_HUM	Service	%rH	0	100.0	Maximum humidity limit
72	72	72	R/W OEM	LIM_MIN_HUM	Service	%rH	0	100.0	Minimum humidity limit
73	73	73	R/W	OFFSET_TEMP_AGUA_CON_PRIORIDAD	Regulation	°C	0	15.0	Offset for water temperature control with compressor priority
74	74	74	R/W OEM	SET_TEMP_MEZCLA_COMP_AGUA	Configuration	°C	10.0	30.0	Setpoint of mixing temperature for stopping the water circuit compressor
75	75	75	R	VER_SOFT	Status	---	0	99.9	pCO3 board software version
76	76	76	R/W	SET_EXT_LIM_CALOR	RTC	°C	-99.9	99.9	Time schedule on by limit setpoint in HEATING mode (winter): limit setpoint
77	77	77	R/W	SET_EXT_LIM_FRIO	RTC	°C	-99.9	99.9	Time schedule on by limit setpoint in COOLING mode (summer): limit setpoint
78	78	78	R/W	SET_INT_LIM_CALOR	RTC	°C	-99.9	99.9	Time schedule on by limit setpoint in HEATING mode (winter): indoor setpoint



# Electronic dehumidification control

## Analogue variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
79	79	79	R/W	SET_INT_LIM_FRIO	RTC	°C	-99.9	99.9	Time schedule on by limit setpoint in COOLING mode (summer): indoor setpoint
80	80	80	R/W	DIF_LIM_FRIO	RTC	°C	0	99.9	Time schedule on by limit setpoint in COOLING mode (summer): limit differential
81	81	81	R/W	DIF_LIM_CALOR	RTC	°C	0	99.9	Time schedule on by limit setpoint in HEATING mode (winter): limit differential
82	82	82	R/W OEM	SET_ON_VALV_CALOR_POR_BAJA_TEXT	Configuration	°C	-10.0	10.0	Setpoint for hot water coil ON with unit OFF due to low outdoor temperature
83	83	83	R/W	SET_IMPULSION_CALOR_MAX	Regulation	°C	SET_IMPULSION_CALOR_MIN	55.0	Setpoint for maximum discharge air temperature control in HEATING mode (winter)
84	84	84	R/W	BANDA_IMP_CALOR	Regulation	°C	0	20.0	Differential for maximum supply air temperature control in HEATING mode (winter)
85	85	85	R/W	SET_INT_AGUA	RTC	°C	-99.9	99.9	Time schedule with setpoint change: indoor water setpoint
86	86	86	R/W	SET_INT_HUM	RTC	%rH	0	99.9	Time schedule with setpoint change: indoor humidity setpoint
87	87	87	R/W	SET_INT_LIM_AGUA	RTC	°C	-99.9	99.9	Time schedule on by limit water setpoint: indoor setpoint
88	88	88	R/W	SET_INT_LIM_HUM	RTC	%rH	0	99.9	Time schedule on by limit humidity setpoint: indoor setpoint
89	89	89	R/W	SET_EXT_AGUA	RTC	°C	-99.9	99.9	Time schedule with setpoint change: outdoor water setpoint
90	90	90	R/W	SET_EXT_HUM	RTC	%rH	0	99.9	Time schedule with setpoint change: outdoor humidity setpoint
91	91	91	R/W OEM	SET_TEMP_MEZCLA_COMP_AIRE	Configuration	°C	10.0	30.0	Mixing temperature setpoint for stopping the air compressors
92	92	92	R/W	SET_EXT_LIM_AGUA	RTC	°C	-99.9	99.9	Time schedule on by limit water setpoint: limit setpoint
93	93	93	R/W	SET_EXT_LIM_HUM	RTC	%rH	0	99.9	Time schedule on by limit humidity setpoint: limit setpoint
94	94	94	R/W	DIF_LIM_AGUA	RTC	°C	0	99.9	Time schedule on by limit water setpoint: limit differential
95	95	95	R/W	DIF_LIM_HUM	RTC	%rH	0	99.9	Time schedule on by limit humidity setpoint: limit differential
96	96	96	R/W	BANDA_HUM_CALOR	Regulation	%rH	0	10.0	Humidity control in HEATING mode (winter): diferencial
97	97	97	R/W	BANDA_FCOOL_INV	Regulation	°C	-5.0	5.0	Free-cooling ramp in HEATING mode (winter): offset
98	98	98	R/W	OFFSET_FCOOL_INV	Regulation	°C	0	5.0	Free-cooling ramp in HEATING mode (winter): differ.
99	99	99	R/W	BANDA_FDESH_INV	Regulation	%rH	-5.0	5.0	Free-dehum. ramp in HEATING mode (winter): offset
100	100	100	R/W	OFFSET_FDESH_INV	Regulation	%rH	0	5.0	Free-dehum. ramp in HEATING mode (winter): differ.
101	101	101	R/W OEM	OFFSET_TEMP_AGUA	Configuration	°C	0	5.0	Offset for water temperature control with compressor
102	102	102	R/W OEM	SET_ANTIHIELO_AGUA_PWA	Alarm	°C	-20.0	10.0	Anti-freeze alarm setpoint of the PWA exchanger
103	103	103	R/W OEM	DIF_ANTIHIELO_AGUA_PWA	Alarm	°C	0	10.0	Anti-freeze alarm differential of the PWA exchanger
105	105	105	R/W OEM	TAR_TEMP_RET_PISCINA	Service	°C	-9.9	9.9	Calibration of the pool return temperature probe
106	106	106	R/W OEM	TAR_TEMP_IMP_AGUA_INT_COMPRESOR	Service	°C	-9.9	9.9	Calibration of the outlet temperature probe of the water circuit exchanger
107	107	107	R/W OEM	TAR_TEMP_IMP_AGUA_PWA	Service	°C	-9.9	9.9	Calibration of the PWA outlet temperature probe
108	108	108	R/W OEM	TAR_TEMP_AMB	Service	°C	-9.9	9.9	Calibration of the ambient air temperature probe
109	109	109	R/W OEM	TAR_TEMP_ENTRADA_BAC	Service	°C	-9.9	9.9	Calibration of the BAC inlet temperature probe
110	110	110	R/W OEM	TAR_TEMP_SALIDA_BAC	Service	°C	-9.9	9.9	Calibration of the BAC outlet temperature probe
111	111	111	R/W OEM	SET_OFF_COMPUERTA_POR_BAJA_TEXT	Configuration	°C	-20.0	10.0	Outdoor temperature to close the outer damper
112	112	112	R/W	OFFSET_CAL_IMP_CALOR	Regulation	°C	0	30.0	Ambient temperature compensation in order to calculate supply air setpoint in HEATING mode (winter)
113	113	113	R/W	SET_IMPULSION_CALOR_MIN	Regulation	°C	25.0	SET_IMPULSION_CALOR_MAX	Setpoint for minimum supply air temperature control in HEATING mode (winter)
114	114	114	R/W	OFFSET_CAL_IMP_FRIO	Regulation	°C	0	30.0	Ambient temp. compensation in order to calculate supply air setpoint in COOLING mode (summer)
115	115	115	R/W	SET_IMPULSION_FRIO_MAX	Regulation	°C	SET_IMPULSION_FRIO_MIN	30.0	Setpoint for maximum supply air temperature control in COOLING mode (summer)

## Analogue variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
116	116	116	R/W OEM	SET_AL_INCENDIO	Alarm	°C	40.0	80.0	Fire alarm setpoint (return air temperature)
117	117	117	R/W OEM	DIF_AL_INCENDIO	Alarm	°C	10.0	50.0	Fire alarm differential (return air temperature)
118	118	118	R/W OEM	OFFSET_AL_IMPULSION_ALTA	Alarm	°C	0	20.0	Setpoint compensation for high discharge air temperature alarm
119	119	119	R/W OEM	DIF_AL_IMPULSION_ALTA	Alarm	°C	1.0	10.0	Differential for high discharge air T alarm
121	121	121	R	SET_IMPULSION_CALOR_CAL	Status	°C	0	55.0	Discharge air setpoint calculated in HEATING mode (winter)
122	122	122	R	SET_IMPULSION_FRIO_CAL	Status	°C	0	30.0	Discharge air setpoint calculated in COOLING mode (summer)
127	127	127	R/W	VAR_ANALOGICA_AUX_PVPRO_1	Special	---	-3276.8	3276.7	Analogue variable No.1 saved for the PVPRO
128	128	128	R/W	VAR_ANALOGICA_AUX_PVPRO_2	Special	---	-3276.8	3276.7	Analogue variable No.2 saved for the PVPRO
129	129	129	R/W	SET_HAB_RES_TEMP_EXT	Regulation	°C	-20.0	40.0	Setpoint for electrical heaters enabling due to low outdoor temperature
131	131	131	R	Current_1_L_SPV	Status	A	0	999.9	Current line 1
132	132	132	R	Current_2_L_SPV	Status	A	0	999.9	Current line 2
133	133	133	R	Current_3_L_SPV	Status	A	0	999.9	Current line 3
134	134	134	R	Apparent_Power_1_L_SPV	Status	kVAr	0	999.9	Reactive power line 1
135	135	135	R	Apparent_Power_2_L_SPV	Status	kVAr	0	999.9	Reactive power line 2
136	136	136	R	Apparent_Power_3_L_SPV	Status	kVAr	0	999.9	Reactive power line 3
137	137	137	R	Power_1_L_SPV	Status	kW	0	999.9	Effective power line 1
138	138	138	R	Power_2_L_SPV	Status	kW	0	999.9	Effective power line 2
139	139	139	R	Power_3_L_SPV	Status	kW	0	999.9	Effective power line 3
140	140	140	R	Power_L_SPV	Status	kW	0	999.9	Equivalent power
141	141	141	R	VT_L_SPV	Status	---	0	9999	Multiplier of the voltage transformer
142	142	142	R	Frequency	Status	Hz	0	99.9	Frequency of power supply
143	143	143	R/W OEM	SET_ANTIHELO_AGUA_BAC	Alarm	°C	-20.0	10.0	Initial value of the BAC antifreeze alarm
144	144	144	R/W OEM	DIF_ANTIHELO_AGUA_BAC	Alarm	°C	0	10.0	Differential value of the BAC antifreeze alarm
145	145	145	R/W OEM	DIF_TEMP_RENOVACION_CAL	Service	°C	0	9.9	Temperature differ. for the calculated renovation
146	146	146	R/W OEM	LIM_MIN_HUM_ALARMA	Service	%rH	0	100.0	Minimum humidity limit for alarm signalling
147	147	147	R/W OEM	LIM_MAX_HUM_ALARMA	Service	%rH	0	100.0	Maximum humidity limit for alarm signalling
148	148	148	R/W	LIM_SUP_TEMP_CALOR	Regulation	°C	LIM_INF_TEMP_CALOR	50.0	Upper limit of temperature setpoint on HEAT
149	149	149	R/W	LIM_INF_TEMP_CALOR	Regulation	°C	0	LIM_SUP_TEMP_CALOR	Lower limit of temperature setpoint on HEAT
151	151	151	R	Sobrepresion	Service	%	0	99.9	Calculation of the actual overpressure
152	152	152	R/W	CTE_AJUSTE_SOBREPRESION	Service	---	0	10	Constant adjustment of the OVERPRESSURE
153	153	153	R	A O U T _ C O M P U E R T A _ EXTRACCION	Analog output	---	0	999.9	Output extraction air damper
154	154	154	R	SET_HUM_BLOQ_COMP_FRIO_FC	Compressor	%rH	0	100	Block compressor setpoint in summer with free-cooling with high outdoor humidity
155	155	155	R/W OEM	Pda_VENT_INT_min	Service	Pa	0	9999	Point differential pressure min. of indoor fan
156	156	156	R/W OEM	Rpm_VENT_INT_min	Service	rpm	0	9999	Point rpm minimum of indoor fan
157	157	157	R/W OEM	Pda_VENT_INT_max	Service	Pa	0	9999	Point differential pressure max. of indoor fan
158	158	158	R/W OEM	Rpm_VENT_INT_max	Service	rpm	0	9999	Point rpm maximum of indoor fan
159	159	159	R/W OEM	Speed_Input_perc_VENTILACION_Fan1	Service	%	0	100	Percentage of speed modulation in VENTILATION mode with indoor fan
160	160	160	R/W OEM	Speed_Input_perc_FRIO_Fan1	Service	%	0	100	Percentage of speed modulation in COOLING mode with indoor fan
161	161	161	R/W OEM	Speed_Input_perc_CALOR_Fan1	Service	%	0	100	Percentage of speed modulation in HEATING mode with indoor fan
162	162	162	R	Speed_Hz_VFD_INT	Status	Hz	0	99.9	Frequency read on the indoor motor
163	163	163	R	Analog_IN1_Ebm_Fan1	Status	Pa	0	32767	Pressure differential read on the indoor fan
164	164	164	R	Speed_rpm_VFD_INT	Status	rpm	0	9999	Speed read on the indoor motor



# Electronic dehumidification control

## Analogue variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
165	165	165	R	Rpm_VENT_INT_calculado	Status	rpm	0	32767	Speed calculated on the indoor fan
166	166	166	R	MOD_MB_VFD_CIAT_1.Min_Setting_A1	Status	%	0	1000.0	Minimum value of the analog input A1 of indoor motor VFD
167	167	167	R	MOD_MB_VFD_CIAT_1.Max_Setting_A1	Status	%	0	1000.0	Maximum value of the analog input A1 of indoor motor VFD
168	168	168	R	MOD_MB_VFD_CIAT_1.Min_Frequency	Status	Hz	0	320.0	Minimum frequency value of indoor motor VFD
169	169	169	R	MOD_MB_VFD_CIAT_1.Max_Frequency	Status	Hz	0	320.0	Maximum frequency value of indoor motor VFD
170	170	170	R/W OEM	Pda_VENT_RET_min	Service	Pa	0	9999	Point differential pressure minimum of return fan
171	171	171	R/W OEM	Rpm_VENT_RET_min	Service	rpm	0	9999	Point rpm minimum of return fan
172	172	172	R/W OEM	Pda_VENT_RET_max	Service	Pa	0	9999	Point differential pressure maximum of return fan
173	173	173	R/W OEM	Rpm_VENT_RET_max	Service	rpm	0	9999	Point rpm maximum of return fan
174	174	174	R/W OEM	Speed_Input_perc_VENTILACION_Fan2	Service	%	0	100	Percentage of speed modulation in VENTILATION mode with return fan
175	175	175	R/W OEM	Speed_Input_perc_FRIO_Fan2	Service	%	0	100	Percentage of speed modulation in COOLING mode with return fan
176	176	176	R/W OEM	Speed_Input_perc_CALOR_Fan2	Service	%	0	100	Percentage of speed modulation in HEATING mode with return fan
177	177	177	R	Speed_Hz_VFD_RET	Status	Hz	0	99.9	Frequency read on the return motor
178	178	178	R	Analog_IN1_Ebm_Fan2	Status	Pa	0	32767	Pressure differential read on the return fan
179	179	179	R	Speed_rpm_VFD_RET	Status	rpm	0	9999	Speed read on the return motor
180	180	180	R	Rpm_VENT_RET_calculado	Status	rpm	0	32767	Speed calculated on the return fan
181	181	181	R	MOD_MB_VFD_CIAT_2.Min_Setting_A1	Status	%	0	1000.0	Minimum value of the analog input A1 of return motor VFD
182	182	182	R	MOD_MB_VFD_CIAT_2.Max_Setting_A1	Status	%	0	1000.0	Maximum value of the analog input A1 of return motor VFD
183	183	183	R	MOD_MB_VFD_CIAT_2.Min_Frequency	Status	Hz	0	320.0	Minimum frequency value of return motor VFD
184	184	184	R	MOD_MB_VFD_CIAT_2.Max_Frequency	Status	Hz	0	320.0	Maximum frequency value of return motor VFD
185	185	185	R/W	NUM_WO_DIG_1	Configuration	---	0	9	Work Order Number of unit - DIGIT 1
186	186	186	R/W	NUM_WO_DIG_2	Configuration	---	0	9	Work Order Number of unit - DIGIT 2
187	187	187	R/W	NUM_WO_DIG_3	Configuration	---	0	9	Work Order Number of unit - DIGIT 3
188	188	188	R/W	NUM_WO_DIG_4	Configuration	---	0	9	Work Order Number of unit - DIGIT 4
189	189	189	R/W	NUM_WO_DIG_5	Configuration	---	0	9	Work Order Number of unit - DIGIT 5
190	190	190	R/W	NUM_WO_DIG_6	Configuration	---	0	9	Work Order Number of unit - DIGIT 6
191	191	191	R/W	NUM_WO_DIG_7	Configuration	---	0	9	Work Order Number of unit - DIGIT 7
192	192	192	R/W	NUM_WO_DIG_8	Configuration	---	0	9	Work Order Number of unit - DIGIT 8
193	193	193	R	SOND_AMB_1_TEMP	Status	°C	-99.9	99.9	Room probe n° 1 - temperature value
194	194	194	R	SOND_AMB_1_HUM	Status	%rH	0.0	99.9	Room probe n° 1 - humidity value
195	195	195	R	SOND_AMB_1_ROCIO	Status	°C	-99.9	99.9	Room probe n° 1 - dew point
196	196	196	R	SOND_AMB_2_TEMP	Status	°C	-99.9	99.9	Room probe n° 2 - temperature value
197	197	197	R	SOND_AMB_2_HUM	Status	%rH	0.0	99.9	Room probe n° 2 - humidity value
198	198	198	R	SOND_AMB_2_ROCIO	Status	°C	-99.9	99.9	Room probe n° 2 - dew point
199	199	199	R	SEL_TEMP_2_SOND_AMB	Configuration	---	0: average 1: minimal 2: maximum		Selection of temperature value with 2 ambient probe mode (0 = average, 1 = minimal, 2 = maximum)
200	200	200	R	SEL_HUM_2_SOND_AMB	Configuration	---	0: average 1: minimal 2: maximum		Selection of humidity value with 2 ambient probe mode (0 = average, 1 = minimal, 2 = maximum)
201	201	201	R	CAUDAL_RENOVACION_MSK	Status	x10 m3/h	0	9999	Renovation flow of outdoor air
202	202	202	R	NUM_WO_H_SPV	Status		0	9999	Work Order Number of unit (high level)
203	203	203	R	NUM_WO_L_SPV	Status		0	9999	Work Order Number of unit (low level)
204	204	204	R	SOND_EXT_1_TEMP	Status	°C	-99.9	99.9	Outdoor probe n° 1 - temperature value
205	205	205	R	SOND_EXT_1_HUM	Status	%rH	0.0	99.9	Outdoor probe n° 1 - humidity value
206	206	206	R	SOND_EXT_1_ROCIO	Status	°C	-99.9	99.9	Outdoor probe n° 1 - dew point

## 14.4. Integer variables

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
1	209	5002	R/W OEM	TIPO_SONDA_EXT	Configuration	---	0: No 1: 1 RS485 probe 2: PLAN probe		Type of outdoor probe
2	210	5003	R/W OEM	TIME_RET_OFF_BOMBA_COMPRESOR	Compressor	°C	0	999	Delay stoping the pump of the water circuit
3	211	5004	R	CO2	Status	ppm	0	32767	Reading of the CO2 air quality sensor
4	212	5005	R/W	SP_CO2	Regulation	ppm	-32767	32767	CO2 air quality control setpoint
5	213	5006	R/W	DIF_CO2	Regulation	ppm	-32767	32767	CO2 air quality control differential
6	214	5007	R	Concentration_ppm_Gas_Leakag	Status	ppm	0	32767	Ppm concentration in the gas leakage detector
7	215	5008	R	Concentration_Percent_Gas_Leakag	Status	%	0	100	Percentage concentration in the gas leakage detector
8	216	5009	R/W OEM	Alarm_Setp_ppm	Alarm	ppm	0	32767	Alarm limit in ppm for gas leakage detector
9	217	5010	R/W OEM	TIME_MIN_APERTURA_ON_REC	Configuration	s	0	999	Time required with minimum opening outdoor air damper for turning ON the recovery compressor
10	218	5011	R	N_HOR_COMP1	Status	h	0	32767	Operating hours of compressor 1 circuit 1
11	219	5012	R	N_HOR_COMP2	Status	h	0	32767	Operating hours of compressor 1 circuit 2 (units 2 circ.) or compressor 3 (units 4 circ.)
12	220	5013	R	N_HOR_CR	Status	h	0	32767	Operating hours of recovery compressor
13	221	5014	R/W OEM	SET_HOR_CR	Service	h	0	32000	Operating hours limit of recovery compressor
14	222	5015	R	PR_ENT_EXTERIOR	Status	kc/kg	0	99	Integer part of outdoor enthalpy
15	223	5016	R	SEC_ENT_EXTERIOR	Status	kc/kg	0	999	Decimal part of outdoor enthalpy
16	224	5017	R	PR_ENT_INTERIOR	Status	kc/kg	0	99	Integer part of indoor enthalpy
17	225	5018	R	SEC_ENT_INTERIOR	Status	kc/kg	0	999	Decimal part of indoor enthalpy
18	226	5019	R/W OEM	TIME_RET_AL_TEMP_HUM	Alarm	s	0	999	Delay in return air temperature alarm (high/low temp.)
19	227	5020	R/W OEM	TIME_RET_AL_BP	Compressor	s	0	9999	Delay in low pressure alarm
20	228	5021	R/W	PR_ENT_DIF	Regulation	kc/kg	0	99	Integer part of difference between outdoor and indoor enthalpy
21	229	5022	R/W	SEC_ENT_DIF	Regulation	kc/kg	0	999	Decimal part of difference between outdoor and indoor enthalpy
22	230	5023	R/W OEM	CONF_OUT07	Configuration	---	0: Alarm 1: Dehumidif.		Type of element connected in digital output 07
23	231	5024	R/W OEM	TIME_RET_OFF_VINT_FRIO	Fans	s	0	999	Delay in stopping the indoor fan in COOLING mode (summer)
24	232	5025	R/W OEM	TIME_RET_OFF_VINT_CALOR	Fans	s	0	999	Delay in stopping the indoor fan in HEATING mode (winter)
25	233	5026	R/W OEM	TIME_RET_ON_COMP	Fans	s	0	999	Delay in starting the compressors after starting the indoor fan
26	234	5027	R/W OEM	TIME_RET_AL_TERM_VENT_INT	Alarm	s	0	999	Delay in interlock alarm
27	235	5028	R/W OEM	TIME_MIN_OFF_COMP	Compressor	s	0	9999	Minimum stop time for the compressors
28	236	5029	R/W OEM	NEW_PASS_UT	Seguridad	---	0	9999	New USER password
29	237	5030	R/W OEM	NEW_PASS_ASS	Seguridad	---	0	9999	New MAINTENANCE password
30	238	5031	R/W OEM	NEW_PASS_COS	Seguridad	---	0	9999	New MANUFACTURER password
31	239	5032	R/W OEM	TIME_MIN_ON_ON_COMP	Compressor	s	0	9999	Minimum time between start-ups of the same compressor
32	240	5033	R/W OEM	TIME_MIN_ON_ON_COMP_DIST	Compressor	s	0	9999	Time between start-ups of different compressors
33	241	5034	R/W OEM	TIME_MIN_ON_COMP	Compressor	s	0	9999	Minimum start-up time of a compressor
34	242	5035	R/W OEM	NUM_COMP_CIRC_AGUA	Configuration	---	0: No compresor 1: 1 compr./ 1 circ.		Number of compressors (0, 1 compressor/1 circuit)
35	243	5036	R/W OEM	TIME_INTEGRACION_PWA	Fans	s	0	999	Integral time for proportional + integral control (P+I)
36	244	5037	R/W	SET_RENOVACION	Regulation	%	0	99	% of outdoor air for renewal
37	245	5038	R/W OEM	SET_HOR_ON_EQUIPO	Service	h	0	32000	Operating hours limit of the unit
38	246	5039	R/W OEM	SET_HOR_COMP1	Service	h	0	32000	Operating hours limit of compressor 1 circuit 1
39	247	5040	R/W OEM	SET_HOR_COMP2	Service	h	0	32000	Operating hours limit of compressor 1 circuit 2 (units 2 circ.) or compressor 3 (units 4 circ.)
40	248	5041	R/W OEM	TIME_INTEGRACION_HUM	Fans	s	0	999	Integral time for proportional + integral control (P+I)





# Electronic dehumidification control

## Integer variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
41	249	5042	R/W OEM	NUM_RES	Configuration	---	0: ----- 1: 1 elec. heater 2: 2 elec. heater 3: 2 elec. heater (3st.) 4: proportional		Number of electrical heater stages
42	250	5043	R/W OEM	TIME_INTEGRACION_TEMP	Fans	s	0	999	Integral time for proportional + integral control (P+I)
43	251	5044	R/W	TIPO_REFRIGERANTE	Configuration	---	0: R22 1: R134A 2: R404A 3: R407C 4: R410A		Type of refrigerant
44	252	5045	R	N_ARR_COMP_REC_H	Status	---	0	99	Number of starts of recovery compressor (high level)
45	253	5046	R	N_ARR_COMP_REC_L	Status	---	0	9999	Number of starts of recovery compressor (low level)
46	254	5047	R/W	TIPO_SOND_AMB	Configuration	---	1: 1 probe RS485 2: 2 probes RS485 3: probe PLAN		Type of ambient probe
47	255	5048	R	MINUTO	Status	min	0	99	Clock setting: minute
48	256	5049	R	HORA	Status	h	0	99	Clock setting: hour
49	257	5050	R	DIA	Status	---	0	99	Clock setting: day
50	258	5051	R	MES	Status	---	0	99	Clock setting: month
51	259	5052	R	AGNO	Status	---	0	99	Clock setting: year
52	260	5053	R	DIA_SEMANA	Status	---	0	9	Clock setting: weekday
53	261	5054	R	N_HOR_COMP_AGUA	Status	---	0	32767	Operating hours of water compressor
54	262	5055	R/W OEM	TIPO_FREE_DESHUM	Configuration	---	1: abs. hum + enthalpie		Type of free-dehumidification
55	263	5056	R/W	DESCONEXION_NUM_COMP_AGUA	Commands	---	0	1	Number of stages of compressors to disconnect
56	264	5057	R/W	DESCONEXION_NUM_COMP_REC	Commands	---	0	1	Number of stages of compressors to disconnect
57	265	5058	R/W OEM	TIPO_RELOJ	Configuration	---	0:No # 1:Yes # 2:PLAN		Type of timer board (No, Physical, pLAN)
58	266	5059	R/W	TIME_PANT	Regulation	s	0	999	Automatic OFF time for pGD1 console display lighting
59	267	5060	R/W OEM	SEL_FRIO_CALOR	Configuration	---	0: panel 1: remote 2: automatic		COOLING/HEATING mode selection (panel, remote, automatic)
60	268	5061	R/W OEM	NUM_COMP_CIRC_AIRE	Configuration	---	0: ---- 1: 1 compr./ 1 circ. 2: 2 compr./ 1 circ. 3: 2 compr./ 2 circ.		Number of compressors (0, 1 compressor, 2 compressors - 1 circuit, 2 compressors - 2 circuits, )
61	269	5062	R/W OEM	TAR_CO2	Service	ppm	-9999	9999	Air quality probe set
62	270	5063	R	N_HOR_ON_EQUIPO	Status	---	0	32767	Operating hours of the unit
63	271	5064	R/W	DESCONEXION_NUM_COMP_AIRE_CALOR	Commands	---	0	2	Number of stages of compressors to disconnect
64	272	5065	R/W OEM	TIME_RET_ON_VINT	Fans	s	0	999	Indoor fan start delay with unit "ON"
65	273	5066	R/W OEM	TIME_AL_VIRT	Alarm	s	0	9999	Delay of alarm for disconnection of pLAN sensor
66	274	5067	R	NUM_AL	Status	---	0	99	Number of active alarms
67	275	5068	R/W OEM	SET_HOR_COMP_AGUA	Service	h	0	32000	Operating hours limit of water compressor
68	276	5069	R/W OEM	MIN_APERTURA_ON_REC	Configuration	%	0	99	% opening of damper to enable recovery compressor to be ON
69	277	5070	R	N_HOR_VALV_CALOR	Status	h	0	32767	Operating hours of the hot valve
70	278	5071	R	N_HOR_FCOOL_FDESH	Status	h	0	32767	Operating hours of free-cooling or freeheating
71	279	5072	R/W	TIPO_PROG_HORARIA	RTC	---	0: ON-OFF 1: only setpoint change 2: ON-OFF + limit setpoint 3: Manual 4: 3 setpoint + ON/OFF 5: Forced		Start-up type for the time schedule (0-Schedule ON/OFF, 1-Schedule only setpoint change, 2-Schedule ON/OFF with limit setpoint, 3-Manual, 4-Schedule with 3 setpoint + ON/OFF of the unit, 5-Forced))
72	280	5073	R	N_HOR_REC_ROTATIVO	Status	h	0	32767	Operating hours of wheel recuperator
73	281	5074	R/W	TIME_ARR_FORZADA	RTC	s	1	999	Minimum running time with forced start-up (h)
74	282	5075	R/W	H_ARR_1A	RTC	h	0	23	Start-up hour slot 1 programme 1
75	283	5076	R/W	M_ARR_1A	RTC	min	0	59	Start-up minute slot 1 programme 1
76	284	5077	R/W	H_PAR_1A	RTC	h	0	23	Stop hour slot 1 programme 1

## Integer variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
77	285	5078	R/W	M_PAR_1A	RTC	min	0	59	Stop minute slot 1 programme 1
78	286	5079	R/W	H_ARR_1B	RTC	h	0	23	Start-up hour slot 2 programme 1
79	287	5080	R/W	M_ARR_1B	RTC	min	0	59	Start-up minute slot 2 programme 1
80	288	5081	R/W	H_PAR_1B	RTC	h	0	23	Stop hour slot 2 programme 1
81	289	5082	R/W	M_PAR_1B	RTC	min	0	59	Stop minute slot 2 programme 1
82	290	5083	R/W	H_ARR_1C	RTC	h	0	23	Start-up hour slot 3 programme 1
83	291	5084	R/W	M_ARR_1C	RTC	min	0	59	Start-up minute slot 3 programme 1
84	292	5085	R/W	H_PAR_1C	RTC	h	0	23	Stop hour slot 3 programme 1
85	293	5086	R/W	M_PAR_1C	RTC	min	0	59	Stop minute slot 3 programme 1
86	294	5087	R/W	H_ARR_2A	RTC	h	0	23	Start-up hour slot 1 programme 2
87	295	5088	R/W	M_ARR_2A	RTC	min	0	59	Start-up minute slot 1 programme 2
88	296	5089	R/W	H_PAR_2A	RTC	h	0	23	Stop hour slot 1 programme 2
89	297	5090	R/W	M_PAR_2A	RTC	min	0	59	Stop minute slot 1 programme 2
90	298	5091	R/W	H_ARR_2B	RTC	h	0	23	Start-up hour slot 2 programme 2
91	299	5092	R/W	M_ARR_2B	RTC	min	0	59	Start-up minute slot 2 programme 2
92	300	5093	R/W	H_PAR_2B	RTC	h	0	23	Stop hour slot 2 programme 2
93	301	5094	R/W	M_PAR_2B	RTC	min	0	59	Stop minute slot 2 programme 2
94	302	5095	R/W	H_ARR_2C	RTC	h	0	23	Start-up hour slot 3 programme 2
95	303	5096	R/W	M_ARR_2C	RTC	min	0	59	Start-up minute slot 3 programme 2
96	304	5097	R/W	H_PAR_2C	RTC	h	0	23	Stop hour slot 3 programme 2
97	305	5098	R/W	M_PAR_2C	RTC	min	0	59	Stop minute slot 3 programme 2
98	306	5099	R/W	H_ARR_3A	RTC	h	0	23	Start-up hour slot 1 programme 3
99	307	5100	R/W	M_ARR_3A	RTC	min	0	59	Start-up minute slot 1 programme 3
100	308	5101	R/W	H_PAR_3A	RTC	h	0	23	Stop hour slot 1 programme 3
101	309	5102	R/W	M_PAR_3A	RTC	min	0	59	Stop minute slot 1 programme 3
102	310	5103	R/W	H_ARR_3B	RTC	h	0	23	Start-up hour slot 2 programme 3
103	311	5104	R/W	M_ARR_3B	RTC	min	0	59	Start-up minute slot 2 programme 3
104	312	5105	R/W	H_PAR_3B	RTC	h	0	23	Stop hour slot 2 programme 3
105	313	5106	R/W	M_PAR_3B	RTC	min	0	59	Stop minute slot 2 programme 3
106	314	5107	R/W	H_ARR_3C	RTC	h	0	23	Start-up hour slot 3 programme 3
107	315	5108	R/W	M_ARR_3C	RTC	min	0	59	Start-up minute slot 3 programme 3
108	316	5109	R/W	H_PAR_3C	RTC	h	0	23	Stop hour slot 3 programme 3
109	317	5110	R/W	M_PAR_3C	RTC	min	0	59	Stop minute slot 3 programme 3
110	318	5111	R/W	LUN_A	RTC	---	0	3	Selection of the schedule programme for Monday
111	319	5112	R/W	MAR_A	RTC	---	0	3	Selection of the schedule programme for Tuesday
112	320	5113	R/W	MIE_A	RTC	---	0	3	Selection of the schedule programme for Wednesday
113	321	5114	R/W	JUE_A	RTC	---	0	3	Selection of the schedule programme for Thursday
114	322	5115	R/W	VIE_A	RTC	---	0	3	Selection of the schedule programme for Friday
115	323	5116	R/W	SAB_A	RTC	---	0	3	Selection of the schedule programme for Saturday
116	324	5117	R/W	DOM_A	RTC	---	0	3	Selection of the schedule programme for Sunday
117	325	5118	R/W OEM	CONF_OUT09	Configurat.	---	0: None 1: Recov. compressor 2: Rotary recovery oper.		Type of element connected in digital output 09
118	326	5119	R/W OEM	TIPO_FREE_COOLING	Configurat.	---	1: thermal 2: thermoenthalpic		Type of free-cooling: thermal or thermoenthalpic
119	327	5120	R/W	_NEW_HOUR	RTC	h	0	23	Clock setting: new hour
120	328	5121	R/W	_NEW_MINUTE	RTC	min	0	59	Clock setting: new minutes
121	329	5122	R/W	_NEW_DAY	RTC	---	1	31	Clock setting: new day
122	330	5123	R/W	_NEW_MONTH	RTC	---	1	12	Clock setting: new month



# Electronic dehumidification control

## Integer variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
123	331	5124	R/W	_NEW_YEAR	RTC	---	0	99	Clock setting: new year
124	332	5125	R	RENOVACION_CAL	Status	%	0	99	Calculation of % air renewal depending on mixing temperature
125	333	5126	R	CAL_APER_RENOV_2	Status	%	0	99	Calculation of % damper opening depending on renewal
126	334	5127	R	SET_RENOVACION_CAL	Status	%	0	99	Calculation of outdoor air percentage allowed for renewal
127	335	5128	R/W OEM	TIPO_SONDA_RENOVACION	Configurat.	---	0: None 1: Mixed air T 2: Actual probe 3: pLAN probe		Type of sensor connected
128	336	5129	R/W	DESCONEXION_NUM_COMPRESORES_AIRE_FRIO	Commands	---	0	2	Number of stages of compressors to disconnect
129	337	5130	R/W	DESCONEXION_NUM_RESISTENCIAS	Commands	---	0	NUM_RES	Number of stages of electrical heaters to disconnect
130	338	5131	R	NUM_ETAPAS_COMPRESOR	Status	---	0	4	Number of compressor stages
131	339	5132	R/W	MAX_APERTURA_COMPUERTA	Regulation	%	0	100	Maximum opening of the outdoor air damper
132	340	5133	R/W	MAX_APERTURA_COMPUERTA_FREE	Regulation	%	0	100	Maximum opening of the outdoor air damper with free-cooling or freeheating
133	341	5134	R/W OEM	MIN_APERTURA_VALV_CALOR	Configurat.	%	0	100	Delay time to stop of the H.W.C. pump
134	342	5135	R/W	VAR_ENTERA_AUX_PVPRO_1	Special	---	-32768	32767	Integer variable No.1 saved for the PVPRO
135	343	5136	R/W	VAR_ENTERA_AUX_PVPRO_2	Special	---	-32768	32767	Integer variable No.2 saved for the PVPRO
136	344	5137	R	N_HOR_VENT	Status	h	0	32767	Operating hours of the indoor fan
137	345	5138	R	N_HOR_RES1	Status	h	0	32767	Operating hours of electrical heater No. 1
138	346	5139	R	N_HOR_RES2	Status	h	0	32767	Operating hours of electrical heater No. 2
139	347	5140	R	N_ARR_V_INT_H	Status	---	0	99	Number of starts of the indoor fan (high level)
140	348	5141	R	N_ARR_V_INT_L	Status	---	0	9999	Number of starts of the indoor fan (low level)
141	349	5142	R	N_ARR_COMP1_H	Status	---	0	99	Number of starts of compressor 1 circuit 1 (high level)
142	350	5143	R	N_ARR_COMP1_L	Status	---	0	9999	Number of starts of compressor 1 circuit 1 (low level)
143	351	5144	R	N_ARR_COMP_AGUA_H	Status	---	0	99	Number of starts of water compressor (high level)
144	352	5145	R	N_ARR_COMP_AGUA_L	Status	---	0	9999	Number of starts of water compressor (low level)
145	353	5146	R	N_ARR_COMP2_H	Status	---	0	99	Number of starts of compressor 1 circuit 2 (units 2 circ.) (high level)
146	354	5147	R	N_ARR_COMP2_L	Status	---	0	9999	Number of starts of compressor 1 circuit 2 (units 2 circ.) (low level)
149	357	5150	R	N_ARR_RES1_H	Status	---	0	99	Number of starts of electrical heater stage No.1 (high level)
150	358	5151	R	N_ARR_RES1_L	Status	---	0	9999	Number of starts of electrical heater stage No.1 (low level)
151	359	5152	R	N_ARR_RES2_H	Status	---	0	99	Number of starts of electrical heater stage No.2 (high level)
152	360	5153	R	N_ARR_RES2_L	Status	---	0	9999	Number of starts of electrical heater stage No.2 (low level)
165	373	5166	R/W	MIN_APERTURA_COMPUERTA	Regulation	%	0	100	Minimum opening of the outdoor air damper
166	374	5167	R/W	TIME_ON_AUTOSTART	Regulation	s	5	999	Automatic start-up time after blocking
167	375	5168	R	Voltage_L1_L2_L_SPV	Status	V	0	9999	Voltage between lines 1 and 2
168	376	5169	R	Voltage_L2_L3_L_SPV	Status	V	0	9999	Voltage between lines 2 and 3
169	377	5170	R	Voltage_L3_L1_L_SPV	Status	V	0	9999	Voltage between lines 3 and 1
170	378	5171	R	Voltage_1_L_SPV	Status	V	0	9999	Voltage line 1
171	379	5172	R	Voltage_2_L_SPV	Status	V	0	9999	Voltage line 2
172	380	5173	R	Voltage_3_L_SPV	Status	V	0	9999	Voltage line 3
173	381	5174	R	Power_Factor_MSK_BMS_GAVAZZI	Status	---	0	32	Power factor
174	382	5175	R	Apparent_Energy_H_SPV	Status	kVAh	0	9999	Reactive energy (Integer part)
175	383	5176	R	Apparent_Energy_L_SPV	Status	kVAh	0	9999	Reactive energy (Decimal part)
176	384	5177	R	Energy_H_SPV	Status	KWh	0	9999	Energy (Integer part)
177	385	5178	R	Energy_L_SPV	Status	KWh	0	9999	Energy (Decimal part)

## Integer variables (...continued)

Carel Addr.	Modbus record	Modbus extended	Read / Write	Variable	Parameter type	UOM	Min. value	Max. value	Description
178	386	5179	R	CT_L_SPV	Status	---	0	9999	Multiplier of the current transformer
179	387	5180	R	System_Type	Status	---	0: 3p 1: 3P.n 2: 2P 3: 1P 4: 3P.A		Type of power supply
180	388	5181	R	Hourmeter_H_SPV	Status	h	0	9999	Hours of electrical energy meter (High part)
181	389	5182	R	Hourmeter_L_SPV	Status	h	0	9999	Hours of electrical energy meter (Low part)
182	390	5183	R/W OEM	TIPO_EQUIPO	Configuration	---	0: air-air, 1: water-air		Selection of the type of unit (0=air-air, 1=water-air)
183	391	5184	R/W OEM	TIME_RET_OFF_BOMBA_BAC	Configuration	s	0	999	Delay stopping the pump of the H.W.C.
184	392	5185	R/W OEM	TIME_INTEGRACION_IMP	Fans	s	0	999	Integral time for proportional + integral control (P+I)
186	394	5187	R/W OEM	TIME_VINT_ON_ANTIESTRATIF	Fans	min	0	999	Anti-stratification: indoor fan ON time
187	395	5188	R/W OEM	TIME_VINT_OFF_ANTIESTRATIF	Fans	min	0	999	Anti-stratification: indoor fan OFF time
191	399	5192	R	INFO_EQUIPO_1	Status	---	4: Dehumidicator		Unit information:
192	400	5193	R	INFO_EQUIPO_2	Status	---	0: ----- 1: 1 Comp / 1 Circ 2: 2 Comp / 1 Circ 3: 2 Comp / 2 Circ 10: Rec. Comp. 11: 1 Comp / 1 Circ + Rec. 12: 2 Comp / 1 Circ + Rec. 13: 2 Comp / 2 Circ + Rec.		Unit information: compressors-circuits
193	401	5194	R	INFO_EQUIPO_3	Status	---	1: Electrical heater 2: Gas burner 3: Elec. heater + Gas burner 4: HWC 5: HWC+ Elec. heater 6: HWC+ burner 7: HWC.+ burner + Elec. heater		Unit information: electrical heaters, gas burner, hot water coil
194	402	5195	R/W OEM	TIME_CAL	Service	s	0	99	Damper opening calculation time
195	403	5196	R/W OEM	V_CAL	Service	%	0	99	% damper opening in calculation time
196	404	5197	R/W OEM	TIPO_VENT_INT	Configuration		1: centrifuge 2: axial / radial 3: radial plug-fan 4: centrifuge + VFD		Type of indoor fan
197	405	5198	R/W OEM	SET_CAUDAL_VINT_VENTILACION	Service	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Flow setpoint in ventilation with the plug-fan indoor fan
198	406	5199	R	CAUDAL_VINT_MEDIDO_AJUSTE	Status	x10 m3/h	0	9999	Flow rate measured with plug-fan indoor fan
199	407	5200	R	actual_speed_msk	Status	rpm	0	9999	Speed measured with plug-fan indoor fan
200	408	5201	R/W OEM	SET_CAUDAL_VINT_FRIO	Service	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Flow rate setpoint in cooling mode with plug-fan indoor fan
201	409	5202	R/W OEM	SET_CAUDAL_VINT_CALOR	Service	x10 m3/h	CAUDAL_VINT_NOMINAL_MIN	CAUDAL_VINT_NOMINAL_MAX	Flow rate setpoint in heating mode with plug-fan indoor fan
202	410	5203	R/W OEM	TIPO_VENT_RET	Configuration		1: centrifuge 2: axial / radial 3: radial plug-fan 4: centrifuge + VFD		Type of return fan
203	411	5204	R/W OEM	SET_CAUDAL_VRET_VENTILACION	Service	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Flow rate setpoint in ventilation mode with return plug-fan
204	412	5205	R	CAUDAL_VRET_MEDIDO_AJUSTE	Status	x10 m3/h	0	9999	Flow rate measured with return plug-fan
205	413	5206	R	actual_speed_msk_FAN2	Status	rpm	0	9999	Speed measured with return plug-fan
206	414	5207	R/W OEM	SET_CAUDAL_VRET_FRIO	Service	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Flow rate setpoint in cooling mode with return plug-fan
207	415	5208	R/W OEM	SET_CAUDAL_VRET_CALOR	Service	x10 m3/h	CAUDAL_VRET_NOMINAL_MIN	CAUDAL_VRET_NOMINAL_MAX	Flow rate setpoint in heating mode with return plug-fan

## 15. TECHNICAL AND ELECTRICAL CHARACTERISTICS

<b>microPC board</b>	
<b>ELECTRICAL FEATURES</b>	
Power supply (controller with terminal connected)	230 Vac +10/-15% (by default) 24 Vac +10/-15% 50/60 Hz and 28 to 36 Vdc +10/-20% (optional)
Maximum current with the connected terminal	25 VA (Vac)
Terminal strip	with removable male/female connectors (250 Vac max.) connectors set with screws
Isolation between the power supply line and the control	double
Data memory	13 kB at 8 bits (max. limit: 400,000 writes per memory location)
Working cycle with applications of average complexity	0.2 s
<b>Analogue inputs</b>	
Analogue conversion	A/D converter to 10-bit integrated in CPU
Maximum number	7 in SMALL boards and 12 in MEDIUM boards
Input type: B1, B2, B3, B4, B8 and B9	low temperature NTC: 10k $\Omega$ $\pm$ 0.1% to 25°C; -50/90°C high temperature NTC: 50k $\Omega$ to 25°C; 0/150°C input: 0/1 Vdc
Input type: B5 and B10	low temperature NTC: 10k $\Omega$ to 25°C; -50/90°C high temperature NTC: 50k $\Omega$ to 25°C; 0/150°C input: 0/1 Vdc and 4/20 mA
Input type: B6, B7, B11 and B12	low temperature NTC: 10k $\Omega$ to 25°C; -50/90°C high temperature NTC: 50k $\Omega$ to 25°C; 0/150°C input: 0/1 Vdc radiometric pressure probe
Time constant for each input	0.5 s
Input precision	$\pm$ 0.3% of the complete scale
Classification of the average circuits (IEC EN 61010-1)	Category I
<b>Digital inputs</b>	
No. of inputs on SMALL boards	7
No. of inputs on MEDIUM boards	10
<b>Analogue outputs</b>	
Maximum number	3 in SMALL boards and 4 in MEDIUM boards
Type	0 to 10Vdc
Precision	$\pm$ 3% of the complete scale or $\pm$ 5% of the complete scale (maximum load 5mA)
Resolution	8-bit
Maximum charge	2 k $\Omega$ (5 mA)
<b>Digital outputs</b>	
Composition of groups	SMALL board: Group 1 (1 to 6); Group 2 (7)
	MEDIUM board: Group 1 (1 to 6); Group 2 (7); Group 3 (8 to 12)
Electrical contacts	SMALL board (relays 1 to 7): EN60730-1: NO 1(1)A 250Vac cos $\varphi$ =0.4; 100,000 $\chi\psi\chi\lambda\epsilon\sigma$ UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles
	MEDIUM board (relays 1 to 12): EN60730-1: NO 1(1)A 250Vac cos $\varphi$ =0.4; 100,000 $\chi\psi\chi\lambda\epsilon\sigma$ UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles
	Note: relays of the same group with basic isolation must have the same power supply (24 Vdc or 230 Vac). Relays of the same group have basic isolation among themselves. The isolation between the various groups is double.

<b>microPC board</b>	
<b>TECHNICAL CHARACTERISTICS</b>	
Storage conditions	-20T70 °C; %RH 90 non-condensation
Operating conditions	-10T60 °C; %RH 90 non-condensation
Protection index	IP00
Environmental pollution	normal
Classification according to protection against electric shocks	To be incorporated in class I and/or II appliances
PTI of the insulating materials	250V
Period of electric stress across the insulating parts	Long
Type of relay action	1C
Type of disconnection or microswitching	Micro-switch for all of the relay outlets
Category of resistance to heat and fire	Category D (UL94 - V0)
Immunity from voltage surge	Category 1
Ageing specifications (operating hours)	80.000
Number of automatic operating cycles	100,000 (EN 60730-1); 30,000 (UL 873)
Software class and structure	Class A
Category of protection against discharges (IEC EN 61000-4-5)	Category III
Dimensions: Length x Height x Depth	SMALL board: 175 x 113 x 55 mm (10 DIN modules) MEDIUM board: 228 x 113 x 55 mm (13 DIN modules)

<b>pGD1 Terminal</b>	
<b>TECHNICAL CHARACTERISTICS OF THE DISPLAY</b>	
Type	FSTN graphic
Back-lighting	Blue LED (controlled using software)
Resolution	132 x 64 pixel
<b>TECHNICAL CHARACTERISTICS OF THE POWER SUPPLY</b>	
Voltage	Power supply through the telephone cable or external source 18/30 Vdc protected by an external 250 mA fuse
Maximum power input	1.2 W
<b>CONNECTION WITH THE microPC BOARD</b>	
Type	asynchronous half duplex, 2 dedicated wires
Connector for the terminal	6-way telephone plug
Driver	CMR 7 V (type RS485) balanced differential
<b>GENERAL FEATURES</b>	
Protection index	IP65 for assembly in panel IP40 for wall assembly
UL	type 1
Operating conditions	-20T60 °C, 90% RH non-condensing
Storage conditions	-20T70 °C, 90% RH non-condensing
Software class and structure	A
Classification according to protection against electric shocks	To be incorporated in class I or II appliances
PTI of the insulating material	250V
Dimensions: Length x Height x Depth	156 x 82 x 31 mm



# Electronic dehumidification control

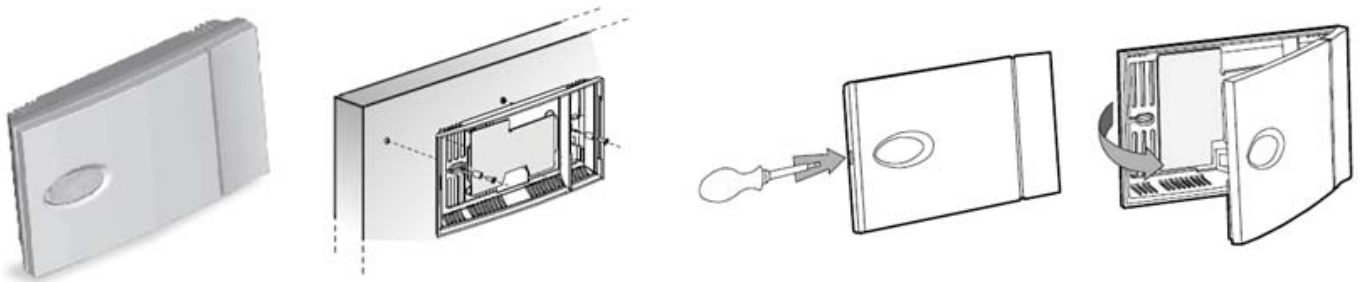
<b>pCOe expansion module</b>	
<b>GENERAL FEATURES</b>	
Storage conditions	-40T70 °C; %RH 90 non-condensing
Operating conditions	-20T70 °C; %RH 90 non-condensing
Protection index	IP40 only on the front panel
Environmental pollution	2
Classification according to protection against electric shocks	To be incorporated in class I and/or II appliances
Period of electric stress across the insulating parts	Long
Type of relay action	1C
Type of disconnection or microswitching	Micro-switch for all of the relay outlets
Category of resistance to heat and fire	Category D
Immunity from voltage surge	Category III
Ageing specifications (operating hours)	80.000
Number of automatic operating cycles	100,000 (EN 60730-1); 30,000 (UL 873)
Software class and structure	Class A
Dimensions: Length x height x width	110 x 70 x 60 mm (4 DIN modules)
<b>CONNECTION WITH <math>\mu</math>PC MEDIUM</b>	
Type	Asynchronous half duplex, 2 dedicated wires
Connector	Removable 3-way connector
Driver	Balanced differential MCR 7V
Maximum distance to $\mu$ PC MEDIUM	With telephone cable: - cable resistance $\leq 0.14 \Omega/m$ : 600 metros - cable resistance $\leq 0.25 \Omega/m$ : 400 metros With shielded cable AWG24 - cable resistance $\leq 0.078 \Omega/m$ : 600 metros
<b>ELECTRICAL FEATURES</b>	
Power supply	24 Vac +10/-15% 50/60 Hz and 48 Vdc (36 to 72 V); P = 6 W (9 VA)
Terminal strip	with removable male/female connectors (250 Vac max.; 8 A max.)
CPU	at 8 bits and 4.91 MHz
Operation delay	0.5s
Maximum transmission speed	19200 bps
<b>Analogue inputs</b>	
Analogue conversion	A/D converter to 10-bit integrated in CPU
Maximum number	4 (B1 to B4)
Type (this can be selected via software)	NTC Carel (-50/90°C; R/T 10k $\Omega$ $\pm$ 1% to 25°C) Voltage: 0/1 Vdc, 0/5 Vdc radiometric or 0/10 Vdc current: 0/20 mA or 4/20 mA. Input resistance: 100k $\Omega$
NTC input type precision	$\pm$ 0.3 complete scale
<b>Digital inputs</b>	
Number and type	4, contact voltage-free, 5 mA, inputs not optically isolated, internal power supply
<b>Analogue outputs</b>	
Number and type	1 (Y1) optically isolated 0/10 Vdc
Precision	$\pm$ 1%
Resolution	8-bit
Maximum charge	1 k $\Omega$ (10 mA)
<b>Digital outputs</b>	
Number and type	4, relays with switched contacts (2000 VA, 250 Vac, 8 A resistive)
Characteristics (EN 60730-1)	2 A resistive, 2 A inductive, $\cos \varphi = 0.4$ , 2(2)A (100.000 cycles)

<b>pGD1 Terminal</b>	
<b>TECHNICAL CHARACTERISTICS OF THE DISPLAY</b>	
Type	FSTN graphic
Back-lighting	Blue LED (controlled using software)
Resolution	132 x 64 pixel
<b>TECHNICAL CHARACTERISTICS OF THE POWER SUPPLY</b>	
Voltage	Power supply through the telephone cable or external source 18/30 Vdc protected by an external 250 mA fuse
Maximum power input	1.2 W
<b>CONNECTION WITH THE microPC BOARD</b>	
Type	asynchronous half duplex, 2 dedicated wires
Connector for the terminal	6-way telephone plug
Driver	CMR 7 V (type RS485) balanced differential
<b>GENERAL FEATURES</b>	
Protection index	IP65 for assembly in panel
	IP40 for wall assembly
UL	type 1
Operating conditions	-20T60 °C, 90% RH non-condensing
Storage conditions	-20T70 °C, 90% RH non-condensing
Software class and structure	A
Classification according to protection against electric shocks	To be incorporated in class I or II appliances
PTI of the insulating material	250V
Dimensions: Length x Height x Depth	156 x 82 x 31 mm

## 15.1. Ambient probe

### Assembly and setting instructions

This probe must be mounted on a wall or a panel at a height of 1.50 meters.



The connection must be done with cable 2 x 1.5 mm<sup>2</sup> at a maximum distance of 30 meters.



interior view, lower housing

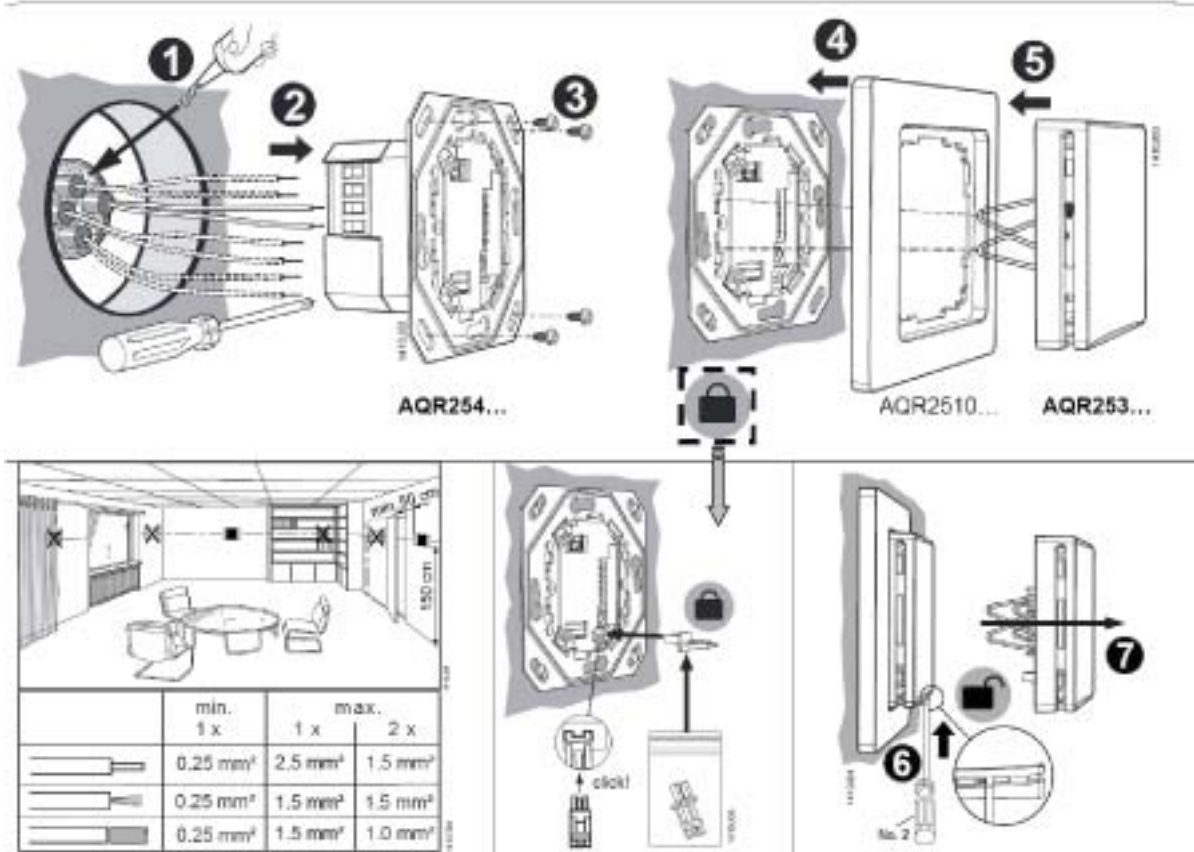


interior view, upper housing



## 15.2. Air quality probe 4.. 20 mA

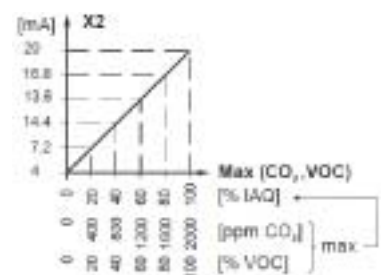
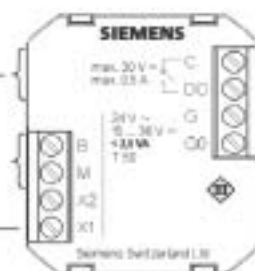
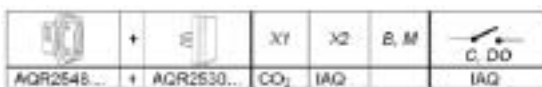
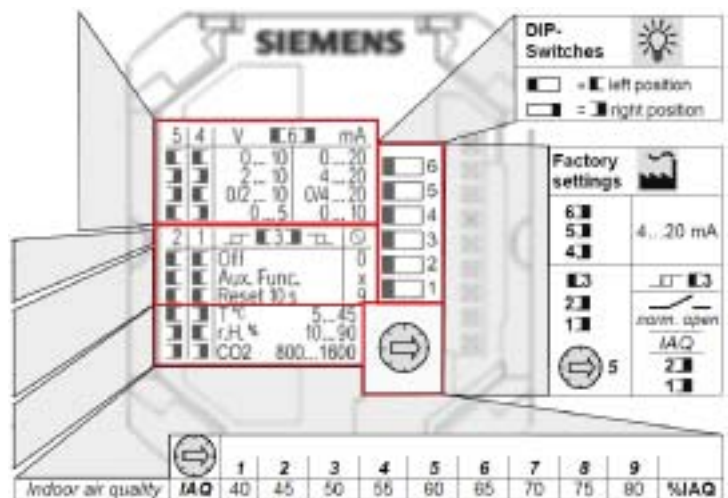
### Assembly instructions



### Setting and electric connections

This probe is configured by analogue output 4...20 mA and digital output N.O. with IAQ setpoint of 60% (possible activation of extraction system).

In the B10 analogue input of  $\mu$ PC medium control, it is possible to connect the output X1 for controlling the CO<sub>2</sub> (ppm) or the output X2 for controlling the IAQ (%).



## 16. TROUBLESHOOTING

- *The unit does not switch on (the power LED on the main board is switched off).* Check:
  1. the presence of main power;
  2. that the transformer output voltage is 24 Vac/Vdc;
  3. that the power supply connector at 24 Vac/Vdc is correctly inserted;
  4. that the overload fuse is intact.
- *When switching on, there are general problems with the LCD (strange characters, blank display).* Check:
  1. that the software in the flash is correct;
  2. the pLAN address of the pCOc and on the terminal (check that they comply with the requirements of the current application);
  3. the connection between the pGD1 terminal and the μPC MEDIUM board.
- *Erroneous readings of the input signals.* Check:
  1. the correct power supply to the μPC MEDIUM board and probes;
  2. the separation between the power supply of the digital inputs and that of the μPC MEDIUM board. A 24 Vac/24 Vac, 5 VA transformer can be used.
  3. that the cables from the probes are connected according to the instructions;
  4. that the probe cables are located far enough away from possible sources of magnetic interference (power cables, contactors, high voltage cables or cables connected to units with high current peaks);
  5. that there is not a high level of heat resistance between the probe and the sensor cap (if present). If necessary, apply conductive paste or oil into the caps to ensure good temperature transfer.
  6. If there is a probe error or μPC MEDIUM board conversion error, the checks to be carried out would vary depending on the type of probe:

### Active temperature/humidity probes with 0/1V signal:

using a voltmeter, measure the probe signal between the Bn and GND terminals and check that the voltage corresponds to the temperature/humidity value: 1 mVdc corresponds to 0.1% HR.

Example: reading 200 mVdc (0.2 Vdc), the probe sends a signal which corresponds to 20%RH; applying the same logic, 0 mVdc corresponds to 0°C/0% RH;

### Pressure probes:

if there are errors when reading these probes, check that:

- the analogue inputs of these sensors are set to receive 4/20 mA signals;
- check that the probe capillary is not blocked.
- the full scale set by the software corresponds to that used by

the sensors.

Using a voltmeter to measure the voltage between the Bn and GND terminals, an indication is obtained of the current probe signal, considering that the input has an impedance of 100Ω, by applying the formula  $I = V/R$ .

The pressure value "Ps" sent by the probe could be calculated as follows (FS = full scale):

$$Ps = (Vmed/100 - 0.004) \times (FSmax - FSmin) / 0.016 + FSmin$$

*Example:* the probe used has FSmin = -0.5 bar, FSmax = 7 bar; the voltage read is equal to Vmed = 1.0 Vdc.

The pressure Ps that the probe is measuring is thus:

$$Ps = (1.0/100 - 0.004) \times [7 - (-0.5)] / 0.016 + (-0.5) = 2.3 \text{ bar}$$

### NTC probes:

The probe signal is a resistive value which depends on the temperature.

The following table indicates some of the resistance values for different temperatures. By disconnecting the input probe and measuring the resistance with a multimeter, the table can be consulted for the corresponding temperature value.

°C	kΩ	°C	kΩ	°C	kΩ
-20	67,7	0	27,2	20	12,0
-15	53,3	5	22,0	25	10,0
-10	42,2	17	17,9	30	8,3
-5	33,8	15	14,6	35	6,9

- *To check the setting of the probe inputs.*

Switch off the μPC MEDIUM board and perform the following measurements with a tester between the Bn and AVSS probe inputs:

probe type	voltage measured
NTC	2.5 V
4/20mA	0 V
0/1V; 0/5V; 0/10V	0 V

- *Unusual alarm signal from the digital input.*

Check whether the alarm signal is present in the input, measure the voltage between the "IDC" common terminal and the digital input terminal which indicates the alarm "IDn":

- if voltage is present (24 Vac or Vdc, depending on the power supply used for the digital inputs), the contact of the connected alarm device is closed;
- if the voltage is near 10 Vac or 10 Vdc (see above) the contact is open.

Unless otherwise expressly stated, the control generates an alarm when detecting open contacts.



