

Vectios™ PJ air-air units

USER BROCHURE

NA 17.91 D 01 - 2020

**Electronic control**

**Vectio**

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ORIGINAL TEXT: SPANISH VERSION

# 1 - GENERAL DESCRIPTION

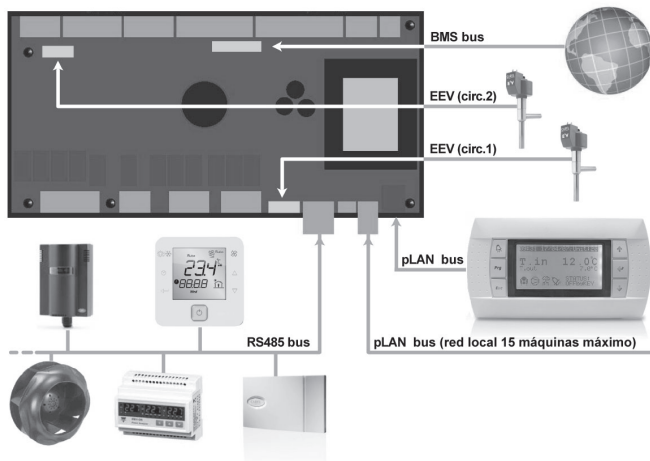
The **Vectic** control is an electronic module with microprocessor designed for the control and supervision of air-air units (especially rooftop models).

This control consist of a control board, sensors, a VecticGD graphic terminal, and a TCO user terminal (optional).

This system uses a RS485 field-bus to manage additional components such as: pCOe expansion modules, SMALL board, plug-fans, probes of temperature or relative humidity of the ambient air, leak detectors, energy meters, etc.

A BMS card (optional) allows the control board to be connected to a centralised technical management system with the following communication protocols: Carel, Modbus RTU, LonWorks®, BACnet™ MSTP, Konnex, Modbus TCP/IP, BACnet™ Ethernet, TCP/IP, SNMP V1-2-3, FTP and HTTP.

It also manages a local connection between units through a pLAN network (µPC MEDIUM Local Area Network), allowing data and information to be exchanged between units, for a maximum of 15 units. This enables the reduction of the number of graphic terminals, since a single shared terminal can monitor all boards in the network.



## Main functions:

- Selection of operating mode: HEATING / COOLING / AUTO / VENTILATION.
- Selection of setpoint.
- Continuous control of the operating parameters.
- Display of the values measured by the sensors.
- Compressors time delays.
- Defrosting management (heat pump units).
- Control of the supply air temperature.
- All-seasons operation via the condensation and evaporation pressure control.
- Setpoint compensation based on the outdoor temperature.
- Hourly and weekly schedule (possibility of 3 setpoints).
- Fire protection.
- Diagnosis of faults and general alarm.

## Optional functions:

This control is used to manage addition components such as:

- External air damper for the renewal of fresh air, depending on the temperature of the mixed air or depending on the air quality sensor.
- Mixing box for thermal, enthalpy or thermo-enthalpy free-cooling.
- Rotary heat exchanger. Wheel speed with on/off control or variable control.
- Cooling circuit for the recovery of the extracted air energy.

- Control of the overpressure.
- Zoning of the air flow up to 4 different areas.
- Low return temperature application.
- Auxiliary electrical heaters: two-stage with on/off control or single-stage with proportional control.
- Hot water coil with 3-way valve, with proportional or on/off control.
- Gas burner with proportional control.
- Gas boiler with proportional control.
- Heat recovery coil with 3-way valve, with proportional control.
- Humidifier with proportional or on/off control.
- Basic dehumidification.
- Active dehumidification with condensation coil.
- Clogged filter pressostat.
- Smoke detection station.
- Refrigerant leak detector.
- RS485 probe(s) of ambient temperature or temperature + humidity.
- Air quality probe(s) for measuring CO<sub>2</sub>
- Energy meter and calculation of the cooling and heating capacities.

## 1.1. VecticGD graphic terminal

This graphic terminal is used to:

- Carry out initial programming of the unit.
- Modify operating parameters.
- Switch the unit ON / OFF.
- Select the operating mode.
- Adjust the setpoints.
- Display the variables controlled and sensor values measured.
- Display the current alarms and their historical record.



## 1.2. TCO user terminal (optional)

This terminal is used to:

- Switch the unit ON / OFF.
- Select the operating mode.
- Adjust the setpoints.
- Display the installation's temperatures and humidity, outdoor temperature, supply air temperature, CO<sub>2</sub> sensor and opening of the outdoor damper.
- Display alarms codes.



# 1 - GENERAL DESCRIPTION

## 1.3. Sensors

### Sensors included with the control:

The standard sensors connected to the control board are:

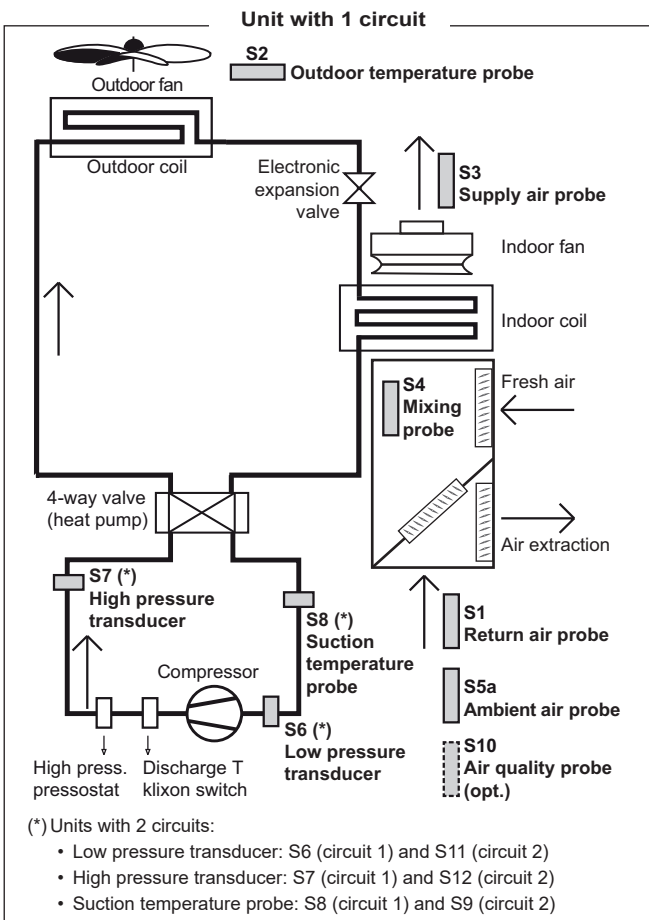
- Return air temperature probe (S1).
- Outdoor air temperature probe (S2).  
*Note: If the unit is integrated in a pLAN network, it can read the value of outdoor temperature measured by the master unit probe.*
- Supply air temperature probe (S3).
- Mixing air temperature probe (S4).
- Ambient air temperature probe, NTC type (S5a).
- Note: If the unit is integrated in a pLAN network, it can read the value of ambient temperature measured by the master unit probe.*
- Transducers of low pressure: circuit 1 (S6) and circuit 2 (S11).
- Transducers of high pressure: circuit 1 (S7) and circuit 2 (S12).
- Suction temperature probes: circuit 1 (S8) and circuit 2 (S9).

### Optional sensors connected on the control board:

- Outdoor air relative humidity (S5h): this probe is used instead of the outdoor temperature probe and is necessary with the option of enthalpic or thermoenthalpic free-cooling.  
When the unit needs the outdoor humidity probe (S5h), this one is connected on the board in place of the NTC ambient temperature probe (S5a). In this case, it's necessary to use a RS485 ambient temperature probe connected on the Field-bus.  
*Note: If the unit is integrated in a pLAN network, it can read the value of outdoor humidity measured by the master unit probe.*
- Air quality probe to enable measuring CO<sub>2</sub>. This probe can be installed in the environment (S10a) or duct-mounted (S10c).

A second probe can be connected on the pCO<sub>e</sub> expansion card with address 9 to improve the air quality control.

*Note: If the unit is integrated in a pLAN network, it can read the value of CO<sub>2</sub> measured by the master unit probe.*



### Optional sensors connected, in series, on the Field-bus:

- RS485 ambient temp. probe (1 to 4 probes connected in series):
  - When the unit needs the outdoor humidity probe (with enthalpic or thermoenthalpic free-cooling), this one is connected on the board in place of the NTC ambient temperature probe (S5a). In this case, a RS485 ambient temperature probe is used.
  - An ambient temperature probe with RS485 communication is required for installation at distances up to 30 meters.  
*Note: If the unit is integrated in a pLAN network, it can read the value of ambient temperature measured by the master unit probe(s).*
- RS485 ambient T + RH probe (1 to 4 probes connected in series):
  - This probe is necessary with enthalpic or thermoenthalpic free-cooling. In this case, the outdoor humidity probe is also added.  
*Note: If the unit is integrated in a pLAN network, it can read the value of ambient T + RH measured by the master unit probe(s).*
- RS485 enthalpy probes on the mixing air and the supply air for calculation of the cooling and heating capacities.

## 1.4. pCO<sub>e</sub> expansion cards (optional)

For the management of some optional elements, the control needs additional inputs and outputs. This problem is solved by the use of pCO<sub>e</sub> expansion card connected in series on the Field-Bus.

### Card with address 8:

This module is needed to manage the options:

- Low outdoor temperature (GREAT COLD).
- Mechanical disconnection of stages.
- Proportional humidifier or overpressure control with exhaust damper.
- Active dehumidification with condensation coil.

### Card with address 9:

This module is needed to manage the options:

- Second air quality probe (CO<sub>2</sub>) for installation in the environment or outdoor. The outdoor probe allows the measurement of the difference between indoor and outdoor CO<sub>2</sub> concentration, in ppm (level of ADI).
- Preheater (electrical heater) in fresh air (for units with 100% fresh air).
- Rotary heat exchanger with variable speed.
- Zoning into 2 zones with dampers.
- Control of supply and return dampers (external to the unit).

## 1.5. SMALL boards (optional)

For the management of some optional elements, the control needs a SMALL board connected in series on the Field-Bus.

### Board with address 4:

- Cooling circuit for the recovery of the extracted air energy.

### Board with address 11:

- Zoning of the air flow up to 4 different zones through dampers.

## 1.6. BMS communication

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

# 1 - GENERAL DESCRIPTION

## Carel and Modbus

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

## Ethernet pCO Web

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

## BACnet™

To establish communication with a network with the BACnet™ MSTP protocol is needed a BACnet™ RS485 serial card (*configuration by the integrator*).

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.

## BACnet™ Ethernet

The Ethernet pCO Web card allows the network communication with the protocol BACnet™ Ethernet (*configuration by the integrator*).

## 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®.

## Konnex (KNX)

A network with the Konnex protocol needs a Konnex serial card (*configuration by the integrator*).

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

## Supervision solutions

Different solutions of supervision are available bases on the dimensions of the installation for unit fitted with Ethernet pCO Web and RS485 Carel / Modbus cards:

### pCO Web

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

### PlantWatchPRO3

This is a solution designed for the monitoring of small and medium-size installations, capable of manage up to 30 units. Suitable for technical environments, no parts are in movement. It's available in two versions: panel and wall.

Includes: 7 " touch display, buzzer for notifications, 1 USB port and 1 SD card slot for downloading reports, charge devices models and applying service packs.

For this option, each unit needs one RS485 Carel / Modbus board.

### BOSS

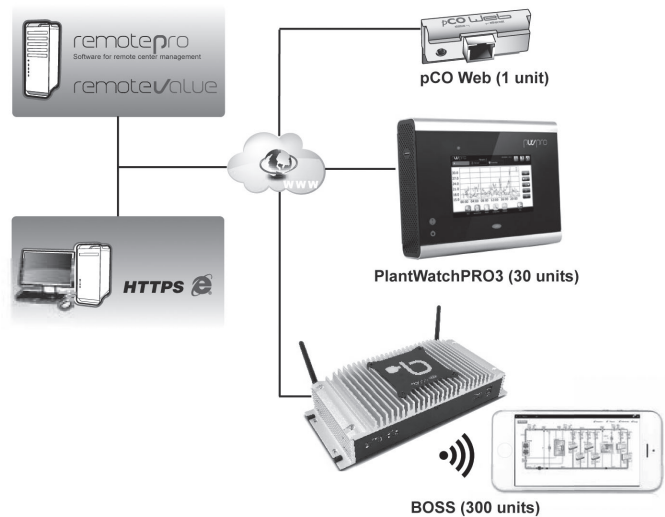
This is the solution for the management and supervision of air-conditioning installations with up to 300 units. Integrated Hotspot Wi-Fi.

It offers advanced monitoring and maintenance functions and allows zones and groups to be created to simplify the management of the installation. It also allows energy meters to be integrated to monitor the installation electricity consumption.

BOSS is available in two versions:

- CPU device.
- CPU device, monitor, keyboard and screen.

For this option, each unit needs one RS485 Carel / Modbus board.



These systems are used to manage the installation remotely. All the information on the system can be accessed via a simple Internet connection. The online interface, the same one used by the local user, enables monitoring and complete configuration of the installation: from the office or anywhere else the user happens to be.

To control multiple sites remotely, there are special tools dedicated to centralized management, such as **RemotePRO** and **RemoteValue**.

## 1.7. Communication in a pLAN network

A pLAN network (Vectic Local Area Network) allows data and information to be exchanged between units, for a maximum of 15 units. This enables the reduction of the number of graphic terminals, since a single shared terminal can monitor all boards in the network.

Characterisc of the network: communications standard: RS485; transmission speed: 65,2 Kbit/s; maximum network length: 500 m.

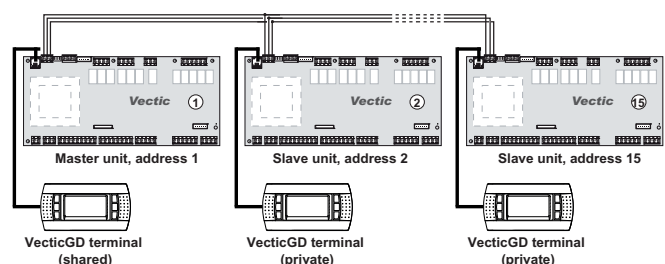
The pLAN network must be composed, at least, by the following components:

- A **control board** for each unit integrated into the network. The maximum number of units in the aforementioned network is 15. One of the units is configured as the master unit in the network and the other units are configured as slaves.
- A **VecticGD terminal** which is configured as shared terminal. All boards integrated into the network can be monitored from this terminal.

Additional components:

- **Private graphic terminals:** it is possible to add the same number of terminals that the number of existing units in the network.
- **Shared sensors:** in a pLAN network with the appropriate facility's conditions, the value measured by some sensors installed on the master unit can be shared with the slave units.

These sensors are: outdoor temperature, ambient temperature, outdoor humidity, ambient humidity and CO<sub>2</sub> air quality.

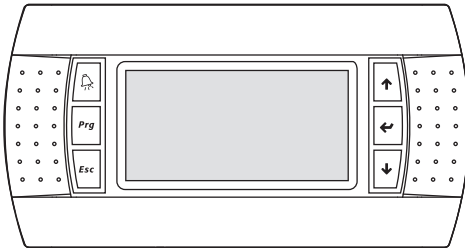


## 2 - USER INTERFACES

### 2.1. VectiGD graphic terminal (standard)

#### Features

- LCD FSTN display (132 x 64 pixel), backlit in blue.
- The screen provides detailed explanations of control in easy to understand English. No decoding is required.
- Only 6, large, easy-to-use buttons are required to maneuver through the entire menus.



Dimensions:  
Length: 156 mm  
Width: 82 mm  
Depth: 31 mm

#### First run of the software

On the first run of the software installed on the control, the following screen appears on the terminal, informing about the installation of the values by default:

```
Warning
INITIALIZATION
Default installation
running...
Please wait
```

The screen that appears later indicates that it is necessary to reset the terminal to confirm installation:

```
Warning
INITIALIZATION
COMPLETED
Switch-off and back on
the controller
```

When you switch on the power again, the terminal loads the initial screen, showing:

- The unit number in the pLAN network (U01 indicates that the unit is the master in the pLAN network or a stand-alone unit).
- The measured indoor temperature (Ind.T).
- The measured outdoor temperature (Out.T).
- The default installation language. The available languages are: Spanish (ES), French (FR), English (EN), Italian (IT), Turkish (TR), and German (AL).
- The time and date.

```
CIAT
U01 Ind.T: 00.0°C
Out.T: 00.0°C
00:00 EN 00/00/00
```

#### Keys and combinations (quick guide)

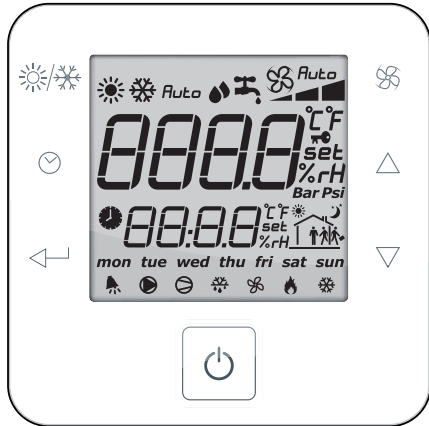
| Key | Function                                                                                                                                                                                                                                                                                                                                                                           |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <b>Alarm</b><br>There is/are active alarm(s) if the key is illuminated red.<br>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.<br>If no alarm is active, the message "No alarm active" appears. |
|     | <b>Prg</b><br>This key allows access to the MAIN MENU. All the screens of this control can be selected from this menu.<br>The key will light up in orange.                                                                                                                                                                                                                         |
|     | <b>Esc</b><br>To exit any screen, pressing this key returns the user to the start screen of the previous menu.<br>From the initial screen, if keeping this key pressed for a few seconds, access is given to a group of help screens with information on the key or key combination that enable performing the most important control functions.                                   |
|     | <b>Esc + Down</b><br>By pressing both keys simultaneously for a few seconds, it's possible to change of unit in the pLAN network.                                                                                                                                                                                                                                                  |
|     | <b>Up Down</b><br>These keys enable consulting the information displayed on-screen by going forward or back.<br>They can also modify values.<br>By pressing both keys at the same time, direct access is gained to the group of screens "06. Input/Output" (belonging to the MAIN MENU).                                                                                           |
|     | <b>Enter</b><br>This enables confirming the modified values.<br>By pressing the key once, the cursor is placed on the first screen parameter.<br>Pressing the key again confirms the adjusted parameter value and it then proceeds to the next parameter.                                                                                                                          |
|     | <b>Prg + Enter</b><br>The unit is switched on or switched off by pressing both these keys at the same time for a few seconds.<br>This action is equivalent to the On/Off from the screen "02. Unit On/Off" (belonging to the MAIN MENU).                                                                                                                                           |
|     | <b>Prg + Up</b><br>HEATING mode (winter) is selected by pressing both these keys at the same time for a few seconds.                                                                                                                                                                                                                                                               |
|     | <b>Prg + Down</b><br>COOLING mode (summer) is selected by pressing both these keys at the same time for a few seconds                                                                                                                                                                                                                                                              |
|     | <b>Alarm + Down</b><br>The language of the screens is selected by pressing both these keys at the same time for a few seconds                                                                                                                                                                                                                                                      |

## 2 - USER INTERFACES

### 2.2. TCO user terminal (optional)

#### Features

- LCD display, backlit in blue.
- Built-in temperature sensor.
- Clock and schedule programming.



Dimensions:  
Length: 86 mm  
Width: 86 mm  
Depth: 51 mm

#### Screen

The TCO terminal has an LCD display to show the information of the unit and to interact with the user.

| Symbol                             | Meaning                                                                                                                        |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|                                    | Selection of HEATING mode (winter)                                                                                             |
|                                    | Selection of COOLING mode (summer)                                                                                             |
| <i>Auto</i>                        | Selection of AUTOMATIC mode                                                                                                    |
|                                    | Indoor fan in operation (3 possible speeds in plug-fan)                                                                        |
|                                    | Main indicator of:<br>- Temperature (°C or °F)<br>- Activated block key (key)<br>- Setpoint (set)<br>- Relative humidity (%RH) |
|                                    | Secondary indicator of:<br>- Temperature (°C or °F)<br>- Setpoint (set)<br>- Hour and minute<br>- Relative humidity (%RH)      |
|                                    | Alarm indicator                                                                                                                |
|                                    | Pump of the hot water coil in operation                                                                                        |
|                                    | Compressor in operation                                                                                                        |
|                                    | Defrosting indicator                                                                                                           |
|                                    | Outdoor fan in operation                                                                                                       |
|                                    | Active backup in HEATING mode                                                                                                  |
|                                    | Operation in cooling mode (in AUTO mode it makes known whether the unit is operating in COOLING or HEATING)                    |
|                                    | Selection of the type of schedule: 6 possible phases.                                                                          |
|                                    | Activation of the indicator of the schedule programming                                                                        |
| <i>mon tue wed thu fri sat sun</i> | Indicators of the days of the week (Monday to Sunday)                                                                          |

#### Keys and combinations (quick guide)

| Key | Function                                                                                                                                                                                                                                                                                                   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <b>Operating mode</b><br>Allows the operating mode to be selected: HEATING, COOLING, AUTO or VENTILATION (only if selection by panel is activated)                                                                                                                                                         |
|     | <b>Fan</b><br>Allows to select 3 different flows in plug-fans:<br>V1: minimum flow<br>V2: nominal flow<br>V3: maximum flow                                                                                                                                                                                 |
|     | <b>Schedule programming</b><br>Short press: allows to activate the schedule programming stored in the TCO terminal<br>Long press (3 secs): allows the time and the schedule programming to be modified.                                                                                                    |
|     | <b>Up / Down</b><br>These keys allow the user to go forward and backward to consult the information found on the screen.<br>They can also modify values                                                                                                                                                    |
|     | <b>Enter</b><br>This enables confirming the modified values.<br>It also allows the set of values to be seen on the screen (temperature measured, temperature setpoint, humidity measured, humidity setpoint, outdoor temperature, discharge T, alarm code, CO <sub>2</sub> mesure, outdoor damper opening) |
|     | <b>On / Off</b><br>Allows the unit to be turned OFF/ON                                                                                                                                                                                                                                                     |

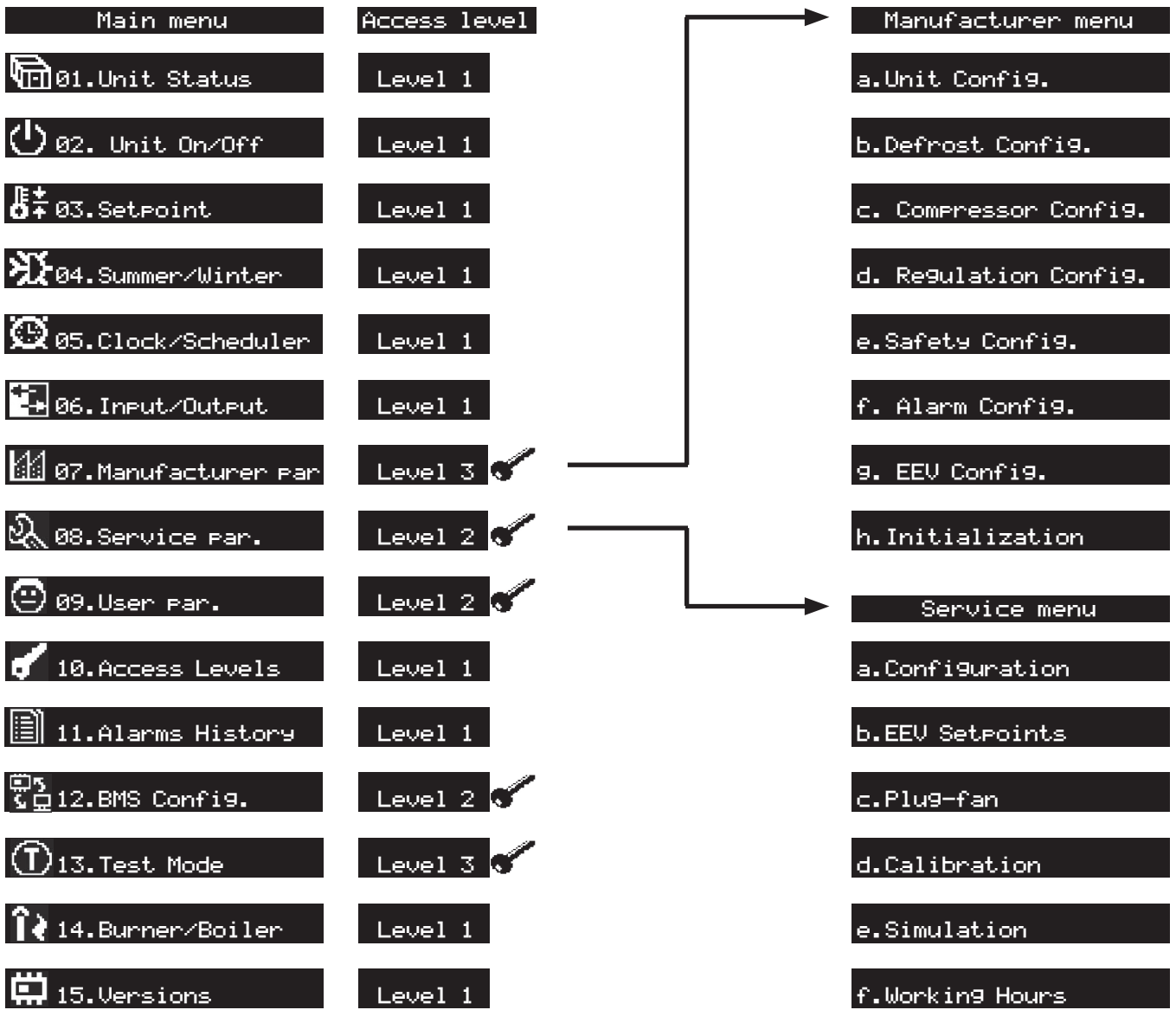
#### View in succession of the values measured

In addition to view in the ambient (or return) air temperature on the main screen, 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:

|                            |                                       |                           |
|----------------------------|---------------------------------------|---------------------------|
| 1) Ambient or return T<br> | 2) Setpoint temp.<br>                 | 3) Ambient RH (opt)<br>   |
| 4) Setpoint RH (opt)<br>   | 5) Outdoor temperature<br>            | 6) Supply temperature<br> |
| 7) Active alarms<br>       | 8) CO <sub>2</sub> measure (opt.)<br> | 9) Outd. damper (opt)<br> |

### 3 - VECTICGD TERMINAL MENU STRUCTURE



#### 3.1. Access levels

3 levels of access are configured for access to the parameters screens: level 1 (no password), level 2 (with password) and level 3 (with password).

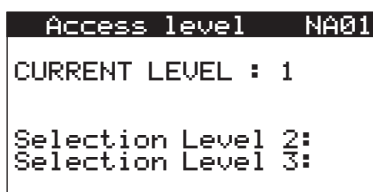
Level 3 password allows access to all level 2 screens.

#### Change in the level of access

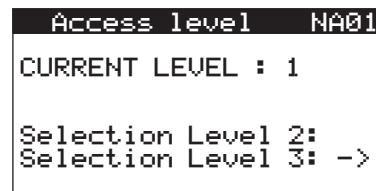
From the initial screen of the terminal, by pressing the key, the **MAIN MENU** is accessed.

The keys and enable navigating through the menu until the Group of screens: **10. Access Levels** is reached.

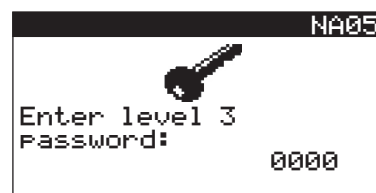
This group of screens is accessed by pressing . The following screen is displayed:



Press the key until the cursor is placed on the desired access level. Then, press on the key.



The screen to enter the password is visualised. If this password is needed, please consult.



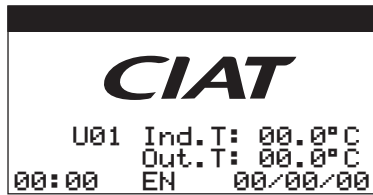
The terminal comes back to the level 1 after a period of inactivity of 10 minutes. The change of level can also be done from one screen of this menu.



## 4 - INFORMATION ABOUT THE UNIT STATUS

### Initial screen

When the VecticGD terminal is switched on, the screen below shows this information:



**U01:** This indicates the number of the unit in which the terminal is connected.

**Ind.T:** This indicates the ambient (by default) or return (optional) air temperature.

**Out.T:** Outdoor air temperature. In units with humidity probe, this indicates the relative humidity of the indoor air.

**00:00:** Time

**00/00/00:** Date

**ES:** Language of the terminal screens. The available languages are: Spanish (ES), French (FR), English (EN), German (DE), Italian (IT), and Turkish (TR).

The language of the screens can be selected by pressing the keys






at the same time for a few seconds.

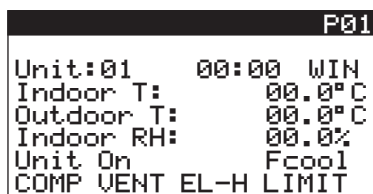
### Unit status screens

The main parameters of the regulation are displayed in this group of screens.

They can be accessed in two ways:

- By pressing the  key from the initial screen.
- By pressing the  key from the initial screen, the MAIN MENU is accessed. The first group of screens is **01. Unit status**. Press the  key to enter the group.

The first screen of this group collects the following information:



**Unit:** This represents the unit number (by default: 01). If the unit is included in a local pLAN, this number can vary between 1 and 15.

**00:00:** Indicates the time.

**WIN / SUM / AL:** This indicates the operating status: WINTER or SUMMER. In the event of alarm, the indication "AL" will appear alternately.

**Indoor T:** This indicates the ambient (by default) or return (optional) air temperature.

**Outdoor T:** This indicates the outdoor air temperature.

**Indoor RH:** This indicates the relative humidity of the indoor air (in units with return or ambient humidity probe, optional).

**Unit:** This indicates the OFF/ON status:

**On** Turned on.

**Off** Turned off.

**Remote Off** If enabled for a remote shutdown.

**Off by Phase** If the unit is shut down by schedule programming.

**Machine status:** Available options status:

**Fcool** Active free-cooling.

**COMP** Active compressors in summer in addition to free-cooling.

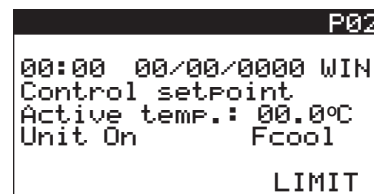
**Deum** Dehumidification.

**Gas** Gas burner/boiler operating above the minimum.

**COMP VENT EL-H:** The meaning of these texts on the display is: compressor (COMP), supply fan (VENT) and electrical heaters (RES) in operation.

**LIMIT:** This text appears intermittently when the control of the supply temperature is activated, limiting the capacity of the unit.

On the second screen of the group is shown:



**00:00** and **00/00/0000:** This indicates the time and date.

**WIN / SUM / AL:** Operating mode.

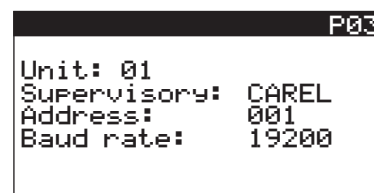
**Active temp.:** Setpoint temperature.

**Unit:** This indicates the OFF/ON status.

**Machine status:** Available options status (e.g. Fcool).

**LIMIT:** This text appears intermittently when the control of the supply temperature is activated

The next screen of the group only appears when the unit is integrated in a pLAN or supervision network (Carel, Konnex, Bacnet Ethernet, Bacnet MSTP, Ethernet, Lonworks and Modbus RTU protocols).



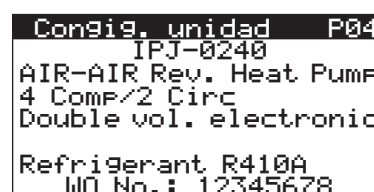
**Unit:** Unit No. in the pLAN network.

**Supervisory:** Type of protocol.

**Address:** in the supervision network. This could be different from the board address.

**Baud rate:** Bit rate (19200, 9600, 4800, 2400, 1200).

The last screen reports on the configuration of the unit.



**№WO:** Work order number of the unit (needed in case of consultation with the Technical Support Service).

## 5 - STARTING / STOPPING THE UNIT

There are different procedures for starting / stopping the unit (On/Off):

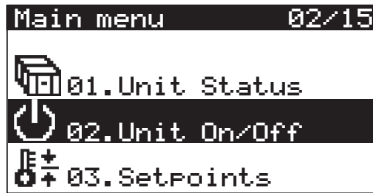
- **By keyboard (from the terminal):**

This procedure is always valid. If the unit is stopped from the terminal, it cannot be started using any of the other procedures. If the unit has stopped, all the functions and the different variables are disabled.

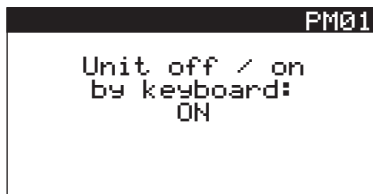
The ON / OFF function can be carried out:

- \* **On the VecticGD terminal:**

From the MAIN MENU, in the group **02. Unit On/Off**.



Press the key, the following screen is reached:



It can also be done from the keyboard of the terminal, by simultaneously pressing the keys for a few seconds.

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

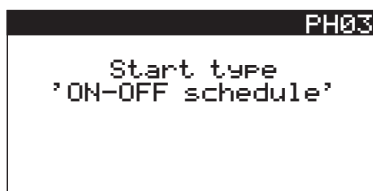
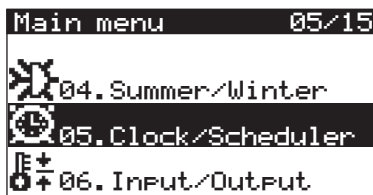
By pressing the key .

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



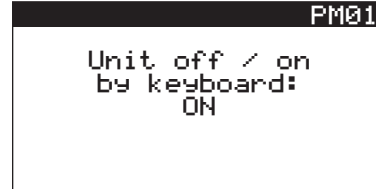
- **By time phase (with scheduling):**

From the MAIN MENU, in the group of screens **05. Clock/Scheduler**, the unit can be stopped outside of the schedule.



Note: See the different types of schedules in the chapter of "Schedule programming".

The "On/Off by time phase" can only be done if the option "On" is selected on the screen PM01.



Important: If the procedures of "On/Off by time phase" and "remote On/Off" are simultaneously active, the unit will start only if both agree.

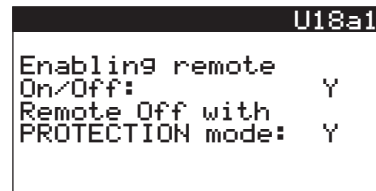
- **By digital input (remote On/Off):**

The "remote On/Off" is carried out by means of the digital input DI7 of connector J4:

- open contact: unit OFF
- closed contact: unit ON

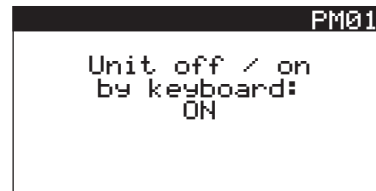
Note: To activate the remote off/on the bridge made in this input must be eliminated (see wiring diagram)

This procedure must be enabled on the group of screens **09. User Par.** (protected by level 2 password).



When the unit is stopped by "remote On/Off", it is also possible to enable the automatic unit start when a temperature setpoint for PROTECTION of the building is reached.

The "remote On/Off" can only be done if the option "On" is selected on the screen PM01.



Note: The "On/Off by keyboard" always has priority over the "remote On/Off".

Important: If the procedures of "remote On/Off" and "On/Off by time phase" are simultaneously active, the unit will start only if both agree.

Important: The "remote On/Off" must be disabled for maintenance tasks.

## 6 - SETPOINTS SELECTION

The control of the ambient temperature is carried out by starting up the unit: compressors and/or backup component (electrical heater, water coil, etc.).

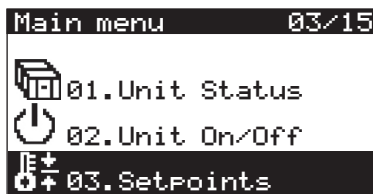
To do so, the control compares the temperature reading of the ambient air probe (or the return probe) with the setpoint value.

The control has two different set points: one for operation in COOLING mode (summer) and another for operation in HEATING mode (winter).

The selection of the setpoint can be carried out:

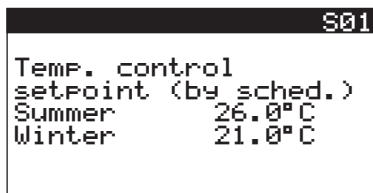
- **On the VectiGD terminal:**

From the MAIN MENU, in the group **03. Setpoints**.

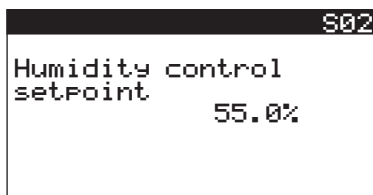


On the first screen of this group, the setpoints of temperature can be selected.

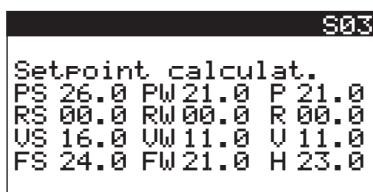
Note: if the indication "by schedule" appears on the screen, this means that the setpoints have been set in the schedule programming.



On the next screen it is possible to modify the humidity setpoint when its management is enabled (optional).



The third screen enables the display of the following calculations of setpoints:



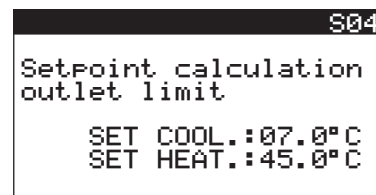
In which:

- PS In COOLING mode (summer): Setpoint + Dead Zone / 2
- PW In HEATING mode (winter): Setpoint + Dead Zone / 2
- P Current selection of the setpoint
- RS Setpoint of the electrical heaters in COOLING mode
- RW Setpoint of the electrical heaters in HEATING mode
- R Current selection of the setpoint for the electrical heaters

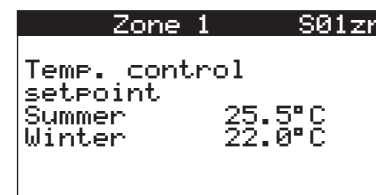
- VS Setpoint of the auxiliary hot water coil in COOLING mode
- VW Setpoint of the auxiliary hot water coil in HEATING mode
- V Current selection of the setpoint for the auxiliary coil
- FV Setpoint of free-cooling in COOLING mode
- FI Setpoint of free-cooling in HEATING mode
- F Current selection of the setpoint for the free-cooling

On the last screen of this group, it is possible to display the limits of setpoint for the supply temperature in COOLING mode (summer) and HEATING mode (winter):

- In COOLING mode (summer): to prevent excessively significant drops in the ambient temperature.
- In HEATING mode (winter): to avoid the stratification of the hot air masses.



When the unit includes the option of zoning up to 4 zones with variation of air flow, the first screens displayed will allow the selection of the setpoints for each zone:



With the air zoning, the control use the minimum setpoint in COOLING mode and the maximum setpoint in HEATING mode, among all the setpoints in the 4 zones. The S01 screen displays these setpoints and their value cannot be changed.

Note: the optional air zoning can be selected on a screen of the group **07. Manufacturer Par.** → **a. Unit Config.** of the TECHNICAL MENU (password protected).

- **On the TCO terminal (optional):**

To modify the setpoint, it is necessary to press only the  $\triangle$  or  $\nabla$  keys.

At that time, the display will light up and the current setpoint value from active mode (COOLING or HEATING) will appear next to the text **set**.



Note: The temperature control can be performed with the ambient probe installed on the TCO terminal (optional).

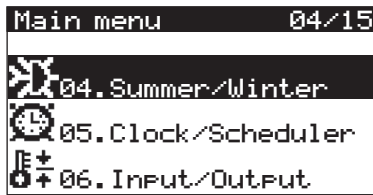
The selection of this probe can only be done from a screen of the Group **07. Manufacturer Par.** (protected by level 3 password).

## 7 - SELECTION OF THE OPERATING MODE

There are different procedures for the selection of the operating mode:

- **On the VeticGD terminal:**

From the MAIN MENU, in the group **04. Summer/Winter**.

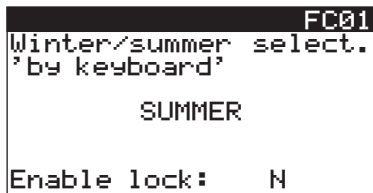


Press the key, the following screen is reached:



This screen allows to select 3 options:

- **By keyboard:** on this screen, it is possible to switch between summer mode (COOLING) and winter mode (HEATING).



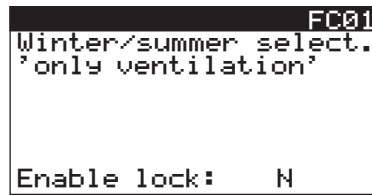
Note: When the parameter «Enable lock» is activated (Y), this screen is for information purposes only, so that the final user cannot change it. In this case, it has been blocked from a screen of the Group **08. Service Par.** (protected by level 2 password).

Nevertheless, these operations can also be carried out using the following key combinations:

: HEATING mode

: COOLING mode

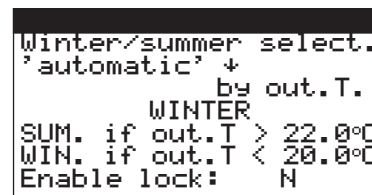
- **Only ventilation:** on this screen, it is possible to select the VENTILATION mode. It allows operation for only indoor fans and free-cooling/free-heating.



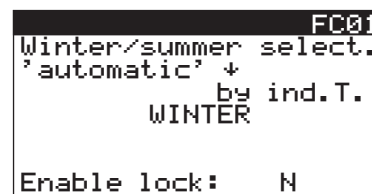
- **Automatic:** on this screen, it is possible to select two options for automatic mode:

\* *By outdoor temperature (by 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.

In this case, the setpoints of outdoor temperature can be modified in COOLING mode or HEATING mode.



\* *By indoor temperature:* The unit changes from operation in COOLING mode to HEATING mode or vice versa depending on the temperature measured by the ambient (or return) air probe and the active COOLING and HEATING setpoints



- **On 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 operating mode selected will be lit up.

The available modes are: HEATING - COOLING - AUTO *Auto* y VENTILATION (without icon).



## 7 - SELECTION OF THE OPERATING MODE

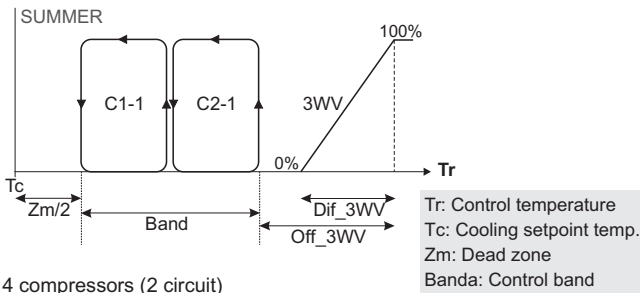
### 7.1. COOLING operating mode (summer) ❄️

The control will compare the temperature reading of the ambient (or return) air probe with the value set by the COOLING setpoint and with the value of the control band.

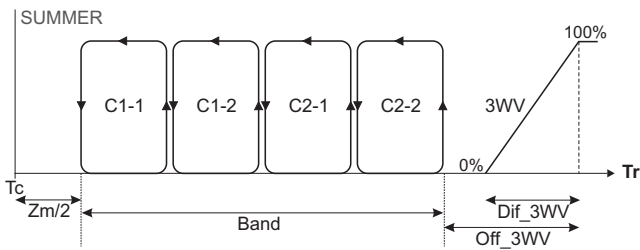
The unit will stop when the ambient (or return) temperature drops below the setpoint + one-half of the dead zone value.

The input command of the various stages is the one featured on the chart.

- 2 compressors (1 circuit)



- 4 compressors (2 circuit)



As backup cooling, these units can incorporate a cold water coil (V3V). For the regulation of the coil, the control has a proportional or on/off output Y2 which controls the three-way valve.

For the input of the compressor stages, the control will use the control band value, whilst for the water coil (optional), it will take the differential into account.

The input command for the previous chart can be modified using parameters in order to give priority to the hot water coil.

Note: When the outdoor coil pressure of a circuit overcomes a limit value (41,5 bar by default), one of the two compressors will be stopped, thereby avoiding the stop of both compressors due to the high pressure. This compressor will start working again if the pressure drops below 36,5 bar.

#### Illustrative example:

- Summer setpoint = 26.0°C
- Differential band = 3.0°C and Dead zone = 0°C
- Unit without cold water coil.

#### Units 2 compressors:

With the temperature below 26.0°C, the compressors stop. If the temperature starts to rise and exceeds 27.5°C, compressor C1-1 starts. If it continues to rise and exceeds 29.0°C, compressor C2-1 is also activated.

If the temperature drops below 27.5°C compressor C2-1 stops. If it continues to drop until reaching a value below 26.0°C, compressor C1-1 stops (the off and on command for the compressors will depend on whether the rotation is activated or not).

#### Units 4 compressors:

The control band is divided between 4 compressors.

### 7.2. HEATING operating mode (winter) ☀️

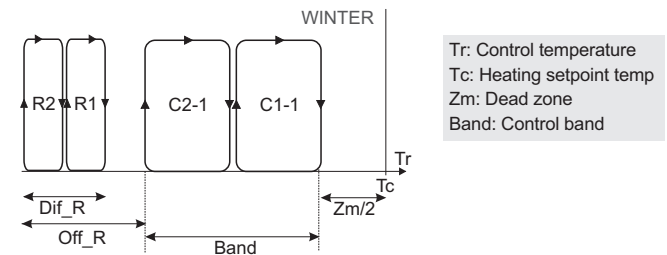
The control will compare the temperature reading of the ambient (or return) air probe with the value set by the HEATING setpoint and with the value of the control band.

As backup heating, these units can incorporate any of the following components:

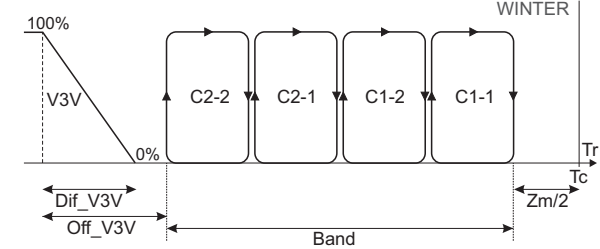
- a hot water coil (V3V).
- two stages of electrical heaters (R)
- a gas burner.
- a gas boiler.

An example of input command of the various stages is the one featured on the chart.

- 2 compressors (1 circuit) + electrical heaters



- 4 compressors (2 circuits) + hot water coil



For the regulation of the hot water coil, the control has a proportional or on/off output Y2 which controls the three-way valve, and for the regulation of the electrical heaters, there are two on/off outputs NO6- NO7.

The previous configuration is typical for the options however the control can also administer a proportional electrical heater stage in the output Y2 and an on/off water coil in output NO6

For the input of the compressor stages, the control will use the control band value, whilst for the input of heaters and of the water coil (optionals), it will take the respective differentials into account.

The input command for the previous chart can be modified using parameters in order to:

- Give priority to the hot water coil (by default).
- Activate the electrical heater stages without activating the compressor(s) for cases of compressor breakdown or blocking due to a low outdoor temperature.

Important: if this blocking is enabled, half of the compressors will be disconnected at an outdoor temperature of -11.5°C, and all other compressors with a temperature of -14.5°C. The recovery compressor (optional) is authorized to operate.

#### Forced disconnection of stages

It is possible to disconnect compressor or electrical heater stages, by using parameters or mechanically through the digital inputs of the expansion card pCOe with address 8.

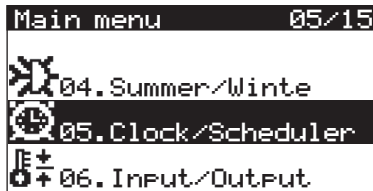
This is useful for reducing electric consumption in time bands when the electric price rate is high or in those cases where the electricity consumption or the section of the electrical outlet are limited.

## 8 - SCHEDULE PROGRAMMING

### 8.1. Schedule programming: VecticGD terminal

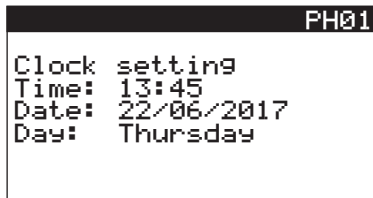
The VecticGD terminal incorporates a time scheduler with possibility of 3 different programs. It allows to choose for each day of the week one of these 3 programs.

The schedule programming is accessed from the MAIN MENU. This is the group of screens **05. Clock/Scheduler**.



#### Date and time

On the first screen, it is possible to change the time and date of the control. The day of the week will be automatically updated.



On the next screen, the automatic change of schedule can be activated (by default).



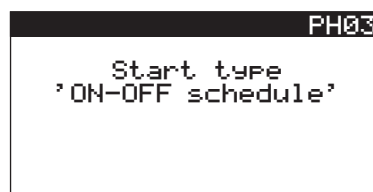
In this way, from LAST SUNDAY IN MARCH at 2.00 hours until LAST SUNDAY IN OCTOBER at 3.00 hours, to the normal schedule (winter schedule) it is necessary to add 60 minutes, thus obtaining the summer schedule.

These values are adjustable to be adapted to different hourly changes out of the European Union.

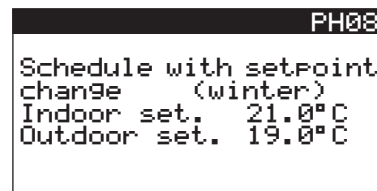
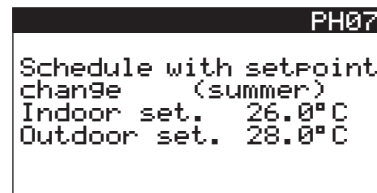
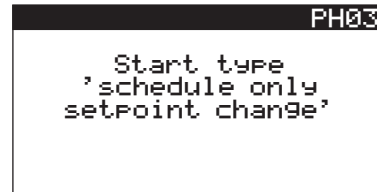
#### Start type

The start type and the condition of the unit outside of the schedule program will be selected on the screen PH03:

- **ON/OFF schedule:** within the program the unit will operate with the setpoint established on COOLING mode (summer) and HEATING mode (winter), whilst outside the schedule it will be stopped.



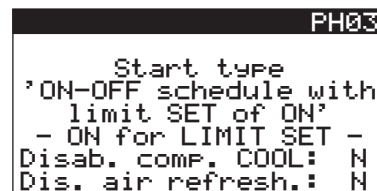
- **Schedule only setpoint change:** two control setpoint temperatures will be set on the screen PH07 (summer) and on the screen PH08 (winter): one, during the program slots (Indoor set.) and another outside the program (Outdoor set.).



- **ON/OFF schedule with limit SET of ON:** outside the schedule program the unit is off, however a start safety device is established when the temperature goes above or below the limit setpoints introduced in PH09, PH10 and PH11.

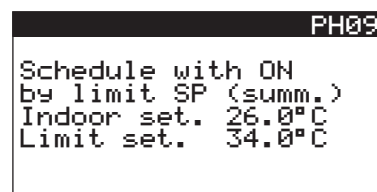
With this type of start-up two new parameters are displayed on the screen:

- \* **Disab. comp. COOL:** when the unit is working with the safety limit setpoint in COOLING mode, the compressors can be disabled in order that if the conditions of the outdoor air are favourable, the unit carries out free-cooling.
- \* **Dis. air refresh.:** when the unit is working with the safety limit setpoint is disabled the air renewal.



The regulation setpoint and safety limit setpoint are established on the screen PH09 (summer) and on the screen PH10 (winter):

- \* **Indoor set.:** setpoint for the time slots.
- \* **Limit set.:** safety limit setpoint outside the schedule.



## 8 - SCHEDULE PROGRAMMING

```

PH10
Schedule with ON
by limit SP (winter)
Indoor set. 21.0°C
Limit set. 13.0°C
    
```

On the screen PH11 the differentials are established for the limit set:

```

PH11
Schedule with ON
by limit SP
Win.Lim. Diff.01.0°C
Sum.Lim. Diff.02.0°C
    
```

- **3 setpoints schedule + OFF of unit:** outside the schedule program the unit is switched off, inside the schedule 3 setpoints can be established: COMFORT: standard setpoint; ECONOMY: setpoint more removed from the comfort point, used at times with low occupancy of the building; and PROTECTION: setpoint of building protection, usually used at night, when the building is empty. This schedule is introduced on PH13, PH14 and PH15.

With this type of start-up two new parameters are displayed on the screen:

- \* **Disab.comf.COOL:** when the unit is working with the safety limit setpoint in COOLING mode, the compressors can be disabled in order that if the conditions of the outdoor air are favourable, the unit carries out free-cooling.
- \* **Dis. air refresh.:** when the unit is working with the safety limit setpoint is disabled the air renewal.

```

PH03
Start type
3 setpoints schedule
+ OFF of unit
- ON for SET LIMITE -
Disab. comp. COOL: N
Dis. air refresh.: N
    
```

On the screen PH13 there will be assigned, for every day of the week, every 30 minutes, which will be the select setpoint.

The symbol that represents each setpoint is: **-** OFF, **■** PROTECTION, **□** ECONOMY, **■** COMFORT.

In the top left zone of the display it is indicated the day of the week to which there is assigned the schedule (in the example: on Monday).

When it is created it is possible to copy in any other day of the week.

For example: it copies to Tuesday: YES (the Tuesday schedule will be the same that on Monday).

```

PH13
MON copy to TUE: YES
23:00 to 23:30
00-08:-----
08-16:-----
16-24:-----
    
```

Three regulation setpoints will be established on screen PH14 (summer) and screen PH15 (winter):

- \* **Set.COMFORT:** standard setpoint of the unit.
- \* **Set.ECONOMY:** setpoint more removed from the comfort point, used at times with low occupancy.
- \* **Set.PROTECTION:** setpoint of building protection, usually used at night, when the building is empty.
- \* **Dif.lim.PROT:** differential for the PROTECTION setpoint.

```

PH14
Schedule with setpoint
change (Summer)
CONFORT Set 26.0°C
ECONOMY Set 28.0°C
PROTECTION Set 34.0°C
PROT.Lim.Dif 02.0°C
    
```

```

PH15
Schedule with setpoint
change (Winter)
CONFORT Set 21.0°C
ECONOMY Set 19.0°C
PROTECTION Set 13.0°C
PROT.Lim.Dif 01.0°C
    
```

- **Manual:** by selecting this type of start the unit will be on or off without taking into account the schedule programming.

In this case, the unit can be switched off/on from this display.


```

PH03
Start type
'Manual'
ON
    
```

```

PH03
Start type
'Manual'
OFF
    
```

- **Forced:** this permits an occasional start-up or shutdown of the unit without modifying the set schedule program. When this period ends, the unit goes back to the start type that was programmed.

To activate it press the key  for a few seconds. Access is gained to a screen on which the forced running time is established.

Note: This forced start-up only can be done from the PH03 screen.

```

PH03
Start type
-FORCED-
ON time: 002 h
    
```

## 8 - SCHEDULE PROGRAMMING

### Daily schedule

Three different daily schedules can be created on the PH04, PH05 and PH06 screens, each of them with a maximum of three time slots in which the unit will be switched on.

Outside of the slots, the unit will work with a different setpoint from the previous one or it will switch off, according to the start type selected on the screen PH03.

For example:

Program 1: Slot 1: morning from 06:30h to 11:00h  
 Slot 2: morning from 11:30h to 13:30h  
 Slot 3: evening from 17:00h to 19:00h

Program 2: Slot 1: morning from 08:00h to 14:00h  
 Slot 2: evening from 17:00h to 20:00h

Program 3: Slot 1: morning from 07:00h to 15:00h

```

PH04
-----
SCHEDULE PROGR. N.1
Slot1 > 06:30 to 11:00
Slot2 > 11:30 to 13:30
Slot3 > 15:00 to 19:00
  
```

```

PH05
-----
SCHEDULE PROGR. N.2
Slot1 > 08:00 to 14:00
Slot2 > 17:00 to 20:30
Slot3 > 00:00 to 00:00
  
```

```

PH06
-----
SCHEDULE PROGR. N.3
Slot1 > 07:00 to 15:00
Slot2 > 00:00 to 00:00
Slot3 > 00:00 to 00:00
  
```

Note: the start type "3 setpoints schedule + OFF of unit" has its own schedule program defined on the screen PH13 (see the previous section).

### Weekly schedule

On this display, it is possible to assign a schedule program for each day of the week.

The available options are:

- 1: schedule program No.1
- 2: schedule program No.2
- 3: schedule program No.3
- 0: no programming

```

PH12
-----
Program selection
Daily start
M:1 T:1 W:1 T:1 F:2
S:3 S:0 -Mon- (0=off)
  
```

### 8.2. Schedule programming: TCO terminal

With the TCO terminal enabled (optional), the schedule programming of this terminal can be done.

Note: the activation of both, the TCO terminal and its scheduler, is carried out from the group of screens 07. **Manufacturer Par.** (protected by level 3 password).

The TCO terminal has a scheduler that allows 6 time slots to be chosen for each day of the week, indicated by the following icons on the screen:



A change in the setpoint temperature or the disconnection of the unit can be scheduled in these time slots.

### Clock setting of the terminal

By pressing the key for a long time, the terminal changes to the initial clock display (CLOC).



From there, by pressing the key, the time update display is accessed.



The current time appears intermittently and can be modified with the help of the keys. The new time can be validated with the key.

The minutes appear below intermittently. Its value can also be modified with the keys and validated with the key.

There are two ways of returning to the main display: by repeatedly pressing the or not acting on the terminal for some seconds.

### Creation of a schedule program

By pressing the key for a long time, the terminal changes to the initial clock display (CLOC).



Next, by pressing the key, the terminal changes to the initial schedule program screen (TIME BAND).






If it desired to abandon the programming, by pressing the key again, the terminal changes to the exit display (ESC), which is exited by pressing .

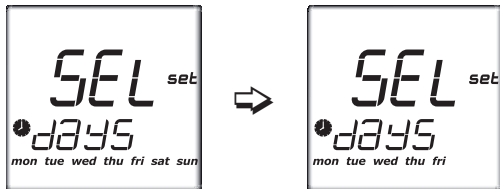




## 8 - SCHEDULE PROGRAMMING

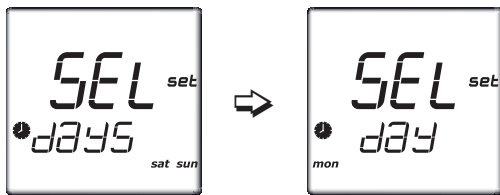
If it is desired to continue with the scheduled programme,  must be pressed with the terminal on the initial programming display (TIME BAND).

The text SEL DAYS will then appear on the display to select the days of the week to which the schedule will apply. With the   keys, the following groups can be selected:





Complete week

Working days




Weekend


Day to day

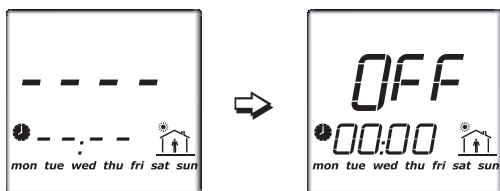
If it's desired to leave the programming, by pressing the  key again, the terminal changes to the exit display (ESC), which is exited by pressing .





If it is desired to continue with the schedule programming, the  key must be pressed on the screen of the days to which it applies in order to access the first time slot. The sequence of these slots is as follows:



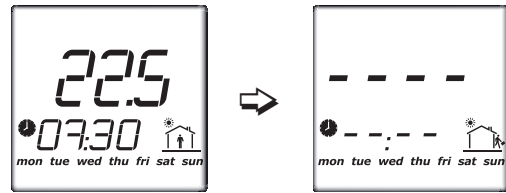
The first time slot will flicker on this display. If it is desired to schedule this slot, the  key will be pressed and automatically stop flickering, going on to appear as follows:






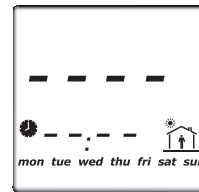
Next, with the  key, the activation time of the program for the selected slot will be set, and then, whether the unit will remain stopped (OFF) or at the setpoint value.

Finally, the schedule slot will cease flickering. By pressing the  key, the scheduling created will be saved and the terminal will go on to display the next slot.

It will be necessary to define a minimum of two slots for each day, since only the initial time is established is established for each slot, and not the ending time.




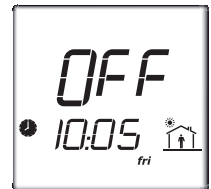
To delete the schedule from a time slot, it is necessary to select it with the  key, and then, by pressing the   keys, the time will be modified until the display returns to show the following:






Note: Before making a new schedule, it must be checked whether there is already one defined. If any schedule is made that may affect another that is already stored, the latter will not be saved.

### Activation of the schedule programming

By pressing the  key for a short time, the stored schedule programming corresponding to the activation time is activated.




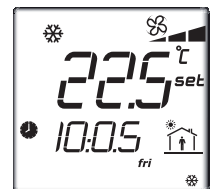
The symbol  and the active scheduling slot will always appear on the main display, both on stopped units and units in operation.

With the unit in operation, by pressing the keys  or  the setpoint for the time slot will be shown.

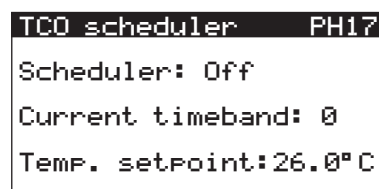


Note: The text **set** will appear next to the setpoint value.

To deactivate the schedule programming, it is necessary only to press the  key for a short while.



The screen PH17 of the VectiGD terminal (group 05. Clock/Scheduler) shows if the scheduler of the TCO terminal is active, the current timeband and the temperature setpoint.



## 9 - DISPLAY OF THE INPUTS / OUTPUTS STATUS

All variables which are controlled by the system are displayed in this group of screens, including the status of the digital inputs, the digital outputs and the analogue outputs, both the main board and the installed expansion cards.

This group of screens is accessed from the MAIN MENU, in **06. Inputs/Outputs**.

- Values measured by the sensors: screens I01, I01a, I01b, I02, I03, I03a, I03b, I03c, I04a, I04b, I05a, I05c, I05e.

```

I01
S1 probe
Return temperature
Probe      16.0°C
S2 probe
Outdoor temperature
Probe      20.0°C
    
```

- Electronic expansion valve(s) reading: screens I06a, I06b, I06c1, I06e, I06f, I06g, I06h.

```

Valve A      I06a
SH: 007.6 K
0000stp      C1
000% 08.3bar C2
EDU: 04.8°C  27.3b9
On           46.2°C
    
```

- Cumulated operating hours by the unit and each compressor: screens I07, I07a.

```

I07
Operating hours
Unit:          00000
Compress. 1-C1:00000
Compress. 2-C1:00000
    
```

- Digital inputs status: screen I08 (main board), screen I08b (expansion card addr.8), screen I08c (expansion card addr.9).

```

I08
Digital input
status (1..14):
CCCCCCCCCCCC
    
```

C: Closed contact  
O: Open contact

- Digital outputs status: screens I09, I09a, I09b, I10, I11 (main board), screen I10b (expansion card addr.9).

```

I09
Compressor 1 - C1 OFF
Compressor 2 - C1 OFF
Compressor 1 - C2 OFF
Compressor 2 - C2 OFF
    
```

- Analogue outputs status: screens I12, I12a (main board), screen I12b (expansion card addr.8), screen I12c (expansion card addr.9).

```

I12
Outdoor damper:025%
Heat valve:      000%
    
```

000%: opening percentage

- Cooling recovery circuit reading (optional): screens I06cr, I06fr, I06er, I05ar, I08cr, I10cr.

```

Active recov. I06cr
SH: 1.4 K
0480stp      C1
100% 09.5bar C2
EDU: 09.0°C  29.5b9
On           49.4°C
    
```

- Measurements performed by the energy meter (optional): screens I15, I16, I17, I18.

```

GAUZZI      I15
Voltages (V)
L1-L2:      00000
L2-L3:      00000
L3-L1:      00000
Neutral 1:  00000
Neutral 2:  00000
Neutral 3:  00000
    
```

- Calculation of the cooling and heating capacities (optional): screens I18b, I18c, I18d, I18e.

```

Refriger. power: I18b
Input enthalpy
value:      00.0 kcal/kg
Input humidity
value:      50.0 %
Input temperature
value:      000.0 °C
    
```

## 10 - VERSIONS OF SOFTWARE AND HARDWARE

In this group of screens **15. Versions** from the MAIN MENU, the Software version installed on the control board is provided.

The second screen of this menu shows the main features of the hardware.

```

SOFTWARE      U01
Vectric Control
Version: 12.5.000 00
Date:      21/01/20
Bios: 6.50  11/03/19
Boot: 5.00  18/07/12
    
```

```

HARDWARE      U02
Board type:    mPC
Board size:    Medium
Total flash:   2048kB
RAM:           1024kB
Built-in type:
Main cycle:    09.2 cycle/s
               0111ms
    
```

# 11 - SAFETY FUNCTIONS

## 11.1. Defrosting function

When the unit is working in HEATING mode, the defrosting of the outdoor coils is performed by cycle inversion in order to remove any ice which has accumulated on them.

In 2-circuits units the defrosting procedure will be independent, i.e., the one will not start until the first one finishes.

Defrosting is carried out in the following cases:

### • Defrosting by minimum pressure

When the pressure measured by the low pressure transducer drops below 2,5 bar (by default).

Note: If the unit tries to perform a 4th defrosting operation in less than an hour, this could be due to a lack of refrigerant caused by a small leak or failure in the expansion valve, which means that the control will trigger a low pressure alarm. This safety device is reset manually.

### • Defrosting by difference with the outdoor temperature

The defrosting function is activated if the difference between the outdoor temperature and the evaporation temperature exceeds 16°C (by default).

In addition to this condition, always it is necessary that:

- The outdoor temperature is lower than 10°C.
- The pressure measured by the low pressure transducer is lower than the initial value for defrosting, 5.6 bar.
- The time that must elapse from the last defrosting of the affected circuit has been exceeded, 20 minutes.
- The time that must elapse from the last defrosting of another circuit (units with 2 circuits) has been exceeded, 90 seconds.

## Defrosting operation

### • Starting defrosting

If one of the last cases is met, once the delay has elapsed at the start of defrosting, 120 seconds, the shut-down of the compressors will be triggered.

The regimen will be changed 30 seconds after the compressors are stopped, giving power to the 4-way valve. The compressors will be started up after 15 seconds, so that they can perform the defrosting procedure.

During the defrosting operation, the behaviour of the other unit components will be as follows:

- The indoor fan will continue to operate.
- the outdoor fans will be connected when a set pressure of 35 bar is exceeded, if the outdoor temperature is greater than -5°C. They will be disconnected if the pressure drops below 33 bar, the outdoor temperature drops below -6°C or a maximum connection time elapses.
- This action enables prolonging the duration of defrosting and, as such, the ice accumulated on the coil is completely removed.
- The optional backup device incorporate by the unit can be enabled: electrical heaters, hot water coil, gas burner or boiler.
- The outdoor air damper (optional) will remain closed, except for 100% fresh air units.
- The electrical heater of the preheating module, optional for 100% fresh air units, will be activated.
- The rotary heat exchanger (optional) will operate. In this case, the outdoor damper will remain open.

### • Ending defrosting

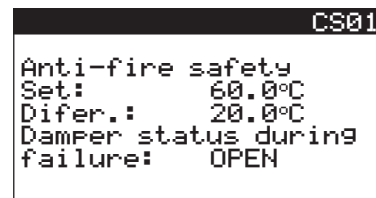
The following conditions must be met in order to end:

- By maximum time, after 10 minutes from the start.
- By pressure, when this exceeds 33 bar.
- By opening the high pressure pressostat. This alarm will not be indicated.

When the defrosting operation ends, the compressors stops, the four-way valve is reversed again and, after this, it will be possible to restart the compressors by the normal pressure control.

## 11.2. Anti-fire safety

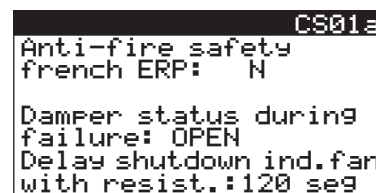
When the return air temperature exceeds a safety value the anti-fire safety device will be activated (60°C by default) and the unit will stop. It will not return to operation until the temperature has dropped to below 40°C.



In units with outdoor air damper it is possible to select the damper position in the event of an anti-fire alarm or when the units incorporates a smoke station (optional) connected to the digital input DI2 (connector J4).

The following functioning logic must be selected to comply with the French regulations on Fire safety (ERP).

- In case of failure of the thermal protection of the indoor fan, this fan and all components are stopped, the outdoor air damper is open to 100% (return air damper closed). Manual reset.
- In case of failure of the thermal protection of the electrical heaters, all components are stopped and the indoor fan after 120 seconds, the outdoor air damper is open to 100% (return air damper closed). Manual reset.



## 11.3. High supply temperature safety

In units with optional electrical heaters or gas burner, when the supply temperature exceeds 55°C, this optional will be shut down and will not be reconnected until this temperature drops below 53°C.

## 11.4. High or low indoor temperature safety

The control indicates an alarm event when the indoor temperature (return or ambient) drops below 15°C or exceeds 40°C.

This alarm is timed at 30 minutes.

## 11 - SAFETY FUNCTIONS

### 11.5. Compressor lock

In the event of a power cut-off for a period longer than 2 hours, the compressors will be locked. The unit must remain 8 hours consecutively with voltage to unlock the compressors.

The warning screen on the VecticGD also shows the remaining time until the end of the locking.

```
Warning          AU01
Compressor lock
for heating of the
crankcase heater (8h)
       7h 59m 35s
Active warning: 00
```

From a screen of the Group 08. **Service Par.** → **f. Working Hours** (protected by level 2 password) allows to reset this lock of compressors, but this shall be recorded in the data register of the control.

```
A01c1
Power ON
Time: 00:00
Date: 00/00/2000
Power OFF
Time: 00:00
Date: 00/00/2000
```

### 11.6. Protections against low temperature (optional)

The control can manage the following protections by means of the pCOe expansion card with address 8:

- Compressor with an additional crankcase heater
- Electrical heater for antifreeze protection of external dampers.
- Electrical heater for protecting the electric panel (1 or 2 stages).
- Hot water coil circuit with the GREAT COLD option. This protection includes an electrical heating for the piping layout.

### 11.7. Clogged filter detector (optional)

A clogged filter pressostat can be connected on the digital input DI6 (connector J4).

This protection can be configured for only signalling on the terminal (by default) or to stop the unit.

```
AL23
U:01
Clogged filter
alarm
(only indication)
No. active Al.: 00
```

### 11.8. Refrigerant leak detector (optional)

A refrigerant leak detector can be connected on the Field-bus of the control board by means of one serial card RS485, with address 6 (9600 bps, 8 bits, without parity and 2 stop bits).

When a concentration of gas established by parameter is exceeded, the alarm is activated and the unit is stopped.

The counter of the number of operating hours and days for the refrigerant gas detector is accessed in the Group of screens 08. **Service Par.** → **f. Working Hours** (protected by level 2 password).

```
A12h
Gas detector No.001
Running hours 00000h
              00000d
```

This information is very important to realize the maintenance tasks on the leakage detector:

- Annual test: To comply with the requirements of the EN378 and F GAS is necessary to perform a test of the detector every year.
- Every 3 years: a calibration is recommended.
- Every 5 / 6 years: change the detector element of the sensor and perform a calibration is recommended.

### 11.9. High temperature safety in tandem compressors (optional)

In units with tandem compressors, working in COOLING mode, when the outdoor coil pressure of a circuit overcomes a limit value (41,5 bar by default), one of the two compressors will be stopped, thereby avoiding the stop of both compressors due to the high pressure.

This compressor will start working again if the pressure drops below 36,5 bar.

### 11.10. High-speed safety on plug-fans (optional)

The VecticGD terminal can display a warning message when a plug-fan exceed the maximum permissible speed for a period of time longer than 30 minutes (by default).


This safety can be configured as indication only (default) or unit shutdown.

```
Warning          AU02
High rpm warning
Fan Addr: 001
(only indication)
maxim. speed: 0000 rpm
Active warning: 00
```



# 12 - ALARMS

## 12.1. Alarm display

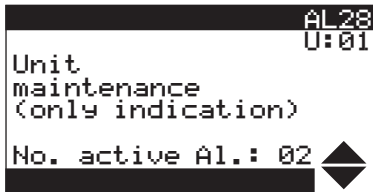
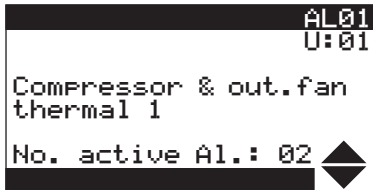
### On the VecticGD terminal:


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. For example:

For example:



By pressing this key  for a second time, the alarm(s) will be reset.

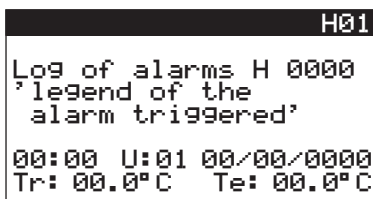
If no alarm is active, the message "No alarm active" appears.



Note: active warnings will also be displayed.

### Alarm History

From the MAIN MENU, the group of screens **11. Alarm History** is accessed.

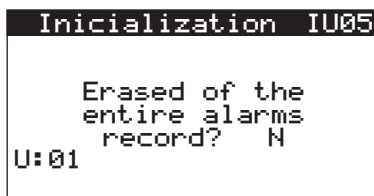
Each screen shows the description of the alarm, together with its date and time, the unit in which the VecticGD terminal is connected (U:01), as well as the ambient (or return) temperature (Tr) and the outdoor temperature existing at the time of the alarm.



By using the   keys, the last 100 alarms stored can be consulted.


The failures of electrical power supply also will remain registered.

From a screen of the Group 07. **Manufacturer Par.** (protected by level 3 password) is possible to delete the "Alarm History".





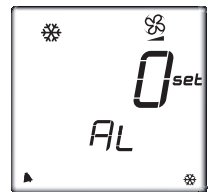
### On the TCO terminal (optional):

If the icon  appears on the TCO terminal display, there is/are active alarm(s).

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. One of those values may be an alarm code. If there is more than one alarm is indicated the code of the most important alarm, And below the symbol AL.



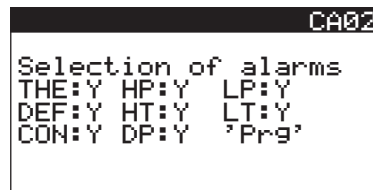
With the  key, it is possible to write on the display the value "0" in the place of the alarm. Pressing the  key will reset inactive alarms and will return to the main display.



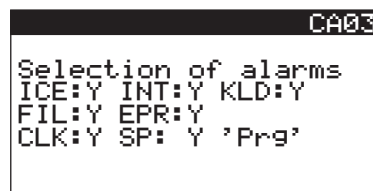
The icon  will disappear from the display if there is no active alarm.

## 12.2. Signalling of remote alarms (optional)


The digital output NO7 (connector J14) can be used to connect an relay for alarm signalling. The alarms that could activate the relay are selected on the Group **07. Manufacturer Par.** → **f. Alarm Config** (protected by level 3 password).



THE: Thermal  
 HP: High pressure  
 LP: Low pressure  
 DEF: Defrost  
 HT: High temperature  
 LT: Low temperature  
 CON: Counters  
 DP: Disconnected probes



ICE: Anti-freeze HWC  
 INT: Indoor fan safety / plug-fan without communication / anti-fire  
 KLD: Compressor discharge  
 FIL: Clogged filter  
 EPR: Eprom not OK  
 CLK: Clock  
 SP: Setpoint Winter / Summer

From these selection screens, by pressing the  key, access is given to additional information screens, indicating which alarm the acronym stands for.

## 12 - ALARMS

### 12.3. Alarm list

| Controlled alarms                                                                                          | Shutdown unit         | Shutdown affected circ. | Type of reset | Timing       | Actuation                                                                                                                                     | VectiGD | TCO    | Addr. |
|------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|---------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|-------|
| Thermal protection of compressors and outdoor fan(s) of circuit 1 or recovery circuit                      | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 1                                                                                                                         | AL01    | AL1    | 27    |
| Thermal protection of compressors and outdoor fan(s) of circuit 2                                          | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 2                                                                                                                         | AL02    | AL2    | 28    |
| High pressure of circuit 1 or recovery circuit                                                             | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 1                                                                                                                         | AL05    | AL5    | 29    |
| High pressure of circuit 2                                                                                 | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 2                                                                                                                         | AL06    | AL6    | 30    |
| 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 s)    | HEATING mode: this closes outdoor air damper and opens hot water coil valve<br>COOLING mode: this stops compressors and closes outdoor damper | AL09    | AL9    | 31    |
| High indoor temperature                                                                                    | No                    | No                      | Manual        | Yes (progr.) | Only indication                                                                                                                               | AL10    | AL10   | 34    |
| Low indoor temperature                                                                                     | No                    | No                      | Manual        | Yes (progr.) | Only indication                                                                                                                               | AL11    | AL11   | 35    |
| Low pressure of circuit 1 or recovery circuit (possible gas leak in the circuit)                           | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 1                                                                                                                         | AL12    | AL12   | 38    |
| Low pressure of circuit 2 (possible gas leak in the circuit)                                               | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 2                                                                                                                         | AL13    | AL13   | 39    |
| Low pressure due to continuous defrosting by min. pressure of circuit 1 (possible gas leak in the circuit) | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 1                                                                                                                         | AL12b   | AL1202 | 225   |
| Low pressure due to continuous defrosting by min. pressure of circuit 2 (possible gas leak in the circuit) | No                    | Yes                     | Auto (*)      | No           | Shutdown of circuit 2                                                                                                                         | AL12c   | AL1203 | 226   |
| Maintenance of compressor 1 - circuit 1                                                                    | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL16    | AL16   | 36    |
| Maintenance of compressor 1 - circuit 2                                                                    | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL17    | AL17   | 37    |
| Maintenance of compressor 2 - circuit 1                                                                    | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL18    | AL18   | 122   |
| Maintenance of compressor 2 - circuit 2                                                                    | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL19    | AL19   | 123   |
| Thermal protection of indoor fan                                                                           | Yes                   | Yes                     | Manual        | 0 s          | Serious alarm, unit shutdown                                                                                                                  | AL20    | AL20   | 40    |
| Failure of high pressure transducer of circuit 1 or recovery circuit                                       | No                    | Yes                     | Auto          | No           | Shutdown of circuit 1                                                                                                                         | AL21    | AL21   | 41    |
| Failure of high pressure transducer of circuit 2                                                           | No                    | Yes                     | Auto          | No           | Shutdown of circuit 2                                                                                                                         | AL22    | AL22   | 42    |
| Failure of low pressure transducer of circuit 1 or recovery circuit                                        | No                    | Yes                     | Auto          | No           | Shutdown of circuit 1                                                                                                                         | AL21b   | AL2102 | 212   |
| Failure of low pressure transducer of circuit 2                                                            | No                    | Yes                     | Auto          | No           | Shutdown of circuit 2                                                                                                                         | AL21c   | AL2103 | 213   |
| Failure of suction temperature probe of circuit 1 or recovery circuit                                      | No                    | No                      | Auto          | No           | Only indication                                                                                                                               | AL21d   | AL2104 |       |
| Failure of suction temperature probe of circuit 2                                                          | No                    | No                      | Auto          | No           | Only indication                                                                                                                               | AL22d   | AL2204 |       |
| Clogged filters                                                                                            | No                    | No                      | Manual        | Yes (5 s)    | Only indication or unit shutdown (configurable by parameter)                                                                                  | AL23    | AL23   | 43    |
| Thermistor of electrical heaters                                                                           | No                    | No                      | Auto (*)      | No           | Shutdown of electrical heaters                                                                                                                | AL24    | AL24   | 48    |
| Gas burner or boiler                                                                                       | No                    | No                      | Manual        | No           | Only indication (safety into the burner/boiler)                                                                                               | AL24    | AL24   | 48    |
| Thermistor of electrical heater for preheating in the fresh air                                            | No                    | No                      | Auto (*)      | No           | Shutdown of electrical heater for preheating in the fresh air                                                                                 | AL24a   | AL24a  | 297   |
| 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   |
| Failure of 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   |
| Failure of ambient temperature probe No.1                                                                  | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL30c   | AL3003 | 164   |
| Failure of 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   |
| Failure of ambient temperature probe No.2                                                                  | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL30f   | AL3006 | 176   |
| Failure of ambient humidity probe No.3                                                                     | No                    | No                      | Manual        | No           | Only indication                                                                                                                               | AL30g   | AL3007 |       |
| RS485 probe No.3 without communication                                                                     | No                    | No                      | Auto          | No           | Only indication                                                                                                                               | AL30h   | AL3008 |       |

(\*) If a certain number of alarms take place over a period of time, this reset can be changed to "Manual" (configurable by parameters).

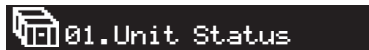
## 12 - ALARMS

| Controlled alarms                                                          | Shutdown unit         | Shutdown affected circ. | Type of reset | Timing        | Actuation                                                                                         | VectricGD | TCO    | Addr. |
|----------------------------------------------------------------------------|-----------------------|-------------------------|---------------|---------------|---------------------------------------------------------------------------------------------------|-----------|--------|-------|
| Failure of ambient temperature probe No.3                                  | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL30i     | AL3009 |       |
| Failure of ambient humidity probe No.4                                     | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL30j     | AL3010 |       |
| RS485 probe No.4 without communication                                     | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL30k     | AL3011 |       |
| Failure of ambient temperature probe No.4                                  | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL30l     | AL3012 |       |
| pLAN network probe: T, RH or CO <sub>2</sub> without communication         | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL31      | AL31   | 110   |
| Failure of the outdoor temperature probe                                   | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL32      | AL32   | 111   |
| Failure of the indoor humidity probe                                       | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL33      | AL33   | 112   |
| Failure of the outdoor humidity probe                                      | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL34      | AL34   | 113   |
| Failure of the supply temperature probe                                    | No                    | No                      | Manual        | No            | Only indication                                                                                   | AL35      | AL35   | 114   |
| Failure of the mixing temperature probe or the 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   |
| Discharge temperature on compressors of circuit 1 exceeded                 | No                    | Yes                     | Auto          | No            | Shutdown of circuit 1                                                                             | AL37      | AL37   | 126   |
| Discharge temperature on compressors of circuit 2 exceeded                 | No                    | Yes                     | Auto          | No            | Shutdown of circuit 2                                                                             | AL38      | AL38   | 127   |
| Anti-fire safety device / smoke detection                                  | Yes                   | Yes                     | Manual        | No            | Serious alarm, shut-down of the unit and outdoor damper open / closed (configurable by parameter) | AL39      | AL39   | 136   |
| Supply temperature limit exceeded                                          | No                    | No                      | Manual        | No            | Shutdown of electrical heaters or gas burner/boiler                                               | AL40      | AL40   | 166   |
| pCOe expansion card address 8 without communication                        | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL45b     | AL4502 | 211   |
| pCOe expansion card address 8 fault alarm                                  | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL45g     | AL4507 | 210   |
| pCOe expansion card address 9 without communication                        | No                    | Yes                     | Auto          | No            | Unit shutdown and dampers on the previous position to the alarm                                   | AL45c     | AL4503 | ---   |
| pCOe expansion card address 9 fault alarm                                  | No                    | No                      | Auto          | No            | Unit shutdown and dampers on the previous position to the alarm                                   | AL45h     | AL4508 | ---   |
| Energy meter without communication                                         | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL46      | AL46   | 192   |
| Supply plug-fan without communication                                      | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL47      | AL47   | 201   |
| Failure of the pressure sensor for air flow control (supply 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   |
| Failure of the pressure sensor for air flow control (return plug-fan)      | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL50      | AL50   | 206   |
| Failure of the leak detector sensor                                        | Yes                   | Yes                     | Manual        | Yes (60 s)    | Unit shutdown                                                                                     | AL51a     | AL5101 | 83    |
| Gas leak detected                                                          | Yes                   | Yes                     | Manual        | Yes (60 s)    | Unit shutdown                                                                                     | AL51b     | AL5102 | 82    |
| Leak detector without communication                                        | Yes                   | Yes                     | Manual        | Yes (30 s)    | Unit shutdown                                                                                     | AL51c     | AL5103 | 81    |
| TCO terminal without communication                                         | No                    | No                      | Auto          | No            | Only indication                                                                                   | ---       | AL6301 | ---   |
| TCO with failure in the internal temperature sensor                        | No                    | No                      | Auto          | No            | Only indication                                                                                   | ---       | AL6302 | ---   |
| Water inlet T probe on the hot water coil (pCOe expansion card address 8)  | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL64      | AL64   | 221   |
| Anti-freeze alarm on the hot water coil (pCOe expansion card address 8)    | 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   | 222   |
| Water outlet T probe on the hot water coil (pCOe expansion card address 8) | 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   | 223   |
| Failure of the ambient air temperature probe (NTC)                         | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL67      | AL67   | 224   |
| Failure of the recovery temp. probe on the wheel (recovery heat exchanger) | No                    | No                      | Auto          | No            | Shutdown of the rotary heat exchanger                                                             | AL69      | AL69   |       |
| Failure in the supply damper (pCOe expansion card address 9)               | Yes                   | Yes                     | Auto          | Yes (150 s)   | Unit shutdown                                                                                     | AL70      | AL70   |       |
| Failure in the return damper (pCOe expansion card address 9)               | Yes                   | Yes                     | Auto          | Yes (150 s)   | Unit shutdown                                                                                     | AL71      | AL71   |       |
| SMALL board without communication (recovery circuit)                       | No                    | No                      | Auto          | No            | Only indication                                                                                   | AL99      | AL99   |       |
| Power cut-off for a period longer than 2 hours                             | Yes                   | Yes                     | Auto          | Yes (2 hours) | Blocking of compressors for 8 hours to ensure heating of the crankcase heater                     | AV01      |        |       |
| Warning whenever the supply fan speed limit (rpm) is exceeded              | No                    | No                      | Auto          | Yes (30 min)  | Only indication<br>Note: Unit shutdown by parameter                                               | AV02      |        |       |
| Warning whenever the return fan speed limit (rpm) is exceeded              | No                    | No                      | Auto          | Yes (30 min)  | Only indication<br>Note: Unit shutdown by parameter                                               | AV02      |        |       |

## 13 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

**Important:** All parameters of level “1” are visible to the final user without any password. Parameters with levels of access “2” and “3” are protected by passwords and they can be found in the complete brochure of the Vecvic control.

### Parameters of “Unit Status”



| Screen | Parameter                 | Description of the parameter                                                   | Value | Min.  | Max. | UOM   | Type    | R/W | Add. BMS |
|--------|---------------------------|--------------------------------------------------------------------------------|-------|-------|------|-------|---------|-----|----------|
| P01    | PLAN_ADDRESS              | Address of the unit in the pLAN network                                        | 0     | 0     | 0    | ---   | Integer | R   |          |
| P01    | HORA                      | Clock: hour                                                                    | 0     | 0     | 0    | h     | Integer | R   | 48       |
| P01    | MINUTO                    | Clock: minute                                                                  | 0     | 0     | 0    | min   | Integer | R   | 47       |
| P01    | MODO_VENT                 | VENTILATION operating mode                                                     | 0     | 0     | 1    | ---   | Digital | R   | 236      |
| P01    | MODO_FRIO                 | COOLING operating mode                                                         | 0     | 0     | 1    | ---   | Digital | R   |          |
| P01    | GLOBAL_ALARM              | Signal of active alarms                                                        | 0     |       |      | ---   | Digital | R   | 26       |
| P01    | TEMP_INT                  | Indoor temperature for regulation of the unit                                  | 0.0   | -99.9 | 0.0  | °C    | Analog. | R   | 291      |
| P01    | TEMP_EXT                  | Temperature of the outdoor air                                                 | 0.0   | -99.9 | 0.0  | °C    | Analog. | R   | 2        |
| P01    | HUM_INT                   | Indoor relative humidity for regulation of the unit                            | 0.0   | 0.0   | 0.0  | %rH   | Analog. | R   | 5        |
| P01    | ESTADO_EQUIPO             | Unit status (ON, OFF, remote OFF, OFF by phase)                                | 0     | 0     | 0    | ---   | Integer | R   |          |
| P01    | ON_FASCE                  | Indication of unit switch-on by schedule programming                           | 0     |       |      | ---   | Digital | R   |          |
| P01    | DESHUMIDIFICA             | Indication of active dehumidifier                                              | 0     |       |      | ---   | Digital | R   |          |
| P01    | HUMIDIFICA                | Indication of active humidifier                                                | 0     | 0     | 1    | ---   | Digital | R   | 22       |
| P01    | ON_COMPENSACION           | Indication of active compensation                                              | 0     |       |      | ---   | Digital | R   |          |
| P01    | ON_DESESCARCHE            | Indication of active defrosting                                                | 0     |       |      | ---   | Digital | R   | 183      |
| P01    | ON_FREECOOL               | Indication of active free-cooling                                              | 0     |       |      | ---   | Digital | R   | 184      |
| P01    | ON_FREEHEAT               | Indication of active free-heating                                              | 0     |       |      | ---   | Digital | R   | 185      |
| P01    | LAMP_COMPRESOR            | Indication of compressors in operation                                         | 0     | 0     | 1    | ---   | Digital | R   |          |
| P01    | LAMP_VINT                 | Indication of indoor fans in operation                                         | 0     | 0     | 1    | ---   | Digital | R   |          |
| P01    | LAMP_RESISTENCIA          | Indication of electrical heaters in operation                                  | 0     | 0     | 1    | ---   | Digital | R   |          |
| P01    | ON_LIMITE_TEMP_IMPULSION  | Indication of unit in operation with limit of supply temperature               | 0     | 0     | 1    | ---   | Digital | R   | 238      |
| P02    | HORA                      | Clock: hour                                                                    | 0     | 0     | 0    | h     | Integer | R   | 48       |
| P02    | MINUTO                    | Clock: minute                                                                  | 0     | 0     | 0    | min   | Integer | R   | 47       |
| P02    | DIA                       | Clock: day                                                                     | 0     | 0     | 0    | day   | Integer | R   | 49       |
| P02    | MES                       | Clock: month                                                                   | 0     | 0     | 0    | month | Integer | R   | 50       |
| P02    | ANO                       | Clock: year                                                                    | 0     | 0     | 0    | year  | Integer | R   | 51       |
| P02    | MODO_FRIO                 | VENTILATION operating mode                                                     | 0     | 0     | 1    | ---   | Digital | R   |          |
| P02    | MODO_VENT                 | COOLING operating mode                                                         | 0     | 0     | 1    | ---   | Digital | R   | 236      |
| P02    | GLOBAL_ALARM              | Signal of active alarms                                                        | 0     |       |      | ---   | Digital | R   | 26       |
| P02    | SET_TEMP_DISPLAY          | Active setpoint temperature                                                    | 0.0   | 0.0   | 0.0  | °C    | Analog. | R   |          |
| P02    | ESTADO_EQUIPO             | ON/OF unit status                                                              | 0     | 0     | 0    | ---   | Integer | R   |          |
| P02    | ON_FASCE                  | Indication of unit switch-on by schedule programming                           | 0     |       |      | ---   | Digital | R   |          |
| P02    | DESHUMIDIFICA             | Indication of active dehumidifier                                              | 0     |       |      | ---   | Digital | R   |          |
| P02    | HUMIDIFICA                | Indication of active humidifier                                                | 0     | 0     | 1    | ---   | Digital | R   | 22       |
| P02    | ON_COMPENSACION           | Indication of active compensation                                              | 0     |       |      | ---   | Digital | R   |          |
| P02    | ON_DESESCARCHE            | Indication of active defrosting                                                | 0     |       |      | ---   | Digital | R   | 183      |
| P02    | ON_FREECOOL               | Indication of active free-cooling                                              | 0     |       |      | ---   | Digital | R   | 184      |
| P02    | ON_FREEHEAT               | Indication of active free-heating                                              | 0     |       |      | ---   | Digital | R   | 185      |
| P02    | LAMP_COMPRESOR            | Indication of compressors in operation                                         | 0     | 0     | 1    | ---   | Digital | R   |          |
| P02    | LAMP_VINT                 | Indication of indoor fans in operation                                         | 0     | 0     | 1    | ---   | Digital | R   |          |
| P02    | LAMP_RESISTENCIA          | Indication of electrical heaters in operation                                  | 0     | 0     | 1    | ---   | Digital | R   |          |
| P02    | ON_LIMITE_TEMP_IMPULSION  | Indication of unit in operation with limit of supply temperature               | 0     | 0     | 1    | ---   | Digital | R   | 238      |
| P03    | PLAN_ADDRESS              | Address of the unit in the pLAN network                                        | 0     | 0     | 0    | ---   | Integer | R   |          |
| P03    | HAB_SUPERVISION           | Enabling the supervision serial card (optional)                                | 1     | 0     | 1    | ---   | Digital | R   | 50       |
| P03    | TIPO_PROT_COM             | Supervision protocol (Carel, Modbus or Lonworks)                               | 1     | 0     | 0    | ---   | Integer | R   |          |
| P03    | BMS_ADDRESS               | Address of the unit in the supervision network                                 | 1     | 0     | 0    | ---   | Integer | R   |          |
| P03    | BAUD_RATE                 | Bits rate (0=1200, 1=2400, 2=4800, 3=9600, 4=19200)                            | 4     | 0     | 4    | ---   | Integer | R   |          |
| P03    | PROT_MODBUS_EXTENDIDO     | Modbus extended                                                                | 1     | 0     | 1    | ---   | Digital | R   |          |
| P03    | Stop_bits_Number_MB       | Bit stop number (1 or 2)                                                       | 0     | 0     | 1    | ---   | Digital | R   |          |
| P03    | Parity_Type_MB            | Type of parity (no parity, odd or even)                                        | 0     | 0     | 2    | ---   | Integer | R   |          |
| P04    | MODELO_EQUIPO             | Unit model                                                                     | 0     | 0     | 40   | ---   | Integer | R   | 58       |
| P04    | INFO_EQUIPO_1             | Unit information: air-air, cooling-only, reversible                            | 1     | 0     | 9    | ---   | Integer | R   | 191      |
| P04    | INFO_EQUIPO_2             | Unit information: compressors-circuits (0,2c-1c,4c-2c) + recovery              | 1     | 0     | 99   | ---   | Integer | R   | 192      |
| P04    | UNICO_VOL_AIRE_EXT_CIRC_2 | Selection of single-volume of outdoor air in 2-circuits units                  | 0     | 0     | 1    | ---   | Digital | R   |          |
| P04    | TIPO_VENT_EXT             | Type of outdoor fan (3=2-speeds, 4=electronic)                                 | 4     | 1     | 4    | ---   | Integer | R   | 1        |
| P04    | INFO_EQUIPO_3             | Unit information: with electrical heaters - gas burner/boiler - hot water coil | 1     | 0     | 9    | ---   | Integer | R   | 193      |
| P04    | TIPO_REFRIGERANTE         | Type of refrigerant (4=R410A)                                                  | 4     | 0     | 4    | ---   | Integer | R   | 43       |
| P04    | NUM_WO_DIG_1              | Work order number of the unit (digit 1)                                        | 0     | 0     | 9    | ---   | Integer | R   | 185      |



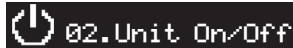
# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Unit Status" (...continuation)



| Screen | Parameter    | Description of the parameter            | Value | Min. | Max. | UOM | Type    | R/W | Add. BMS |
|--------|--------------|-----------------------------------------|-------|------|------|-----|---------|-----|----------|
| P04    | NUM_WO_DIG_2 | Work order number of the unit (digit 2) | 0     | 0    | 9    | --- | Integer | R   | 186      |
| P04    | NUM_WO_DIG_3 | Work order number of the unit (digit 3) | 0     | 0    | 9    | --- | Integer | R   | 187      |
| P04    | NUM_WO_DIG_4 | Work order number of the unit (digit 4) | 0     | 0    | 9    | --- | Integer | R   | 188      |
| P04    | NUM_WO_DIG_5 | Work order number of the unit (digit 5) | 0     | 0    | 9    | --- | Integer | R   | 189      |
| P04    | NUM_WO_DIG_6 | Work order number of the unit (digit 6) | 0     | 0    | 9    | --- | Integer | R   | 190      |
| P04    | NUM_WO_DIG_7 | Work order number of the unit (digit 7) | 0     | 0    | 9    | --- | Integer | R   | 191      |
| P04    | NUM_WO_DIG_8 | Work order number of the unit (digit 8) | 0     | 0    | 9    | --- | Integer | R   | 192      |

## Parameters of "Unit On/Off"



| Screen | Parameter | Description of the parameter                                                                    | Value | Min. | Max. | UOM | Type    | R/W | Add. BMS |
|--------|-----------|-------------------------------------------------------------------------------------------------|-------|------|------|-----|---------|-----|----------|
| PM01   | SYS_ON    | Selection of the unit ON/OFF by keyboard or remote:<br>0: Switch-off (Off)<br>1: Switch-on (On) | 0     | 0    | 1    | --- | Digital | R/W | 65       |

## Parameters of "Setpoint"



| Screen | Parameter                                               | Description of the parameter                                                         | Value | Min.               | Max.               | UOM | Type    | R/W | Add. BMS |
|--------|---------------------------------------------------------|--------------------------------------------------------------------------------------|-------|--------------------|--------------------|-----|---------|-----|----------|
| S01zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_FRIO_T11  | Temperature setpoint in COOLING mode (summer) in the terminal of zone 1 (air zoning) | 26.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 283      |
| S01zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_CALOR_T11 | Temperature setpoint in HEATING mode (winter) in the terminal of zone 1 (air zoning) | 21.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 284      |
| S02zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_FRIO_T12  | Temperature setpoint in COOLING mode (summer) in the terminal of zone 2 (air zoning) | 26.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 285      |
| S02zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_CALOR_T12 | Temperature setpoint in HEATING mode (winter) in the terminal of zone 2 (air zoning) | 21.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 286      |
| S03zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_FRIO_T13  | Temperature setpoint in COOLING mode (summer) in the terminal of zone 3 (air zoning) | 26.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 287      |
| S03zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_CALOR_T13 | Temperature setpoint in HEATING mode (winter) in the terminal of zone 3 (air zoning) | 21.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 288      |
| S04zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_FRIO_T14  | Temperature setpoint in COOLING mode (summer) in the terminal of zone 4 (air zoning) | 26.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 289      |
| S04zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>SET_POINT_TEMP_CALOR_T14 | Temperature setpoint in HEATING mode (winter) in the terminal of zone 4 (air zoning) | 21.0  | 0.0                | 50.0               | °C  | Analog. | R/W | 290      |
| S01    | SET_POINT_TEMP_FRIO                                     | Temperature setpoint in COOLING mode (summer)                                        | 26.0  | LIM_INF_TEMP_FRIO  | LIM_SUP_TEMP_FRIO  | °C  | Analog. | R/W | 15       |
| S01    | SET_POINT_TEMP_CALOR                                    | Temperature setpoint in HEATING mode (winter)                                        | 21.0  | LIM_INF_TEMP_CALOR | LIM_SUP_TEMP_CALOR | °C  | Analog. | R/W | 16       |
| S02    | SET_POINT_HUM                                           | Indoor humidity setpoint                                                             | 50.0  | LIM_INF_HUM        | LIM_SUP_HUM        | %rH | Analog. | R/W | 18       |
| S02    | HAB_SONDA_HUM_INT_VIRTUAL                               | Enabling the pLAN indoor humidity probe                                              | 0     | 0: no              | 1: yes             | --- | Digital | R   |          |
| S03    | SET_COMPRESOR_EN_FRIO                                   | Calculation of setpoints: Setpoint in COOLING mode (summer) + Dead Zone / 2          | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_COMPRESOR_EN_CALOR                                  | Calculation of setpoints: Setpoint In HEATING mode (winter) + Dead Zone / 2          | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_TEMP_COMPRESOR                                      | Current selection of the setpoint                                                    | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_RES_EN_FRIO                                         | Calculation of setpoints: Setpoint of the electrical heaters in COOLING mode         | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_RES_EN_CALOR                                        | Calculation of setpoints: Setpoint of the electrical heaters in HEATING mode         | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_TEMP_RES                                            | Current selection of setpoint for electrical heaters                                 | 0.0   | 0.0                | 99.9               | °C  | Analog. | R   |          |
| S03    | SET_VLV_CALOR_EN_FRIO                                   | Calculation of setpoints: Setpoint of the hot water coil in COOLING mode             | 0.0   | 0.0                | 99.9               | °C  | Analog. | R/W |          |
| S03    | SET_VLV_CALOR_EN_CALOR                                  | Calculation of setpoints: Setpoint of the hot water coil in HEATING mode             | 0.0   | 0.0                | 99.9               | °C  | Analog. | R/W |          |
| S03    | SET_VLV_CALOR                                           | Current selection of setpoint for the hot water coil                                 | 0.0   | 0.0                | 99.9               | °C  | Analog. | R/W |          |
| S03    | SET_FCOOL_VER                                           | Calculation of setpoints: free-cooling in summer                                     | 00.0  | -99.9              | 99.9               | --- | Integer | R   |          |
| S03    | SET_FCOOL_INV                                           | Calculation of setpoints: free-cooling in winter                                     | 00.0  | -99.9              | 99.9               | --- | Integer | R   |          |
| S03    | SET_FHEAT                                               | Calculation of setpoints: free-heating                                               | 00.0  | -99.9              | 99.9               | --- | Integer | R   |          |
| S04    | SET_IMPULSION_FRIO_CAL                                  | Supply setpoint calculated in COOLING mode                                           | 7.0   | 0.0                | 30.0               | °C  | Analog. | R   | 122      |
| S04    | SET_IMPULSION_CALOR_CAL                                 | Supply setpoint calculated in HEATING mode                                           | 45.0  | 0.0                | 55.0               | °C  | Analog. | R   | 121      |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Summer/Winter"



| Screen | Parameter                     | Description of the parameter                                                                                               | Value | Min. | Max. | UOM | Type    | R/W | Add. BMS |
|--------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------|------|------|-----|---------|-----|----------|
| FC01   | SEL_FRIO_CALOR                | Procedures for the selection of the COOLING/HEATING mode:<br>0: by keyboard<br>1: unused<br>2: auto<br>3: only ventilation | 0     | 0    | 3    | --- | Integer | R/W | 59       |
| FC01   | MODO_FRIO_CALOR_AUTO          | COOLING/HEATING selection in AUTO:<br>0: by indoor temperature<br>1: by outdoor temperature                                | 1     | 0    | 1    | --- | Digital | R/W | 232      |
| FC01   | CALOR_FRIO_PANEL              | COOLING/HEATING selection by keyboard:<br>0: HEATING (winter)<br>1: COOLING (summer)                                       | 1     | 0    | 1    | --- | Digital | R/W | 66       |
| FC01   | SET_TEMP_EXT_CAMBIO_FRIO      | Outdoor temperature setpoint for change to COOLING mode (in AUTO mode)                                                     | 22.0  | 99.9 | 99.9 | °C  | Analog. | R/W | 223      |
| FC01   | SET_TEMP_EXT_CAMBIO_CALOR     | Outdoor temperature setpoint for change to HEATING mode (in AUTO mode)                                                     | 20.0  | 99.9 | 99.9 | °C  | Analog. | R/W | 222      |
| FC01   | PGD1_bloqueado_SEL_FRIO_CALOR | Enabling of the blocking of summer / winter selection in the VecticGD (so that the final user cannot change it)            | 0     | 0    | 1    | --- | Digital | R/W | 240      |

## Parameters of "Clock/Scheduler"



| Screen | Parameter                       | Description of the parameter                                                                                                                                                      | Value | Min. | Max. | UOM   | Type    | R/W | Add. BMS |
|--------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|-------|---------|-----|----------|
| PH01   | TIPO_RELOJ                      | Type of clock (No, Actual, pLAN)                                                                                                                                                  | 1     | 0    | 2    | ---   | Integer | R/W | 57       |
| PH01   | HORA                            | Setting the clock: hour                                                                                                                                                           | 0     | 0    | 23   | h     | Integer | R/W | 48       |
| PH01   | NEW_HOUR                        | Setting the clock: new hour                                                                                                                                                       | 0     | 0    | 23   | h     | Integer | R/W |          |
| PH01   | NEW_MINUTE                      | Setting the clock: new minute                                                                                                                                                     | 0     | 0    | 59   | min   | Integer | R/W |          |
| PH01   | MINUTO                          | Setting the clock: minute                                                                                                                                                         | 0     | 0    | 59   | min   | Integer | R/W | 47       |
| PH01   | NEW_DAY                         | Setting the clock: new day                                                                                                                                                        | 0     | 0    | 31   | day   | Integer | R/W |          |
| PH01   | DIA                             | Setting the clock: day                                                                                                                                                            | 0     | 0    | 31   | day   | Integer | R/W | 49       |
| PH01   | NEW_MONTH                       | Setting the clock: new month                                                                                                                                                      | 0     | 0    | 12   | month | Integer | R/W |          |
| PH01   | MES                             | Setting the clock: month                                                                                                                                                          | 0     | 0    | 12   | month | Integer | R/W | 50       |
| PH01   | ANO                             | Setting the clock: year                                                                                                                                                           | 0     | 0    | 99   | year  | Integer | R/W | 51       |
| PH01   | NEW_YEAR                        | Setting the clock: new year                                                                                                                                                       | 0     | 0    | 99   | year  | Integer | R/W |          |
| PH01   | DIA_SEMANA                      | Day of the week                                                                                                                                                                   | 0     | 0    | 0    | day   | Integer | R/W | 52       |
| PH02   | MOD_DST_CIA1_1.En_DST           | Activation of the schedule programming                                                                                                                                            | 1     | 0    | 1    | ---   | Digital | R/W |          |
| PH02   | MOD_DST_CIA1_1.DST_Minute       | Transition time: it is necessary to add 60 minutes, thus obtaining the summer schedule (hourly changes in the European Union)                                                     | 0     | 0    | 240  | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.Srt_DST_MonthW   | Starting date for the implementation of change: day of the month                                                                                                                  | 0     | 0    | 4    | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.Srt_DST_Week     | Starting date for the implementation of change: week                                                                                                                              | 0     | 0    | 7    | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.Srt_DST_Month    | Starting date for the implementation of change: month                                                                                                                             | 0     | 0    | 12   | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.Srt_DST_Hour     | Starting date for the implementation of change: hour                                                                                                                              | 0     | 0    | 23   | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.End_DST_MonthW   | Completion date for the implementation of change: day of the month                                                                                                                | 0     | 0    | 4    | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.End_DST_Week     | Completion date for the implementation of change: week                                                                                                                            | 0     | 1    | 7    | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.End_DST_Month    | Completion date for the implementation of change: month                                                                                                                           | 0     | 1    | 12   | ---   | Integer | R/W |          |
| PH02   | MOD_DST_CIA1_1.End_DST_Hour     | Completion date for the implementation of change: hour                                                                                                                            | 0     | 0    | 23   | ---   | Integer | R/W |          |
| PH03   | TIPO_PROG_HORARIA               | Type of start-up:<br>0 = ON/OFF schedule<br>1 = Schedule only setpoint change<br>2 = ON/OFF schedule with limit SET of ON<br>3 = Forced<br>4 = 3 setpoints schedule + OFF of unit | 3     | 0    | 4    | ---   | Integer | R/W | 71       |
| PH03   | ARR_FORZADO                     | Forced start-up                                                                                                                                                                   | 0     |      |      | ---   | Digital | R/W | 120      |
| PH03   | TIME_ARR_FORZADO                | On time with forced start-up                                                                                                                                                      | 2     | 1    | 999  | h     | Integer | R/W | 73       |
| PH03   | HAB_BLOQ_COMP_ON_FASE_LIM_FRIO  | Disable the compressors in summer with "ON/OFF schedule with limit SET of ON" (nocturnal freecooling)                                                                             | 0     | 0    | 1    | ---   | Digital | R/W | 72       |
| PH03   | HAB_BLOQ_RENOVACION_ON_FASE_LIM | Disable the outdoor air renewal with "ON/OFF schedule with limit SET of ON" (nocturnal operation)                                                                                 | 0     | 0    | 1    | ---   | Digital | R/W | 73       |
| PH04   | H_ARR_1A                        | Start-up hour of slot 1- program 1                                                                                                                                                | 6     | 0    | 23   | h     | Integer | R/W | 74       |
| PH04   | M_ARR_1A                        | Start-up minute of slot 1-program 1                                                                                                                                               | 30    | 0    | 59   | min   | Integer | R/W | 75       |
| PH04   | H_PAR_1A                        | Stop hour of slot 1 - program 1                                                                                                                                                   | 11    | 0    | 23   | h     | Integer | R/W | 76       |
| PH04   | M_PAR_1A                        | Stop minute of slot 1 - program 1                                                                                                                                                 | 0     | 0    | 59   | min   | Integer | R/W | 77       |
| PH04   | H_ARR_1B                        | Start-up hour of slot 2 - program 1                                                                                                                                               | 11    | 0    | 23   | h     | Integer | R/W | 78       |
| PH04   | M_ARR_1B                        | Start-up minute of slot 2 - program 1                                                                                                                                             | 30    | 0    | 59   | min   | Integer | R/W | 79       |
| PH04   | H_PAR_1B                        | Stop hour of slot 2 - program 1                                                                                                                                                   | 13    | 0    | 23   | h     | Integer | R/W | 80       |
| PH04   | M_PAR_1B                        | Stop minute of slot 2 - program 1                                                                                                                                                 | 30    | 0    | 59   | min   | Integer | R/W | 81       |
| PH04   | H_ARR_1C                        | Start-up hour of slot 3 - program 1                                                                                                                                               | 15    | 0    | 23   | h     | Integer | R/W | 82       |
| PH04   | M_ARR_1C                        | Start-up minute of slot 3 - program 1                                                                                                                                             | 0     | 0    | 59   | min   | Integer | R/W | 83       |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Clock/Scheduler" (...continuation)



| Screen | Parameter                                   | Description of the parameter                                        | Value | Min.  | Max.      | UOM | Type    | R/W | Add. BMS |
|--------|---------------------------------------------|---------------------------------------------------------------------|-------|-------|-----------|-----|---------|-----|----------|
| PH04   | H_PAR_1C                                    | Stop hour of slot 3 - program 1                                     | 19    | 0     | 23        | h   | Integer | R/W | 84       |
| PH04   | M_PAR_1C                                    | Stop minute of slot 3 - program 1                                   | 0     | 0     | 59        | min | Integer | R/W | 85       |
| PH05   | H_ARR_2A                                    | Start-up hour of slot1 - program 2                                  | 8     | 0     | 23        | h   | Integer | R/W | 86       |
| PH05   | M_ARR_2A                                    | Start-up minute of slot 1 - program 2                               | 0     | 0     | 59        | min | Integer | R/W | 87       |
| PH05   | H_PAR_2A                                    | Stop hour of slot 1 - program 2                                     | 14    | 0     | 23        | h   | Integer | R/W | 88       |
| PH05   | M_PAR_2A                                    | Stop minute of slot 1 - program 2                                   | 0     | 0     | 59        | min | Integer | R/W | 89       |
| PH05   | H_ARR_2B                                    | Start-up hour of slot 2 - program 2                                 | 17    | 0     | 23        | h   | Integer | R/W | 90       |
| PH05   | M_ARR_2B                                    | Start-up minute of slot 2 - program 2                               | 0     | 0     | 59        | min | Integer | R/W | 91       |
| PH05   | H_PAR_2B                                    | Stop hour of slot 2 - program 2                                     | 20    | 0     | 23        | h   | Integer | R/W | 92       |
| PH05   | M_PAR_2B                                    | Stop minute of slot 2 - program 2                                   | 30    | 0     | 59        | min | Integer | R/W | 93       |
| PH05   | H_ARR_2C                                    | Start-up hour of slot 3 - program 2                                 | 0     | 0     | 23        | h   | Integer | R/W | 94       |
| PH05   | M_ARR_2C                                    | Start-up minute of slot 3 - program 2                               | 0     | 0     | 59        | min | Integer | R/W | 95       |
| PH05   | H_PAR_2C                                    | Stop hour of slot 3 - program 2                                     | 0     | 0     | 23        | h   | Integer | R/W | 96       |
| PH05   | M_PAR_2C                                    | Stop minute of slot 3 - program 2                                   | 0     | 0     | 59        | min | Integer | R/W | 97       |
| PH06   | H_ARR_3A                                    | Start-up hour of slot 1 - program 3                                 | 7     | 0     | 23        | h   | Integer | R/W | 98       |
| PH06   | M_ARR_3A                                    | Start-up minute of slot 1 - program 3                               | 0     | 0     | 59        | min | Integer | R/W | 99       |
| PH06   | H_PAR_3A                                    | Stop hour of slot 1 - program 3                                     | 15    | 0     | 23        | h   | Integer | R/W | 100      |
| PH06   | M_PAR_3A                                    | Stop minute of slot 1 - program 3                                   | 0     | 0     | 59        | min | Integer | R/W | 101      |
| PH06   | H_ARR_3B                                    | Start-up hour of slot 2 - program 3                                 | 0     | 0     | 23        | h   | Integer | R/W | 102      |
| PH06   | M_ARR_3B                                    | Start-up minute of slot 2 - program 3                               | 0     | 0     | 59        | min | Integer | R/W | 103      |
| PH06   | H_PAR_3B                                    | Stop hour of slot 2 - program 3                                     | 0     | 0     | 23        | h   | Integer | R/W | 104      |
| PH06   | M_PAR_3B                                    | Stop minute of slot 2 - program 3                                   | 0     | 0     | 59        | min | Integer | R/W | 105      |
| PH06   | H_ARR_3C                                    | Start-up hour of slot 3 - program 3                                 | 0     | 0     | 23        | h   | Integer | R/W | 106      |
| PH06   | M_ARR_3C                                    | Start-up minute of slot 3 - program 3                               | 0     | 0     | 59        | min | Integer | R/W | 107      |
| PH06   | H_PAR_3C                                    | Stop hour of slot 3 - program 3                                     | 0     | 0     | 23        | h   | Integer | R/W | 108      |
| PH06   | M_PAR_3C                                    | Stop minute of slot 3 - program 3                                   | 0     | 0     | 59        | min | Integer | R/W | 109      |
| PH07   | SET_INT_FRIO                                | Schedule only setpoint change: internal Set in summer               | 26.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 61       |
| PH07   | SET_EXT_FRIO                                | Schedule only setpoint change: external Set in summer               | 28.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 59       |
| PH08   | SET_INT_CALOR                               | Schedule only setpoint change: internal Set in winter               | 21.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 60       |
| PH08   | SET_EXT_CALOR                               | Schedule only setpoint change: external Set in winter               | 19.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 58       |
| PH09   | SET_INT_LIM_FRIO                            | ON/OFF schedule with limit SET of ON (summer): internal Set         | 26.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 79       |
| PH09   | SET_EXT_LIM_FRIO                            | ON/OFF schedule with limit SET of ON (summer): limit Set            | 34.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 77       |
| PH10   | SET_INT_LIM_CALOR                           | ON/OFF schedule with limit SET of ON (winter): internal Set         | 21.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 78       |
| PH10   | SET_EXT_LIM_CALOR                           | ON/OFF schedule with limit SET of ON (winter): limit Set            | 13.0  | -99.9 | 99.9      | °C  | Analog. | R/W | 76       |
| PH11   | DIF_LIM_CALOR                               | ON/OFF schedule with limit SET of ON (winter): differential         | 1.0   | 0.0   | 99.9      | °C  | Analog. | R/W | 81       |
| PH11   | DIF_LIM_FRIO                                | ON/OFF schedule with limit SET of ON (summer): differential         | 2.0   | 0.0   | 99.9      | °C  | Analog. | R/W | 80       |
| PH12   | LUN_A                                       | Monday schedule (0 = off; 1 = prog. 1; 2 = prog. 2; 3 = prog. 3)    | 1     | 0     | 3         | --- | Integer | R/W | 110      |
| PH12   | MAR_A                                       | Tuesday schedule (0 = off; 1 = prog. 1; 2 = prog. 2; 3 = prog. 3)   | 1     | 0     | 3         | --- | Integer | R/W | 111      |
| PH12   | MIE_A                                       | Wednesday schedule (0 = off; 1 = prog. 1; 2 = prog. 2; 3 = prog. 3) | 1     | 0     | 3         | --- | Integer | R/W | 112      |
| PH12   | JUE_A                                       | Thursday schedule (0 = off; 1 = prog. 1; 2 = prog. 2; 3 = prog. 3)  | 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 = prog. 1; 2 = prog. 2; 3 = prog. 3)  | 0     | 0     | 3         | --- | Integer | R/W | 115      |
| PH12   | DOM_A                                       | Sunday schedule (0 = off; 1 = prog. 1; 2 = prog. 2; 3 = prog. 3)    | 0     | 0     | 3         | --- | Integer | R/W | 116      |
| PH12   | DIA_SEMANA                                  | Weekday                                                             | 0     | 0     | 0         | day | Integer | R/W | 52       |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.FH1_Day_Prg          | Schedule day FH1 -- 0=don - 6=sab                                   | 0     | 0     | 6         | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.FH1_Day_Copy         | Day of copy FH1 -- 0=dom - 6=sab                                    | 0     | 0     | 6         | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.FH1_Copy             | Enabling copy of the daily program                                  | 0     | 0     | 1         | --- | Digital | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Hour_Start_Pointer   | Current start hour in programming                                   | 0     | 0     | 23        | --- | Integer | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.En_Pointer           | Enabling graphic programming                                        | 0     | 0     | 1         | --- | Digital | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Minute_Start_Pointer | Current start minute in programming                                 | 0     | 0     | 23        | --- | Integer | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Hour_End_Pointer     | Current end hour in programming                                     | 0     | 0     | 23        | --- | Integer | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Minute_End_Pointer   | Current end minute in programming                                   | 0     | 0     | 23        | --- | Integer | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Loaded               | Load of FH data                                                     | 0     | 0     | 1         | --- | Digital | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_00_00             | Schedule 00:00                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_00_30             | Schedule 00:30                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_01_00             | Schedule 01:00                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_01_30             | Schedule 01:30                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_02_00             | Schedule 02:00                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIA1_1.Fh_02_30             | Schedule 02:30                                                      | 0     | 0     | Set_Limit | --- | Integer | R/W |          |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Clock/Scheduler" (...continuation)



| Screen | Parameter                       | Description of the parameter                                          | Value | Min.  | Max.      | UOM | Type    | R/W | Add. BMS |
|--------|---------------------------------|-----------------------------------------------------------------------|-------|-------|-----------|-----|---------|-----|----------|
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_03_00 | Schedule 03:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_03_30 | Schedule 03:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_04_00 | Schedule 04:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_04_30 | Schedule 04:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_05_00 | Schedule 05:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_05_30 | Schedule 05:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_06_00 | Schedule 06:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_06_30 | Schedule 06:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_07_00 | Schedule 07:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_07_30 | Schedule 07:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Loaded   | Load of FH data                                                       | 0     | 0     | 1         | --- | Digital | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_08_00 | Schedule 08:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_08_30 | Schedule 08:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_09_00 | Schedule 09:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_09_30 | Schedule 09:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_10_00 | Schedule 10:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_10_30 | Schedule 10:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_11_00 | Schedule 11:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_11_30 | Schedule 11:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_12_00 | Schedule 12:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_12_30 | Schedule 12:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_13_00 | Schedule 13:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_13_30 | Schedule 13:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_14_00 | Schedule 14:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_14_30 | Schedule 14:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_15_00 | Schedule 15:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_15_30 | Schedule 15:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Loaded   | Load of FH data                                                       | 0     | 0     | 1         | --- | Digital | R   |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_16_00 | Schedule 16:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_16_30 | Schedule 16:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_17_00 | Schedule 17:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_17_30 | Schedule 17:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_18_00 | Schedule 18:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_18_30 | Schedule 18:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_19_00 | Schedule 19:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_19_30 | Schedule 19:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_20_00 | Schedule 20:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_20_30 | Schedule 20:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_21_00 | Schedule 21:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_21_30 | Schedule 21:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_22_00 | Schedule 22:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_22_30 | Schedule 22:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_23_00 | Schedule 23:00                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH13   | MOD_SCHED_GRAPH_CIAT_1.Fh_23_30 | Schedule 23:30                                                        | 0     | 0     | Set_Limit | --- | Integer | R/W |          |
| PH14   | SET_INT_FRIO                    | Setpoint for COMFORT time slots in summer                             | 26.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 61       |
| PH14   | SET_EXT_FRIO                    | Setpoint for ECONOMY time slots in summer                             | 28.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 59       |
| PH14   | SET_EXT_LIM_FRIO                | Setpoint for BUILDING PROTECTION time slots in summer                 | 34.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 77       |
| PH14   | DIF_LIM_FRIO                    | Differential for setpoint of BUILDING PROTECTION in summer            | 2.0   | 0.0   | 99.9      | °C  | Analog  | R/W | 80       |
| PH15   | SET_INT_CALOR                   | Setpoint for COMFORT time slots in winter                             | 21.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 60       |
| PH15   | SET_EXT_CALOR                   | Setpoint for ECONOMY time slots in winter                             | 19.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 58       |
| PH15   | SET_EXT_LIM_CALOR               | Setpoint for BUILDING PROTECTION time slots in winter                 | 13.0  | -99.9 | 99.9      | °C  | Analog  | R/W | 76       |
| PH15   | DIF_LIM_CALOR                   | Differential for the setpoint of BUILDING PROTECTION in winter        | 1.0   | 0.0   | 99.9      | °C  | Analog  | R/W | 81       |
| PH16   | ThTune_clock_hours              | Display of data from the TCO terminal: hour                           | 0     | 0     | 99        | --- | Integer | R   |          |
| PH16   | ThTune_clock_minutes            | Display of data from the TCO terminal: minutes                        | 0     | 0     | 99        | --- | Integer | R   |          |
| PH16   | NEW_DAY                         | Display of data from the TCO terminal: day                            | 0     | 0     | 31        | --- | Integer | R/W |          |
| PH16   | NEW_MONTH                       | Display of data from the TCO terminal: month                          | 0     | 0     | 12        | --- | Integer | R/W |          |
| PH16   | NEW_YEAR                        | Display of data from the TCO terminal: year                           | 0     | 0     | 99        | --- | Integer | R/W |          |
| PH16   | ThTune_clock_weekday            | Display of data from the TCO terminal: weekday                        | 0     | 1     | 7         | --- | Integer | R   |          |
| PH17   | HAB_PROG_HORARIA_CLOCK_KEY      | Display of data from the TCO terminal: ON/OFF schedule prog.          | 0     | 0     | 1         | --- | Digital | R   |          |
| PH17   | ThTune_Temperature_setpoint     | Display of data from the TCO terminal: temperature setpoint           | 0.0   | 0.0   | 99.9      | --- | Analog  | R/W |          |
| PH17   | Current_Timeband_Icon           | Display of data from the TCO terminal: current band of schedule prog. | 0     | 0     | 6         | --- | Integer | R/W |          |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Input/Output"



| Screen | Parameter                                    | Description of the parameter                                                                                           | Value | Min.  | Max.  | UOM     | Type    | R/W | Add. BMS |
|--------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|---------|---------|-----|----------|
| I01    | TEMP_RET                                     | Display of the return air temperature                                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 1        |
| I01    | TEMP_EXT                                     | Display of the outdoor air temperature                                                                                 | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 2        |
| I01a   | TEMP_SONDA_AMB                               | Display of the ambient air temperature (NTC or RS485)                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W |          |
| I01a   | SONDA_AMB_1_TEMP                             | Display of the ambient temperature probe No.1 - RS485                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 193      |
| I01a   | SONDA_AMB_2_TEMP                             | Display of the ambient temperature probe No.2 - RS485                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 196      |
| I01a   | SONDA_AMB_3_TEMP                             | Display of the ambient temperature probe No.3 - RS485                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 241      |
| I01a   | SONDA_AMB_4_TEMP                             | Display of the ambient temperature probe No.4 - RS485                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 244      |
| I01a   | SEL_TEMP_SONDAS_AMB_CALOR                    | Selection of the value of ambient temperature with RS485 probes in HEATING mode (0 = middle, 1 = minimum, 2 = maximum) | 0     | 0     | 2     | ---     | Integer | R/W | 200      |
| I01a   | SEL_TEMP_SONDAS_AMB_FRIO                     | Selection of the value of ambient temperature with RS485 probes in COOLING mode (0 = middle, 1 = minimum, 2 = maximum) | 0     | 0     | 2     | ---     | Integer | R/W | 199      |
| I01b   | TEMP_TCO                                     | Selection of the value of ambient temperature with TCO terminal                                                        | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 14       |
| I02    | HUM_INT                                      | Display of the ambient humidity RS485 probe (middle value)                                                             | 0.0   | 0.0   | 0.0   | %rH     | Analog. | R/W | 5        |
| I02    | SONDA_AMB_1_HUM                              | Display of the ambient humidity probe No.1 - RS485                                                                     | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R   | 194      |
| I02    | SONDA_AMB_2_HUM                              | Display of the ambient humidity probe No.2 - RS485                                                                     | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R   | 197      |
| I02    | SONDA_AMB_3_HUM                              | Display of the ambient humidity probe No.3 - RS485                                                                     | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R   | 242      |
| I02    | SONDA_AMB_4_HUM                              | Display of the ambient humidity probe No.4 - RS485                                                                     | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R   | 245      |
| I02a   | HUM_EXT                                      | Display of the outdoor air humidity                                                                                    | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R/W | 6        |
| I03    | TEMP_IMP                                     | Display of the supply air temperature                                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 7        |
| I03    | TEMP_MEZCLA                                  | Display of the mixing air temperature                                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 8        |
| I03a   | CO2                                          | Display of the CO2 probe or the difference between indoor probe and outdoor probe (in units with outdoor CO2 probe)    | 0     | 0     | 32767 | ppm     | Integer | R/W | 3        |
| I03a   | CO2_FISICA_zona1                             | Reading of the CO2 probe of zone 1 (zoning into 2 zones)                                                               | 0     | 0     | 32767 | ppm     | Integer | R/W | 256      |
| I03a   | CO2_FISICA_zona2                             | Reading of the CO2 probe of zone 2 (zoning into 2 zones) or second CO2 probe or outdoor CO2 probe                      | 0     | 0     | 32767 | ppm     | Integer | R/W | 220      |
| I03b   | TEMP_ENTRADA_BAC                             | Display of the water inlet temperature of the hot water coil                                                           | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 25       |
| I03b   | TEMP_SALIDA_BAC                              | Display of the water outlet temperature of the hot water coil                                                          | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 26       |
| I03c   | TEMP_EXTRACCION_RUEDA                        | Display of the exhaust air temperature on the wheel                                                                    | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 247      |
| I03c   | TEMP_RECUPERACION_RUEDA                      | Display of the recovery air temperature on the wheel                                                                   | 0.0   | -99.9 | 99.9  | °C      | Analog. | R/W | 249      |
| I04a   | PR_ENT_EXTERIOR                              | Display of the outdoor enthalpy                                                                                        | 0.0   | -99.9 | 99.9  | Kcal/Kg | Integer | R/W | 14       |
| I04a   | HUM_EXT                                      | Display of the outdoor air humidity                                                                                    | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R/W | 6        |
| I04b   | PR_ENT_INTERIOR                              | Display of the indoor enthalpy                                                                                         | 0.0   | -99.9 | 99.9  | Kcal/Kg | Integer | R/W | 16       |
| I04b   | HUM_INT                                      | Indoor air humidity to control the unit                                                                                | 0.0   | -99.9 | 99.9  | %rH     | Analog. | R/W | 5        |
| I05a   | T_P_HP_C1                                    | Display of the high pressure transducer of circuit 1                                                                   | 0.0   | -99.9 | 99.9  | bar     | Analog. | R   | 3        |
| I05a   | TEMP_CAL_HP_C1                               | Calculated temperature for high pressure of circuit 1                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 123      |
| I05a   | T_P_HP_C2                                    | Display of the high pressure transducer of circuit 2                                                                   | 0.0   | -99.9 | 99.9  | bar     | Analog. | R   | 4        |
| I05a   | TEMP_CAL_HP_C2                               | Calculated temperature for high pressure of circuit 2                                                                  | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   | 124      |
| I05ar  | T_P_HP_CR                                    | Display of the high pressure transducer of the recovery circuit                                                        | 0.0   | -99.9 | 99.9  | BAR     | Analog. | R   |          |
| I05ar  | TEMP_CAL_HP_CR                               | Calculated temperature for high pressure of the recovery circuit                                                       | 0.0   | -99.9 | 99.9  | °C      | Analog. | R   |          |
| I05c   | T_P_LP_C1_AIN06                              | Display of the low pressure transducer of circuit 1                                                                    | 0.0   | -99.9 | 99.9  | bar     | Analog. | R   |          |
| I05c   | TEMP_CAL_LP_C1_AIN06                         | Calculated temperature for low pressure of circuit 1                                                                   | 0.0   | -99.9 | 99.9  | ---     | Analog. | R   |          |
| I05c   | T_P_LP_C2_AIN11                              | Display of the low pressure transducer of circuit 2                                                                    | 0.0   | -99.9 | 99.9  | bar     | Analog. | R   |          |
| I05c   | TEMP_CAL_LP_C2_AIN11                         | Calculated temperature for low pressure of circuit 2                                                                   | 0.0   | -99.9 | 99.9  | ---     | Analog. | R   |          |
| I05cr  | T_P_LP_CR_AIN11                              | Display of the low pressure transducer of the recovery circuit                                                         | 0.0   | -99.9 | 99.9  | BAR     | Analog. | R   |          |
| I05cr  | TEMP_CAL_LP_CR_AIN11                         | Calculated temperature for low pressure of the recovery circuit                                                        | 0.0   | -99.9 | 99.9  | ---     | Analog. | R   |          |
| I05e   | TEMP_ASP_C1_AIN08                            | Display of the suction temperature of circuit 1                                                                        | 0.0   | -99.9 | 99.9  | ---     | Analog. | R   |          |
| I05e   | SHTemp_A                                     | Display of overheating of circuit 1                                                                                    | 00.0  | -99.9 | 99.9  | ---     | Integer | R   |          |
| I05e   | TEMP_ASP_C2_AIN09                            | Display of the suction temperature of circuit 2                                                                        | 0.0   | -99.9 | 99.9  | ---     | Analog. | R   |          |
| I05e   | SHTemp_B                                     | Display of overheating of circuit 2                                                                                    | 00.0  | -99.9 | 99.9  | ---     | Integer | R   |          |
| I06a   | MOD_EVO_ONBOARD_SPEC_2.A10_SH_SH             | Overheating on the expansion valve of circuit 1                                                                        | 0.0   | -72.0 | 324.0 | °C/°F   | Analog. | R/W |          |
| I06a   | MOD_EVO_ONBOARD_SPEC_2.A5_SH_SUCT_TEMP       | Suction temperature on the circuit 1 valve                                                                             | 0.0   | -76.0 | 392.0 | °C/°F   | Analog. | R/W |          |
| I06a   | MOD_EVO_ONBOARD_SPEC_2.I4_EEV_POSITION_STEPS | Valve position for circuit 1                                                                                           | 0     | 0     | 9999  | steps   | Integer | R/W |          |
| I06a   | COMPRESOR_1                                  | Contactora of compressor 1 of circuit 1                                                                                | 0     | 0     | 1     | ---     | Digital | R   | 16       |
| I06a   | MOD_EVO_ONBOARD_SPEC_2.A7_SH_EVAP PRES       | Evaporating pressure on the circuit 1 valve                                                                            | 0.0   | -10.0 | 10.0  | barg    | Analog. | R/W |          |
| I06a   | COMPRESOR_1_2                                | Contactora of compressor 2 of circuit 1                                                                                | 0     | 0     | 1     | ---     | Digital | R/W |          |
| I06a   | MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP       | Evaporating temperature on the circuit 1 valve                                                                         | 0.0   | -10.0 | 10.0  | °C/°F   | Analog. | R/W |          |
| I06a   | T_P_HP_C1                                    | High pressure transducer of circuit 1                                                                                  | 0.0   | -99.9 | 99.9  | bar     | Analog. | R   | 3        |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Input/Output" (...continuation)



| Screen | Parameter                                               | Description of the parameter                                 | Value | Min.  | Max.  | UOM   | Type    | R/W | Add. BMS |
|--------|---------------------------------------------------------|--------------------------------------------------------------|-------|-------|-------|-------|---------|-----|----------|
| I06a   | MOD_EVO_ONBOARD_SPEC_2.I8_REG_STATUS                    | Status of EVD control on the circuit 1 valve                 | 0     | 1     | 14    | ---   | Integer | R/W |          |
| I06a   | TEMP_CAL_HP_C1                                          | Calculated temperature for high pressure of circuit 1        | 0.0   | -99.9 | 99.9  | °C    | Analog  | R   | 123      |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.A68_SH_SH_2ND                    | Overheating on the expansion valve of circuit 2              | 0.0   | -72.0 | 324.0 | °C/°F | Analog  | R/W |          |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_2ND             | Suction temperature on the circuit 2 valve                   | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.I49_EEV_POSITION_STEPS_2ND       | Valve position for circuit 2                                 | 0     | 0     | 999   | steps | Integer | R/W |          |
| I06b   | COMPRESOR_2                                             | Contactora of compressor 1 of circuit 2                      | 0     | 0     | 1     | ---   | Digital | R   | 17       |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_2ND             | Evaporating pressure on the circuit 2 valve                  | 0.0   | -10.0 | 10.0  | barg  | Analog  | R/W |          |
| I06b   | COMPRESOR_2_2                                           | Contactora of compressor 2 of circuit 2                      | 0     | 0     | 1     | ---   | Digital | R/W |          |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_2ND             | Evaporating temperature on the circuit 2 valve               | 0.0   | -10.0 | 10.0  | °C/°F | Analog  | R/W |          |
| I06b   | T_P_HP_C2                                               | High pressure transducer of circuit 2                        | 0.0   | -99.9 | 99.9  | bar   | Analog  | R   | 4        |
| I06b   | MOD_EVO_ONBOARD_SPEC_2.I51_REG_STATUS_2ND               | Status of EVD control on the circuit 2 valve                 | 0     | 1     | 17    | ---   | Integer | R/W |          |
| I06b   | TEMP_CAL_HP_C2                                          | Calculated temperature for high pressure of circuit 2        | 0.0   | -99.9 | 99.9  | °C    | Analog  | R   | 124      |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.A68_SH_SH_CR                     | Overheating on the expansion valve of recovery circuit       | 0.0   | -72.0 | 324.0 | °C/°F | Analog  | R/W |          |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_CR              | Suction temperature on the recovery circuit valve            | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.I49_EEV_POSITION_STEPS_CR        | Valve position for recovery circuit                          | 0     | 0     | 999   | steps | Integer | R/W |          |
| I06cr  | COMP_REC_1                                              | Contactora of compressor 1 of recovery circuit               | 0     | 0     | 1     | ---   | Digital | R   |          |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_CR              | Evaporating pressure on the recovery circuit valve           | 0.0   | -10.0 | 10.0  | barg  | Analog  | R/W |          |
| I06cr  | COMP_REC_2                                              | Contactora of compressor 2 of recovery circuit               | 0     | 0     | 1     | ---   | Digital | R/W |          |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_CR              | Evaporating temperature on the recovery circuit valve        | 0.0   | -10.0 | 10.0  | °C/°F | Analog  | R/W |          |
| I06cr  | T_P_HP_CR                                               | High pressure transducer of recovery circuit                 | 0.0   | -99.9 | 99.9  | BAR   | Analog  | R   |          |
| I06cr  | MOD_EVO_ONBOARD_SPEC_2.I51_REG_STATUS_CR                | Status of EVD control on the recovery circuit valve          | 0     | 1     | 17    | ---   | Integer | R/W |          |
| I06cr  | TEMP_CAL_HP_CR                                          | Calculated temperature for high pressure of recovery circuit | 0.0   | -99.9 | 99.9  | °C    | Analog  | R   |          |
| I06c1  | MOD_EVO_ONBOARD_SPEC_2.A104_DISCHARGE_SH                | Overheating on the discharge                                 | 0.0   | -72.0 | 324.0 | °C/°F | Analog  | R/W |          |
| I06c1  | MOD_EVO_ONBOARD_SPEC_2.A105_DISCHARGE_TEMP              | Discharge temperature                                        | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06e   | MOD_EVO_ONBOARD_SPEC_2.A7_SH_EVAP_PRES                  | Evaporating pressure on the circuit 1 valve                  | 0.0   | -2.0  | 29.0  | barg  | Analog  | R/W |          |
| I06e   | MOD_EVO_ONBOARD_SPEC_2.A19_POSITIONING_MODE_mAMPERE     | Input value 4-20mA on the circuit 1 valve                    | 4.0   | 4.0   | 20.0  | mA    | Analog  | R/W |          |
| I06e   | MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP                  | Evaporating temperature on the circuit 1 valve               | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06f   | MOD_EVO_ONBOARD_SPEC_2.A5_SH_SUCT_TEMP                  | Suction temperature on the circuit 1 valve                   | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06er  | MOD_EVO_ONBOARD_SPEC_2.DUMMY                            | Evaporating pressure on the recovery circuit valve           | 0.0   | -2.0  | 29.0  | barg  | Analog  | R/W |          |
| I06er  | MOD_EVO_ONBOARD_SPEC_2.A19_POSITIONING_MODE_mAMPERE     | Input value 4-20mA on the recovery circuit valve             | 4.0   | 4.0   | 20.0  | mA    | Analog  | R/W |          |
| I06er  | MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP                  | Evaporating temperature on the recovery circuit valve        | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06fr  | TEMP_ASP_CR                                             | Suction temperature on the recovery circuit valve            | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06g   | MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_2ND             | Evaporating pressure on the circuit 2 valve                  | 0.0   | -2.0  | 29.0  | barg  | Analog  | R/W |          |
| I06g   | MOD_EVO_ONBOARD_SPEC_2.A78_POSITIONING_MODE_mAMPERE_2ND | Input value 4-20mA on the circuit 2 valve                    | 0.0   | 4.0   | 20.0  | mA    | Analog  | R/W |          |
| I06g   | MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_2ND             | Evaporating temperature on the circuit 2 valve               | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I06h   | MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_2ND             | Suction temperature on the circuit 2 valve                   | 0.0   | -76.0 | 392.0 | °C/°F | Analog  | R/W |          |
| I07    | N_HOR_ON_EQUIPO                                         | Display of operating hours of unit                           | 0     | 0     | 999   | h     | Integer | R/W | 62       |
| I07    | N_HOR_COMP1                                             | Display of operating hours of compressor 1 circuit 1         | 0     | 0     | 999   | h     | Integer | R/W | 10       |
| I07    | N_HOR_COMP1_2                                           | Display of operating hours of compressor 2 circuit 1         | 0     | 0     | 999   | h     | Integer | R/W | 53       |
| I07a   | N_HOR_COMP2                                             | Display of operating hours of compressor 1 circuit 2         | 0     | 0     | 999   | h     | Integer | R/W | 11       |
| I07a   | N_HOR_COMP2_2                                           | Display of operating hours of compressor 2 circuit 2         | 0     | 0     | 999   | h     | Integer | R/W | 69       |
| I07a   | N_HOR_CR                                                | Display of operating hours of recovery compressor            | 0     | 0     | 999   | h     | Integer | R/W | 12       |
| I08    | DIN01_RTVI_VIRT                                         | Status of digital input 1: indoor fan thermal protection     | 0     | 0     | 1     | ---   | Digital | R/W |          |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Input/Output" (...continuation)

### 06. Input/Output

| Screen | Parameter                                              | Description of the parameter                                                                               | Value | Min.  | Max. | UOM   | Type    | R/W | Add. BMS |
|--------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------|-------|------|-------|---------|-----|----------|
| I08    | DIN02_INC_VIRT                                         | Status of digital input 2: gas detector                                                                    | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN03_AP1_VIRT                                         | Status of digital input 3: high pressure circuit 1                                                         | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN04_TC1_VIRT                                         | Status of digital input 4: thermal protection of compressors and outdoor fans of circuit 1                 | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN05_TS_VIRT                                          | Status of digital input 5: safety of el. heaters / burner / boiler                                         | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN06_FS_VIRT                                          | Status of digital input 6: clogged filters detector                                                        | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN07_ON_OFF_VIRT                                      | Status of digital input 7: remote ON/OFF                                                                   | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN08_AH_BAC_VIRT                                      | Status of digital input 8: antifreeze safety of the hot water coil (HWC)                                   | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN09_AP2_VIRT                                         | Status of digital input 9: high pressure circuit 2                                                         | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08    | DIN10_TC2_VIRT                                         | Status of digital input 10: thermal protection of compressors and outdoor fans of circuit 2                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08b   | DIN21_OFF_1ET_VIRT                                     | Status of digital input 21: disconnection of 1 compressor stage                                            | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08b   | DIN22_OFF_2ET_VIRT                                     | Status of digital input 22: disconnection of 2 compressor stages                                           | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08b   | DIN23_OFF_4ET_VIRT                                     | Status of digital input 23: disconnection of 4 compressor stages                                           | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08b   | DIN24_OFF_RES_VIRT                                     | Status of digital input 24: disconnection of electrical heaters                                            | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08c   | DIN25_VIRT                                             | Status of digital input 25: opening of supply damper of zone 1                                             | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08c   | DIN26_VIRT                                             | Status of digital input 26: opening of supply damper of zone 2                                             | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08c   | DIN27_VIRT                                             | Status of digital input 27: opening of return damper of zone 1                                             | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08c   | DIN28_VIRT                                             | Status of digital input 28: opening of return damper of zone 2                                             | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG01_INTERBQ                                       | Status of digital input 01 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG02_INC                                           | Status of digital input 02 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG03_AP1                                           | Status of digital input 03 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG04_TC_CR                                         | Status of digital input 04 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG05_C_F                                           | Status of digital input 05 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG06_FS                                            | Status of digital input 06 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I08cr  | IN_DIG07_ON_OFF                                        | Status of digital input 07 of SMALL board: recovery circuit                                                | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I09    | COMPRESOR_1                                            | Status of contactor of compressor 1 circuit 1                                                              | 0     | 0     | 1    | ---   | Digital | R/W | 16       |
| I09    | COMPRESOR_1_2                                          | Status of contactor of compressor 2 circuit 1                                                              | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I09    | COMPRESOR_2                                            | Status of contactor of compressor 1 circuit 2                                                              | 0     | 0     | 1    | ---   | Digital | R/W | 17       |
| I09    | COMPRESOR_2_2                                          | Status of contactor of compressor 2 circuit 2                                                              | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I09a   | RES_ELECTRICA_1_O_VALV                                 | Status of contactor of 1st stage of electrical heaters or gas burner or gas boiler or hot water coil valve | 0     | 0     | 1    | ---   | Digital | R/W | 20       |
| I09a   | RES_ELECTRICA_2                                        | Status of contactor of 2nd stage of electrical heaters                                                     | 0     | 0     | 1    | ---   | Digital | R/W | 21       |
| I10    | OUT_VIC1                                               | Status of cycle reversing valve of circuit 1                                                               | 0     | 0     | 1    | ---   | Digital | R/W | 18       |
| I10    | OUT_VIC2                                               | Status of cycle reversing valve of circuit 2                                                               | 0     | 0     | 1    | ---   | Digital | R/W | 19       |
| I10    | VENTILADOR_EXT_1                                       | Status of outdoor fan(s) of circuit 1                                                                      | 0     | 0     | 1    | ---   | Digital | R/W | 23       |
| I10    | VENTILADOR_EXT_2                                       | Status of outdoor fan(s) of circuit 2                                                                      | 0     | 0     | 1    | ---   | Digital | R/W | 24       |
| I10b   | DOUT22_VIRT                                            | Status of digital output 22: supply damper of zone 1                                                       | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I10b   | DOUT23_VIRT                                            | Status of digital output 23: supply damper of zone 2                                                       | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I10b   | DOUT24_VIRT                                            | Status of digital output 24: return damper of zone 1                                                       | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I10b   | DOUT25_VIRT                                            | Status of digital output 25: return damper of zone 2                                                       | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I10cr  | COMP_REC_1                                             | Status of contactor of compressor of recovery circuit                                                      | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I10cr  | OUT_VIC_CR                                             | Status of cycle reversing valve of recovery circuit                                                        | 0     | 0     | 1    | ---   | Digital | R/W |          |
| I02zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.TEMP_TCO11                  | Visualization of the temperature measured by the terminal in zone 1 (zoning of the air flow)               | 0,0   | -99,9 | 99,9 | °C/°F | Analog  | W   |          |
| I02zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.TEMP_TCO12                  | Visualization of the temperature measured by the terminal in zone 2 (zoning of the air flow)               | 0,0   | -99,9 | 99,9 | °C/°F | Analog  | W   |          |
| I02zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.TEMP_TCO13                  | Visualization of the temperature measured by the terminal in zone 3 (zoning of the air flow)               | 0,0   | -99,9 | 99,9 | °C/°F | Analog  | W   |          |
| I02zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.TEMP_TCO14                  | Visualization of the temperature measured by the terminal in zone 4 (zoning of the air flow)               | 0,0   | -99,9 | 99,9 | °C/°F | Analog  | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.COMPUERTA_IMP_ZONA1_ABIERTA | Status of digital input 01 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.COMPUERTA_IMP_ZONA2_ABIERTA | Status of digital input 02 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.COMPUERTA_IMP_ZONA3_ABIERTA | Status of digital input 03 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.COMPUERTA_IMP_ZONA4_ABIERTA | Status of digital input 04 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.IN_DIG05_INC                | Status of digital input 05 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.IN_DIG06_RTVI               | Status of digital input 06 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |
| I08zn  | MOD_MB_UPC_ZONIFICA_CIA1_1.IN_DIG07_ON_OFF             | Status of digital input 07 of SMALL board (addr.11): zoning of the air flow                                | 0     | 0     | 1    | ---   | Digital | W   |          |

# 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

## Parameters of "Input/Output" (...continuation)



| Screen | Parameter                                                   | Description of the parameter                                                                                                                                                 | Value  | Min.   | Max.   | UOM  | Type    | R/W | Add. BMS |
|--------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|------|---------|-----|----------|
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>APERTURA_COMPUERTA_IMP_ZONA1 | Status of the supply damper in zone 1 (zoning of the air flow)                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>APERTURA_COMPUERTA_IMP_ZONA2 | Status of the supply damper in zone 2 (zoning of the air flow)                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>APERTURA_COMPUERTA_IMP_ZONA3 | Status of the supply damper in zone 3 (zoning of the air flow)                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>APERTURA_COMPUERTA_IMP_ZONA4 | Status of the supply damper in zone 4 (zoning of the air flow)                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>DOUT5                        | Status of output No.5 of SMALL board (addr.11)                                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>DOUT6                        | Status of output No.5 of SMALL board (addr.11)                                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I09zn  | MOD_MB_UPC_ZONIFICA_CIAT_1.<br>DOUT5                        | Status of alarm relay of SMALL board (addr.11)                                                                                                                               | 0      | 0      | 1      | ---  | Digital | W   |          |
| I11    | ON_VENTILADOR_INT                                           | Status of indoor unit supply fan                                                                                                                                             | 0      | 0      | 1      | ---  | Digital | R   | 15       |
| I11    | OUT_07                                                      | Status of output NO7 in which one of the following options can be connected: on-off humidifier, circulation pump of the hot water coil, boiler pump or rotary heat exchanger | 0      | 0      | 1      | ---  | Digital | R/W |          |
| I12    | VIS_Y1_AOUT_COMPUERTA                                       | Display of opening % of outdoor air damper (optional). Range vary between 0% (0V) and 100% (10V)                                                                             | 0      | 0      | 999    | ---  | Integer | R   |          |
| I12    | HAB_VALVULA_CALOR                                           | Display of opening % of HWC valve                                                                                                                                            | 0      | 0      | 1      | ---  | Digital | R/W | 103      |
| I12    | HAB_QUEMADOR_GAS                                            | Display of opening % of gas burner/boiler                                                                                                                                    | 0      | 0      | 1      | ---  | Digital | R/W | 86       |
| I12    | HAB_RESISTENCIA_PROP                                        | Display of opening % of proportional electrical heater                                                                                                                       | 0      | 0      | 1      | ---  | Digital | R   |          |
| I12    | HAB_OUT_COMP_INVERTER_OK                                    | Display of inverter compressor status                                                                                                                                        | 0      | 0      | 1      | ---  | Digital | R   |          |
| I12    | HAB_AOUT2_CON_SOBREPRESION                                  | Display of opening % of overpressure damper                                                                                                                                  | 0      | 0      | 1      | ---  | Digital | R   |          |
| I12a   | VIS_Y3                                                      | Display of operating % of electronic outdoor fan(s) of circuit 1                                                                                                             | 0      | 0      | 0      | ---  | Integer | R/W |          |
| I12a   | VIS_Y4                                                      | Display of operating % of electronic outdoor fan(s) of circuit 2                                                                                                             | 0      | 0      | 0      | ---  | Integer | R/W |          |
| I12b   | VIS_Y6                                                      | Display of % proportional humidifier or exhaust damper or 3-way valve (3-WV) of the condensation coil with active dehumidification                                           | 0      | 0      | 999    | ---  | Integer | R/W |          |
| I12c   | VIS_Y7                                                      | Display of operating % of the wheel (variable rotary heat exchanger) or preheater with electrical heater                                                                     | 0      | 0      | 999    | ---  | Integer | R/W |          |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Energy_Address_Msk          | Reading of the energy meter: address                                                                                                                                         | 0      | 0      | 254    | ---  | Integer | R/W |          |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_L1_L2_L_SPV         | Reading of the energy meter: voltage between phases L1-L2                                                                                                                    | 0      | 0      | 99990  | V    | Integer | R   | 167      |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_L2_L3_L_SPV         | Reading of the energy meter: voltage between phases L2-L3                                                                                                                    | 0      | 0      | 99990  | V    | Integer | R   | 168      |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_L3_L1_L_SPV         | Reading of the energy meter: voltage between phases L3-L1                                                                                                                    | 0      | 0      | 99990  | V    | Integer | R   | 169      |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_1_L_SPV             | Reading of the energy meter: voltage between phase and neutral L1                                                                                                            | 0      | 0      | 99990  | V    | Integer | R   | 170      |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_2_L_SPV             | Reading of the energy meter: voltage between phase and neutral 2                                                                                                             | 0      | 0      | 99990  | V    | Integer | R   | 171      |
| I15    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Voltage_3_L_SPV             | Reading of the energy meter: voltage between phase and neutral 3                                                                                                             | 0      | 0      | 99990  | V    | Integer | R   | 172      |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Energy_Address_Msk          | Reading of the energy meter: address                                                                                                                                         | 0      | 0      | 254    | ---  | Integer | R/W |          |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Current_1_L_SPV             | Reading of the energy meter: phase current L1                                                                                                                                | 0.0    | 0.0    | 999.9  | A    | Analog. | R   | 131      |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Current_2_L_SPV             | Reading of the energy meter: phase current L2                                                                                                                                | 0.0    | 0.0    | 999.9  | A    | Analog. | R   | 132      |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Current_3_L_SPV             | Reading of the energy meter: phase current L3                                                                                                                                | 0.0    | 0.0    | 999.9  | A    | Analog. | R   | 133      |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Power_Factor_L_MSK          | Reading of the energy meter: power factor                                                                                                                                    | 0      | 0      | 9      | ---  | Integer | R   |          |
| I16    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Frequency                   | Reading of the energy meter: frequency                                                                                                                                       | 0.0    | 0.0    | 99.9   | Hz   | Analog. | R   | 142      |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Energy_Address_Msk          | Reading of the energy meter: address                                                                                                                                         | 0      | 0      | 254    | ---  | Integer | R/W |          |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Apparent_Power_1_L_SPV      | Reading of the energy meter: reactive power phase L1                                                                                                                         | 0.0    | 0.0    | 999.9  | kVAr | Analog. | R   | 134      |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Apparent_Power_2_L_SPV      | Reading of the energy meter: reactive power phase L2                                                                                                                         | 0.0    | 0.0    | 999.9  | kVAr | Analog. | R   | 135      |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Apparent_Power_3_L_SPV      | Reading of the energy meter: reactive power phase L3                                                                                                                         | 0.0    | 0.0    | 999.9  | kVAr | Analog. | R   | 136      |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Apparent_Power_L_SPV        | Reading of the energy meter: total reactive power                                                                                                                            | 0000.0 | 0000.0 | 0999.9 | ---  | Integer | R   |          |
| I17    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Apparent_Energy_M_MSK       | Reading of the energy meter: equivalent reactive energy                                                                                                                      | 0      | 0      | 999    | ---  | Integer | R/W |          |
| I18    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Energy_Address_Msk          | Reading of the energy meter: address                                                                                                                                         | 0      | 0      | 254    | ---  | Integer | R/W |          |
| I18    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Power_1_L_SPV               | Reading of the energy meter: phase power L1                                                                                                                                  | 0.0    | 0.0    | 999.9  | kW   | Analog. | R   | 137      |
| I18    | MOD_MB_ENERGY_METERS_CIAT_1.<br>Power_2_L_SPV               | Reading of the energy meter: phase power L2                                                                                                                                  | 0.0    | 0.0    | 999.9  | kW   | Analog. | R   | 138      |



## 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

### Parameters of "Input/Output" (...continuation)

### 06. Input/Output

| Screen | Parameter                                          | Description of the parameter                                                                                                    | Value | Min.   | Max.   | UOM      | Type    | R/W | Add. BMS |
|--------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|----------|---------|-----|----------|
| I18    | MOD_MB_ENERGY_METERS_CIA1_1.Power_3_L_SPV          | Reading of the energy meter: phase power L3                                                                                     | 0.0   | 0.0    | 999.9  | kW       | Analog. | R   | 139      |
| I18    | MOD_MB_ENERGY_METERS_CIA1_1.Power_L_SPV            | Reading of the energy meter: total power                                                                                        | 0.0   | 0.0    | 999.9  | kW       | Analog. | R   | 140      |
| I18    | MOD_MB_ENERGY_METERS_CIA1_1.Energy_M_MSK           | Reading of the energy meter: energy                                                                                             | 0     | 0      | 999    | ---      | Integer | R   |          |
| I18    | MOD_MB_ENERGY_METERS_CIA1_1.MWh                    | Reading of the energy meter: MWh                                                                                                | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18    | MOD_MB_ENERGY_METERS_CIA1_1.Hourmeter_M_MSK        | Reading of the energy meter: time (hours)                                                                                       | 0     | 0      | 999    | ---      | Integer | R   |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Detect_Device_Number_Tmp | Refrigerant gas detector number                                                                                                 | 1     | 1      | 247    | ---      | Integer | R/W |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Concentration_Percent    | Reading of the gas leak detector: concentration (%)                                                                             | 0     | 0      | 100    | %        | Integer | R   |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Concentration_ppm        | Reading of the gas leak detector: concentration (ppm)                                                                           | 0     | 0      | 32767  | ppm      | Integer | R   |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Red_Led                  | Reading of the gas leak detector: red led (1: Active; 0: Off)                                                                   | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Green_Led                | Reading of the gas leak detector: green led (1: Active; 0: Off)                                                                 | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18a   | MOD_MB_GAS_LEAKAGE_CIA1_1.Relay_Status             | Reading of the gas leak detector: relay (1: Active; 0: Off)                                                                     | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18b   | ENTALPIA_MEZCLA_KCAL                               | Calculation of cooling and heating capacities: display of input enthalpy                                                        | 0.0   | 0.0    | 99.9   | Kcal/Kg  | Analog. | R   | 237      |
| I18b   | SONDA_MEZCLA_HUM                                   | Calculation of cooling and heating capacities: supply probe - display of input humidity                                         | 50.0  | 0.0    | 99.9   | %rH      | Analog. | R/W | 232      |
| I18b   | SONDA_MEZCLA_TEMP                                  | Calculation of cooling and heating capacities: mixing probe RS485 - display of input temperature                                | 0.0   | -999.9 | 999.9  | °C       | Analog. | R   | 231      |
| I18c   | ENTALPIA_IMPULSION_KCAL                            | Calculation of cooling and heating capacities: display of output enthalpy                                                       | 0.0   | 0.0    | 99.9   | Kcal/Kg  | Analog. | R   | 238      |
| I18c   | SONDA_IMPULSION_HUM                                | Calculation of cooling and heating capacities: supply probe - display of output humidity                                        | 0.0   | 0.0    | 99.9   | %rH      | Analog. | R   | 235      |
| I18c   | SONDA_IMPULSION_TEMP                               | Calculation of cooling and heating capacities: mixing probe RS485 - display of output temperature                               | 0.0   | -999.9 | 999.9  | °C       | Analog. | R   | 234      |
| I18c   | MODO_FRIO_2                                        | Calculation of cooling and heating capacities: operating mode                                                                   | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18d   | SET_CAUDAL_VINT_CALOR                              | Calculation of cooling and heating capacities: display of supply flow                                                           | 1200  | 0      | 9999   | x10 m3/h | Integer | R/W | 201      |
| I18d   | DIF_ENTALPIA_POT_TERMICA_KCAL                      | Calculation of cooling and heating capacities: display of the input-output enthalpy difference                                  | 0.0   | 0.0    | 99.9   | KJ/Kg    | Analog. | R   |          |
| I18d   | Densidad_aire_impulsion                            | Calculation of cooling and heating capacities: display of air density                                                           | 0     | 0      | 9999   | x10 g/m3 | Integer | R   |          |
| I18d   | Pot_termica                                        | Calculation of cooling and heating capacities: display of total capacity                                                        | 0.0   | 0.0    | 3276.7 | KW       | Analog. | R   | 239      |
| I18d   | MOD_MB_ENERGY_METERS_CIA1_1.Power_L_SPV            | Calculation of cooling and heating capacities: display of electric power                                                        | 0.0   | 0.0    | 999.9  | kW       | Analog. | R   | 140      |
| I18e   | MODO_FRIO_2                                        | Calculation of cooling and heating capacities: operating mode                                                                   | 0     | 0      | 1      | ---      | Digital | R   |          |
| I18e   | EER_COP                                            | Calculation of cooling and heating capacities: display of EER / COP calculation                                                 | 0.0   | 0.0    | 99.9   | ---      | Analog. | R   | 240      |
| I18e   | ON_COMPRESOR                                       | Calculation of cooling and heating capacities: display of started compressors                                                   | 0     | 0      | 1      | ---      | Digital | R   | 186      |
| I18e   | PORC_COMPRESORES                                   | Calculation of cooling and heating capacities: display of compressor stages (%)                                                 | 0     | 0      | 999    | %        | Integer | R   |          |
| I18e   | COMPRESOR_REC                                      | Calculation of cooling and heating capacities: display of recovery compressor                                                   | 0     | 0      | 1      | ---      | Digital | R/W | 117      |
| I18e   | RENOVACION_CAL                                     | Calculation of cooling and heating capacities: display of air renewal calculated depending on the mixing probe or the CO2 probe | 0     | 0      | 99     | %        | Integer | R   | 124      |
| I18e   | TEMP_INT                                           | Calculation of cooling and heating capacities: display of indoor temperature used in the unit control                           | 0.0   | -99.9  | 99.9   | °C       | Analog. | R/W | 291      |
| I18e   | TEMP_EXT                                           | Calculation of cooling and heating capacities: display of outdoor temperature                                                   | 0.0   | -99.9  | 99.9   | °C       | Analog. | R/W | 2        |

### Parameters of "Access Levels"

### 10. Access Levels

| Screen | Parameter               | Description of the parameter | Value | Min. | Max. | UOM | Type    | R/W | Add. BMS |
|--------|-------------------------|------------------------------|-------|------|------|-----|---------|-----|----------|
| NA01   | ACTUAL_ACCES_LEVEL      | Current access level         | 1     | 1    | 9    | --- | Integer | R   |          |
| NA01   | NOT_PASS_ACCESS_LEVEL_1 | Without access to level 1    | 0     | 0    | 1    | --- | Digital | R/W |          |
| NA01   | MASK_ACCES_LEVEL_1      | Access to level 1            | 0     | 0    | 1    | --- | Digital | R/W |          |
| NA01   | NOT_PASS_ACCESS_LEVEL_2 | Without access to level 2    | 0     | 0    | 1    | --- | Digital | R/W |          |
| NA01   | MASK_ACCES_LEVEL_2      | Access to level 2            | 0     | 0    | 1    | --- | Digital | R/W |          |
| NA01   | NOT_PASS_ACCESS_LEVEL_3 | Without access to level 3    | 0     | 0    | 1    | --- | Digital | R/W |          |
| NA01   | MASK_ACCES_LEVEL_3      | Access to level 3            | 0     | 0    | 1    | --- | Digital | R/W |          |

## 13 - LIST OF CONTROL PARAMETERS WITH "LEVEL OF ACCESS 1"

### Parameters of "Alarms History"

#### 11. Alarms History

| Screen | Parameter     | Description of the parameter                     | Value | Min.  | Max. | UOM   | Type    | R/W | Add. BMS |
|--------|---------------|--------------------------------------------------|-------|-------|------|-------|---------|-----|----------|
| H01    | Last_Ind_Read | Last alarm input                                 | 0     | 0     | 999  | ---   | Integer | R   |          |
| H01    | MASK_CODE     | Description of the alarm                         | 0     | 0     | 99   | ---   | Integer | R   |          |
| H01    | MASK_HOUR     | Hour                                             | 0     | 0     | 99   | ---   | Integer | R   |          |
| H01    | MASK_MINUTE   | Minute                                           | 0     | 0     | 99   | ---   | Integer | R   |          |
| H01    | PLAN_ADDRESS  | pLAN address                                     | 0     | 0     | 15   | ---   | Integer | R/W |          |
| H01    | MASK_DAY      | Day                                              | 0     | 1     | 31   | day   | Integer | R   |          |
| H01    | MASK_MONTH    | Month                                            | 0     | 1     | 99   | month | Integer | R   |          |
| H01    | MASK_YEAR     | Year                                             | 0     | 0     | 99   | year  | Integer | R   |          |
| H01    | MASK_TEMP_INT | Indoor air temperature at the time of the alarm  | 0.0   | -99.9 | 99.9 | °C    | Analog  | R   |          |
| H01    | MASK_TEMP_EXT | Outdoor air temperature at the time of the alarm | 0.0   | -99.9 | 99.9 | °C    | Analog  | R   |          |

### Parameters of "Burner/Boiler"

#### 14. Burner/Boiler

| Screen | Parameter              | Description of the parameter                                                                                                                                 | Value | Min.  | Max. | UOM | Type    | R/W | Add. BMS |
|--------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|------|-----|---------|-----|----------|
| G01    | CONTROL_QUEMADOR_GAS   | Control of the gas burner or gas boiler:<br>0 = burner/boiler as 2nd stage;<br>1 = only burner/boiler<br>2 = only burner/boiler with low outdoor temperature | 0     | 0     | 2    | --- | Integer | R/W | 2        |
| G01    | SET_QUEMADOR_BAJA_TEXT | Setpoint of outdoor temperature below which the burner/boiler is activated instead of compressors                                                            | 5.0   | -10.0 | 10.0 | °C  | Analog  | R/W | 120      |

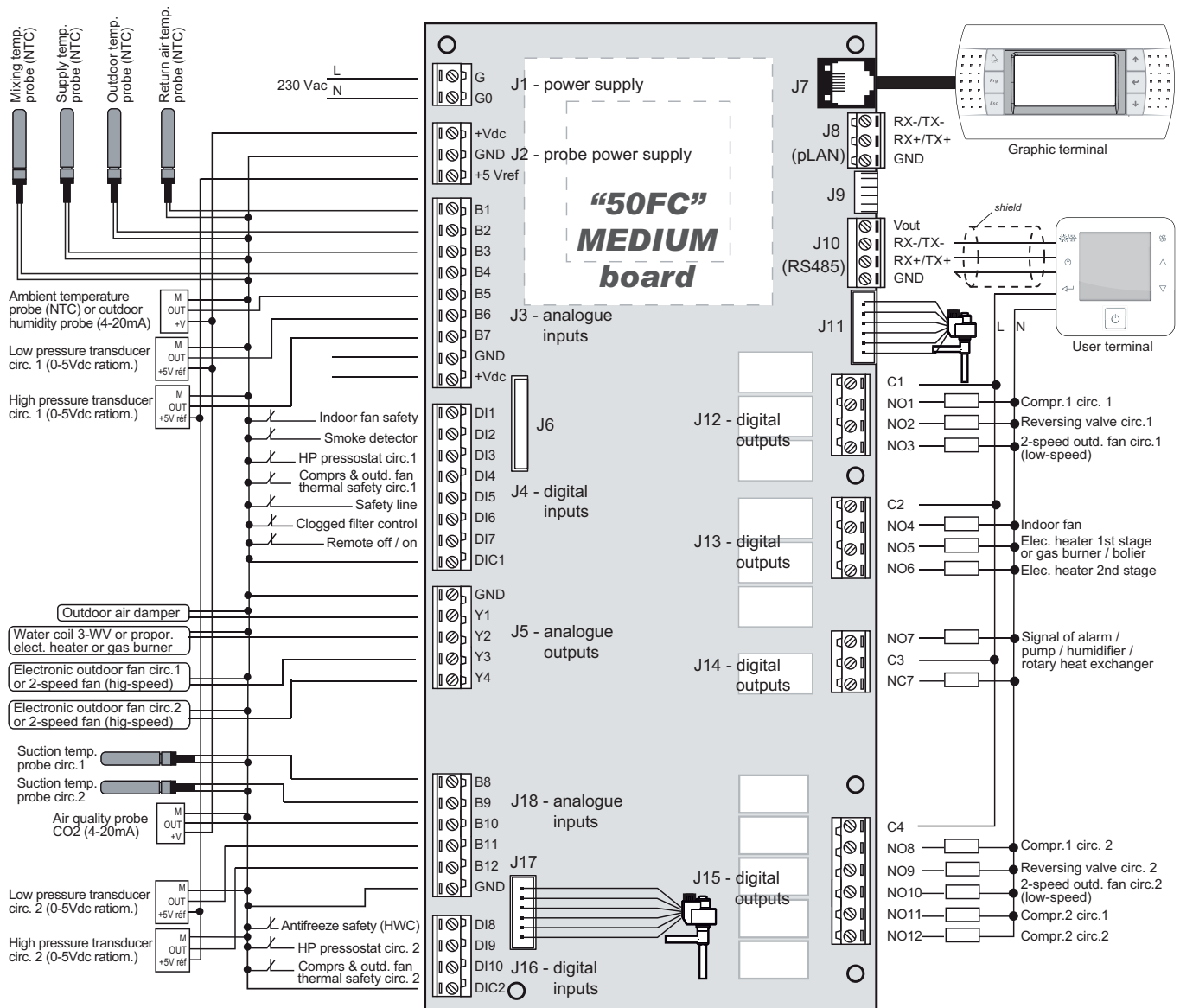
### Parameters of "Versions"

#### 15. Versions

| Screen | Parameter                                | Description of the parameter                           | Value | Min. | Max. | UOM | Type    | R/W | Add. BMS |
|--------|------------------------------------------|--------------------------------------------------------|-------|------|------|-----|---------|-----|----------|
| V01    | logo_bool                                | Type of logo                                           | 0     | 0    | 1    | --- | Digital | R/W |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.SwVerX_msk         | Release version (high part)                            | 9     | 1    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.SwVerY_msk         | Release version (low part)                             | 9     | 0    | 9    | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.SwVerZ_msk         | Sequential number                                      | 0     | 0    | 999  | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.SwBetaOfficial_msk | If the software is a BETA version (0=Beta; 1=Official) | 0     | 0    | 1    | --- | Digital | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.SwVerD_msk         | Demo version                                           | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Sw_Day             | Software: day                                          | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Sw_Month           | Software: month                                        | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Sw_Year            | Software: year                                         | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.H_Bios_Release     | Version number of the BIOS (high part)                 | 0     | 0    | 9    | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.L_Bios_Release     | Version number of the BIOS (low part)                  | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Bios_Day           | BIOS: day                                              | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Bios_Month         | BIOS: month                                            | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Bios_Year          | BIOS: year                                             | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.H_Boot_Release     | Version number of the BOOT (high part)                 | 0     | 0    | 9    | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.L_Boot_Release     | Version number of the BOOT (low part)                  | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Boot_Day           | BOOT: day                                              | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Boot_Month         | BOOT: month                                            | 0     | 0    | 99   | --- | Integer | R   |          |
| V01    | MOD_HWSW_CHK_CIAT_2_1.Boot_Year          | BOOT: year                                             | 0     | 0    | 99   | --- | Integer | R   |          |
| V02    | PCO_TYPE                                 | Type of board                                          | 0     | 1    | 12   | --- | Integer | R/W |          |
| V02    | BOARD_TYPE                               | Board size                                             | 0     | 0    | 99   | --- | Integer | R/W |          |
| V02    | MOD_HWSW_CHK_CIAT_2_1.pCO_Compact_Type_A | pCO Compact Type A                                     | 0     | 0    | 1    | --- | Digital | R   |          |
| V02    | MEMORY_SIZE0                             | Flash memory                                           | 0     | 0    | 9999 | --- | Integer | R/W |          |
| V02    | MEMORY_SIZE1                             | RAM memory                                             | 0     | 0    | 9999 | --- | Integer | R/W |          |
| V02    | MOD_HWSW_CHK_CIAT_2_1.Builtin_DSP        | Built-in type                                          | 0     | 0    | 9    | --- | Integer | R   |          |
| V02    | MOD_HWSW_CHK_CIAT_2_1.Cycle_X_Sec        | Program cycle                                          | 0.0   | 0.0  | 99.9 | --- | Analog  | R   |          |
| V02    | MOD_HWSW_CHK_CIAT_2_1.Cycle_Time         | Cycle/s                                                | 0     | 0    | 9999 | --- | Integer | R   |          |

# 14 - CONNECTIONS

## 14.1. Main board



### Connector J1

Unit power supply

### Connector J2

Sensors power supply

### Connector J3 (Analog inputs)

Temperature, pressure and humidity reading sensors:

- B1: return air temperature probe
- B2: outdoor air temperature probe
- B3: supply air temperature probe
- B4: mixing air temperature probe
- B5: NTC ambient air temperature probe (by default) or outdoor air relative humidity probe (optional)
- B6: low pressure transducer circuit 1
- B7: high pressure transducer circuit 1

### Connector J4 (Digital inputs)

Safety devices and failure indication:

- D11: indoor fan protection

D12: smoke detector (optional)

D13: high pressure pressostat circuit 1

D14: compressor and outdoor fan protection circuit 1

D15: safety thermistor for the electrical heater or gas burner/boiler alarm signal (optionals)

D16: clogged filter control (optional)

D17: remote On / Off

### Connector J5 (Analog outputs)

Proportional control of the unit components and optional elements:

- Y1: control of the opening of the outdoor air damper
- Y2: control of the 3-way valve of the hot water coil or the heat recovery coil or proportional electrical heater or gas burner/boiler (optional)
- Y3: outdoor fan circuit 1: electronic fan (standard) or high-speed (optional 2-speed fan)
- Y4: outdoor fan circuit 1: electronic fan (standard) or high-speed (optional 2-speed fan)

### Connector J6

Connection of the BMS communication card

# 14 - CONNECTIONS

## Connector J7

Connection of the VecticGD graphic terminal

## Connector J8

Connection of the pLAN network

## Connector J10

Connection of the RS485 Fieldbus (TCO terminal, sensors, etc)

## Connector J11

Electronic expansion valve circuit 1

## Connector J12 (Digital outputs)

On/off control of the unit components:

- NO1: compressor 1 of circuit 1
- NO2: cycle reversing valve circuit 1
- NO3: low-speed outdoor fan circuit 1 (optional 2-speed fan)

## Connector J13 (Digital outputs)

On/off control of the unit components:

- NO4: indoor fan
- NO5: 1st stage of electrical heater or gas burner or boiler (optionals)
- NO6: 2nd stage of electrical heater

## Connector J14 (Digital outputs)

On/off control of the unit components:

- NO7: alarm signal or pump in the hot water coil circuit or on-off

humidifier or rotary heat exchanger (optionals)

## Connector J15 (Digital outputs)

On/off control of the unit components:

- NO8: compressor 1 of circuit 2 (units with 2 circuits)
- NO9: cycle reversing valve circuit 2 (units with 2 circuits)
- NO10: low-speed outdoor fan circuit 2 (optional 2-speed fan)
- NO11: compressor 2 of circuit 1
- NO12: compressor 2 of circuit 2 (units with 2 circuits)

## Connector J16 (Digital inputs)

Safety devices and failure indication:

- DI8: antifreeze safety for the hot water coil
- DI9: high pressure pressostat circuit 2 (units with 2 circuits)
- DI10: compressor and outdoor fan protection circuit 2 (units with 2 circuits)

## Connector J17

Electronic expansion valve circuit 2 (units with 2 circuits)

## Connector J18 (Analog inputs)

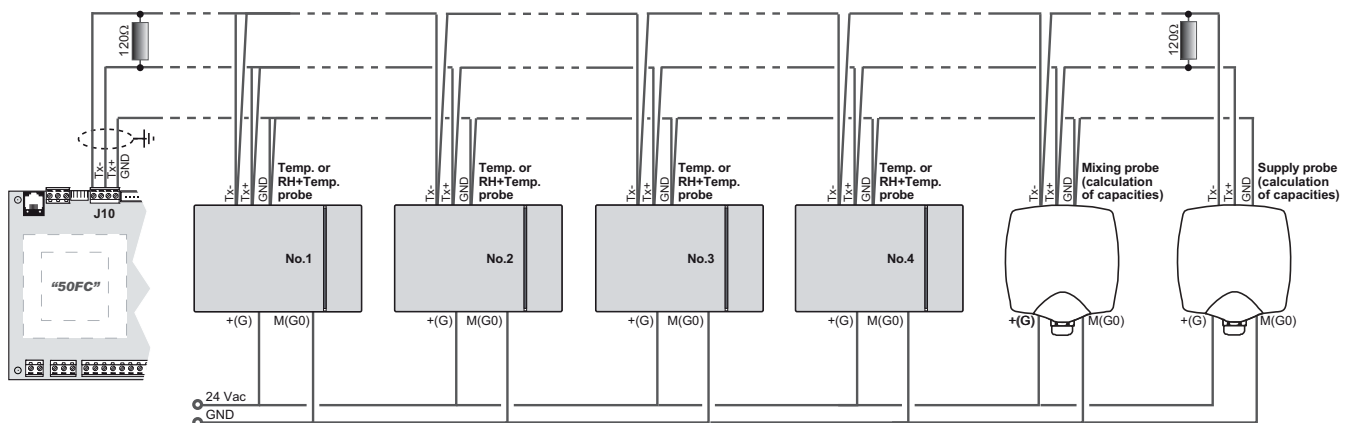
Temperature, pressure and humidity reading sensors:

- B8: suction temperature probe circuit 1
- B9: suction temperature probe circuit 2
- B10: air quality probe (optional)
- B11: low pressure transducer circuit 2
- B12: high pressure transducer circuit 2

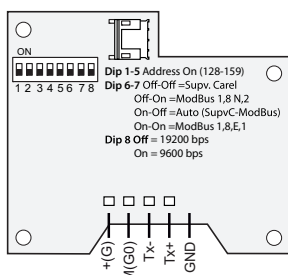
## 14.2. Serial connection of RS485 probes to the Field-bus of the control board (optional)

The following serial probes can be connected on the RS485 Field-bus (connector J10), configured with different addresses:

- 1 to 4 probes of ambient temperature or temperature + humidity.
- Enthalpy probes on the mixing air and the supply air for calculation of the cooling and heating capacities.



### RS485 probes configuration:



| Ambient probe No.1: | Ambient probe No.2: | Ambient probe No.3: | Ambient probe No.4: | Mixing enthalpic probe: | Supply enthalpic probe: |
|---------------------|---------------------|---------------------|---------------------|-------------------------|-------------------------|
| Address: 128        | Address: 129        | Address: 130        | Address: 131        | Address: 132            | Address: 133            |
| Modbus 1, 8, N, 2   | Modbus 1, 8, N, 2   | Modbus 1, 8, N, 2   | Modbus 1, 8, N, 2   | Modbus 1, 8, N, 2       | Modbus 1, 8, N, 2       |
| 9600 bps            | 9600 bps            | 9600 bps            | 9600 bps            | 9600 bps                | 9600 bps                |



**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.

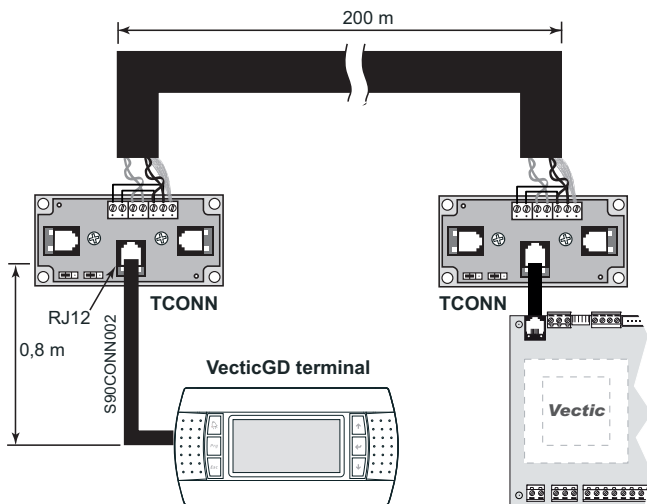
# 14 - CONNECTIONS

## 14.3. Connection of terminals to the control board

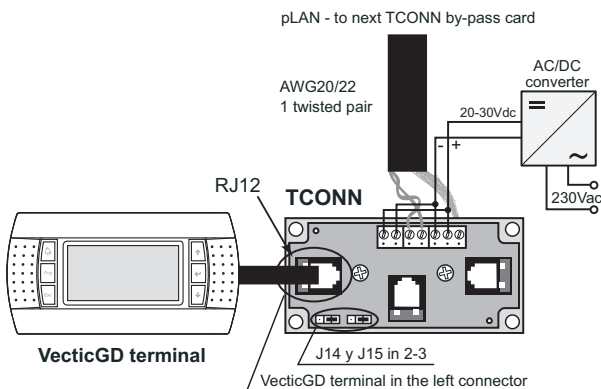
### Connection of the VecticGD terminal (standard)

The terminal can be installed at a maximum distance of 500 metres from the microPC control board.

- 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 VecticGD terminal and the control 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 screen accessed, set address 16 in:  
`Display address setting.`

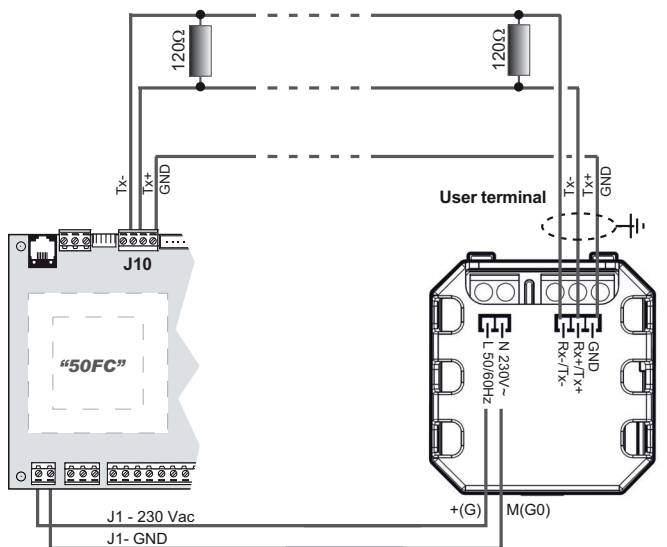
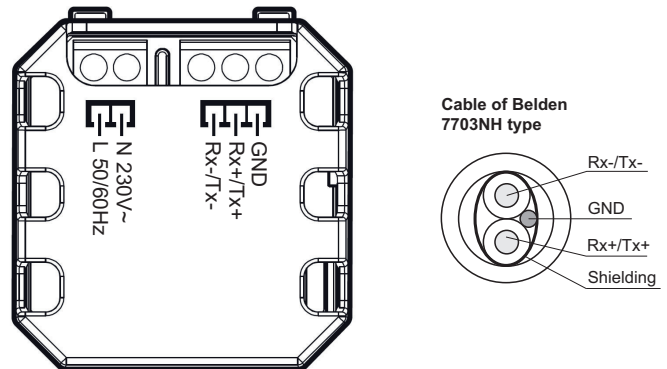
Note: If the terminal is going to be integrated into the pLAN, refer to the "Vectic control brochure", which explains the configuration of the terminals in the network.

### Connection of the TCO terminal (optional)

The terminal can be installed on the RS485 Filed-bus at a maximum distance of 100 metres from the 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).



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

#### Configuration:

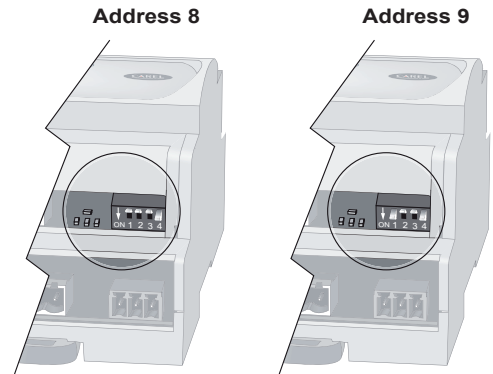
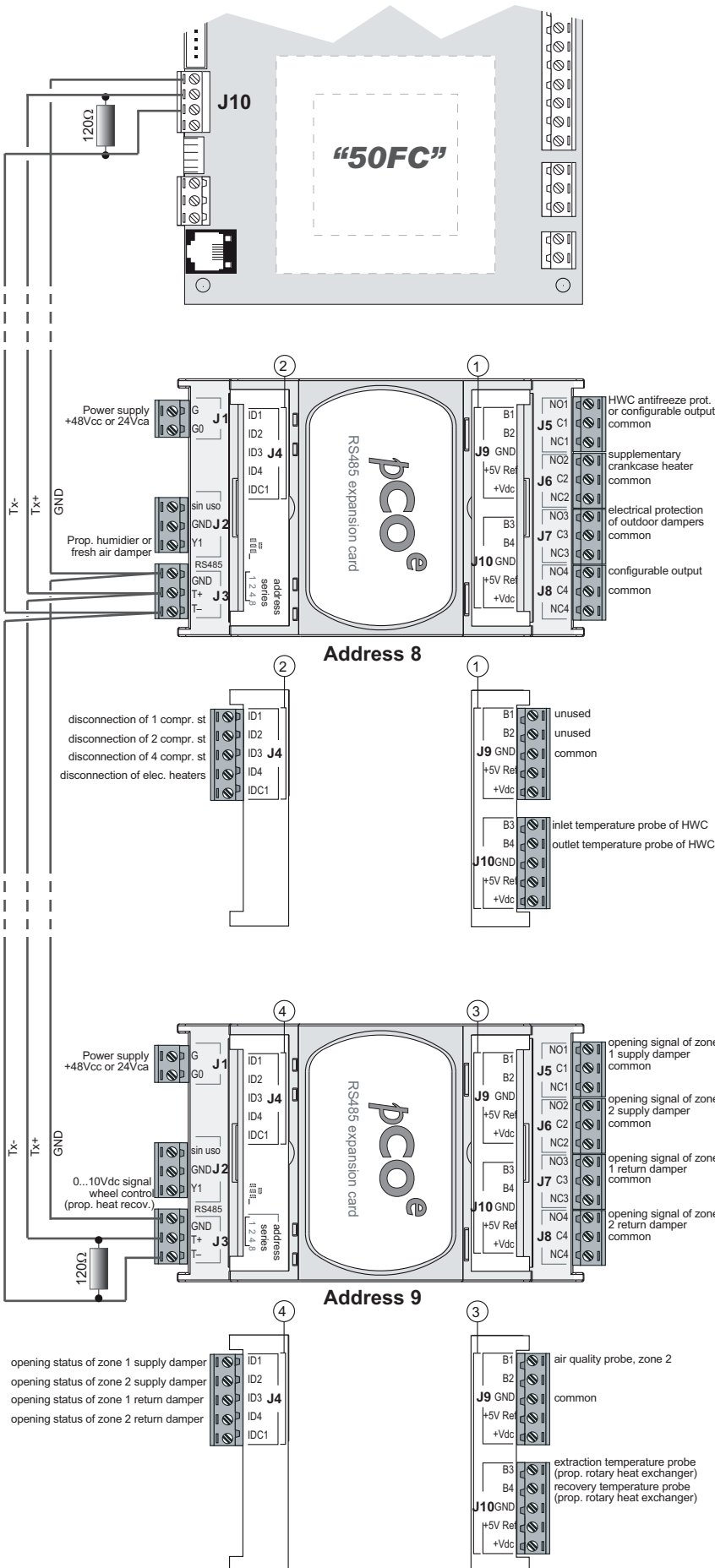
To ensure communication between the TCO terminal and the control board, the terminal must be configured with address 10 and speed 9600 bps.

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 "irit." symbol. The terminal will be fully operational after a few seconds.

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

# 14 - CONNECTIONS

## 14.4. Connection of pCOe expansion cards to the control board (optional)



### pCOe card with address 8

#### Analog inputs

- B1: unused
- B2: unused
- B3: T probe on the HWC inlet with GREAT COLD
- B4: T probe on the HWC outlet with GREAT COLD

#### Digital inputs

- D11: disconnection of 1 compressor stage or alarm signal or pump in the hot water coil circuit or compressor in the recovery circuit or on-off humidifier or rotary heat exchanger
- D12: disconnection of 2 compressor stages
- D13: disconnection of 4 compressor stages
- D14: disconnection of electrical heaters

#### Digital outputs

- NO1: electrical heating for the piping layout of the water circuit with GREAT COLD or configurable output (humidifier, HWC pump, alarm signal,...)
- NO2: compressor with supplementary crankcase heater
- NO3: electrical heater for protection of outdoor damper or solenoid valve SV1 with active dehumidification
- NO4: configurable output (humidifier, HWC pump, alarm signal,...) or solenoid valve SV2 with active dehumidification

#### Analog output

- Y1: proportional humidifier or exhaust damper or control of the proportional 3VW of the condensation coil with active dehumidification

### pCOe card with address 9

#### Analog inputs

- B1: second air quality probe for installation in the environment or outdoor (4-20mA / 0...5000 ppm) or air quality probe for the zone 2 (4-20mA)
- B2: unused
- B3: exhaust T probe (prop. rotary heat exchanger)
- B4: recovery T probe (prop. rotary heat exchanger)

#### Digital inputs

- D11: opening status of the supply damper of zone 1 or the supply damper external to the unit or alarm on the thermistors of the electrical heater for preheating
- D12: opening status of the supply damper of zone 2
- D13: opening status of the return damper of zone 1 or return damper external to the unit
- D14: opening status of the return damper of zone 2

#### Digital outputs

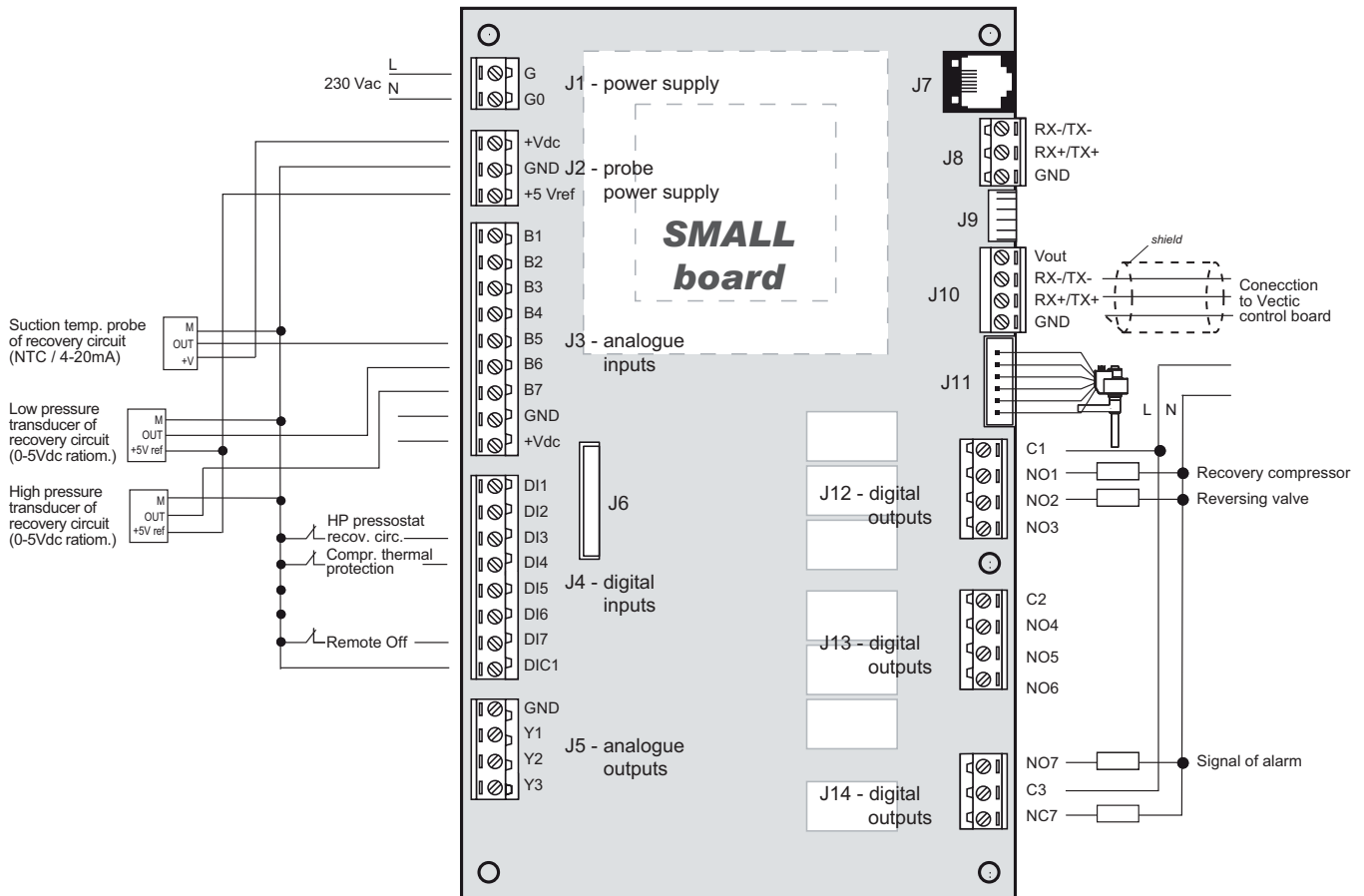
- NO1: opening signal of supply damper of the zone 1 or supply damper (external to the unit)
- NO2: opening signal of supply damper of the zone 2
- NO3: opening signal of return damper of the zone 1 or return damper (external to the unit)
- NO4: opening signal of return damper of the zone 2

#### Analog output

- Y1: 0...10Vdc output for wheel control (proportional rotary heat exchanger) or preheater with electrical heater (100% fresh air)

## 14 - CONNECTIONS

### 14.5. Connection of the SMALL board with address 4 to control the recovery circuit (optional)



The management of the cooling circuit for the recovery of the extracted air energy (optional) is done with a SMALL board connected in series on the Field-Bus. Address 4.

#### Connector J1

Unit power supply

#### Connector J2

Sensors power supply

#### Connector J3 (Analog inputs)

Temperature and pressure reading sensors:

B5: suction temperature probe of the recovery circuit

B6: low pressure transducer of the recovery circuit

B7: high pressure transducer of the recovery circuit

#### Connector J4 (Digital inputs)

Safety devices and failure indication:

DI3: high pressure pressostat of the recovery circuit

DI4: compressor thermal protection of the recovery circuit

DI7: remote off

#### Connector J10

RS485 Fieldbus connection with the Vetic control board.

Board address = 4

#### Connector J11

Cycle reversing valve of the recovery circuit

#### Connector J12 (Digital outputs)

On/off control of the unit components:

NO1: recovery compressor

NO2: cycle reversing valve of the recovery circuit

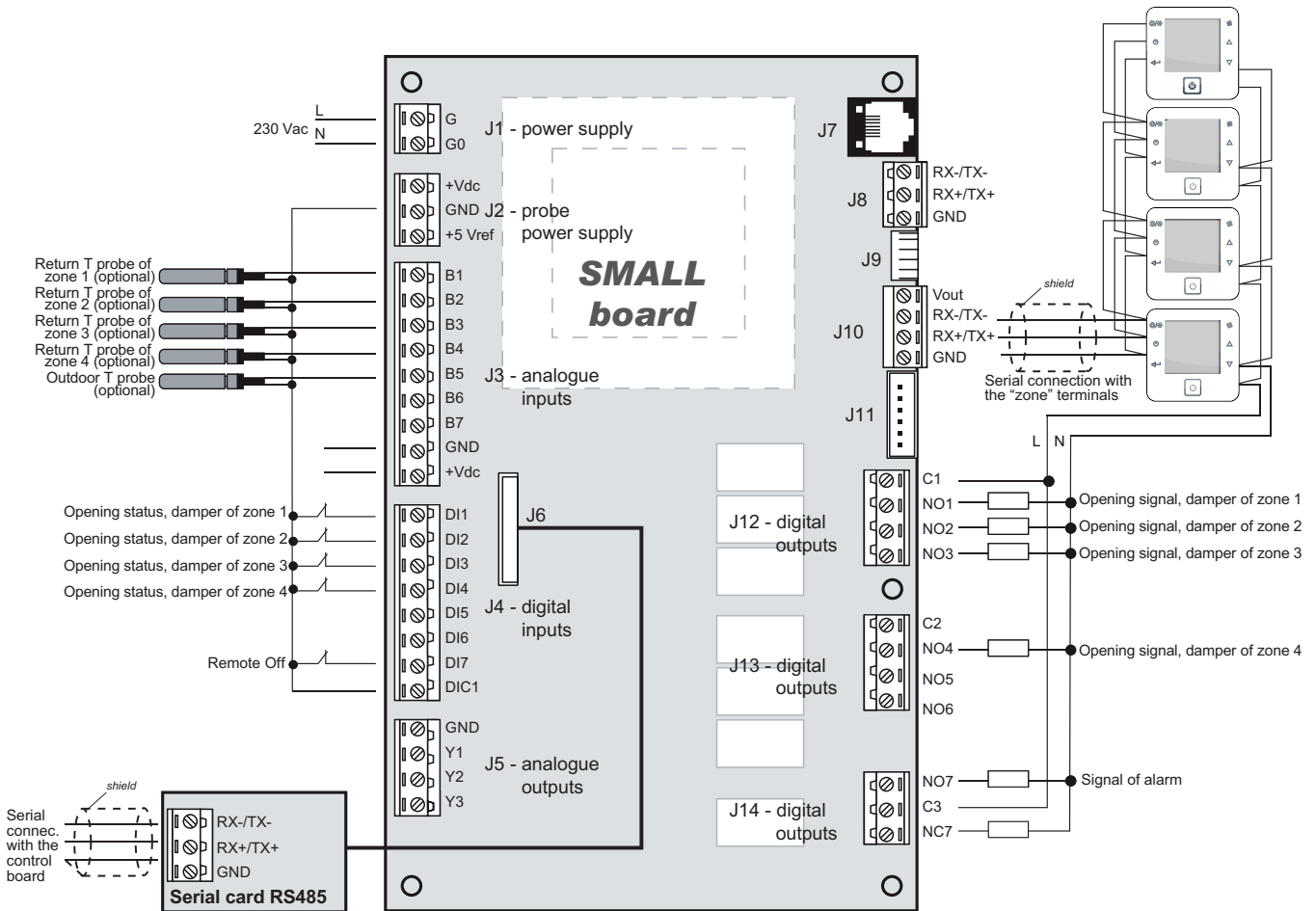
#### Connector J14 (Digital outputs)

On/off control of the unit components:

NO7: signal of alarm

## 14 - CONNECTIONS

### 14.6. Connection of the SMALL board with address 11 for zoning the air flow (optional)



The zoning of the air flow up to 4 different zones through dampers (optional) is done with a SMALL board connected in series on the Field-Bus. Address 11.

#### Connector J1

Unit power supply

#### Connector J2

Sensors power supply

#### Connector J3 (Analog inputs)

Temperature reading sensors:

- B1: return temperature probe of the zone 1 (optional) (1)
- B2: return temperature probe of the zone 2 (optional) (1)
- B3: return temperature probe of the zone 3 (optional) (1)
- B4: return temperature probe of the zone 4 (optional) (1)
- B5: outdoor temperature probe (optional) (2)

#### Connector J4 (Digital inputs)

Status:

- DI1: opening status of the supply damper of the zone 1
- DI2: opening status of the supply damper of the zone 2
- DI3: opening status of the supply damper of the zone 3

(1) By default, the probes of ambient temperature built-in the zone terminals are used by the control

(2) By default, the probe of outdoor temperature connected on the main control board is used by the control (connector J3 - B2)

DI4: opening status of the supply damper of the zone 4

DI7: remote off

#### Connector J6

RS485 Fieldbus serial connection with the Vecitic control board.

Board address = 11

#### Connector J10

RS485 Fieldbus serial connection with the "Zone" terminals (up to 4 terminals).

#### Connector J12 (Digital outputs)

On/off control of dampers:

- NO1: opening signal of the supply damper of the zone 1
- NO2: opening signal of the supply damper of the zone 2
- NO3: opening signal of the supply damper of the zone 3

#### Connector J13 (Digital outputs)

On/off control of dampers:

- NO4: opening signal of the supply damper of the zone 4

#### Connector J14 (Digital outputs)

On/off control of the unit components:

- NO7: signal of alarm



## 15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

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.

### microPC board

#### ELECTRICAL FEATURES

|                                                         |                                                                                                |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Power supply (controller with terminal connected)       | 230 Vac +10/-15% (by default)<br>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.)<br>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                                                                                          |

#### Analogue inputs

|                                                         |                                                                                                                                            |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 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: 10kΩ ± 0.1% to 25°C; -50/90°C<br>high temperature NTC: 50kΩ to 25°C; 0/150°C<br>input: 0/1 Vdc                        |
| Input type: B5 and B10                                  | low temperature NTC: 10kΩ to 25°C; -50/90°C<br>high temperature NTC: 50kΩ to 25°C; 0/150°C<br>input: 0/1 Vdc and 4/20 mA                   |
| Input type: B6, B7, B11 and B12                         | low temperature NTC: 10kΩ to 25°C; -50/90°C<br>high temperature NTC: 50kΩ to 25°C; 0/150°C<br>input: 0/1 Vdc<br>radiometric pressure probe |
| Time constant for each input                            | 0.5 s                                                                                                                                      |
| Input precision                                         | ± 0.3% of the complete scale                                                                                                               |
| Classification of the average circuits (IEC EN 61010-1) | Category I                                                                                                                                 |

#### Digital inputs

|                                |    |
|--------------------------------|----|
| No. of inputs on SMALL boards  | 7  |
| No. of inputs on MEDIUM boards | 10 |

#### Analogue outputs

|                |                                                                             |
|----------------|-----------------------------------------------------------------------------|
| Maximum number | 3 in SMALL boards and 4 in MEDIUM boards                                    |
| Type           | 0 to 10Vdc                                                                  |
| Precision      | ± 3% of the complete scale or ± 5% of the complete scale (maximum load 5mA) |
| Resolution     | 8-bit                                                                       |
| Maximum charge | 2 kΩ (5 mA)                                                                 |

#### Digital outputs

|                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Composition of groups                                                                                                                                                                                                                                  | SMALL board: Group 1 (1 to 6); Group 2 (7)<br>MEDIUM board: Group 1 (1 to 6); Group 2 (7); Group 3 (8 to 12)                                                                                                                                                                                                                                                                                                                               |
| Electrical contacts<br>Note: relays of the same group with basic isolation must have the same power supply (24 Vdc or 230 Vac).<br>Relays of the same group have basic isolation among themselves. The isolation between the various groups is double. | SMALL board (relays 1 to 7):<br>EN60730-1: NO 1(1)A 250Vac cos φ =0.4; 100,000 χψχλεσ<br>UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles<br>Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles<br><br>MEDIUM board (relays 1 to 12):<br>EN60730-1: NO 1(1)A 250Vac cos φ =0.4; 100,000 χψχλεσ<br>UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles<br>Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles |

#### TECHNICAL CHARACTERISTICS

|                                                                |                                                                                                     |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Storage conditions / Operating conditions                      | -20T70 °C; %RH 90 non-condensation / -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)<br>MEDIUM board: 228 x 113 x 55 mm (13 DIN modules) |

## 15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

### pCOe expansion modules

#### GENERAL CHARACTERISTICS

|                                                                |                                                    |
|----------------------------------------------------------------|----------------------------------------------------|
| 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)                   |

#### CONNECTION WITH $\mu$ PC MEDIUM BOARD

|                                           |                                                                                                                                                                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                                      | Asynchronous half duplex, 2 dedicated wires                                                                                                                                                                                     |
| Connector                                 | Removable 3-way connector                                                                                                                                                                                                       |
| Driver                                    | Balanced differential MCR 7V                                                                                                                                                                                                    |
| Maximum distance to $\mu$ PC MEDIUM board | With telephone cable:<br>- cable resistance $\leq 0.14 \Omega/m$ : 600 metros<br>- cable resistance $\leq 0.25 \Omega/m$ : 400 metros<br><br>With shielded cable AWG24<br>- cable resistance $\leq 0.078 \Omega/m$ : 600 metros |

#### ELECTRICAL FEATURES

|                            |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| Power supply               | 24 Vac $\pm 10/-15\%$ 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                                                              |

#### Analogue inputs

|                                          |                                                                                                                                                                            |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)<br>Voltage: 0/1 Vdc, 0/5 Vdc radiometric or 0/10 Vdc<br>current: 0/20 mA or 4/20 mA. Input resistance: 100k $\Omega$ |
| NTC input type precision                 | $\pm 0.3$ complete scale                                                                                                                                                   |

#### Digital inputs

|        |                                                                                     |
|--------|-------------------------------------------------------------------------------------|
| Number | 4                                                                                   |
| Type   | Contact voltage-free, 5 mA,<br>Inputs not optically isolated, internal power supply |

#### Analogue outputs

|                |                             |
|----------------|-----------------------------|
| Number         | 1 (Y1)                      |
| Type           | Optically isolated 0/10 Vdc |
| Precision      | $\pm 1\%$                   |
| Resolution     | 8-bit                       |
| Maximum charge | 1 k $\Omega$ (10 mA)        |

#### Digital outputs

|                              |                                                                             |
|------------------------------|-----------------------------------------------------------------------------|
| Number                       | 4                                                                           |
| Type                         | 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) |

## 15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

| <b>VectiGD 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 CHARACTERISTICS</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                                                                                           |

| <b>TCO terminal</b>                                            |                                                                                      |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>TECHNICAL CHARACTERISTICS OF THE POWER SUPPLY</b>           |                                                                                      |
| Voltage                                                        | Power supply 230Vac(+10/-15) 50/60Hz                                                 |
| Maximum power                                                  | 1 VA                                                                                 |
| <b>CONNECTION WITH THE microPC BOARD</b>                       |                                                                                      |
| Type                                                           | AGW20 or AGW22 with 1 braided pair + drainwire + shielding                           |
| <b>GENERAL CHARACTERISTICS</b>                                 |                                                                                      |
| Protection index                                               | IP20                                                                                 |
| Operating conditions                                           | -10T60 °C, 10 to 90% RH non-condensing                                               |
| Storage conditions                                             | -20T70 °C, 10 to 90% RH non-condensing                                               |
| Software class and structure                                   | A                                                                                    |
| Environmental pollution                                        | 2                                                                                    |
| Category of resistance to heat and fire                        | Category D                                                                           |
| Immunity from voltage surge                                    | Category 2                                                                           |
| Classification according to protection against electric shocks | To be incorporated in class I and/or II appliances                                   |
| Electric safety                                                | IEC EN 60730-1, IEC EN 60730-2-9                                                     |
| Electromagnetic compatibility                                  | IEC EN 61000-6-1, IEC 61000-6-3, IEC EN 61000-6-2, IEC EN 61000-6-4                  |
| PTI of the insulating material                                 | 275 V                                                                                |
| Precision of the temperature measurement                       | 0T40 °C ± 1%                                                                         |
| Dimensions: Length x Height x Depth                            | Model to fit: 86 x 86 x 51 mm<br>Surface model: 86 x 142 x 23 mm or 142 x 86 x 23 mm |

# 15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

## 15.1. Ambient probe

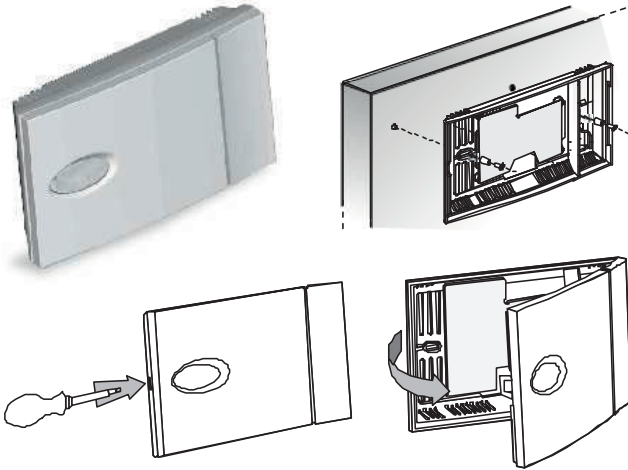
### Wall version (DPW)

Case index of protection: IP30

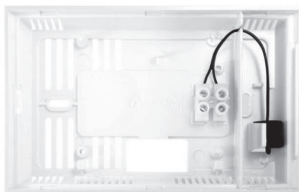
Sensor index of protection: IP30.

#### Assembly and setting instructions

- This probe must be fixed to the panel or the wall of the room to be conditioned, at ca. 1.5 m height.
- Open the case using a flathead screwdriver in the slot, paying extra care not to damage the electronic parts.



- Fasten the rear of the sensor case to the panel or the wall (for fastening the case, use the screws supplied with the fastening kit, paying attention to use the proper spacers, to not damage the sensor's electronics).
- The electrical connection must be carried out depending on the unit setting:
  - NTC probe S5a: B5 (connector J3) : with 2 x 1,5 mm<sup>2</sup> section cable, within a maximum distance of 30 metres.
  - RS485 (connector J10): with AWG20 section cable, single braided pair preferably shielded with drain wire + Power supply 24 Vac (2 wires).
  - \* Temperature: S21 to S24.
  - \* Temperature + humidity: S31 to S34.
- Note: in the case of more than one probe, connection of the probes in series, in the RS485 network.
- Close the sensor with the top cover by pressing lightly.



Inside view, bottom shell



Inside view, top shell

### Duct version (DPD)

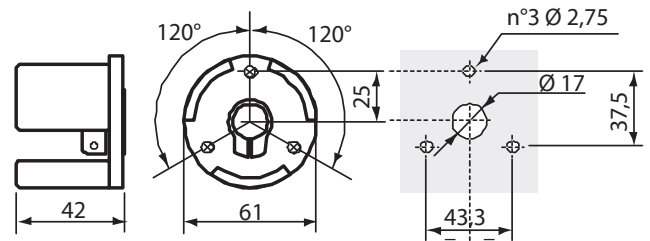
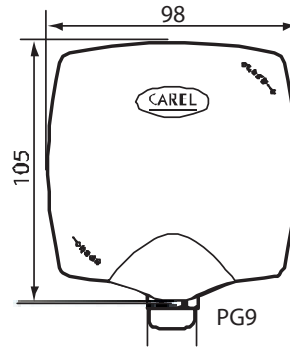
Case index of protection: IP55

Sensor index of protection: IP40.

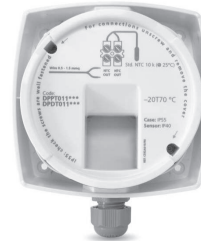
#### Assembly and setting instructions

- The duct version is connected to the air duct using the special fastening bracket.
- Fasten the bracket to the air duct.

- Insert the rod on the bracket to the required depth.
- Tighten the screw on the bracket to fasten.



- For the electrical connections, remove the top cover of the sensor. Remove the cover by rotating it anticlockwise



View of sensor without cover

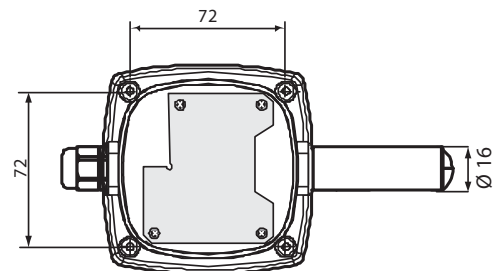


Interior view

### Industrial environment version (DPP)

Case index of protection: IP55

Sensor index of protection: IP54.



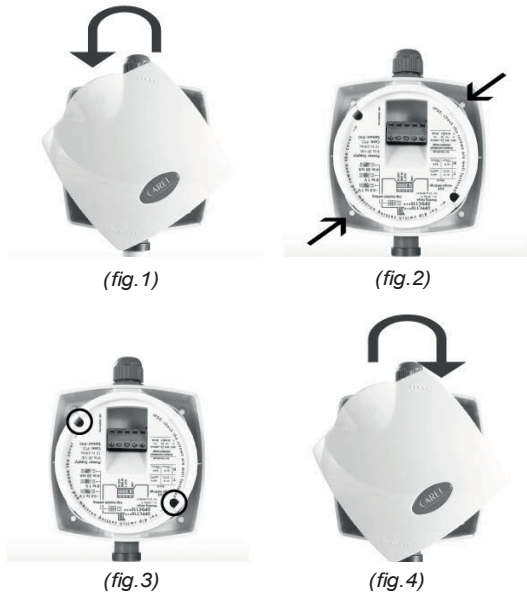
#### Assembly and setting instructions

The industrial environment version is wall or panel mounted.

- Open the case by turning the top cover anticlockwise (fig.1).
- Fasten the rear of the sensor case to the panel or the wall (use the screws supplied together with the sensor) placing the screws in the holes provided. (fig.2).

# 15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

- Make sure that the screws that hold the board protective cover are fastened tightly (fig.3).
- Close the sensor by turning the cover clockwise (fig.4).



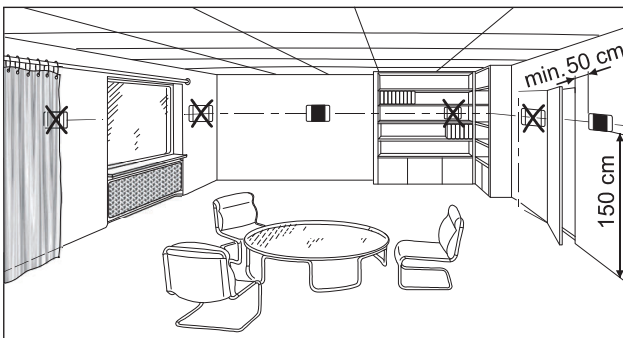
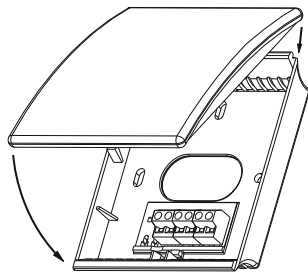
## Cleaning and maintenance

When cleaning the instrument do not use ethyl alcohol, hydrocarbons (petrol), ammonia and derivatives. Use neutral detergents and water. Periodically check the aeration slits on the sensor to make sure that air can flow freely through, without obstructions due to impurities or dust in the site of installation.

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

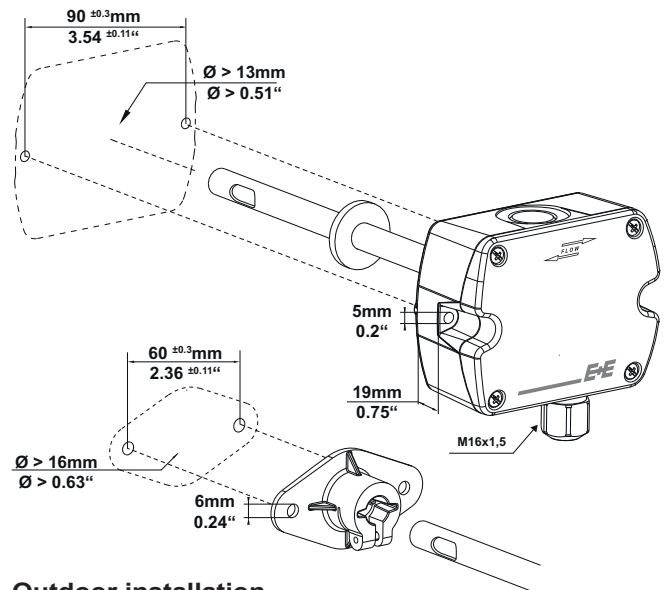
### Installation in the environment

- This probe must be fixed to the interior wall of the room to be conditioned, at ca. 1.5 m height in the room and at least 50 cm from the next wall.
- It should never be mounted:
  - On outside walls.
  - In niches or behind curtains.
  - Above or near heat sources or shelves.
  - On walls covering heat sources such as a chimney.
  - In the radiation range of heat sources and lighting bodies e.g. spotlights.
  - In areas exposed to direct solar radiation.

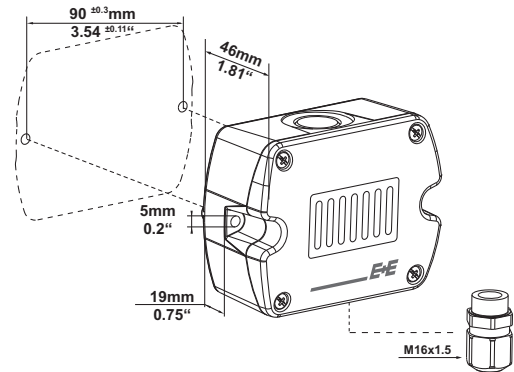


### Duct-mounted

This version can be connected to the air duct in these two ways:

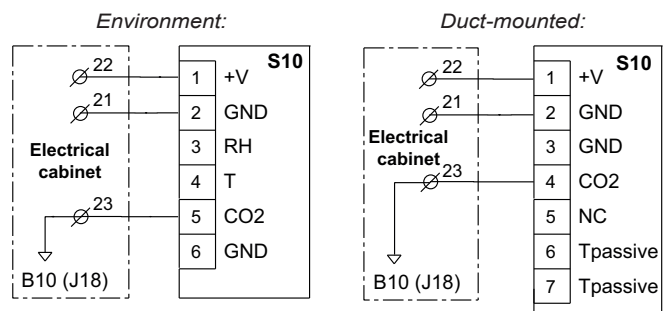


### Outdoor installation



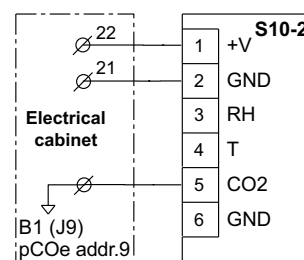
### Electrical connection

This probe (S10) is configured as analogue output 4...20 mA (0..2000 ppm), in the analogue input B10 of the control board (connector J18). Recommended cable section: 1,5 mm<sup>2</sup>



The second probe (S10-2) is configured as analogue output 4...20 mA (0..2000 ppm), in the analogue input B1 of the expansion card pCOe with address 9 (connector J9). Recommended cable section: 1,5 mm<sup>2</sup>.

### Environment or outdoor:



## 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 VecticGD 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.



