Air-air units

Electronic control

VECTIC

User manual
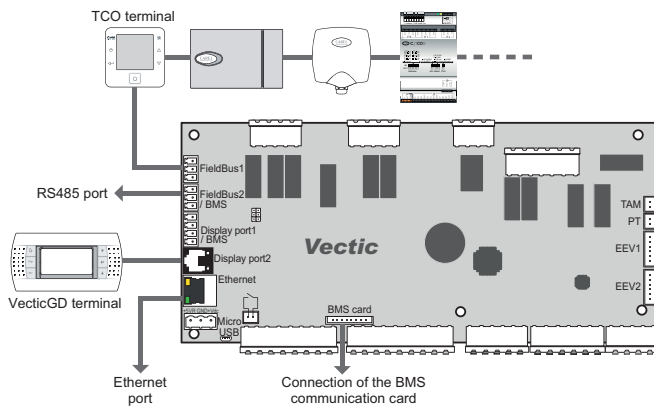
CIAT

CONTENTS

ORIGINAL TEXTS: SPANISH VERSION

1 - GENERAL DESCRIPTION

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

This control consist of a µPC3 control board, sensors, a VecticGD graphic terminal, and a TCO user terminal (optional).

The µPC3 control board comes equipped with a web tool, C.FIELD, which can be accessed through the board's IP address. This tool enables users to monitor the status of the unit at all times. By navigating through various menus, users can view the variables that are controlled by the Vectic control.

The control board includes a RS485 field-bus *(Fieldbus1)* to manage additional components such as: c.pCOe expansion modules, SMALL boards, plug-fans, probes of temperature or relative humidity of the ambient air, energy meters, etc.

This board also integrates two BMS communication ports:

- One RS485 port *(Fieldbus2/BMS)* for communication with:
  - Modbus RTU.
  - BACnet MSTP (additional license required).

  This port allows the unit to be connected to our remote monitoring solution: **ABOUND HVAC Performance**.

- One Ethernet IP port *(Ethernet)* for communication with:
  - Modbus TCP/IP.
  - BACnet IP (additional license required).

  The Ethernet port allows the unit to be connected on a **shared network (SHRD)** of up to 15 units, with one unit configured as "Lead" and the rest as "Lag". This network allows the exchange of data and information among the various units. Depending on the installation conditions, it can also share the readings of certain probes installed in the unit that is configured as the "Lead" unit, as well as temperature setpoints and operating mode. Furthermore, it is possible to configure one of the units as a "Backup" to be activated in case of malfunction of the other unit.

  This port also enables integration of the unit with our local supervision solutions: **BOSS mini** (50 units) and **BOSS** (300 units).
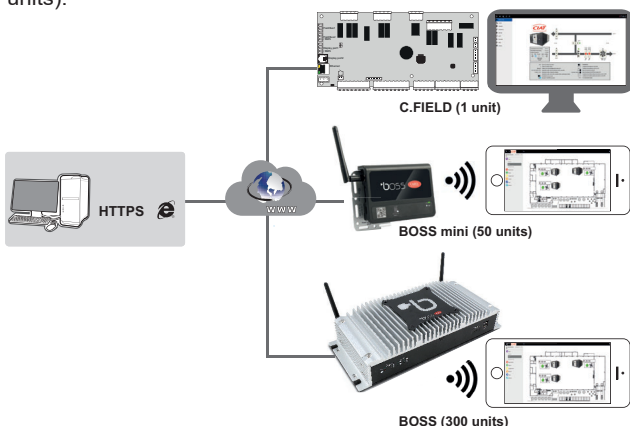
A communication card *(BMS card)* (optional) can also be connected to the µPC3 control board for the following protocols:

- BACnet MSTP;
- BACnet Ethernet;
- Modbus RTU;
- Ethernet TCP/IP.

Main functions of Vectic control:

- 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 zones.
- Constant supply pressure control.
- Unit with 100% fresh air.
- Preheater (electrical heater) in fresh air (for units with 100% fresh air).
- 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 switch.
- Smoke detection station.
- Refrigerant leak detector.
- RS485 probe(s) of ambient temperature or temperature + humidity.
- Air quality probe(s) for measuring CO_2
- Energy meter and calculation of cooling and heating capacities, thermal and electrical energy, and seasonal energy efficiencies.
- Low outdoor temperature (GREAT COLD).
- Remote COOLING / HEATING.
- Mechanical disconnection of stages.

C.FIELD web tool

The µPC3 control board includes a web tool for managing the operation of the unit. C.FIELD facilitates unit setup, commissioning, maintenance and software version updates.

To access C.FIELD it is only necessary to know the IP address of the board: **http://IP_address/commissioning/index.html**

Note: if the board is not connected to the Internet, C.FIELD can be accessed via the microUSB port.

There are four levels of access, sorted from highest to lowest: Administrator, Service, User, Guest. The Web Interface section is displayed at all levels, also for guest users.
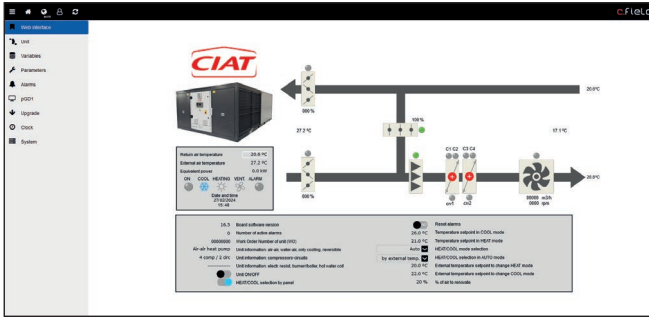
The C.FIELD menu includes the following sections:
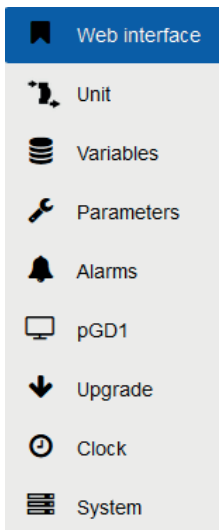
Web interface: synoptic of the air circuit, visualization of the main variables and some parameters. Access to the cooling circuit overview.

Unit: display of the value of the inputs/outputs grouped by type.

Variables: unit supervision variables divided into groups.

Parameters: all control parameters divided into groups.

Alarms: recording of alarms.

pGD1: emulation of the VecticGD terminal with all its functionalities.

Update: management of software updates, operating system and C.FIELD.

Clock: date, time and time zone.

System: µPC3 board information.

BOSSmini and BOSS supervision solutions

The following supervision solutions are available depending on the dimensions of the installation:

BOSS mini

It is the solution for the management and supervision of small or medium-sized air conditioning installations. Up to 10 units with 50 variables per unit or 50 units with 10 variables maximum per unit.

The µPC3 control board allows for communication through its built-in Ethernet port.

Its main advantages are:

- Integrated WIFI Hotspot for direct access without any extra infrastructure.
- Smartphone compatibility.

- Secure supervisor control from remote through a simple browser.
- Introduces Bacnet protocol (MSTP and TCP/IP) along with Modbus protocols (MSTP and TCP/IP)
- Integration of BMS with IP Lag mode (sharing values of interest for the general management of the building).

To access BOSSmini it is only necessary to know its identification number (xxxx):

http://mboss-xxxx/boss/
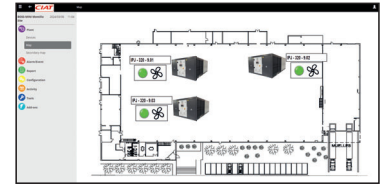
BOSSmini offers four different access levels, allowing for both commissioning and daily access for system maintenance. It also includes advanced monitoring functions and allows for the creation of areas and groups to simplify installation management.

This solution also allows the integration of energy meters for monitoring the electrical consumption of the installation.

BOSSmini is shipped from the factory with pre-configured settings and customizations that are based on the specific needs and specifications of each customer.

Available in two versions:

- CPU device.
- CPU device, monitor, mouse and keyboard.
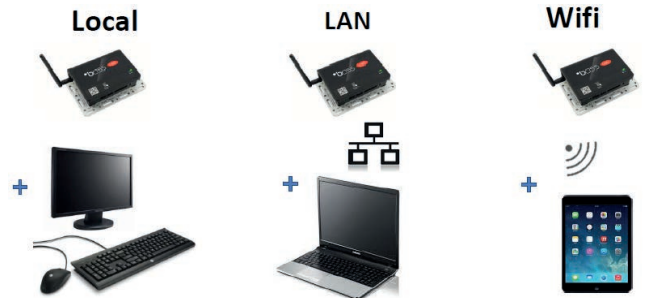
BOSS

It is the solution for the management and supervision of large air conditioning installations, up to 300 units and 3500 variables.

The µPC3 control board also allows for communication through its built-in Ethernet port. It has the same features as BOSSmini.

To access BOSS: **http://boss-xxxx/boss/**

BOSSmini and BOSS enable remote system management. A simple Internet connection provides access to all the information on the system (Router LAN o 3G/4G). The Web interface, the same that is available to the local user, allows the monitoring and complete configuration of the installation: from the office or any other current location of the user.
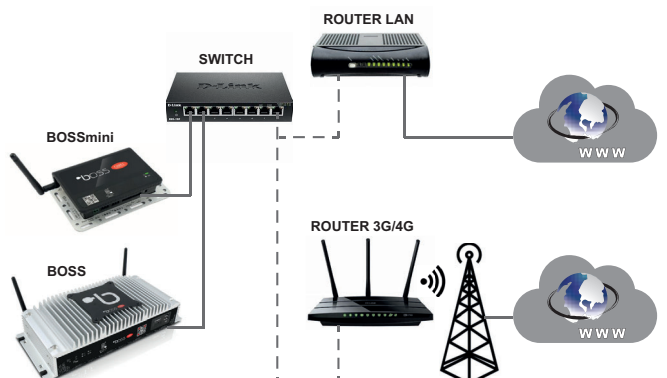
ABOUND HVAC Performance supervision solution

ABOUND HVAC Performance is a remote supervision solution dedicated to monitoring and controlling several CIAT machines in real time.

Its main advantages are:

- Improved energy performance. European regulations encourage buildings to install control and supervision systems to achieve the 2030 energy efficiency target of ≥ 27%.
- Access to the operating trend curves for analysis.
- Improved availability rate for the machines.
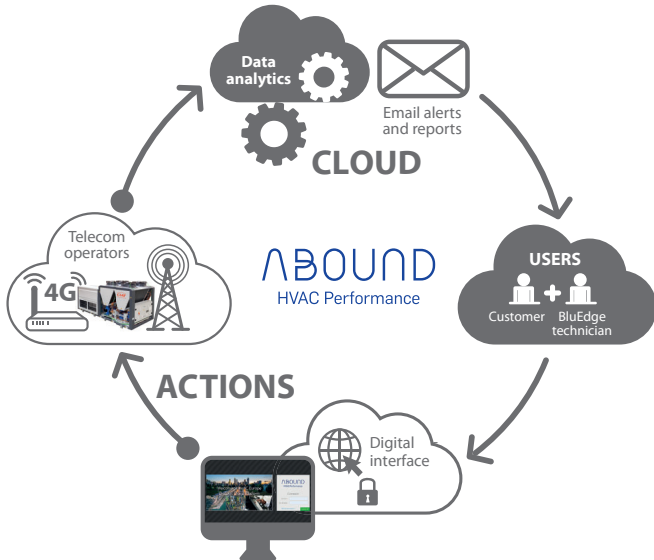
Equipment required

- A transportable box that can be used on both, machines which are already in use (existing inventory) and on new machines.

  One box can manage up to 5 units connected in series via the Modbus RS485 port of each µPC3 control board.
- Contents of the box (available in 230V and 400V)
  - 1 GPRS / 4G LTE-M modem
  - 1 SIM SMART card
  - 1 power supply (24 VDC)
  - 1 power protection device
  - 1 GSM antenna
  - Rail mounting
  - Enclosed casing to protect the equipment during transport
  - Packing box for cable routing (bus, power supply)

Features of ABOUND HVAC Performance

ABOUND HVAC Performance will send data in real time to the supervision website. The machine operating data can be accessed from any PC, smartphone or tablet. Any event can configured to trigger a mail alert.

- Parameters monitored: Overview, controller dashboard, events and temperature curves.
- Monthly and annual reports are available to analyse :
  - The performance and operation of the machine.

    Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.
- Incidents such as a drift in the measurements on a temperature sensor, incorrectly set control parameters, or even incorrect settings between one compressor stage and the other are immediately detected, and the corrective actions put in place.

BluEdge maintenance service

With your BluEdge service agreement, enabled by Abound HVAC Performance supervision solution, both you and our highly trained team will gain visibility, access expert advice and effectively optimise the lifecycle outcomes of your installation.

How does it work?

The cloud collects and analyses equipment data. 24/7 remote monitoring

After analysis, our remote experts develop tailored solutions

We deliver the results and recommendations for action

We dispatches to address indentified solution

Your connected equipment provides status updates to our technical service
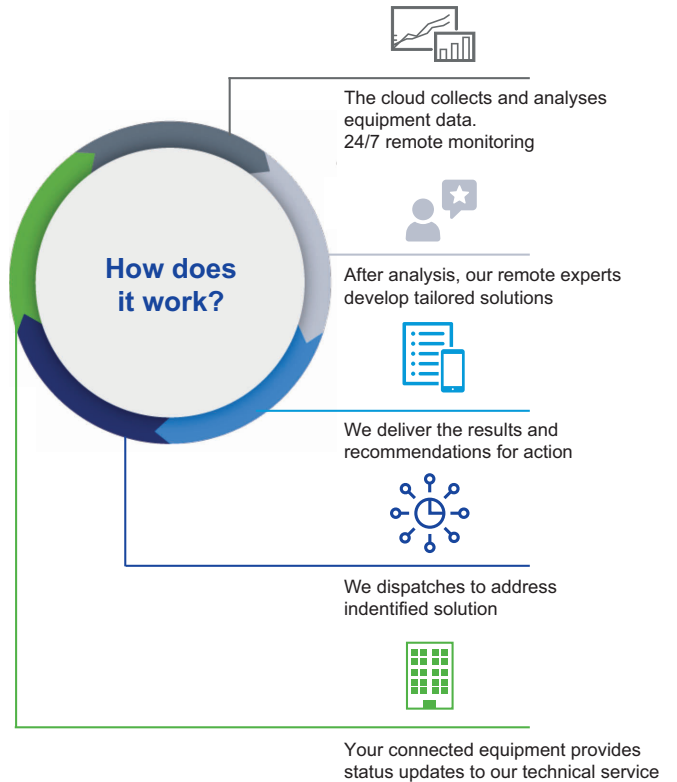
Maintenance levels available with BluEdge

CORE — Empower BluEdge® teams with digital tools and dashboards to **monitor** your HVAC assets

ENHANCE — Remote experts **analyse** data to deliver proactive health and performance insights

ELITE — Predictive analytics and dispatch to **optimise** key outcomes

Communication in a SHRD shared network

By default, the electronic control is configured for a stand-alone unit, but it is also possible to include it in an SHRD shared network as "Lead", "Lag" or "Backup".

The "Lead/Lag" network allows the exchange of data and information between the units, and depending on the conditions of the installation, it can share the reading of some probes installed on the unit configured as "Lead", temperature setpoints, and operating mode. The maximum number of units that can be integrated into a "Lead/Lag" network is 15.

The Backup network allows to configure one unit as a "Backup", for activation in case of malfunction of the other unit. The maximum number of units that can be integrated into a Backup network is 2.

Communication between network units is via the Ethernet port of each control board.

"Lead" unit, address 1   "Lag" unit, address 2   "Lag" unit, address 15
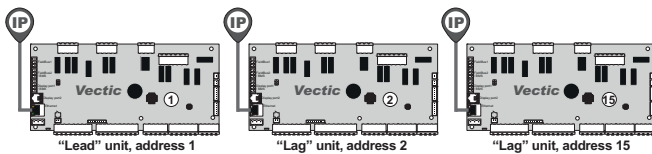
Functionality

Important: to use any of the following functionalities it is necessary to configure in the "Selection software" one unit as "Lead" and the others as "Lag" (including the backup unit).

The SHRD network allows to have the following functionalities depending on the parametrized configuration:

● **Lead/Lag:**

It allows to share some of the probes installed in the "Lead" unit: ambient temperature or ambient temperature + humidity, outdoor temperature, outdoor humidity and CO_2 air quality.

● **Extended Lead/Lag:**

It includes "Lead/Lag" functionalities and the "Lead" unit provides ambient temperature setpoints to the other units.

● **Lead/Lag with the same operating mode:**

It includes the "Extended Lead/Lag" functionalities and the "Lead" unit also provides the status (Cooling- Heating - Ventilation) to the other units.

● **Backup in case of alarm:**

One of the two units is configured as a backup unit, for activation in case of malfunction of the other one.

● **Extended Backup:**

It includes the "Backup in case of alarm" functionalities and also, the control manages the automatic switching between the two units weekly, to compensate the operation times of both units.

Important: the "Backup in case of alarm" function always prevails over "Extended Backup", i.e. if one unit has to operate for a specific week but a severe alarm appears, it will automatically switch operation to the other unit.

Alarm levels are set to determine which of the two units should operate (see "Alarms" Chapter).

Note: In the case of installations with Backup units, it is not possible to share the probes, since both units must be fully autonomous in their operation. If both units are connected to the same supply duct network, it is imperative that the installation consists of non-return dampers (installer responsibility).

For more detailed information refer to the manual of the Vectic control.

Communication in a pLAN local network

This connection on a pLAN local network allows reducing the number of VecticGD terminals, since a single shared terminal can monitor all units in the network.

The maximum number of units that can be configured on a Lead/Lag pLAN network is 15, and in case of Backup units is 2.

The maximum number of units that can be connected on a pLAN network is 15. As many VecticGD terminals as units can be added to the network. The terminal installed on the unit with address 1 will be configured as shared and the rest as private.

Important: If the units are also to be included in a SHRD shared network, the same addresses must be used on both networks to avoid errors. Both, units and VecticGD terminals, are shipped configured from the factory.

Units configured as "Backup" cannot be connected in a local pLAN network, since the two units must be fully autonomous in their operation.

Communication between the units of the pLAN network is carried out using the Display port1/BMS of each control board.

Unit with address 1   Unit with address 2   Unit with address 15

VecticGD terminal (shared)   VecticGD terminal (private)   VecticGD terminal (private)
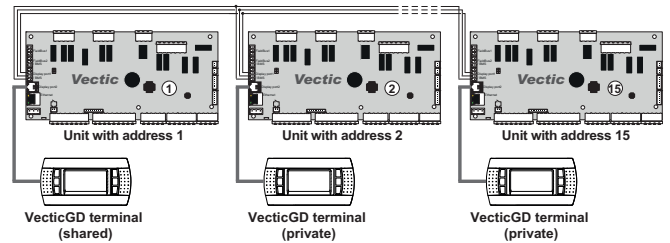
Characterisc of the network: communications standard: RS485; transmission speed: 65,2 Kbit/s; maximum network length: 500 m.

For more detailed information refer to the manual of the Vectic control.

3 - COMPOSITION

3.1. VecticGD graphic terminal

This terminal, fitted as standard on the electrical cabinet, is very easy to use. It 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.

This terminal is used to:

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

Note: multiple units can share a single terminal, if they are integrated into a pLAN local network (for up to 15 units).

3.2. TCO user terminal (optional)

This terminal can be installed on the electrical cabinet, instead of the VecticGD graphic terminal. In this case, the remote connection of the VecticGD terminal is possible.

This terminal is used to:

- Switch the unit ON / OFF.
- Select the operating mode and adjust the setpoints.
- Display the installation's temperatures and humidity, outdoor temperature, supply air temperature, CO_2 sensor and opening of the outdoor damper.
- Display alarms codes.

3.3. 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 into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- Supply air temperature probe (S3).
- Mixing air temperature probe (S4).
- Ambient air temperature probe, NTC type (S5a).

  Note: If the unit is integrated into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- 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 into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- Air quality probe to enable measuring CO_2. This probe can be installed in the environment (S10a) or duct-mounted (S10c).

  A second probe can be connected on the c.pCOe expansion card with address 9 to improve the air quality control.

  Note: If the unit is integrated into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- Outdoor coil temperature probe (S9): in unit with 1 circuit, the input intended for the suction probe of circuit 2 can be used to connect this probe.

Unit with 1 circuit

(*) Units with 2 circuits:
- Low pressure transducer: S6 (circuit 1) and S11 (circuit 2)
- High pressure transducer: S7 (circuit 1) and S12 (circuit 2)
- Suction temperature probe: S8 (circuit 1) and S9 (circuit 2)
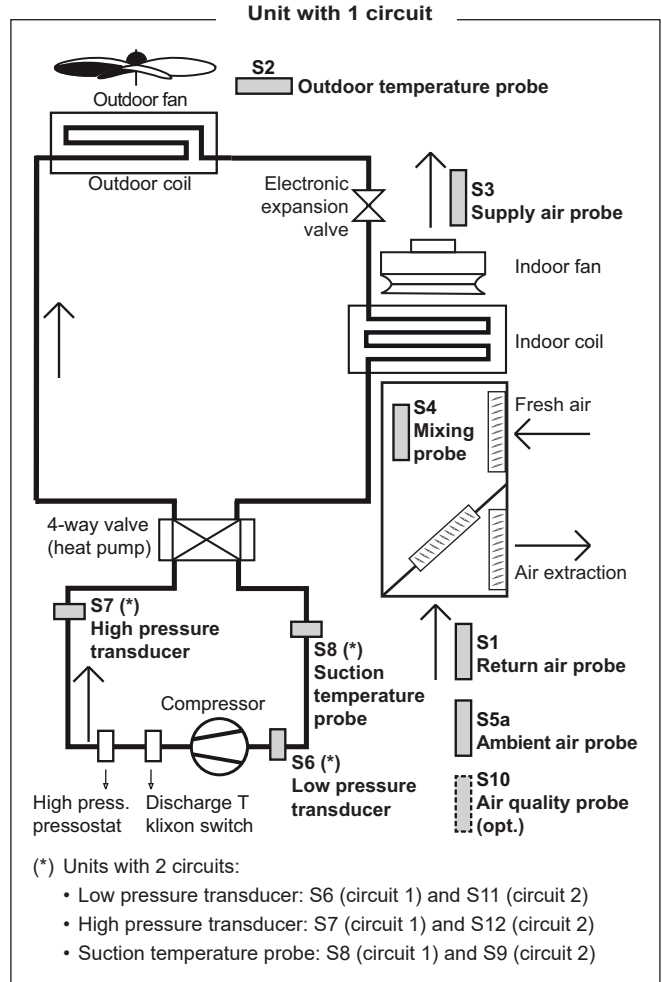
Optional sensors connected, in series, on the Field-bus:

- 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 into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- 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 into a shared network (SHRD), it can read the value measured by the probe of the unit configured as "Lead".

- RS485 enthalpy probes on the mixing air and the supply air. Combined with an energy meter, these probes allow the calculation of cooling and heating capacities, thermal and electrical energy, and seasonal energy efficiencies.

3.4. c.pCOe 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 c.pCOe expansion card connected in series on the Field-Bus.

Basic module with address 8:

This module is needed to manage the options:

- Low outdoor temperature (GREAT COLD).
- Remote COOLING / HEATING.
- Mechanical disconnection of stages.
- Proportional humidifier or overpressure control with exhaust damper.
- Active dehumidification with condensation coil.
- Unit with 100% fresh air.
- Failure signaling of compressors manual motor starters (MMS).

Basic module with address 9:

This module is needed to manage the options:

- Second air quality probe (CO_2) for installation in the environment or outdoor. The outdoor probe allows the measurement of the diference between indoor and outdoor CO2 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).
- Constant supply pressure control.
- Overpressure control with return fan.
- Pressure control with supply damper.
- Failure signaling of compressors manual motor starters (MMS).
- Control of air renewal through an external extractor.

Enhanced module with address 4:

The management of the cooling circuit for the recovery of the extracted air energy (optional) is done with this module.

It can also be used instead of modules with addresses 8 and 9 with the following optional:

- Low outdoor temperature (GREAT COLD).
- Remote COOLING / HEATING.
- Proportional humidifier or overpressure control with exhaust damper.
- Active dehumidification with condensation coil.
- Second air quality probe (CO_2) for installation in the environment or outdoor.
- Constant supply pressure control.
- Overpressure control with return fan.

3.5. Driver EVDEVO (optional)

For the management of bipolar electronic expansion valves (optional) it is necessary to connect in series on the Field-Bus an EVDEVO driver with address 7, 71 or 72 (depending on the manufacturer).

3.6. SMALL board (optional)

A SMALL board connected in series on the Field-Bus with address 11 allows the management of the zoning of the air flow up to 4 different zones through dampers (optional).

3.7. BMS communication cards (optional)

The µPC3 control board includes two communication ports that allow connection with a centralized technical management system: a RS485 port and an Ethernet port.

Additionally, a BMS communication card (optional) can be connected to the control board for the following protocols: BACnet Ethernet, BACnet MSTP, Ethernet and Modbus RTU.

BACnet™ Ethernet

(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.

The PCO Web Ethernet card allows the network communication with the protocol BACnet™ Ethernet. In this case, no additional license is required since it is associated with the card.

BACnet™ RS485

(Configuration by the integrator)

To establish communication with a network with the BACNet™ MSTP protocol is needed a BACnet™ RS485 serial card. In this case, no additional license is required since it is associated with the card.

Modbus RTU RS485

A Modbus RTU RS485 serial card can be used to connect the unit to a second BMS management system.
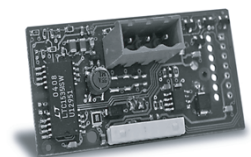
PCO Web Ethernet

This card enables the management and supervision of a single unit via an HTML page that is embedded in the card. Its main advantage over the C.FIELD application included in the µPC3 board is that it allows for the storage of a data record.

4 - USER INTERFACES

4.1. VecticGD 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:

  156 mm (Length) x 82 mm (Width) x 31 mm (Depth)
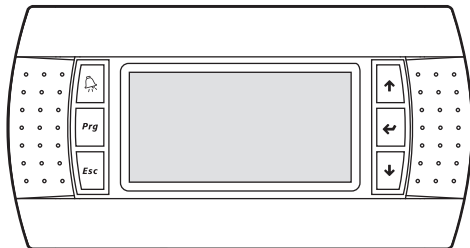
First run of the software

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:
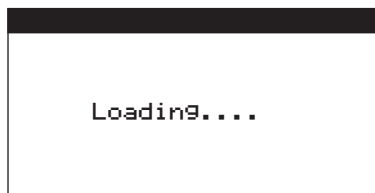
The screen will look like this when these values are loaded:

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

- The unit number in a shared network (U01 corresponds to the unit configured as "Lead" of the 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) and Italian (IT).

- The time and date.

Keys and combinations (quick guide)

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

4 - USER INTERFACES

4.2. TCO user terminal (optional)

Features

● LCD display, backlit in blue.
● Built-in temperature sensor.
● Clock and Scheduling.
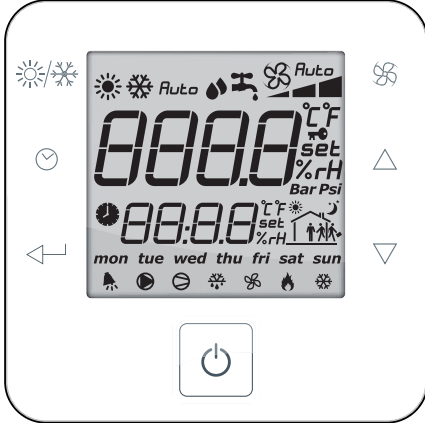
Dimensions:
Length: 86 mm
Width: 86 mm
Depth: 51 mm

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)
Auto	Selection of AUTOMATIC mode
❀	Supply fan in operation (3 possible speeds in plug-fan)
888.8 ℃℉ set %rH	Main indicator of: - Temperature (ºC or ºF) - Activated lock key (key) - Setpoint (set) - Relative humidity (%RH)
88:8.8 ℃℉ set %rH	Secondary indicator of: - Temperature (ºC or ºF) - Setpoint (set) - Hour and minute - 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 Scheduling
mon tue wed thu fri sat sun	Indicators of the days of the week (Monday to Sunday)

Keys and combinations (quick guide)

Key		Function
☀/❄	Operating mode	Allows the operating mode to be selected: HEATING, COOLING, AUTO or VENTILATION (only if selection by panel is activated)
❀	Fan	Allows to select 3 different flows in plug-fans: V1: minimum flow V2: nominal flow V3: maximum flow
🕐	Scheduling	Short press: allows to activate the Scheduling stored in the TCO terminal Long press (3 secs): allows the time and the Scheduling to be modified.
△▽	Up / Down	These keys allow the user to go forward and backward to consult the information found on the screen. They can also modify values
⇐	Enter	This enables confirming the modified values. 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$_2$ mesure, fresh air damper opening)
⏻	On / Off	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 — 25.6 ℃ 10:05 fri
2) Setpoint temp. — 23.0 ℃ set
3) Ambient RH (opt) — 58 %rH
4) Setpoint RH (opt) — 50 set %rH
5) Outdoor temperature — 32.6 ℃ tE
6) Supply temperature — 14.8 ℃ tS
7) Active alarms — 601 AL
8) CO$_2$ measure (opt.) — 630 Co2
9) Outd. damper (opt) — 20 Eco

Main menu	Access level		Manufacturer menu
01.Unit Status	Level 1		a.Unit Config.
02.Unit On/Off	Level 1		b.Defrost Config.
03.Setpoint	Level 1		c. Compressor Config.
04.Summer/Winter	Level 1		d. Regulation Config.
05.Clock/Scheduler	Level 1		e.Safety Config.
06.Input/Output	Level 1		f. Alarm Config.
07.Manufacturer Par	Level 3		g. EEV Config.
08.Service Par.	Level 2		h.Initialization
09.User Par.	Level 2		Service menu
10.Access Levels	Level 1		a.Configuration
11.Alarms History	Level 1		b.EEV Setpoints
12.BMS Config.	Level 2		c.Plug-fan
13.Test Mode	Level 3		d.Calibration
14.Burner/Boiler	Level 1		e.Simulation
15.Versions	Level 1		f.Working Hours

5.1. 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 Prg key, the **MAIN MENU** is acceded.

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:

```
   Access level    NA01

CURRENT LEVEL : 1


Selection Level 2:
Selection Level 3:
```

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

```
   Access level    NA01

CURRENT LEVEL : 1


Selection Level 2:
Selection Level 3: ->
```

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

```
                    NA05



Enter level 3
password:
              0000
```

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.

Initial screen

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

```
                  CIAT

        U01  Ind.T: 00.0°C
             Out.T: 00.0°C
     00:00   EN    00/00/00
```
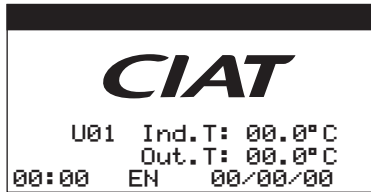
U01: This indicates the number of the unit in which the terminal is connected.

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) and Italian (IT).

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 [Prg] 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.

```
   Main menu        01/15

   🗄 01.Unit Status
   ⏻ 02.Unit On/Off
   🎚 03.Setpoints
```
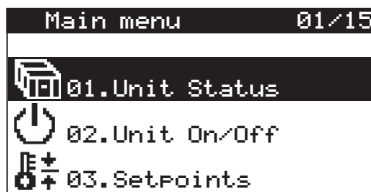
The first screen of this group collects the following information:

```
                       P01
   Unit:01     00:00   WIN
   Indoor T:          00.0°C
   Outdoor T:         00.0°C
   Indoor RH:         00.0%
   Unit On           Fcool
   COMP VENT EL-H LIMIT
```
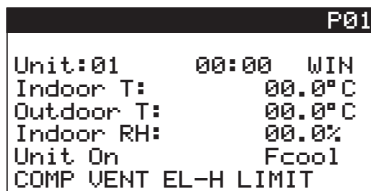
00:00: Indicates the time.

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 Scheduling.

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:

```
                       P02
   00:00  00/00/0000 WIN
   Control setpoint
   Active temp.: 00.0°C
   Unit On          Fcool

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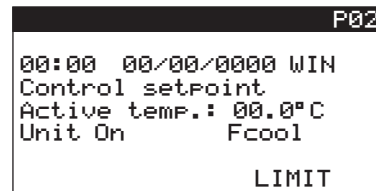
00:00 and **00/00/0000:** This indicates the time and date.

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 BMS supervision network. It is possible to independently configure the two BMS ports on the control board: BMS1 (BMS card) and BMS2 (Fieldbus2/BMS).

```
                       P03
   Unit: 01
   Supervisory: Modbus RTU
                BMS1   BMS2
   ADDRESS:      1      1
   Baud rate:  19200  19200
   Bits stop:    2      2
   Parity:       No     No
```
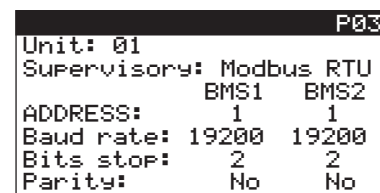
Supervisory: Type of protocol.

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

Baud rate: Bit rate (38400, 19200, 9600, 4800, 2400, 1200).

The last screen reports on the configuration of the unit.

```
      Config. unidad    P04
           IPJ-0240
   AIR-AIR Rev. Heat Pump
   4 Comp/2 Circ
   Double vol. electronic

   Refrigerant R410A
       WO No.: 12345678
```
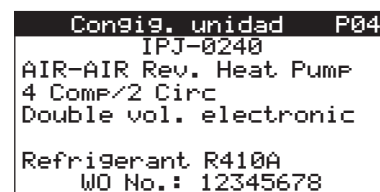
Nº WO: Work order number of the unit (needed in case of consultation with the Technical Support Service).

7 - 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.**

```
Main menu          02/15
▣□ 01.Unit Status
⏻ 02.Unit On/Off
🌡± 03.Setpoints
```

Press the ⏎ key, the following screen is reached:

```
                   PM01
    Unit off / on
    by keyboard:
         ON
```
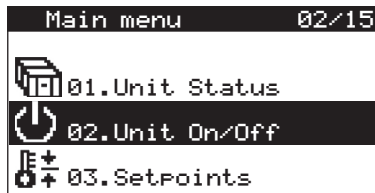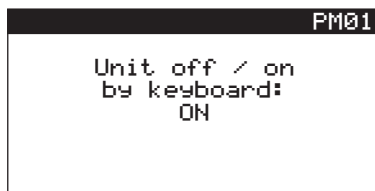
It can also be done from the keyboard of the terminal, by simultaneously pressing the `Prg` ⏎ keys for a few seconds.

* **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.

```
OFF
10:05 fri
```

• **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.

```
Main menu          05/15
🌣 04.Summer/Winter
🕐 05.Clock/Scheduler
🌡± 06.Input/Output
```

```
                   PH03
    Start type
    'ON-OFF schedule'
```
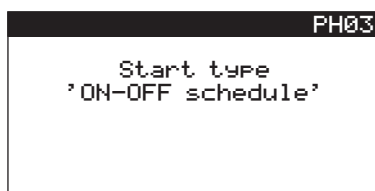
Note: See the different types of schedules in the chapter of "Scheduling".

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

```
                   PM01
    Unit off / on
    by keyboard:
         ON
```
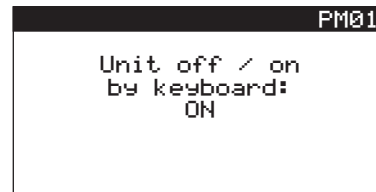
Important: If the procedures of "On/Off by time phase" and "remote On/Off" are simultaneously active, the unit will start only if both agree.

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

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

- 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).

```
                   U18a1
Enabling remote
On/Off:              Y
Remote Off with
PROTECTION mode:     Y
```
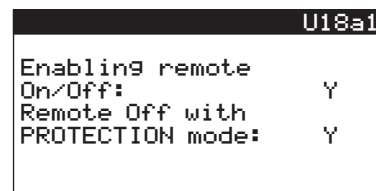
When the unit is stopped by "remote On/Off", it is also possible to enable the automatic unit start when a temperature setpoint for PROTECTION of the building is reached.

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

```
                   PM01
    Unit off / on
    by keyboard:
         ON
```
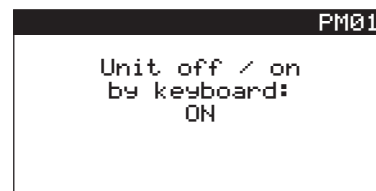
Note: The "On/Off by keyboard" always has priority over the "remote On/Off".

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.

8 - 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 VecticGD terminal:**

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

```
Main menu          03/15
▯ 01.Unit Status
⏻ 02.Unit On/Off
▯ 03.Setpoints
```
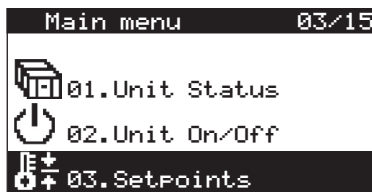
On the first screen of this group, the setpoints of temperature can be selected.

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

```
                      S01
Temp. control
setpoint (by sched.)
Summer         26.0°C
Winter         21.0°C
```
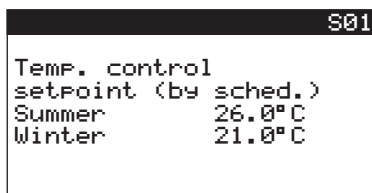
On the next screen it is possible to modify the humidity setpoint when its management is enabled (optional).

```
                      S02
Humidity control
setpoint
               55.0%
```
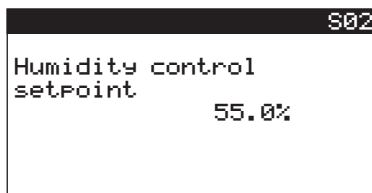
The third screen enables the display of the following calculations of setpoints:

```
                      S03
Setpoint calculat.
PS 26.0 PW 21.0  P 21.0
RS 00.0 RW 00.0  R 00.0
VS 16.0 VW 11.0  V 11.0
FS 24.0 FW 21.0  H 23.0
```
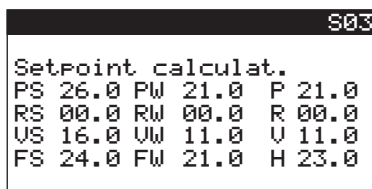
In which:

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 avoids the stratification of the hot air masses.

```
                      S04
Setpoint calculation
outlet limit

    SET COOL.:07.0°C
    SET HEAT.:45.0°C
```
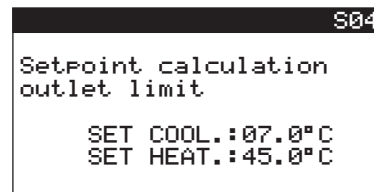
When the unit includes the option of zoning up to 4 zones with variation of air flow, the first screens displayed will allow the selection of the setpoints for each zone:

```
    Zone 1         S01zn
Temp. control
setpoint
Summer         25.5°C
Winter         22.0°C
```
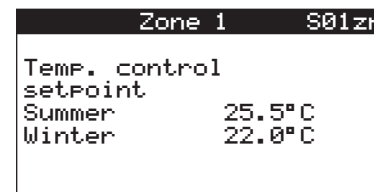
With the air zoning, the control use the minimum setpoint in COOLING mode and the maximum setpoint in HEATING mode, among all the setpoints in the 4 zones. The S01 screen displays these setpoints and their value cannot be changed.

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 △ or ▽ 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**.

```
  ❄           ✿
  23.0°C
         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).

9 - SELECTION OF THE OPERATING MODE

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

• **On the VecticGD terminal:**

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

```
Main menu          04/15
░░04.Summer/Winter
🕐05.Clock/Scheduler
🔧06.Input/Output
```

Press the [↵] key, the following screen is reached:

```
                   FC01
Winter/summer   select.
'by keyboard'

          WINTER

Enable lock:     N
```

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).

```
                   FC01
Winter/summer   select.
'by keyboard'

          SUMMER

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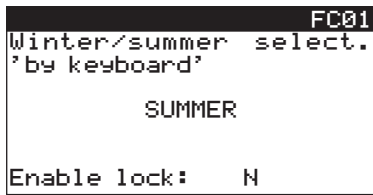
Note: When the parameter «Enable lock» is activated (Y), this screen is for information purposes only, so that the final user cannot change it. In this case, it has been locked from a screen of the Group **08. Service Par.** (protected by level 2 password).

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

[Prg] [↑] : HEATING mode

[Prg] [↓] : COOLING mode

- **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.

```
                   FC01
 select. Winter/summer
      'automatic'  ↓
             by out.T.
          WINTER
SUM. if out.T > 22.0°C
WIN. if out.T < 20.0°C
Enable lock:     N
```
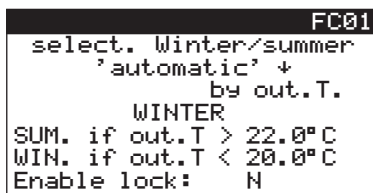
    * *By indoor temperature:* The unit changes from operation in COOLING mode to HEATING mode or vice versa depending on the temperature measured by the ambient (or return) air probe and the active COOLING and HEATING setpoints

```
                   FC01
Winter/summer   select.
'automatic'  ↓
             by ind.T.
          WINTER

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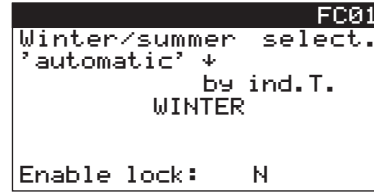
- **Only ventilation:** on this screen it is possible to select the VENTILATION mode. It allows operation for only indoor fans and free-cooling/free-heating.

```
                   FC01
Winter/summer   select.
'only ventilation'


Enable lock:     N
```
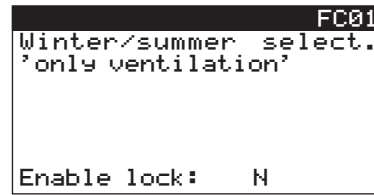
- **Ventilation mode with 100% fresh air (optional):** on this screen it is possible to select this ventilation mode. It allows operation for indoor fans, the return damper will close and the fresh air and extraction air dampers (according to the assembly) will be opened at 100%. The analog input U2 of the c.pCOe expansion module with address 8 is used for the activation of this mode.

```
                   FC01
Winter/summer   select.
'ventilation 100%'


Enable lock:     N
```
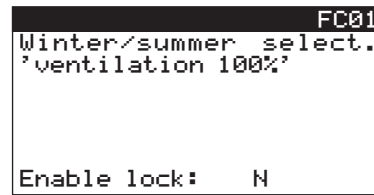
• **On the TCO terminal (optional):**

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 availables modes are: HEATING ☀ - COOLING ❄ - AUTO *Auto* y VENTILATION (without icon).
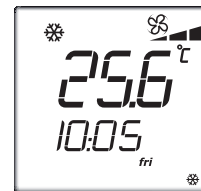
• **Remote COOLING/HEATING (optional):**

The selection of the COOLING/HEATING operating mode can be done using the digital input U5 of the expansion card c.pCOe with address 8:

- closed contact: HEATING mode (Winter)
- open contact: COOLING mode (Summer)

Note: The selection of the type of switching "by digital input" is carried out on a screen of the Group **07. Manufacturer Par.** (protected by level 3 password).

9.1. 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)

Tr: Control temperature
Tc: Cooling setpoint temp.
Zm: Dead zone
Banda: Control band
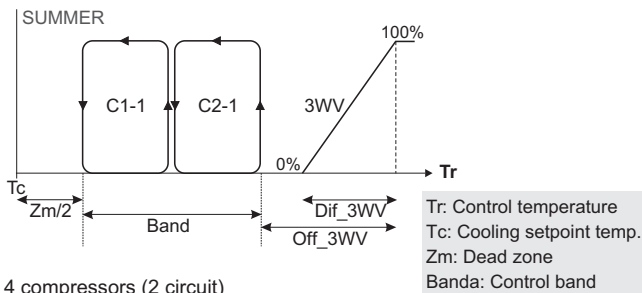
• 4 compressors (2 circuit)
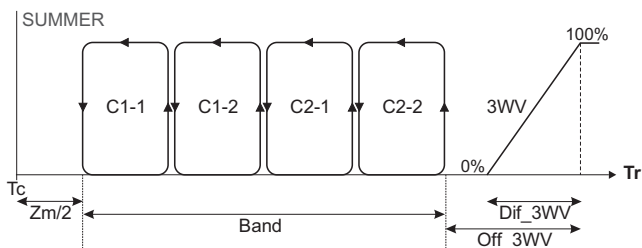
As backup cooling, these units can incorporate a cold water coil (V3V). For the regulation of the coil, the control has a proportional or on/off output Y2 which controls the three-way valve.

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 = 26.0ºC

- Differential band = 3.0ºC and Dead zone = 0ºC

- Unit without cold water coil.

• *Units 2 compressors:*

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

If the temperature drops below 27.5ºC compressor C2-1 stops. If it continues to drop until reaching a value below 26.0ºC, 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.

9.2. 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

Tr: Control temperature
Tc: Heating setpoint temp
Zm: Dead zone
Band: Control band
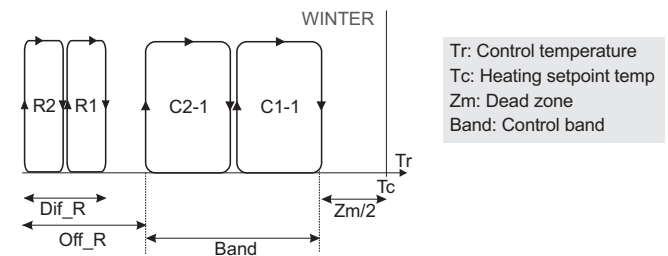
• 4 compressors (2 circuits) + hot water coil
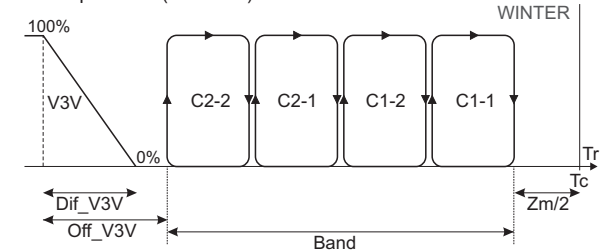
For the regulation of the hot water coil, the control has a proportional or on/off output Y2 which controls the three-way valve, and for the regulation of the electrical heaters, there are two on/off outputs NO6- NO7.

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 locking due to a low outdoor temperature.

  Important: if this locking is enabled, half of the compressors will be disconnected at an outdoor temperature of -11'5ºC, and all other compressors with a temperature of -14.5ºC. 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 using the digital inputs of the expansion card c.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.

10 - TIME SCHEDULING

10.1. Scheduling: VecticGD terminal

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

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

```
Main menu          05/15
╳╳ 04.Summer/Winte
🕐 05.Clock/Scheduler
📊 06.Input/Output
```

Note: the scheduling can be easily configured on machines integrated in a monitoring network with BOSS / BOSS mini thanks to its web interface.

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.

```
                   PH01
uPC Clock
Clock setting
Time:  13:45
Data:  22/06/2017
Day:   Thursday
Confirm:  NO
```
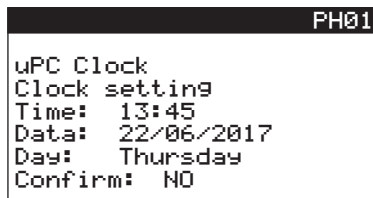
In the next screen the time zone can be selected.

```
Timezone           PH02
Current:
(UTC+01:00) Brussels,
Copenhagen, Madrid,
Paris
```
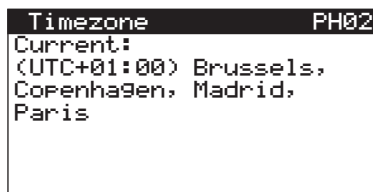
Note: The schedule is automatically adjusted to changes in EU time.

Types of schedule

The scheduler allows choosing between different operating modes of the unit within the time slots and outside of them:

- **ON/OFF schedule:** within the time slots, the unit will operate with the setpoints established in group **03. Setpoints** for COOLING mode (summer) and HEATING mode (winter), whilst outside the time slots it will be stopped.

- **Schedule only setpoint change:** within the time slots, the unit will operate with the setpoints established for COOLING mode (summer) and HEATING mode (winter), whilst outside the time slots it will operate with different setpoints.

- **ON/OFF schedule with limit SET of ON:** within the time slots, the unit will operate with the setpoints established for COOLING mode (summer) and HEATING mode (winter), whilst outside the time slots it will be stopped. In this case, a starting safety is established when the temperature rises or falls from a limit setpoint.

- **Schedule with 3 setpoints + OFF of the unit:** within the time slots, the unit will operate with one of the three possible setpoints established for COOLING mode (summer) and HEATING mode (winter), whilst outside the time slots it will be stopped.

    The three setpoints that can be established are:

- COMFORT: standard setpoint of the unit.
- ECONOMY: setpoint further away from the comfort point, used at times with low occupancy.
- PROTECTION: setpoint of building protection, usually used at night, when the building is empty.

The schedule type is selected on the screen PH03:

- **ON/OFF schedule:**

```
                   PH03
       Start type
    'ON-OFF schedule'
```
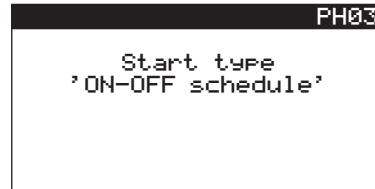
The unit will operate with the setpoint temperatures established on COOLING mode (summer) and HEATING mode (winter).

- **Schedule only setpoint change:**

```
                   PH03
       Start type
      'schedule only
     setpoint change'
```
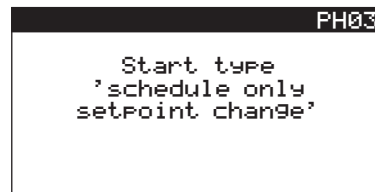
Two control setpoint temperatures will be set on the screen PH07 (summer) and on the screen PH08 (winter):

* Indoor set: setpoint inside the time slots.
* Outdoor set: setpoint outside the time slots.

```
                   PH07
Schedule with setpoint
change     (summer)
Indoor set.    26.0°C
Outdoor set.   28.0°C
```

```
                   PH08
Schedule with setpoint
change     (winter)
Indoor set.    21.0°C
Outdoor set.   19.0°C
```
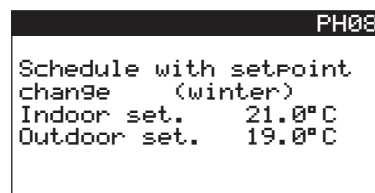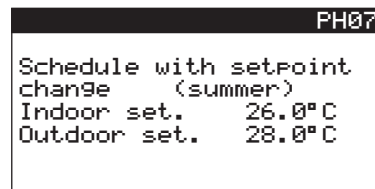
- **ON/OFF schedule with limit SET of ON:**

With this type of schedule 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.

```
                   PH03
       Start type
    'ON-OFF schedule with
     limit SET of ON'
     - ON for LIMIT SET -
  Disab. comp. COOL:  N
  Dis. air refresh.:  N
```
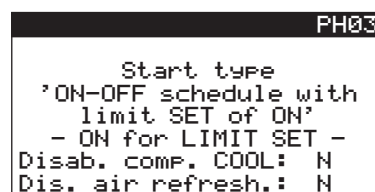
10 - TIME SCHEDULING

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 time slots.

```
                              PH09

Schedule with ON
by limit SP (summ.)
Indoor set.    26.0°C
Limit set.     34.0°C

```

```
                              PH10

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

```

The differentials for the limit setpoint are established on the screen PH11:

```
                              PH11

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

```

● **Schedule with 3 setpoints + OFF of the unit:**

Two new parameters are displayed on the screen PH03 with this type of schedule:

* `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.

```
                              PH03

        Start type
   'ON-OFF schedule with
      limit SET of ON'
     - ON for LIMIT SET -
Disab. comp. COOL:   N
Dis. air refresh.:   N
```

Three regulation setpoint temperatures will be established on the screens PH14 (Summer) and PH15 (Winter) :

* `Set.COMFORT:` standard setpoint of the unit.

* `Set.ECONOMY:` setpoint further away 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.

The differentials for the PROTECTION setpoint will also be established.

* `Dif.lim.PROT:` differential for the PROTECTION setpoint.

```
                              PH14

Schedule with setpoint
change (Summer)
COMFORT 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
```

On the PH13 screen, the time slots with the different setpoints will be assigned for each day of the week.

In the top left zone of the screen 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).

```
 SCHEDULER               PH13
Day: MON
Copy in: TUE      Ok? Yes
☑ 1 07:00 ECONOMY
☑ 2 09:00 CONFORT
☑ 3 17:00 PROTECTION
☑ 4 21:00 OFF
Save?    Yes
```

On the PH13a and PH13b screens, the setpoints for vacation periods and special days will be assigned respectively.

```
 VACATION PERIOD        PH13a
   Start   End    Status
☑ 01/01  06/01  PROTECT.
☑ 01/04  07/04  OFF
☑ 01/08  15/00  OFF


```

```
 SPECIAL DAYS           PH13b
☑ 1 28/02 ECONOMY
☑ 2 01/05 PROTECTION
☑ 3 01/08 OFF
☑ 4 04/09 OFF
☑ 5 06/12 PROTECTION
☑ 6 08/12 PROTECTION
```

In addition to the schedule types described above, the scheduler also allows the following actions in PH03:

● **Manual:** The unit will be running or stopped without taking into account the time schedule. In this case, the unit can be switched OFF/ON from this screen.

```
                              PH03

      Start type
      'Manual'

         ON

```

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

```
                              PH03

      Start type
      -FORCED-

ON time: 002 h

```

10 - TIME SCHEDULING

This type of schedule does not appear in the screen selection.

To activate it press the key [Prg] 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.

Daily schedule

On screens PH04, PH05 and PH06 three different daily schedules can be created, each with a maximum of three time slots in which the unit will be started. The unit will work inside and outside the time slots with the type of schedule 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
```
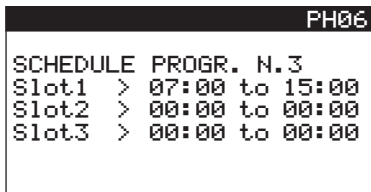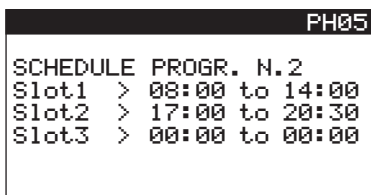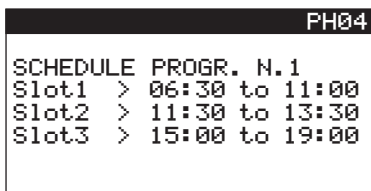
Note: the start type "**3 setpoints schedule + OFF of unit**" has its own schedule program defined on the screen PH13 (see the previous section).

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)
```
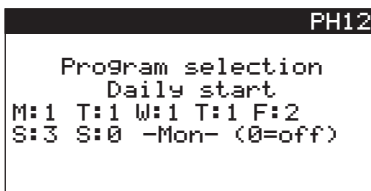
10.2. Scheduling: TCO terminal

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 key ⟵ 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 ⟵.

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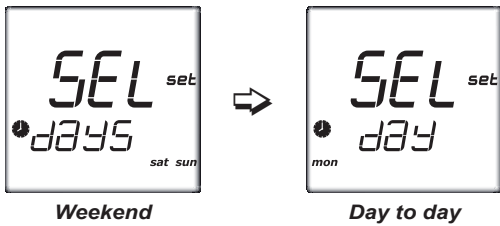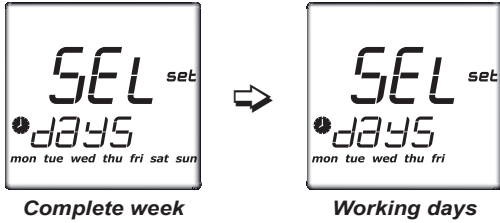
If it's desired to leave the programming, by pressing the △ key again, the terminal changes to the exit display (ESC), which is exited by pressing ◁⊐.

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 desired to schedule this slot, the ◁⊐ key will be pressed and automatically stop flickering, going on to appear as follows:
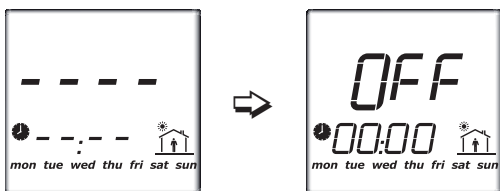
Next, with the ◁⊐ key, the activation time of the program for the selected slot will be set, and then, whether the unit will remain stopped (OFF) or at the setpoint value.

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.
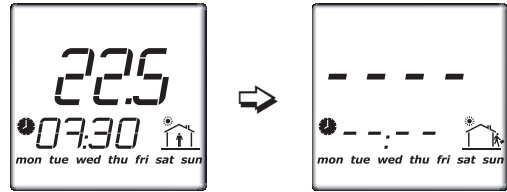
To delete the schedule from a time slot, it is necessary to select it with the ◁⊐ key, and then, by pressing the △ ▽ keys, the time will be modified until the display returns to show the following:
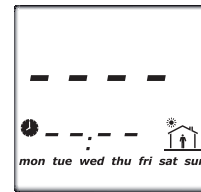
Note: Before making a new schedule, it must be checked whether there is already one defined. If any schedule is made that may affect another that is already stored, the latter will not be saved.

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 VecticGD terminal (group **05. Clock/Scheduler)** shows if the scheduler of the TCO terminal is active, the current timeband and the temperature setpoint.


```
                                PH17
TCO Scheduler
Scheduler: OFF
Temp. setpoint: 26.0ºC
Scheduler OFF: NO
Current timeband: 0
```
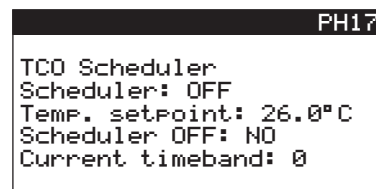
11 - DISPLAY OF THE INPUTS / OUTPUTS STATUS

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: screen I01, I01a, I01b, I02, I03, I03a, I03b, I03c, I04a, I04b, I05a, I05c, I05e, I06a, I06b, I12d.

```
                          I01

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

● Electronic expansion valve(s) reading: screens I06a1, I06b1, I06c1, I06e, I06f, I06g.

```
EEV                  I06a
Opening:      0000stp
              000.0%
Status:       ---
Protection:   None

 SH:  000.0K
```

● 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...10):
CCCCC CCCCC
```

C: Closed contact
O: Open contact

● Digital outputs status: screens I09, I09a, I10, I11 (main board), I10b (expansion card addr.8), I10c (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 I06cr1, I06cr2, I06fr, I06er, I05ar, I08cr, I10cr.

```
Active recovey    I06cr1
Cooling capacity: 000%
Pres.HP: 000.0bar
HP. Temp: 000.0°C

suct. T:  000.0°C
evap P:   000.0barg
evap T:   000.0°C
```

● Optional element readings: R-410A leak detector: screen I18a; energy meter: screens I15, I16, I17, I18; and calculation of cooling and heating capacities, thermal and electrical energy, and seasonal energy efficiencies: screens I18b, I18c, I18d, I18e, I18f, I18g, I18h.

```
     Energy meter     I15
Voltages
V L1-L2:        000.0 V
V L2-L3:        000.0 V
V L3-L1:        000.0 V
V L1:           000.0 V
V L2:           000.0 V
V L3:           000.0 V
```

```
Cooling mode        I18f
Cooling energy:
                  0 kWh

Electric energy:
                  0 kWh

SEER:  0.0
```

12 - 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.

```
SOFTWARE             V01
     Vectic Control

Version:   16.7.0
Date:      25/09/24

SO:   5.1.6
Boot: 5.1.6
```

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

```
HARDWARE             V02
Board type:  uPC3
Board size: Medium
Main cycle: 247ms
     4.0 cycles/s
```

13.1. 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 (R410A) or 2,2 bar (R454B) (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 16ºC (by default).

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

- The outdoor temperature is lower than 10ºC.

- The pressure measured by the low pressure transducer is lower than the initial value for defrosting, 5,6 bar (R410A) or 5,0 bar (R454B).

- The pressure is not rising.

- The time that must elapse from the last defrosting of the affected circuit has been excelled, 20 minutes.

- The time that must elapse from the last defrosting of another circuit (units with 2 circuits) has been excelled, 90 seconds.

Note: There is the possibility of a defrosting by time (rescue defrosting), so that if the pressure measured by the low transducer is less than 5,6 bar (R410A) or 5,0 bar (R454B) for a time of more than 3 hours (180 min), a defrosting is made without taking into account the difference of 16ºC with the outdoor temperature (configurable by parameters).

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 supply fan will continue to operate.

- the outdoor fans will be connected when a set pressure of 35 bar (R410A) or 32,2 bar (R454B) is exceeded, if the outdoor temperature is greater than -5ºC. They will be disconnected if the pressure drops below 33 bar (R410A) or 30,4 bar (R454B) the outdoor temperature drops below -6ºC 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.

In the case of 1-circuit units with an outdoor coil temperature probe (optional) a special configuration for the outdoor fans is possible: they will be connected when a pressure of 28 bar (R410A) or 25,7 bar (R454B) is exceeded and will not be disconnected until the pressure does not drop below 26 bar (R410A) or 23,8 bar (R454B), the temperature measured in the probe is higher than 5ºC or a maximum connection time elapses. In this case, the duration of the defrosting is also modified (16 minutes).

- The optional backup device incorporate by the unit can be enabled: electrical heaters, hot water coil, gas burner or boiler.

- The fresh 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 fresh air damper will remain open.

Note: control of compressors by minimum supply temperature is stopped during the defrosting operation.

● **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 (R410A) o 30,4 bar (R454B).

- By opening the high pressure switch. 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.

13.2. Compressor lockage

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.

```
Alarms              01/02
          17:00  01/01/2023
AV01-Compressor lockage
for heating of the
cranckcase heater (8h)
         7h 59m 35s
```
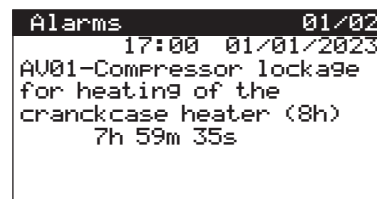
From a screen of the Group **08. Service Par. → f. Working Hours** (protected by level 2 password) allows to reset this lockage of compressors, but this shall be recorded in the data register of the control.

```
                     A01c
Compressor lockage reset
for heating od the
cranckcase heater (8h)

NO              7h 59m 35s
```

```
                    A01c1
Power ON
Hora : 00:00
Fecha: 00/00/2000

Power OFF
Hora:  00:00
Fecha: 00/00/2000
```
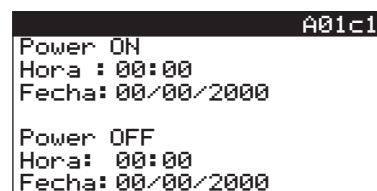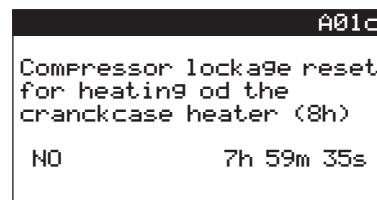
13.3. Failure safety of compressors manual motor starters (MMS) (optional)

The c.pCOe expansion modules with addresses 8 or 9 can be used for failure signaling in any of the manual motor starters. This safety can be configured as only an indication or shutdown of the associated compressor (CS15 screen).

13.4. 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.

13.5. High or low indoor temperature safety

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

This alarm is timed at 30 minutes.

13.6. High supply temperature safety

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

13.7. Protection in case of blockage of the supply duct

This protection is enabled by default, on the CU21b screen of the group **07. Manufacturer Par. → a. Unit Config.** (protected by level 3 password):

```
SUPPLY RPM LIMIT    CU21b
(DUCT BLOCKAGE)
Enabling:         YES
DIFF. P. LIM:     015.0%
RPM LIM:          075.0%
RPM SET:          060.0%
DEL. OFF LIM:      045s
```

When the following conditions are met:

● Differential supply pressure < 15% maximum differential pressure.

● Supply fan speed (rpm) > 75% maximum rpm of the supply fan.

The flow reduction is activated by blocking the duct, which entails the following action:

● The supply fan is set to 60% rpm of its maximum speed.

● The AV24 warning is displayed in VecticGD terminal (see alarm table).

Once the conditions are no longer met (duct unlocked), the unit returns to normal operation after 45 seconds (configurable by parameter).

13.8. Anti-fire safety

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

```
                           CS01
Anti-fire safety
Set: 60.0ºC
Difer.:        20.0ºC
Damper status during
failure:       OPEN
```

In units with fresh 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.

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 supply fan, this fan and all components are stopped, the fresh air damper is open to 100% (return air damper closed). Manual reset.

Note: this safety is a priority to that of the A2L sensor.

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

```
                           CS01a
Anti-fire safety
french ERP:    N

Damper status during
failure: OPEN
Delay shutdown ind.fan
with resist.:120 seg
```

Special anti-fire safety

This functionality allows the selection of the fan flow rate when a fire alarm occurs. It is configured on the CU12c screen of the group **07. Manufacturer Par. → a. Unit Config.** (protected by level 3 password)

It also allows to select manual or automatic reset for the anti-fire safety, on the CA10 screen of the group **f. Alarms Config.**

13.9. Clogged filter detector (optional)

A clogged filter switch can be connected on the digital input DI6.

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

```
Alarms              01/02
        17:00  01/01/2023
AL23-Clogged filter
(only indication)
```

13.10. R-454B Refrigerant leak detector (standard)

Due to the A2L category of the R-454B refrigerant (lightly flammable), units incorporating this refrigerant require the installation of a leak detector in the indoor circuit. This detector uses infrared instead of semiconductor technology with no need of calibration (self-calibration), with very fast time response, and high lifetime (life cycle: 15 years).

This detector is installed on a panel next to the supply fans. This position ensures the correct reading of the gas concentration in the indoor coil.

The R-454B refrigerant is selected on the screen CU12 of the group **07. Manufacturer Par. → a. Unit Config.** (protected by level 3 password) The "A2L sensor" (leak detector for R-454B) is also activated on this screen.

```
                          CU12
Clock card         YES

Refrigerant        R454B

Gas leak det.      NO

A2L Sensor         YES
```

The working pressures of the cooling circuits are automatically adjusted according to the type of refrigerant.

In group **07. Manufacturer Par. → b. Defrost Config.** it is possible to check the value of these parameters:

Screen	Parameter	R-410A	R-454B
CD09	Setpoint to start the defrosting	5.6 bar	5.0 bar
CD09	Setpoint to end the defrosting	33.0 bar	30.4 bar
CD04	Setpoint for start of defrosting by minimal pressure	2.5 bar	2.2 bar

In group **07. Manufacturer Par. → e. Safety Config.** it is possible to check the value of these parameters:

Screen	Parameter	R-410A	R-454B
CS12	Start value of the alarm of low pressure safety	2.0 bar	1.7 bar
CS12	Final value of the alarm of low pressure safety	4.0 bar	3.6 bar

The screen CS14 of the group **07. Manufacturer Par. → e. Safety Config.** shows the parameters of mitigation in case of refrigerant leakage:

```
                          CS14
A2L mitigation

Time ret. AL:      0180s
%LFL AL:           050.0%
%LFL reset:        010.0%
%Fan Prot. Mode:    100%
```

• The parameter "Time ret. AL" (by default, 180 seconds) allows setting the delay time so that when a warning appears on the sensor it does not become an alarm. After this period the PROTECTION MODE will be activated.

• The parameter "%LFL AL" (by default, 50%) allows to adjust the percentage of the LFL from which the refrigerant leak failure occurs (ON of the hysteresis cycle). With this value the unit starts operating in PROTECTION MODE.

• The parameter "%LFL reset" (by default, 10%) allows to adjust the percentage of LFL (Lower Flammability Limit) below which the refrigerant leak alarm ends (OFF of the hysteresis cycle). With this value the unit stops operating in PROTECTION MODE.

• The parameter "%Fan Prot. Mode" (by default, to 100%) allows to adjust the percentage of the airflow rate of the indoor fans (supply and also return if available) when the unit starts operating in PROTECTION MODE.

The PROTECTION MODE instantly disables the compressors and support elements, activates the indoor fans (supply and also return if available) at 100% of airflow (parameterizable) and opens the fresh air damper at 100% (if available). This happens temporarily, as long as the leak occurs or the sensor remains in failure. If either of these two conditions ceases, the unit will return to the operating mode it had before the leak (ON, OFF, COOLING, HEATING, VENT, etc.) and the protection mode warning will disappear.

```
Alarms              01/02
         17:00  01/01/2023

AV06 - A2L protection
mode
```

In any case, alarms will be maintained until they are reset from the VecticGD terminal (manual reset).

The alarms related to the leak detector are:

• AL85: A2L sensor without communication.

• AL86: A2L sensor failure.

• AL87: Refrigerant leakage, within the defined hysteresis cycle.

• AL88: Critical alarm, refrigerant leakage and failure of the indoor fan (communication, sensor, etc).

Detectors in the outdoor circuit (optional)

It is possible to install two leak detectors in each of the unit's outdoor circuits. This is necessary when using outdoor fans coupled to a duct (optional upon request). It is configured on the CU17e screen of the group **07. Manufacturer Par. → a. Unit Config.**

The status of these sensors can be viewed on the I19b1 and I19b2 screens of the group **06. Inputs/Outputs**.

If a leak is detected or the sensor is broken/offline, the unit goes into PROTECTION MODE. This mode instantly disables the compressors and support elements, activates the indoor fans (supply and also return if available) at 100% of airflow (parameterizable) and opens the fresh air damper to 100% (if available) and, in addition, activates the outdoor fans (100% if they are electronic fans, at high speed for 2-speeds fans or simply activated in the case of radial fans). This happens temporarily, as long as the leak occurs or the sensor remains in failure. If either of these two conditions ceases, the unit will return to the operating mode it had before the leak (ON, OFF, COOLING, HEATING, VENT, etc.) and the protection mode warning will disappear.

The alarms related to these leak detectors are:

• AL121, AL122 (outdoor circuit 1) and AL126, AL127 (outdoor circuit 2): A2L sensor without communication.

• AL123, AL124 (outdoor circuit 1) and AL128, AL129 (outdoor circuit 2): A2L sensor failure.

• AL125 (outdoor circuit 1) and AL130 (outdoor circuit 2): Refrigerant leakage, within the defined hysteresis cycle.

13.11. R-410A refrigerant leak detector (optional)

In units with R-410A refrigerant, a leak detector can be connected on the RS485 Field-bus of the control board, with address 6 (19200 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

Reset:    NO

Days since the last
reset:           00000
```

This information is very important to perform 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 years: The sensor element of the detector must be changed and calibrated.

13.12. 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.

```
Alarms             01/02
        17:00  01/01/2023
AV02-Hihg rpm warning
supply fans
(only indication)
```

13.13. Protections against low temperature (optional)

The control can manage the following protections by means of the c.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.

14 - ALARMS

14.1. 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:

```
Alarms          01/02
        17:00  01/01/2023
AL01-Compressor and
outdoor fan thermal
switch of circuit 1
```

```
Alarms          02/02
        18:00  02/01/2023
AL28-Unit maintenance
(only indication)
```

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.

```
Alarms          012/015
ALXX-'legend of the
 alarm triggered'
```

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".

```
Inicialization  IU05

        Erased of the
        entire alarms
         record?   N
U:01
```

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.

14.2. Signalling of remote alarms (optional)

The digital output NO7 can be used to connect an relay for general alarm signalling.

Important: Output NO7 can also be used for the following optional elements: pump in the hot water coil circuit, pump in the boiler circuit, heat recovery coil, on-off humidifier or rotary heat exchanger, so these optional elements are not compatibles. Outputs NO1 or NO4 of the expansion card c.pCOe with address 8 can also be used to connect some of the above optional elements.

The alarms that could activate the relay are selected on the Group **07. Manufacturer Par. → f. Alarm Config** (protected by level 3 password).

```
                        CA02

Selection of alarms
THE:Y  HP:Y    LP:Y
DEF:Y  HT:Y    LT:Y
CON:Y  DP:Y    'Prg'
```

THE: Thermal
HP: High pressure
LP: Low pressure
DEF: Defrost

HT: High temperature
LT: Low temperature
CON: Counters
DP: Disconnected probes

```
                        CA03

Selection of alarms
ICE:Y  INT:Y  KLD:Y
FIL:Y  EPR:Y
CLK:Y  SP: Y  'Prg'
```

ICE: Anti-freeze HWC
INT: Supply fan safety / plug-fan without communication / anti-fire
KLD: Compr. discharge

FIL: Clogged filter
EPR: Eprom not OK
CLK: Clock
SP: Setpoint Winter / Summer

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

14.3. Alarm list

Controlled alarms	Unit shutdown	Affected circ. shutdown	Reset Type	Timing	Actuation	Alarm level (**)	VecticGD	TCO	Add.
Thermal protection of compressors and outdoor fan(s) of circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit 1	1 (2 with manual reset)	AL01	AL1	27
Thermal protection of compressor of recovery circuit	No	Yes	Auto(*)	No	Stop the recovery compressor	1 (2 with manual reset)	AL01a	---	269
Thermal protection of compressors and outdoor fan(s) of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	1 (2 with manual reset)	AL02	AL2	28
High pressure of circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit 1	1 (2 with manual reset)	AL05	AL5	29
High or low pressure of recovery circuit	No	Yes	Auto (*)	No	Stop the recovery compressor	1 (2 with manual reset)	AL05cr	---	118
High pressure of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	1 (2 with manual reset)	AL06	AL6	30
Safety alarm of the rotary heat exchanger	No	No	Manual	No	Stop the rotary heat exchanger	1	AL07a	AL701	---
Maintenance of recovery compressor	No	No	Manual	No	Only indication	0	AL08	AL8	119
Anti-freeze alarm of hot water coil	Yes (in COOLING)	Yes, all circuits (in COOLING)	Manual	Yes, 2 s	HEATING mode: this closes fresh air damper and opens hot water coil valve COOLING mode: this stops compressors and closes fresh air damper	2	AL09	AL9	31
High indoor temperature	No	No	Auto	Yes (progr.)	Only indication	0	AL10	AL10	34
Low indoor temperature	No	No	Auto	Yes (progr.)	Only indication	0	AL11	AL11	35
Low pressure of circuit 1 (possible gas leak in the circuit)	No	Yes	Auto (*)	No	Shutdown of circuit 1	1 (2 with manual reset)	AL12	AL12	38
Low pressure of recovery circuit	No	Yes	Auto	Yes, 15 s (progr.)	Stop the recovery compressor	0 (1 with manual reset)	AL12cr	---	267
Low pressure of circuit 2 (possible gas leak in the circuit)	No	Yes	Auto (*)	No	Shutdown of circuit 2	1 (2 with manual reset)	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	1 (2 with manual reset)	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	1 (2 with manual reset)	AL12c	AL1203	226
Maintenance of compressor 1 - circuit 1	No	No	Manual	No	Only indication	0	AL16	AL16	36
Maintenance of compressor 1 - circuit 2	No	No	Manual	No	Only indication	0	AL17	AL17	37
Maintenance of compressor 2 - circuit 1	No	No	Manual	No	Only indication	0	AL18	AL18	122
Maintenance of compressor 2 - circuit 2	No	No	Manual	No	Only indication	0	AL19	AL19	123
Thermal protection of supply fan	Yes	Yes, all circuits	Manual	0 s	Serious alarm, unit shutdown	3	AL20	AL20	40
Failure of high pressure transducer of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	1 (2 after delay)	AL21	AL21	41
Failure of high pressure transducer of recovery circuit	No	Yes	Auto	No	Stop the recovery compressor	1 (2 after delay)	AL21cr	---	274
Failure of high pressure transducer of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	1 (2 after delay)	AL22	AL22	42
Failure of low pressure transducer of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	1 (2 after delay)	AL21b	AL2102	212
Failure of low pressure transducer of recovery circuit	No	Yes	Auto	No	Stop the recovery compressor	1 (2 after delay)	AL22cr	---	273
Failure of low pressure transducer of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	1 (2 after delay)	AL21c	AL2103	213
Failure of suction temperature probe of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	1 (2 after delay)	AL21d	AL70	---
Failure of suction temperature probe of recovery circuit	No	Yes	Auto	No	Stop the recovery compressor	1 (2 after delay)	AL21dcr	---	275
Failure of suction temperature probe of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	1 (2 after delay)	AL22d	AL71	---
Failure of outdoor coil temperature probe (units with 1 circuit)	No	No	Auto	No	Only indication, end of running of outdoor fans during defrosting by time and not by outdoor coil temperature probe	1 (2 after delay)	AL22d	AL71	---
Clogged filters	Yes	No	Auto	Yes, 2 s	Only indication or unit shutdown (configurable by parameter)	3 or 1	AL23	AL23	43
Thermistor of electrical heaters	Yes	Yes, all circuits	Auto (*)	Yes, 4 s	Shutdown of electr. heaters, burner or boiler Unit/compressor shutdown (configurable by parameter) Locking by repeated alarms	3 or 2	AL24	AL24	44

(*) If a certain number of alarms take place over a period of time, this reset can be changed to "Manual" (configurable by parameters).
(**) Alarm levels with "Backup". Please refer to the meaning in the following section.

Controlled alarms	Unit shutdown	Affected circ. shutdown	Reset Type	Timing	Actuation	Alarm level (**)	VecticGD	TCO	Add.
Thermistor of electrical heater for preheating in the fresh air	No	No	Auto (*)	Yes,14 s (progr.)	Shutdown of electrical heater for preheating in the fresh air	3	AL24a	AL2401	297
Locking the electrical heating contactor	Yes	Yes	Manual	No	Unit shutdown and ventilation mode at maximum flow Note: the magneto-thermal switches of the electrical heaters will automatically open using current emission coils connected mechanically to them	3	AL24b	AL2402	354
Failure of Eprom memory of the µPC3 board	No	No	Manual	No	Serious alarm	3	AL26	AL26	32
Failure of Eprom memory of the SMALL board (zoning)	No	No	Manual	No	Serious alarm, but only indication	1	AL26zn	---	---
µPC3 board clock missing or not working	No	No	Manual	No	Only indication	1	AL27	AL27	33
SMALL board clock missing or not working (zoning)	No	No	Manual	No	Only indication	0	AL27zn	---	---
unit maintenance (cumulative operating hours)	No	No	Manual	No	Only indication	3 or 1	AL28	AL28	108
Failure of return temperature probe	Yes	Yes	Manual	No	Serious alarm, unit shutdown	0	AL29	AL29	109
Failure of ambient humidity probe No.1	No	No	Auto	Yes,10 s (progr.)	Only indication	0	AL30a	AL3001	165
RS485 probe No.1 without communication	No	No	Auto	Yes,10 s	Only indication Stop of zone 1 (air flow zoning)	0	AL30b	AL3002	163
Failure of ambient temperature probe No.1	No	No	Auto	Yes,10 s (progr.)	Only indication Stop of zone 1 (air flow zoning)	0	AL30c	AL3003	164
Failure of ambient humidity probe No.2	No	No	Auto	Yes,10 s (progr.)	Only indication	0	AL30d	AL3004	177
RS485 probe No.2 without communication	No	No	Auto	Yes, 10 s	Only indication Stop of zone 2 (air flow zoning)	0	AL30e	AL3005	175
Failure of ambient temperature probe No.2	No	No	Auto	Yes,10 s (progr.)	Only indication Stop of zone 2 (air flow zoning)	0	AL30f	AL3006	176
Failure of ambient humidity probe No.3	No	No	Auto	Yes,10 s (progr.)	Only indication	0	AL30g	AL3007	259
RS485 probe No.3 without communication	No	No	Auto	Yes, 10 s	Only indication Stop of zone 3 (air flow zoning)	0	AL30h	AL3008	257
Failure of ambient temperature probe No.3	No	No	Auto	Yes,10 s (progr.)	Only indication Stop of zone 3 (air flow zoning)	0	AL30i	AL3009	258
Failure of ambient humidity probe No.4	No	No	Auto	Yes,10 s (progr.)	Only indication	0	AL30j	AL3010	262
RS485 probe No.4 without communication	No	No	Auto	Yes,10 s	Only indication Stop of zone 4 (air flow zoning)	0	AL30k	AL3011	260
Failure of ambient temperature probe No.4	No	No	Auto	Yes,10 s (progr.)	Only indication Stop of zone 4 (air flow zoning)	1	AL30l	AL3012	261
Probe in the SHRD shared network without communication: temperature, RH or CO_2	No	No	Auto	Yes,30 s (progr.)	Only indication	0	AL31	AL31	110
Failure of the indoor (return) humidity probe	No	No	Auto	No	Only indication	1	AL33	AL33	112
Failure of the outdoor humidity probe	No	No	Auto	No	Only indication	1	AL34	AL34	113
Failure of the supply temperature probe	No	No	Auto	No	Only indication	1	AL35	AL35	114
Failure of the mixing temperature probe or the air quality probe	No	No	Auto	No	Only indication	1	AL35a	AL3501	130
COOLING setpoint < HEATING setpoint	Yes	Yes	Manual	No	Serious alarm, unit shutdown	3	AL36	AL36	115
COOLING setpoint < HEATING setpoint in zone 1	Yes	Yes	Auto	No	Unit shutdown (air flow zoning)	0	AL36a	---	360
COOLING setpoint < HEATING setpoint in zone 2	Yes	Yes	Auto	No	Unit shutdown (air flow zoning)	0	AL36b	---	361
COOLING setpoint < HEATING setpoint in zone 3	Yes	Yes	Auto	No	Unit shutdown (air flow zoning)	0	AL36c	---	362
COOLING setpoint < HEATING setpoint in zone 4	Yes	Yes	Auto	No	Unit shutdown (air flow zoning)	0	AL36d	---	363
Anti-fire safety device / smoke detection	Yes	Yes, all circuits	Manual	No	Serious alarm, shut-down of the unit and fresh air damper open / closed (configurable by parameter)	3	AL39	AL39	136
Supply temperature limit exceeded	No	No	Manual	No	Shutdown of electrical heaters or gas burner/boiler	3	AL40	AL40	166
c.pCOe expansion card with address 8 without communication	No	No	Auto	No	Only indication	0	AL45b	AL4502	211
c.pCOe expansion card addr. 8 alarm mismatch	No	No	Auto	No	Only indication	0	AL45g	AL4507	210
c.pCOe expansion card with address 9 without communication	No	No	Manual	No	Unit shutdown and dampers on the previous position to the alarm (zoning 2 zones)	0	AL45c	AL4503	---
c.pCOe expansion card addr. 9 alarm mismatch	No	No	Auto	No	Only indication	0	AL45h	AL4508	---
Energy meter without communication	No	No	Auto	No	Only indication	0	AL46	AL46	192
Supply plug-fan addr.1 without communication	No	No	Auto	No	Only indication	1	AL47	AL47	201

(*) If a certain number of alarms take place over a period of time, this reset can be changed to "Manual" (configurable by parameters).
(**) Alarm levels with "Backup". Please refer to the meaning in the following section.

Controlled alarms	Unit shutdown	Affected circ. shutdown	Reset Type	Timing	Actuation	Alarm level (**)	VecticGD	TCO	Add.
Supply plug-fan addr.22 without communic.	No	No	Auto	No	Only indication	1	AL47a	---	---
Supply plug-fan addr.23 without communic.	No	No	Auto	No	Only indication	1	AL47b	---	---
Supply plug-fan addr.24 without communic.	No	No	Auto	No	Only indication	1	AL47c	---	---
Supply plug-fan addr.25 without communic.	No	No	Auto	No	Only indication	1	AL47d	---	---
Supply plug-fan addr.26 without communic.	No	No	Auto	No	Only indication	1	AL47e	---	---
Supply plug-fan addr.27 without communic.	No	No	Auto	No	Only indication	1	AL47f	---	---
Supply plug-fan addr.28 without communic.	No	No	Auto	No	Only indication	1	AL47g	---	---
Failure of the pressure sensor for air flow control (supply plug-fan)	Yes	No	Manual	No	Unit shutdown	3	AL48	AL48	202
Return plug-fan addr.2 without communic.	No	No	Auto	No	Only indication	1	AL49	AL49	205
Return plug-fan addr.32 without communic.	No	No	Auto	No	Only indication	1	AL49a	---	---
Return plug-fan addr.33 without communic.	No	No	Auto	No	Only indication	1	AL49b	---	---
Return plug-fan addr.34 without communic.	No	No	Auto	No	Only indication	1	AL49c	---	---
Return plug-fan addr.35 without communic.	No	No	Auto	No	Only indication	1	AL49d	---	---
Return plug-fan addr.36 without communic.	No	No	Auto	No	Only indication	1	AL49e	---	---
Return plug-fan addr.37 without communic.	No	No	Auto	No	Only indication	1	AL49f	---	---
Return plug-fan addr.38 without communic.	No	No	Auto	No	Only indication	1	AL49g	---	---
Failure of the pressure sensor for air flow control (return plug-fan)	No	No	Manual	No	Only indication	3	AL50	AL50	206
Failure of the R-410A leak detector sensor	No	Yes, all circuits	Manual	Yes, 60 s	Compressors shutdown	3	AL51a	AL5101	83
R-410A gas leak detected	No	Yes, all	Manual	Yes, 60 s	Compressor shutdown	2	AL51b	AL5102	82
R-410A leak detector without communication	No	Yes, all	Manual	Yes, 30 s	Compressor shutdown	2	AL51c	AL5104	81
R-410A leak detector: maintenance notice	No	No	Manual	No	Only indication	0	AL51d	AL5103	---
TCO terminal without communication	No	No	Auto	No	Only indication	1	AL63a	AL6301	---
TCO with failure in the internal temperature sensor	Yes	No	Auto	No	Only indication or unit shutdown (configurable by parameter)	3 or 1	AL63b	AL6302	---
TCO terminal with internal humidity sensor failure	No	No	Auto	No	Only indication	0	AL63c	AL6303	---
TCO terminal with clock card failure	No	No	Auto	No	Only indication	0	AL63d	AL6304	---
Water inlet temperature probe on the hot water coil (c.pCOe expansion card add. 8)	No	No	Auto	No	Only indication	0	AL64	AL64	221
Water outlet temperature probe on the hot water coil (c.pCOe expansion card add. 8)	No	No	Auto	Yes, 5 s	The pump is activated and the hot water coil valve open to 100%	0	AL65	AL65	222
Anti-freeze alarm on the hot water coil (c.pCOe expansion card address 8)	No	Yes, all (in COOLING)	Manual	Yes, 10 s	Serious alarm, compressors are stopped, pump is activated and hot water coil valve opens to 100%	2	AL66	AL66	223
Failure of the NTC or RS485 ambient air temperature probe	Yes	No	Auto	Yes, 5 s	Only indication or unit shutdown (configurable by parameter)	3 or 1	AL67	AL67	224
Failure of the CO_2 air quality probe	No	No	Auto	Yes, 5 s	Only indication	1	AL67a	AL6701	---
Failure of the CO_2 air quality probe installed outdoor or in zone 2	No	No	Auto	Yes, 5 s	Only indication	1	AL67c	---	---
Failure of the differential pressure sensor of the supply air	No	No	Auto	Yes, 5 s	Constant supply pressure control is stopped	1	AL67b	---	---
Failure of extraction temp. probe on the wheel	No	No	Auto	Yes, 5 s	Stop the rotary heat exchanger	1	AL68	AL68	---
Failure of recovery temp. probe on the wheel	No	No	Auto	Yes, 5 s	Stop the rotary heat exchanger	1	AL69	AL69	---
Failure of the supply damper not open (c.pCOe expansion card address 9)	Yes	No	Manual	Yes, 160 s	Without indication or unit shutdown (configurable by parameter)	3 or 0	AL70	---	---
Failure in the return damper not open (c.pCOe expansion card address 9)	Yes	No	Manual	Yes, 160 s	Without indication or unit shutdown (configurable by parameter)	3 or 0	AL71	---	---
Failure in the supply damper not closed (c.pCOe expansion card address 9)	No	No	Manual	Yes, 160 s	Only indication	1	AL72	---	---
Failure in the return damper not closed (c.pCOe expansion card address 9)	No	No	Manual	Yes, 160 s	Only indication	1	AL73	---	---
Failure of the supply damper not open in zone 1	No	No	Auto	Yes, 30 s (progr.)	Stop of zone 1 (air flow zoning)	0	AL70z	---	---
Failure of the supply damper not open in zone 2	No	No	Auto	Yes, 30 s (progr.)	Stop of zone 2 (air flow zoning)	0	AL71z	---	---
Failure of the supply damper not open in zone 3	No	No	Auto	Yes, 30 s (progr.)	Stop of zone 3 (air flow zoning)	0	AL72z	---	---
Failure of the supply damper not open in zone 4	No	No	Auto	Yes, 30 s (progr.)	Stop of zone 4 (air flow zoning)	0	AL73z	---	---
Failure of return temperature probe in zone 1	No	No	Auto	No	Stop of zone 1 (return probe control activated) (air flow zoning)	0	AL74zn	---	---
Failure of return temperature probe in zone 2	No	No	Auto	No	Stop of zone 2 (return probe control activated) (air flow zoning)	0	AL75zn	---	---
Failure of return temperature probe in zone 3	No	No	Auto	No	Stop of zone 3 (return probe control activated) (air flow zoning)	0	AL76zn	---	---

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

(**) Alarm levels with "Backup". Please refer to the meaning in the following section.

Controlled alarms	Unit shutdown	Affected circ. shutdown	Reset Type	Timing	Actuation	Alarm level (**)	VecticGD	TCO	Add.
Failure of return temperature probe in zone 4	No	No	Auto	No	Stop of zone 4 (return probe control activated) (air flow zoning)	0	AL77zn	---	---
Unit stop with minimum air flow at constant supply pressure	Yes	No	Auto (*)	Yes,120 s	Unit shutdown	3	AL74	---	---
Alarm for continuous operation of the condensate pump	Yes, (in COOLING)	Yes, (in COOLING)	Manual	Yes,420 s	The condensate pump is stopped	1	AL75	---	---
Driver EVDEVO address 7 without communic. (bipolar electronic expansion valves)	No	Yes, all circuits	Manual	Yes,30 s	Shutdown of all circuit	3	AL81	---	---
EEPROM of the EVDEVO driver broken	No	Yes, all circuits	Manual	No	Shutdown of all circuit	3	AL82	---	---
Electronic bipolar expansion valve of circuit 1 broken or disconnected	No	Yes	Manual	No	Shutdown of circuit 1	2	AL83	---	---
Electronic bipolar expansion valve of circuit 2 broken or disconnected	No	Yes	Manual	No	Shutdown of circuit 2	2	AL84	---	---
A2L sensor without communication (R-454B refrigerant leak detector of the indoor circuit)	No	Yes, all circuits	Manual	Yes,30 s	Unit in A2L protection mode	3	AL85	---	---
Failure of the A2L sensor (R-454B refrigerant leak detector of the indoor circuit)	No	Yes, all circuits	Manual	Yes,180 s	Unit in A2L protection mode	3	AL86	---	---
Leak detected by A2L sensor (R-454B refrigerant leak detector of the indoor circuit)	Yes	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL87	---	---
Critical A2L sensor alarm (R-454B refrigerant leak detector of the indoor circuit)	Yes	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL88	---	---
c.pCOe expansion card address 4 without communication: recovery circuit	No	No	Auto	No	Only indication	1	AL99	---	---
SMALL board with address 11 without communication: zoning of the air flow	No	No	Auto	No	Only indication	1	AL99zn	---	---
Number of writes on the control board retain memory exceeded	Yes	Yes	Auto	No	Unit shutdown	3	AL100	---	---
Write error on the control board retain memory	No	No	Auto	No	Solo señalización	3	AL101	---	---
Electronic bipolar expansion valve of circuit 1 broken or disconnected	Yes	Yes	Manual	No	Shutdown of circuit 1	1 (2 after delay)	AL102	---	---
Electronic bipolar expansion valve of circuit 2 broken or disconnected	Yes	Yes	Manual	No	Shutdown of circuit 2	1 (2 after delay)	AL103	---	---
Electronic bipolar expansion valve of recovery circuit broken or disconnected	Yes	Yes	Manual	No	Shutdown of recovery circuit	1 (2 after delay)	AL104	---	---
Energy meter: RS485 probe No.5 without communication	No	No	Auto	No	Only indication	0	AL107	---	---
Energy meter: RS485 probe No.6 without communication	No	No	Auto	No	Only indication	0	AL108	---	---
Energy meter: Failure of mixing temperature probe No.5	No	No	Auto	No	Only indication	0	AL105	---	---
Energy meter: Failure of supply temperature probe No.6	No	No	Auto	No	Only indication	0	AL106	---	---
Energy meter: Failure of mixing humidity probe No.5	No	No	Auto	No	Only indication	0	AL109	---	---
Energy meter: Failure of supply humidity probe No.6	No	No	Auto	No	Only indication	0	AL110	---	---
Alarm driver Eliwell address 71	Yes	Yes	Manual	No	Shutdown of circuit 1	1 (2 after delay)	AL111	---	368
Alarm driver Eliwell address 72	Yes	Yes	Manual	No	Shutdown of circuit 2	1 (2 after delay)	AL112	---	369
Failure of the differential pressure sensor for overpressure control with return fan	No	No	Auto	Yes, 5 s	Overpressure control with return fans is stopped	1	AL113	---	348
Manual motor starter (MMS) of compressor 1 in OFF position	No	No	Manual	Yes, 5 s	Only indication or compressor shutdown (config. by parameter)	2	AL115	---	410
Manual motor starter (MMS) of compressor 1_2 in OFF position	No	No	Manual	Yes, 5 s	Only indication or compressor shutdown (config. by parameter)	2	AL116	---	411
Manual motor starter (MMS) of compressor 2 in OFF position	No	No	Manual	Yes, 5 s	Only indication or compressor shutdown (config. by parameter)	2	AL117	---	412
Manual motor starter (MMS) of compressor 2_2 in OFF position	No	No	Manual	Yes, 5 s	Only indication or compressor shutdown (config. by parameter)	2	AL118	---	413
Manual motor starter (MMS) of recovery compressor in OFF position	No	No	Manual	Yes, 5 s	Only indication or compressor shutdown (config. by parameter)	2	AL119	---	414
Differ. pressure sensor for pressure control with supply damper broken or disconnected	No	No	Auto	No	Pressure control with supply damper is stopped	1	AL120	---	348
R-454B leak detector No.1 of outdoor circuit 1: A2L sensor without communication	No	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL121	---	---
R-454B leak detector No.2 of outdoor circuit 1: A2L sensor without communication	No	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL122	---	---
R-454B leak detector No.1 of outdoor circuit 1: failure of the A2L sensor	No	Yes, all circuits	Manual	Yes,180 s (progr.)	Unit in A2L protection mode	3	AL123	---	---
R-454B leak detector No.2 of outdoor circuit 1: failure of the A2L sensor	No	Yes, all circuits	Manual	Yes,180 s (progr.)	Unit in A2L protection mode	3	AL124	---	---

(*) If a certain number of alarms take place over a period of time, this reset can be changed to "Manual" (configurable by parameters).
(**) Alarm levels with "Backup". Please refer to the meaning in the following section.

14 - ALARMS

Controlled alarms	Unit shutdown	Affected circ. shutdown	Reset Type	Timing	Actuation	Alarm level (**)	VecticGD	TCO	Add.
R-454B leak detector of outdoor circuit 1: leak detected by A2L sensor	Yes	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL125	---	---
R-454B leak detector No.1 of outdoor circuit 2: A2L sensor without communication	No	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL126	---	---
R-454B leak detector No.2 of outdoor circuit 2: A2L sensor without communication	No	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL127	---	---
R-454B leak detector No.1 of outdoor circuit 2: failure of the A2L sensor	No	Yes, all circuits	Manual	Yes,180 s (progr.)	Unit in A2L protection mode	3	AL128	---	---
R-454B leak detector No.2 of outdoor circuit 2: failure of the A2L sensor	No	Yes, all circuits	Manual	Yes,180 s (progr.)	Unit in A2L protection mode	3	AL129	---	---
R-454B leak detector of outdoor circuit 2: leak detected by A2L sensor	Yes	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AL130	---	---
General alarm of main supply fan address 1	Yes	Yes	Auto	Yes, 5 s	Unit shutdown	3	---	---	---
General alarm of secondary supply fans address 22 to address 28	No	No	Auto	Yes, 5 s	Only indication	0	---	---	---
General alarm of main return fan address 2	Yes	Yes	Auto	Yes, 5 s	Unit shutdown	3	---	---	---
General alarm of secondary return fans address 32 to address 38	No	No	Auto	Yes, 5 s	Only indication	0	---	---	---
Power cut-off for a period longer than 2 hours	No	Yes, all circuits	Auto	Yes, 2 hours	Compressors locking for 8 hours to ensure heating of crankcase heater	3	AV01	---	---
Warning whenever the supply fan speed limit (rpm) is exceeded	Yes	No	Auto	Yes, 30 min	Only indication or unit shutdown (configurable by parameter)	3 or 1	AV02	---	---
Warning whenever the return fan speed limit (rpm) is exceeded	Yes	No	Auto	Yes, 30 min	Only indication or unit shutdown (configurable by parameter)	3 or 1	AV03	---	---
Low flow warning in constant supply pressure control	No	Yes, all circuits	Auto	Yes, 120 s	Without permissions all the thermal power elements of the unit	2	AV04	---	---
Warning whenever return flow setpoint > supply flow setpoint, with overpressure control	No	No	Auto	No	Only indication	0	AV05	---	---
A2L protection mode	Yes	Yes, all circuits	Manual	No	Unit in A2L protection mode	3	AV06	---	---
Low overheating SH in the valve of circuit 1	No	No	Auto	No	Only indication	0	AV07	---	---
Low overheating SH in the valve of circuit 2	No	No	Auto	No	Only indication	0	AV08	---	---
Low overheating SH in the valve of recovery circuit	No	No	Auto	No	Only indication	0	AV09	---	---
Low evaporation temperature of circuit 1	No	No	Auto	No	Only indication	0	AV10	---	---
Low evaporation temperature of circuit 2	No	No	Auto	No	Only indication	0	AV11	---	---
Low evaporation temperature of recovery circuit	No	No	Auto	No	Only indication	0	AV12	---	---
High evaporation temperature of circuit 1	No	No	Auto	No	Only indication	0	AV13	---	---
High evaporation temperature of circuit 2	No	No	Auto	No	Only indication	0	AV14	---	---
High evaporation temperature of rec. circuit	No	No	Auto	No	Only indication	0	AV15	---	---
High condensation temperature of circuit 1	No	No	Auto	No	Only indication	0	AV16	---	---
High condensation temperature of circuit 2	No	No	Auto	No	Only indication	0	AV17	---	---
High condensation temperature of rec.circuit	No	No	Auto	No	Only indication	0	AV18	---	---
Low suction temperature of circuit 1	No	No	Auto	No	Only indication	0	AV19	---	---
Low suction temperature of circuit 2	No	No	Auto	No	Only indication	0	AV20	---	---
Low suction temperature of recovery circuit	No	No	Auto	No	Only indication	0	AV21	---	---
Defrost by minimum pressure of circuit 1	No	Yes	Auto(*)	No	Only indication	0	AV22	---	---
Defrost by minimum pressure of circuit 2	No	Yes	Auto(*)	No	Only indication	0	AV23	---	---
Flow reduction due to blocking of supply duct	No	No	Auto	No	Supply fan speed (rpm) limitation	1	AV24	---	---

(*) If a certain number of alarms take place over a period of time, this reset can be changed to "Manual" (configurable by parameters).
(**) Alarm levels with "Backup". Please refer to the meaning in the following section.

14.4. Alarm levels with "Backup"

"Backup in case of alarm" function always prevails over "Extended Backup", i.e. if one unit has to operate for a specific week but a severe alarm appears, it will automatically switch operation to the other unit.

Alarm levels are set to determine which of the two units should operate.

Note: In some cases the alarm level can be set by parameters.

The following table indicates the different alarm levels:
• Level 0: no alarm
• Level 1: mild alarm
• Level 2: severe alarm
• Level 3: critical alarm
It is also possible to change the alarm level, from level 1 to level 2, if

it persists for a period of time (default 20 minutes).

Based on these alarm levels, the software performs a comparison between the two units and sets which one should work:

• If both units have the same alarm level they will continue to work the same as until then..

• With different alarm level, the unit with the lowest alarm level will operate.

• It can also be configured by parameter that does not exist a back-up with alarm levels 1 and 2. In this case the units only switch with the alarm level 3.

Important: the software incorporates a series of securities that guarantee that one of the units will always work (and only one).

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15 - LIST OF CONTROL PARAMETERS WITH "ACCESS LEVEL 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 Vectic control.

Parameters of "Unit Status"

01.Unit Status
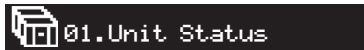
Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
P01	PLAN_ADDRESS	Address of the unit in the shared network	0	0	0	---	Integer	R	
P01	HORA	Clock: hour	0	0	0	h	Integer	R	48
P01	MINUTO	Clock: minute	0	0	0	min	Integer	R	47
P01	MODO_VENT	VENTILATION operating mode	0	0	1	---	Digital	R	236
P01	MODO_FRIO	COOLING operating mode	0	0	1	---	Digital	R	14
P01	GLOBAL_ALARM	Signal of active alarms	0	0	1	---	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	EN_FASE_HOR_NUEVA	Indication of unit switch-on by schedule programming	0	0	1	---	Digital	R	
P01	DESHUMIDIFICA	Indication of active dehumidifier	0	0	1	---	Digital	R	304
P01	HUMIDIFICA	Indication of active humidifier	0	0	1	---	Digital	R	22
P01	ON_COMPENSACION	Indication of active compensation	0	0	1	---	Digital	R	
P01	ON_DESESCARCHE	Indication of active defrosting	0	0	1	---	Digital	R	183
P01	ON_FREECOOL	Indication of active free-cooling	0	0	1	---	Digital	R	184
P01	ON_FREEHEAT	Indication of active free-heating	0	0	1	---	Digital	R	185
P01	LAMP_COMPRESOR	Indication of compressors in operation	0	0	1	---	Digital	R	
P01	LAMP_VINT	Indication of supply 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	0	1	---	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	EN_FASE_HOR_NUEVA	Indication of unit switch-on by schedule programming	0	0	1	---	Digital	R	
P02	DESHUMIDIFICA	Indication of active dehumidifier	0	0	1	---	Digital	R	
P02	HUMIDIFICA	Indication of active humidifier	0	0	1	---	Digital	R	22
P02	ON_COMPENSACION	Indication of active compensation	0	0	1	---	Digital	R	
P02	ON_DESESCARCHE	Indication of active defrosting	0	0	1	---	Digital	R	183
P02	ON_FREECOOL	Indication of active free-cooling	0	0	1	---	Digital	R	184
P02	ON_FREEHEAT	Indication of active free-heating	0	0	1	---	Digital	R	185
P02	LAMP_COMPRESOR	Indication of compressors in operation	0	0	1	---	Digital	R	
P02	LAMP_VINT	Indication of supply 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 shared 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	Type of protocol in supervision network: Modbus RTU	1	0	1	---	Integer	R	227
P03	BMS_ADDRESS	Address of the unit in the supervision network of the BMS port it is connected to (BMS1 or BMS2)	1	0	207	---	Integer	R	228
P03	BAUD_RATE	Bits rate in the supervision network of the BMS port it is connected to (BMS1 or BMS2): 0=1200, 1=2400, 2=4800, 3=9600, 4=19200, 5= 38400	4	0	4	---	Integer	R	229
P03	Stop_bits_Number_MB	Number of stop bits for the MODBUS protocol (0 = 2 stop bits, 1= 1 stop bit)	0	0	1	---	Digital	R	282
P03	Parity_Type_MB	Type of parity for the MODBUS protocol in the supervision network of the BMS port it is connected to (BMS1 or BMS2): 0= no; 1= pair; 2= odd	0	0	2	---	Integer	R	230
P04	MODELO_EQUIPO	Unit model	0	0	99	---	Integer	R	58
P04	INFO_EQUIPO_1	Unit information (0= air-air cooling-only; 1= air-air heat pump)	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 axial fan; 4= electronic axial fan or plug-fan)	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

Parameters of "Unit Status" (...continuation) 01.Unit Status
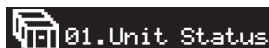
Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
P04	TIPO_REFRIGERANTE	Type of refrigerant (4=R410A, 5=R-454B)	4	0	5	---	Integer	R	43
P04	NUM_WO_DIG_1	Work order number of the unit (digit 1)	0	0	9	---	Analog.	R	185
P04	NUM_WO_DIG_2	Work order number of the unit (digit 2)	0	0	9	---	Analog.	R	186
P04	NUM_WO_DIG_3	Work order number of the unit (digit 3)	0	0	9	---	Analog.	R	187
P04	NUM_WO_DIG_4	Work order number of the unit (digit 4)	0	0	9	---	Analog.	R	188
P04	NUM_WO_DIG_5	Work order number of the unit (digit 5)	0	0	9	---	Analog.	R	189
P04	NUM_WO_DIG_6	Work order number of the unit (digit 6)	0	0	9	---	Analog.	R	190
P04	NUM_WO_DIG_7	Work order number of the unit (digit 7)	0	0	9	---	Analog.	R	191
P04	NUM_WO_DIG_8	Work order number of the unit (digit 8)	0	0	9	---	Analog.	R	192

Parameters of "Unit On/Off" 02.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: 0: Switch-off (Off) # 1: Switch-on (On)	0	0	1	---	Digital	R/W	65
PM01z	SYS_ON_T11	Selection of the zone 1 ON/OFF by keyboard or remote: 0: Switch-off (Off) # 1: Switch-on (On)	0	0	1	---	Digital	R/W	364
PM01z	SYS_ON_T12	Selection of the zone 2 ON/OFF by keyboard or remote: 0: Switch-off (Off) # 1: Switch-on (On)	0	0	1	---	Digital	R/W	365
PM01z	SYS_ON_T13	Selection of the zone 3 ON/OFF by keyboard or remote: 0: Switch-off (Off) # 1: Switch-on (On)	0	0	1	---	Digital	R/W	366
PM01z	SYS_ON_T14	Selection of the zone 4 ON/OFF by keyboard or remote: 0: Switch-off (Off) # 1: Switch-on (On)	0	0	1	---	Digital	R/W	367

Parameters of "Setpoint" 03.Setpoint

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
S01zn	SET_POINT_TEMP_FRIO_T11	Temperature setpoint in COOLING mode (summer) in the terminal of zone 1 (zoning of the air flow)	26.0	0.0	50.0	°C	Analog.	R/W	283
S01zn	SET_POINT_TEMP_CALOR_T11	Temperature setpoint in HEATING mode (winter) in the terminal of zone 1 (zoning of the air flow)	21.0	0.0	50.0	°C	Analog.	R/W	284
S02zn	SET_POINT_TEMP_FRIO_T12	Temperature setpoint in COOLING mode (summer) in the terminal of zone 2 (zoning of the air flow)	26.0	0.0	50.0	°C	Analog.	R/W	285
S02zn	SET_POINT_TEMP_CALOR_T12	Temperature setpoint in HEATING mode (winter) in the terminal of zone 2 (zoning of the air flow)	21.0	0.0	50.0	°C	Analog.	R/W	286
S03zn	SET_POINT_TEMP_FRIO_T13	Temperature setpoint in COOLING mode (summer) in the terminal of zone 3 (zoning of the air flow)	26.0	0.0	50.0	°C	Analog.	R/W	287
S03zn	SET_POINT_TEMP_CALOR_T13	Temperature setpoint in HEATING mode (winter) in the terminal of zone 3 (zoning of the air flow)	21.0	0.0	50.0	°C	Analog.	R/W	288
S04zn	SET_POINT_TEMP_FRIO_T14	Temperature setpoint in COOLING mode (summer) in the terminal of zone 4 (zoning of the air flow)	26.0	0.0	50.0	°C	Analog.	R/W	289
S04zn	SET_POINT_TEMP_CALOR_T14	Temperature setpoint in HEATING mode (winter) in the terminal of zone 4 (zoning of the air flow)	21.0	0.0	50.0	°C	Analog.	R/W	290
S01	SET_POINT_TEMP_FRIO	Temperature setpoint in COOLING mode (summer)	26.0	0.0	50.0	°C	Analog.	R/W	15
S01	SET_POINT_TEMP_CALOR	Temperature setpoint in HEATING mode (winter)	21.0	0.0	50.0	°C	Analog.	R/W	16
S02	SET_POINT_HUM	Indoor humidity setpoint	50.0	0.0	100.0	%rH	Analog.	R/W	18
S02	HAB_SONDA_HUM_INT_VIRTUAL	Enabling the indoor humidity probe in the SHRD shared network	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

Parameters of "Summer/Winter"

`04.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: 0: by keyboard 1: remote (by digital input) 2: auto 3: only ventilation 4: ventilation 100% fresh air 5: SHRD shared network	2	0	5	---	Integer	R/W	59
FC01	MODO_FRIO_CALOR_AUTO	COOLING/HEATING selection in AUTO: 0: by indoor temperature; 1: by outdoor temperature	1	0	1	---	Digital	R/W	232
FC01	CALOR_FRIO_PANEL	COOLING/HEATING selection by keyboard: 0: HEATING (winter); 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 locking of summer / winter selection in the VecticGD (so that the final user cannot change it)	0	0	1	---	Digital	R/W	240
FC01	ON_VENT_100_AE_REMOTO	Enabling of the VENTILATION mode with 100% fresh air remotely (analog input U2 of the c.pCOe expansion card with address 8)	0	0	1	---	Digital	R	

Parameters of "Clock/Scheduler"

`05.Clock/Scheduler`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH01	TIPO_RELOJ	Type of clock (0= No, 1= Actual, 2= Shared network)	1	0	2	---	Integer	R/W	57
PH01	NEW_HOUR	Setting the clock: new hour	0	0	23	h	Integer	R/W	119
PH01	NEW_MINUTE	Setting the clock: new minute	0	0	59	min	Integer	R/W	120
PH01	NEW_DAY	Setting the clock: new day	0	0	31	day	Integer	R/W	121
PH01	NEW_MONTH	Setting the clock: new month	0	0	12	month	Integer	R/W	122
PH01	NEW_YEAR	Setting the clock: new year	0	0	99	year	Integer	R/W	123
PH01	DIA_SEMANA	Day of the week	0	0	0	day	Integer	R/W	52
PH01	NEW_DATE_MSK	Confirm time change	0	0	1	---	Digital	R/W	
PH02	TZ_Idx	Index used to change the time zone (management change from winter to summer and vice versa automatically)	52	1	TZ_IdxMax	---	Integer	R	
PH03	TIPO_PROG_HORARIA	Type of start-up: 0 = ON/OFF schedule 1 = Schedule only setpoint change 2 = ON/OFF schedule with limit SET of ON 3 = Forced 4 = 3 setpoints schedule + OFF of unit	3	0	4	---	Integer	R/W	71
PH03	ARR_FORZADO	Forced start-up	0	0	1	---	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
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

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

05.Clock/Scheduler

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
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	Thrusday 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	Scheduler_1.Day	Programming day	0	0	6	---	Integer	R/W	
PH13	Scheduler_1.CopyTo_Day	Copy day	0	0	7	---	Integer	R/W	
PH13	Scheduler_1.EnDayCopy	Enabling copy	0	0	1	---	Digital	R/W	
PH13	Scheduler_1.Event_Msk[0].Enabled	Daily event enabled	0	0	1	---	Digital	R/W	
PH13	Scheduler_1.Event_Msk[0].Hours	Start time of the daily event	0	0	23	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[0].Mins	Starting minute of the daily event	0	0	59	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[0].UnitStatus	Daily event unit status (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[1].Enabled	Daily event enabled	0	0	1	---	Digital	R/W	
PH13	Scheduler_1.Event_Msk[1].Hours	Start time of the daily event	0	0	23	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[1].Mins	Starting minute of the daily event	0	0	59	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[1].UnitStatus	Daily event unit status (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[2].Enabled	Daily event enabled	0	0	1	---	Digital	R/W	
PH13	Scheduler_1.Event_Msk[2].Hours	Start time of the daily event	0	0	23	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[2].Mins	Starting minute of the daily event	0	0	59	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[2].UnitStatus	Daily event unit status (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[3].Enabled	Daily event enabled	0	0	1	---	Digital	R/W	
PH13	Scheduler_1.Event_Msk[3].Hours	Start time of the daily event	0	0	23	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[3].Mins	Starting minute of the daily event	0	0	59	---	Integer	R/W	
PH13	Scheduler_1.Event_Msk[3].UnitStatus	Daily event unit status (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13	Scheduler_1.DaysSchedMsg	Messages to be displayed for daily events	0	0	9	---	Integer	R	
PH13	Scheduler_1.SaveData	Save data	0	0	1	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[0].Enabled	Leave period	0	0	1	---	Digital	R/W	
PH13a	Scheduler_1.VacationsSched[0].StartDay	First day of the period	0	1	31	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[0].StartMonth	First month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[0].EndDay	Last day of the period	0	1	31	---	Integer	R/W	

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

05.Clock/Scheduler

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH13a	Scheduler_1.VacationsSched[0].EndMonth	Last month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[0].UnitStatus	Unit status during the holiday period (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[1].Enabled	Leave period	0	0	1	---	Digital	R/W	
PH13a	Scheduler_1.VacationsSched[1].StartDay	First day of the period	0	1	31	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[1].StartMonth	First month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[1].EndDay	Last day of the period	0	1	31	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[1].EndMonth	Last month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[1].UnitStatus	Unit status during the holiday period (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[2].Enabled	Leave period	0	0	1	---	Digital	R/W	
PH13a	Scheduler_1.VacationsSched[2].StartDay	First day of the period	0	1	31	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[2].StartMonth	First month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[2].EndDay	Last day of the period	0	1	31	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[2].EndMonth	Last month of the period	0	1	12	---	Integer	R/W	
PH13a	Scheduler_1.VacationsSched[2].UnitStatus	Unit status during the holiday period (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT)	0	0	3	---	Integer	R/W	
PH13a	Scheduler_1.VacationsMsg	Messages to be displayed for holiday periods	0	0	9	---	Integer	R	
PH13b	Scheduler_1.SpecDaysSched[0].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[0].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[0].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[0].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[1].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[1].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[1].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[1].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[2].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[2].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[2].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[2].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[3].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[3].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[3].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[3].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[4].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[4].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[4].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[4].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[5].Enabled	Special day enabled	0	0	1	---	Digital	R/W	
PH13b	Scheduler_1.SpecDaysSched[5].SpecialDay	Special day	0	1	31	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[5].SpecialMonth	Special month	0	1	12	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysSched[5].UnitStatus	Unit status on special day (0=OFF; 1=PROTECTION; 2=ECONOMY; 3=COMFORT; 4=AUTO)	0	0	4	---	Integer	R/W	
PH13b	Scheduler_1.SpecDaysMsg	Messages to be displayed for special days	0	0	9	---	Integer	R	
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	121
PH16	NEW_MONTH	Display of data from the TCO terminal: month	0	0	12	---	Integer	R/W	122
PH16	NEW_YEAR	Display of data from the TCO terminal: year	0	0	99	---	Integer	R/W	123
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 scheduling	0	0	6	---	Integer	R/W	

Parameters of "Input/Output"

`06. 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	1
I01	TEMP_EXT	Display of the outdoor air temperature	0.0	-99.9	99.9	°C	Analog.	R	2
I01a	TEMP_SONDA_AMB	Display of the ambient air temperature (NTC or RS485)	0.0	-99.9	99.9	°C	Analog.	R	
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	---	Analog.	R	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	---	Analog.	R	199
I01b	TEMP_TCO	Selection of the value of ambient temperature with TCO terminal	0.0	-99.9	99.9	°C	Analog.	R	14
I02	HUM_SONDA_INT_RS485_O_AI10	Display of the ambient humidity RS485 probe (middle value)	0.0	-99.9	99.9	%rH	Analog.	R	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	6
I02b	Speed_Input_Rpm_FRIO_Fan1	rpm setpoint for control of supply fan in COOING mode	1200	0	2950	rpm	Integer	R	275
I02b	Speed_Input_Rpm_CALOR_Fan1	rpm setpoint for control of supply fan in HEATING mode	1200	0	2950	rpm	Integer	R	277
I02b	Speed_Input_Rpm_VENTIL_Fan1	rpm setpoint for control of supply fan in VENTILATION	1200	0	2950	rpm	Integer	R	279
I02b	CAUDAL_VINT_MEDIDO_AJUSTE	Measured flow rate at supply	0	0	99999	m³/h	Integer	R	198
I02b	actual_speed_msk_Fan1	Current speed of supply fan	0	0	9999	rpm	Integer	R	199
I02b	SET_CAUDAL_VINT_FRIO	Setpoint for constant supply flow control in COOING mode	30600	0	99999	m³/h	Integer	R	200
I02b	SET_CAUDAL_VINT_CALOR	Setpoint for constant supply flow control in HEATING mode	30600	0	99999	m³/h	Integer	R	201
I02b	SET_CAUDAL_VINT_VENTILACION	Setpoint for constant supply flow control in VENTILATION	30600	0	99999	m³/h	Integer	R	197
I02b	Speed_Input_perc_FRIO_Fan1	% setpoint for PWM control of supply fan in COOING mode	50.0	0.0	100.0	%	Analog.	R	160
I02b	Speed_Input_perc_CALOR_Fan1	% setpoint for PWM control of supply fan in HEATING mode	50.0	0.0	100.0	%	Analog.	R	161
I02b	Speed_Input_perc_VENTIL_Fan1	% setpoint for PWM control of supply fan in VENTILATION	50.0	0.0	100.0	%	Analog.	R	159
I02c	Speed_Input_Rpm_FRIO_Fan2	rpm setpoint for control of return fan in COOING mode	1200	0	2950	rpm	Integer	R	276
I02c	Speed_Input_Rpm_CALOR_Fan2	rpm setpoint for control of return fan in HEATING mode	1200	0	2950	rpm	Integer	R	278
I02c	Speed_Input_Rpm_VENTIL_Fan2	rpm setpoint for control of return fan in VENTILATION	1200	0	2950	rpm	Integer	R	280
I02c	CAUDAL_VRET_MEDIDO_AJUSTE	Measured flow rate at return	0	0	99999	m³/h	Integer	R	204
I02c	actual_speed_msk_Fan2	Current speed of return fan	0	0	9999	rpm	Integer	R	205
I02c	SET_CAUDAL_VRET_FRIO	Setpoint for constant return flow control in COOING mode	30600	0	99999	m³/h	Integer	R	206
I02c	SET_CAUDAL_VRET_CALOR	Setpoint for constant return flow control in HEATING mode	30600	0	99999	m³/h	Integer	R	207
I02c	SET_CAUDAL_VRET_VENTILACION	Setpoint for constant return flow control in VENTILATION	30600	0	99999	m³/h	Integer	R	203
I02c	Speed_Input_perc_FRIO_Fan2	% setpoint for PWM control of return fan in COOING mode	50.0	0.0	100.0	%	Analog.	R	175
I02c	Speed_Input_perc_CALOR_Fan2	% setpoint for PWM control of return fan in HEATING mode	50.0	0.0	100.0	%	Analog.	R	176
I02c	Speed_Input_perc_VENTIL_Fan2	% setpoint for PWM control of return fan in VENTILATION	50.0	0.0	100.0	%	Analog.	R	174
I03	TEMP_IMP	Display of the supply air temperature	0.0	-99.9	99.9	°C	Analog.	R	7
I03	TEMP_MEZCLA	Display of the mixing air temperature	0.0	-99.9	99.9	°C	Analog.	R	8
I03a	CO2	Display of the CO2 probe or the difference between indoor probe and outdoor probe (in units with outdoor CO2 probe)	0	-9999	9999	ppm	Integer	R	3
I03a	CO2_FISICA_zona1	Reading of the CO2 probe of zone 1 (zoning into 2 zones)	0	-9999	9999	ppm	Integer	R	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	-9999	9999	ppm	Integer	R	220
I03a1	CO2	Display of the differential pressure sensor reading for air renewal (Pa)	0	-9999	9999	Pa	Integer	R	3
I03b	TEMP_ENTRADA_BAC	Display of the water inlet temperature of the hot water coil	0.0	-99.9	99.9	°C	Analog.	R	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	26
I03c	TEMP_EXTRACCION_RUEDA	Display of the exhaust air temperature on the wheel	0.0	-99.9	99.9	°C	Analog.	R	247
I03c	TEMP_RECUPERACION_RUEDA	Display of the recovery air temperature on the wheel	0.0	-99.9	99.9	°C	Analog.	R	249
I04a	ENTALPIA_EXT_KCAL	Display of the outdoor enthalpy	0.0	-99.999	99.999	Kcal/kg	Integer	R	14,15
I04a	HUM_EXT	Display of the outdoor air humidity	0.0	-99.9	99.9	%rH	Analog.	R	6
I04b	ENTALPIA_INT_KCAL	Display of the indoor enthalpy	0.0	-99.999	99.999	Kcal/kg	Integer	R	16,17
I04b	HUM_INT	Display of the indoor air humidity	0.0	-99.9	99.9	%rH	Analog.	R	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

Parameters of "Input/Output" (...continuation)   `06.Input/Output`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I05c	T_P_LP_C1_AIN06	Display of the low pressure transducer of circuit 1	0.0	-99.9	99.9	bar	Analog.	R	204
I05c	TEMP_CAL_LP_C1_AIN06	Calculated temperature for low pressure of circuit 1	0.0	-99.9	99.9	---	Analog.	R	206
I05c	T_P_LP_C2_AIN09	Display of the low pressure transducer of circuit 2	0.0	-99.9	99.9	bar	Analog.	R	205
I05c	TEMP_CAL_LP_C2_AIN09	Calculated temperature for low pressure of circuit 2	0.0	-99.9	99.9	---	Analog.	R	207
I05e	TEMP_ASP_C1_AIN08	Display of the suction temperature of circuit 1	0.0	-99.9	99.9	---	Analog.	R	251
I05e	SHTemp_A	Display of overheating of circuit 1	00.0	-99.9	99.9	---	Integer	R	
I05e	TEMP_ASP_C2_AIN11	Display of the suction temperature of circuit 2	0.0	-99.9	99.9	---	Analog.	R	252
I05e	SHTemp_B	Display of overheating of circuit 2	00.0	-99.9	99.9	---	Integer	R	
I05f	TEMP_ASP_C2_AIN11	Display of the outdoor coil temperature (1-circuit units)	0.0	-99.9	99.9	---	Analog.	R	252
I06a	T_P_HP_C1	Display of the high pressure transducer of circuit 1	0.0	-99.9	99.9	bar	Analog.	R	3
I06a	TEMP_CAL_HP_C1	Calculated temperature for high pressure of circuit 1	0.0	-99.9	99.9	°C	Analog.	R	123
I06a	COMPRESOR_1	Contactor of compressor 1 circuit 1	0	0	1	---	Digital	R	16
I06a	COMPRESOR_1_2	Contactor of compressor 2 circuit 1	0	0	1	---	Digital	R	76
I06a	TEMP_ASP_C1_EVOS	Suction temperature on circuit 1	0.0	-99.9	99.9	°C	Analog.	R	
I06a	T_P_LP_C1_EVOS	Evaporating pressure on circuit 1	0.0	-99.9	99.9	bar	Analog.	R	
I06a	TEMP_CAL_LP_C1_EVOS	Evaporating temperature on circuit 1	0.0	-99.9	99.9	°C	Analog.	R	
I06a1	I4_EEV_POSITION_STEP	Valve position (steps) of circuit 1	0	-9999	9999	---	Integer	R	
I06a1	A17_EEV_POSITION_PERCENT	Valve opening (%) of circuit 1	0.0	0.0	100.0	%	Analog.	R	255
I06a1	EVD1_RegStatus	Status of circuit 1 valve	0	-32768	32767	---	Integer	R	
I06a1	EVD1_ProtStatus	Status of circuit 1 valve protection	0	-32768	32767	---	Integer	R	
I06a1	SH_A_EVOS	Overheating on the expansion valve of circuit 1	0.0	-99.9	99.9	K	Analog.	R	253
I06b	T_P_HP_C2	Display of the high pressure transducer of circuit 2	0.0	-99.9	99.9	bar	Analog.	R	4
I06b	TEMP_CAL_HP_C2	Calculated temperature for high pressure of circuit 2	0.0	-99.9	99.9	°C	Analog.	R	124
I06b	COMPRESOR_2	Contactor of compressor 1 circuit 2	0	0	1	---	Digital	R	17
I06b	COMPRESOR_2_2	Contactor of compressor 2 circuit 2	0	0	1	---	Digital	R	77
I06b	TEMP_ASP_C2_EVOS	Suction temperature on circuit 2	0.0	-99.9	99.9	°C	Analog.	R	
I06b1	T_P_LP_C2_EVOS	Evaporating pressure on circuit 2	0.0	-99.9	99.9	bar	Analog.	R	
I06b1	TEMP_CAL_LP_C2_EVOS	Evaporating temperature on circuit 2	0.0	-99.9	99.9	°C	Analog.	R	
I06b1	I149_EEV_POSITION_STEP_2ND	Valve position (steps) of circuit 2	0	-9999	9999	---	Integer	R	
I06b1	A66_EEV_POSITION_PERCENT_2ND	Valve opening (%) of circuit 2	0.0	0.0	100.0	%	Analog.	R	256
I06b1	EVD2_RegStatus	Status of circuit 2 valve	0	-32768	32767	---	Integer	R	
I06b1	EVD2_ProtStatus	Status of circuit 2 valve protection	0	-32768	32767	---	Integer	R	
I06b1	SH_B_EVOS	Overheating on the expansion valve of circuit 1	0.0	-99.9	99.9	K	Analog.	R	254
I06c1	TEMP_ASP_C1_EVOS	Suction temperature on circuit 1	0.0	-99.9	99.9	°C	Analog.	R	
I06c1	SH_A_EVOS	Overheating on the expansion valve of circuit 1	0.0	-99.9	99.9	K	Analog.	R	253
I06e	T_P_LP_C1_EVOS	Evaporating pressure on the circuit 1 valve	0.0	-99.9	99.9	bar	Analog.	R	
I06e	TEMP_CAL_LP_C1_EVOS	Evaporating temperature on the circuit 1 valve	0.0	-99.9	99.9	°C	Analog.	R	
I06f	TEMP_ASP_C2_EVOS	Suction temperature on circuit 2	0.0	-99.9	99.9	°C	Analog.	R	
I06f	SH_B_EVOS	Overheating on the expansion valve of circuit 2	0.0	-99.9	99.9	K	Analog.	R	254
I06g	T_P_LP_C2_EVOS	Evaporating pressure on the circuit 2 valve	0.0	-99.9	99.9	bar	Analog.	R	
I06g	TEMP_CAL_LP_C2_EVOS	Evaporating temperature on the circuit 2 valve	0.0	-99.9	99.9	°C	Analog.	R	
I07	N_HOR_ON_EQUIPO	Display of operating hours of unit	0	0	32767	h	Integer	R	62
I07	N_HOR_COMP1	Display of operating hours of compressor 1 circuit 1	0	0	32767	h	Integer	R	10
I07	N_HOR_COMP1_2	Display of operating hours of compressor 2 circuit 1	0	0	32767	h	Integer	R	53
I07a	N_HOR_COMP2	Display of operating hours of compressor 1 circuit 2	0	0	32767	h	Integer	R	11
I07a	N_HOR_COMP2_2	Display of operating hours of compressor 2 circuit 2	0	0	32767	h	Integer	R	69
I07a	N_HOR_CR	Display of operating hours of recovery compressor	0	0	32767	h	Integer	R	12
I08	DIN01_RTVI	Status of digital input 1: supply fan thermal protection	0	0	1	---	Digital	R	12
I08	DIN02_INC	Status of digital input 2: gas detector	0	0	1	---	Digital	R	135
I08	DIN03_AP1	Status of digital input 3: high pressure circuit 1	0	0	1	---	Digital	R	1
I08	DIN04_TC1	Status of digital input 4: thermal protection of compressors and outdoor fans of circuit 1	0	0	1	---	Digital	R	5
I08	DIN05_TS_IC	Status of digital input 5: safety of el. heaters / burner / boiler	0	0	1	---	Digital	R	7
I08	DIN06_FS	Status of digital input 6: clogged filters detector	0	0	1	---	Digital	R	11
I08	DIN07_ON_OFF	Status of digital input 7: remote ON/OFF	0	0	1	---	Digital	R	
I08	DIN08_AH_BAC_REC_ROT	Status of digital input 8: antifreeze safety of the hot water coil (HWC)	0	0	1	---	Digital	R	
I08	DIN09_AP2	Status of digital input 9: high pressure circuit 2	0	0	1	---	Digital	R	2
I08	DIN10_TC2	Status of digital input 10: thermal protection of compressors and outdoor fans of circuit 2	0	0	1	---	Digital	R	6
I08a	DIN21_OFF_1ET	Status of digital input 21: disconnection of 1 compressor stage	0	0	1	---	Digital	R	
I08a	DIN_OFF_2ET	Status of digital input 22: disconnection of 2 compressor stages	0	0	1	---	Digital	R	

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

`06.Input/Output`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I08a	DIN_OFF_4ET	Status of digital input 23: disconnection of 4 compressor stages	0	0	1	---	Digital	R	
I08a	DIN_OFF_RES	Status of digital input 24: disconnection of electrical heaters	0	0	1	---	Digital	R	
I08b	DIN25_DEBUG	Status of digital input 25: opening of supply damper of zone 1	0	0	1	---	Digital	R	
I08b	DIN26_DEBUG	Status of digital input 26: opening of supply damper of zone 2	0	0	1	---	Digital	R	
I08b	DIN27_DEBUG	Status of digital input 27: opening of return damper of zone 1	0	0	1	---	Digital	R	
I08b	DIN28_DEBUG	Status of digital input 28: opening of return damper of zone 2	0	0	1	---	Digital	R	
I09	COMPRESOR_1	Status of contactor of compressor 1 circuit 1	0	0	1	---	Digital	R	16
I09	COMPRESOR_1_2	Status of contactor of compressor 2 circuit 1	0	0	1	---	Digital	R	76
I09	COMPRESOR_2	Status of contactor of compressor 1 circuit 2	0	0	1	---	Digital	R	17
I09	COMPRESOR_2_2	Status of contactor of compressor 2 circuit 2	0	0	1	---	Digital	R	77
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	20
I09a	RES_ELECTRICA_2	Status of contactor of 2nd stage of electrical heaters	0	0	1	---	Digital	R	21
I10	OUT_VIC1	Status of cycle reversing valve of circuit 1	0	0	1	---	Digital	R	18
I10	OUT_VIC2	Status of cycle reversing valve of circuit 2	0	0	1	---	Digital	R	19
I10	VENTILADOR_EXT_1	Status of outdoor fan(s) of circuit 1	0	0	1	---	Digital	R	23
I10	VENTILADOR_EXT_2	Status of outdoor fan(s) of circuit 2	0	0	1	---	Digital	R	24
I10b	DOUT18	Status of digital output 18: electical heating for the piping layout of the water circuit with GREAT COLD or configurable output (humidifier, HWC pump, alarm signal,...)	0	0	1	---	Digital	R	
I10b	DOUT19	Status of digital output 19: compressor with supplementary crankcase heater	0	0	1	---	Digital	R	
I10b	DOUT20	Status salida digital 20: electrical heater for protection of fresh air damper or solenoid valve SV1 with actve dehumidification	0	0	1	---	Digital	R	
I10b	DOUT21	Status of digital output 21: configurable output (humidifier, HWC pump, alarm signal,...) or solenoid valve SV2 with actve dehumidification	0	0	1	---	Digital	R	
I10c	DOUT22	Status of digital output 22: supply damper of zone 1	0	0	1	---	Digital	R	
I10c	DOUT23	Status of digital output 23: supply damper of zone 2	0	0	1	---	Digital	R	
I10c	DOUT24	Status of digital output 24: return damper of zone 1	0	0	1	---	Digital	R	
I10c	DOUT25	Status of digital output 25: return damper of zone 2	0	0	1	---	Digital	R	
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, rotary heat exchanger or remote alarm signal	0	0	1	---	Digital	R	
I12	AOUT_COMPUERTA	Display of opening % of fresh air damper (optional). Range vary between 0% (0V) and 100% (10V)	0.0	0.0	100.0	---	Analog.	R	10
I12	AOUT_VALV_O_RES_PROP_O_HUMIDIF	Display of opening % of : HWC heat valve or proportional electrical heater or proportional humidifier or gas burner/boiler or overpressure damper	0.0	0.0	100.0	---	Analog.	R	11
I12a	AOUT_VEN_EXT1	Display of operating % of electronic outdoor fan(s) of circuit 1	0.0	0.0	100.0	---	Analog.	R	12
I12a	AOUT_VEN_EXT2	Display of operating % of electronic outdoor fan(s) of circuit 2	0.0	0.0	100.0	---	Analog.	R	13
I12b	AOUT6	Display of % proportional humidifier or exhaust damper or 3-way valve (3-WV) of the condensation coil with active dehumidification	0.0	0.0	100.0	---	Analog.	R	
I12c	AOUT7	Display of operating % of the wheel (variable rotary heat exchanger) or preheater with electrical heater	0.0	0.0	100.0	---	Analog.	R	
I12d	SET_PRES_DIF_IMP	Differential pressure sensor setpoint for constant supply pressure	200	0	10000	Pa	Integer	R	292
I12d	PRES_DIF_IMP	Differential pressure sensor reading for constant supply pressure	0	-99999	99999	Pa	Integer	R	291
I12d1	SET_PRES_DIF_IMP	Differential pressure sensor setpoint for overpressure control with return fan	45	-50	50	Pa	Integer	R	292
I12d1	PRES_DIF_IMP	Differential pressure sensor reading for overpressure control with return fan	0	-99999	99999	Pa	Integer	R	291
I12d2	SET_PRES_COMP_IMP_ACTIVA	Differential pressure sensor setpoint for pressure control with supply damper	600	0	1000	Pa	Integer	R	
I12d2	PRES_DIF_IMP	Differential pressure sensor reading for pressure control with supply damper	0	0	1000	Pa	Integer	R	291
I12d2	HAB_AUTO_SET_PRES_COMP_IMP_OK	Display of active AUTO mode for pressure control with supply damper	0	0	1	---	Digital	R	
I12d2	MODO_BOOST_ON	Type of AUTO mode for pressure control with supply damper: 0: Standard mode (STD) active 1: Boost mode (BOOST) active	0	0	1	---	Digital	R	
I12e	ACTIVAR_FBC1	Status of the condensate pump	0	0	1	---	Digital	R	
I12e	DEMANDA_ACTIVAR_FBC1	Condensate pump operating demand	0	0	1	---	Digital	R	
I15	VOLTAGE_L1_L2	Reading of the energy meter: voltage between phases L1-L2	0	-9999	9999	V	Integer	R	167
I15	VOLTAGE_L3_L1	Reading of the energy meter: voltage between phases L2-L3	0	-9999	9999	V	Integer	R	168
I15	VOLTAGE_L3_L1	Reading of the energy meter: voltage between phases L3-L1	0	-9999	9999	V	Integer	R	169
I15	VOLTAGE_L2	Reading of the energy meter: voltage between phase L1 and neutral	0	-9999	9999	V	Integer	R	170
I15	VOLTAGE_L2	Reading of the energy meter: voltage between phase L2 and neutral	0	-9999	9999	V	Integer	R	171
I15	VOLTAGE_L3	Reading of the energy meter: voltage between phase L3 and neutral	0	-9999	9999	V	Integer	R	172
I16	CURRENT_L1	Reading of the energy meter: current phase L1	0.0	-999.9	999.9	A	Analog.	R	131
I16	CURRENT_L2	Reading of the energy meter: current phase L2	0.0	-999.9	999.9	A	Analog.	R	132

Parameters of "Input/Output" (...continuation)   `06.Input/Output`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I16	CURRENT_L3	Reading of the energy meter: current phase L3	0.0	-999.9	999.9	A	Analog.	R	133
I16	TYPE_INDUCTIVE_O_CAPACITIVE	Inductive character L (0) or capacitive character C (1) of the equivalent electrical load of the unit	0	0	1	---	Digital	R	334
I16	POWER_FACTOR	Reading of the energy meter: power factor	0	0	32	---	Integer	R	173
I16	FREQUENCY	Reading of the energy meter: frequency	0.0	-999.9	999.9	Hz	Analog.	R	142
I17	REACTIVE_POWER_L1	Reading of the energy meter: reactive power phase L1	0.0	-999.9	999.9	kVAR	Analog.	R	134
I17	REACTIVE_POWER_L2	Reading of the energy meter: reactive power phase L2	0.0	-999.9	999.9	kVAR	Analog.	R	135
I17	REACTIVE_POWER_L3	Reading of the energy meter: reactive power phase L3	0.0	-999.9	999.9	kVAR	Analog.	R	136
I17	REACTIVE_POWER_TOTAL	Reading of the energy meter: total reactive power	0.0	-999.9	999.9	kVAR	Analog.	R	315
I17	REACTIVE_ENERGY	Reading of the energy meter: equivalent reactive energy	0	0	4294967295	kWhR	Integer	R	174,175
I18	POWER_L1	Reading of the energy meter: phase power L1	0.0	-999.9	999.9	W	Analog.	R	137
I18	POWER_L2	Reading of the energy meter: phase power L2	0.0	-999.9	999.9	W	Analog.	R	138
I18	POWER_L3	Reading of the energy meter: phase power L3	0.0	-999.9	999.9	W	Analog.	R	139
I18	POWER_TOTAL	Reading of the energy meter: total power		-999.9	999.9	kW	Analog.	R	140
I18	ENERGY	Reading of the energy meter: energy	0	0	4294967295	kWh	Integer	R	176,177
I18	HOURMETER_EM	Reading of the energy meter: time (hours)	0	0	4294967295	h	Integer	R	180,181
I18a	DevAddr_GLD	Number of the R-410A gas leak detector	6	0	999	---	Integer	R/W	
I18a	Concentration_Percent_Gas_Leakag	Reading of the R-410A gas leak detector: concentration (%)	0	0	100	%	Integer	R	7
I18a	Concentration_ppm_Gas_Leakag	Reading of the R-410A gas leak detector: concentration (ppm)	0	0	5000	ppm	Integer	R	6
I18a	RedLedStatus_GLD	Reading of the R-410A gas leak detector: red led: 1= Active; 0= Off	0	0	1	---	Digital	R	
I18a	GreenLedStatus_GLD	Reading of the R-410A gas leak detector: green led: 1= Active; 0= Off	0	0	1	---	Digital	R	
I18a	Relay_Status_GLD	Reading of the R-410A 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	-999.9	999.9	Kcal/Kg	Analog.	R	237
I18b	SONDA_MEZCLA_HUM	Calculation of cooling and heating capacities: supply probe - display of input humidity	0.0	0.0	100.0	%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	-999.9	999.9	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	100.0	%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
I18d	CAUDAL_IMPULSION_MSK	Calculation of cooling and heating capacities: display of supply flow	0	-99999	99999	x10 m³/h	Integer	R/W	
I18d	DIF_ENTALPIA_POT_TERMICA_KCAL	Calculation of cooling and heating capacities: display of the input-output enthalpy difference	0.0	-999.9	999.9	KJ/Kg	Analog.	R	268
I18d	Densidad_aire_impulsion	Calculation of cooling and heating capacities: display of air density	0	-99999	99999	x10 g/m³	Integer	R	231
I18d	Pot_termica	Calculation of cooling and heating capacities: display of total capacity	0.0	-9999.9	9999.9	KW	Analog.	R	239
I18d	POWER_TOTAL	Calculation of cooling and heating capacities: display of electric power	0.0	-9999.9	9999.9	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	-999.9	999.9	---	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	100	%	Integer	R	232
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	100	%	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
I18f	TH_ENERGY_FRIO	Thermal energy in COOLING mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18f	ELEC_ENERGY_FRIO	Electrical energy in COOLING mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18f	SEER	Seasonal efficiency in COOLING mode with at least one active compressor	0.0	0.0	10.0	---	Analog.	R	

Parameters of "Input/Output" (...continuation)   `06.Input/Output`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I18g	TH_ENERGY_CALOR	Thermal energy in HEATING mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18g	ELEC_ENERGY_CALOR	Electrical energy in HEATING mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18g	SCOP	Seasonal efficiency in HEATING mode with at least one active compressor	0.0	0.0	10.0	---	Analog.	R	
I18h	TH_ENERGY_AUTO	Thermal energy in AUTO mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18h	ELEC_ENERGY_AUTO	Electrical energy in AUTO mode with at least one active compressor	0	0	4294967295	kWh	Integer	R	
I18h	SPERF	Seasonal efficiency in AUTO mode with at least one active compressor	0.0	0.0	10.0	---	Analog.	R	
I06cr1	T_P_HP_CR	Display of the high pressure transducer of the recovery circuit	0.0	-999.9	999.9	bar	Analog.	R	263
I06cr1	TEMP_CAL_HP_CR	Calculated temperature for high pressure of the recovery circuit	0.0	-999.9	999.9	°C	Analog.	R	265
I06cr1	COMPRESOR_REC	Contactor of recovery circuit compressor	0	0	1	---	Digital	R	117
I06cr1	TEMP_ASP_CR	Suction temperature on the recovery circuit	0.0	-999.9	999.9	°C	Analog.	R	259
I06cr1	T_P_LP_CR	Evaporating pressure on the recovery circuit	0.0	-999.9	999.9	bar	Analog.	R	264
I06cr1	TEMP_CAL_LP_CR	Evaporating temperature on the recovery circuit	0.0	-999.9	999.9	°C	Analog.	R	266
I06cr2	EEV_POS_STEPS_CR	Valve position (steps) of the recovery circuit	0	-9999	9999	---	Integer	R	
I06cr2	EEV_POS_PERCENT_CR	Valve opening (%) of the recovery circuit	0.0	0.0	100.0	%	Analog.	R	261
I06cr2	EVD_CR_RegStatus	Status of the recovery circuit valve	0	-32768	32767	---	Integer	R	
I06cr2	EVD_CR_ProtStatus	Status of the recovery circuit valve protection	0	-32768	32767	---	Integer	R	
I06cr2	SH_EVOS_CR	Overheating on the expansion valve of the recovery circuit	0.0	-999.9	999.9	ºC	Analog.	R	260
I08cr	CR_DIN01_DEBUG	Status of digital input: remote On/Off	0	0	1	---	Digital	R	
I08cr	CR_DIN02_DEBUG	Status of digital input: high pressure switch of the recovery circuit	0	0	1	---	Digital	R	
I08cr	CR_DIN03_DEBUG	Status of digital input: compressor thermal protection of the recovery circuit	0	0	1	---	Digital	R	
I08cr	DIN25_M8_C_F_DEBUG	Status of digital input: remote Cooling/Heating	0	0	1	---	Digital	R	
I10cr	COMPRESOR_REC	Status of digital output: Contactor of the recovery compresor	0	0	1	---	Digital	R	117
I10cr	OUT_VIC_CR	Status of digital output: cycle reversing valve of recovery compresor	0	0	1	---	Digital	R	278
I10cr	RELE_ALARMA_CR	Status of digital output: alarm relay	0	0	1	---	Digital	R	
I10cr	DOUT19	Status of digital output 19: compressor with supplementary crankcase heater	0	0	1	---	Digital	R	
I10cr	DOUT20	Status of digital output 20: electrical heater for protection of fresh air damper or solenoid valve SV1 with actve dehumidification	0	0	1	---	Digital	R	
I10cr	DOUT18	Status of digital output 18: electical heating for the piping layout of the water circuit with GREAT COLD or configurable output (humidifier, HWC pump, alarm signal,...)	0	0	1	---	Digital	R	
I02zn	TEMP_TCO11	Display of the temperature meaured by terminal on zone 1 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	294
I02zn	TEMP_TCO12	Display of the temperature meaured by terminal on zone 2 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	295
I02zn	TEMP_TCO13	Display of the temperature meaured by terminal on zone 3 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	296
I02zn	TEMP_TCO14	Display of the temperature meaured by terminal on zone 4 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	297
I03zn	TEMP_RET_Z1	Display of the NTC probe return temperature (optional) of zone 1 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	299
I03zn	TEMP_RET_Z2	Display of the NTC probe return temperature (optional) of zone 2 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	300
I03zn	TEMP_RET_Z3	Display of the NTC probe return temperature (optional) of zone 3 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	301
I03zn	TEMP_RET_Z4	Display of the NTC probe return temperature (optional) of zone 4 (air zoning)	0.0	-99.9	99.9	°C	Analog.	R	302
I08zn	COMPUERTA_IMP_ZONA1_ABIERTA	Status of digital input 01 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	COMPUERTA_IMP_ZONA2_ABIERTA	Status of digital input 02 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	COMPUERTA_IMP_ZONA3_ABIERTA	Status of digital input 03 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	COMPUERTA_IMP_ZONA4_ABIERTA	Status of digital input 04 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	ZONIF_4Z_UPC2.IN_DIG05_INC	Status of digital input 05 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	ZONIF_4Z_UPC2.IN_DIG06_RTVI	Status of digital input 06 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I08zn	ZONIF_4Z_UPC2.IN_DIG07_ON_OFF	Status of digital input 07 of SMALL board (addr.11): air flow zoning	0	0	1	---	Digital	R	
I09zn	COMPUERTA_IMP_ZONA1_ABIERTA	Status of supply damper of zone 1 (air flow zoning)	0	0	1	---	Digital	R	
I09zn	COMPUERTA_IMP_ZONA2_ABIERTA	Status of supply damper of zone 2 (air flow zoning)	0	0	1	---	Digital	R	
I09zn	COMPUERTA_IMP_ZONA3_ABIERTA	Status of supply damper of zone 3 (air flow zoning)	0	0	1	---	Digital	R	

Parameters of "Input/Output" (...continuation) `06.Input/Output`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I09zn	COMPUERTA_IMP_ZONA4_ABIERTA	Status of supply damper of zone 4 (air flow zoning)	0	0	1	---	Digital	R	
I09zn	ZONIF_4Z_UPC2.DOUT5	Status of output No.5 of SMALL board (addr.11) (air flow zoning)	0	0	1	---	Digital	R	
I09zn	ZONIF_4Z_UPC2.DOUT6	Status of output No.6 of SMALL board (addr.11) (air flow zoning)	0	0	1	---	Digital	R	
I09zn	ZONIF_4Z_UPC2.RELE_ALARMA_4Z	Status of alarm relay of SMALL board (addr.11) (air flow zoning)	0	0	1	---	Digital	R	
I19	A2L_SENSOR_PERCENT_LFL	Percentage LFL of A2L sensor of the indoor circuit (R-454B leak detector)	0.0	-999.9	999.9	%	Analog.	R	316
I19	A2L_SENSOR_PERCENT_VOL	Volume percentage of A2L sensor of the indoor circuit (R-454B leak detector)	0.0	-999.9	999.9	%	Analog.	R	317
I19	A2L_SENSOR_TEMP	Temperature of A2L sensor of the indoor circuit (R-454B leak detector)	0.0	-999.9	999.9	°C	Analog.	R	318
I19	A2L_SENSOR_LIFE	Life of A2L sensor of the indoor circuit (R-454B leak detector)	0	0	32767	---	Integer	R	293
I19b1	A2L_SENSOR_PERCENT_LFL_EXT1_1	Percentage LFL of A2L sensor No.1 of the outdoor circuit 1 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b1	A2L_SENSOR_PERCENT_VOL_EXT1_1	Volume percentage of A2L sensor No.1 of the outdoor circuit 1 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b1	A2L_SENSOR_PERCENT_LFL_EXT1_2	Percentage LFL of A2L sensor No.2 of the outdoor circuit 1 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b1	A2L_SENSOR_PERCENT_VOL_EXT1_2	Volume percentage of A2L sensor No.2 of the outdoor circuit 1 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b2	A2L_SENSOR_PERCENT_LFL_EXT2_1	Percentage LFL of A2L sensor No.1 of the outdoor circuit 2 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b2	A2L_SENSOR_PERCENT_VOL_EXT2_1	Volume percentage of A2L sensor No.1 of the outdoor circuit 2 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b2	A2L_SENSOR_PERCENT_LFL_EXT2_2	Percentage LFL of A2L sensor No.2 of the outdoor circuit 2 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	
I19b2	A2L_SENSOR_PERCENT_VOL_EXT2_2	Volume percentage of A2L sensor No.2 of the outdoor circuit 2 (R-454B leak detector)	0.0	0.0	100.0	%	Analog.	R	

15 - LIST OF CONTROL PARAMETERS WITH "ACCESS LEVEL 1"

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	

Parameters of "Alarms History"

`11.Alarms History`

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
H01	AlrmLogsIdx	Index to sort alarms	0	0	999	---	Integer	R	
H01	AlrmLogHour	Time to which the alarm log value is referred by the AlrmLogsIdx index	0	0	99	---	Integer	R	
H01	AlrmLogMinute	Minute to which the alarm log value is referred by the AlrmLogsIdx index	0	0	99	---	Integer	R	
H01	AlrmLogDay	Day to which the alarm log value refers by the AlrmLogsIdx index	0	0	99	---	Integer	R	
H01	AlrmLogMonth	Month to which the alarm log value refers by the AlrmLogsIdx index	0	0	99	---	Integer	R	
H01	AlrmLogYear	Year to which the alarm log value refers by the AlrmLogsIdx index	0	0	99	---	Integer	R	
H01	AlrmLogCode	Alarm code (used to display active alarms from the alarm table)	0	0	9	---	Integer	R	
H02	AlrmLogDelete	Clear alarm log (0: Nothing 1: Clear alarm log) NOTE: Required to be at level 3 access	0	0	1	---	Digital	R/W	

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: 0 = burner/boiler as 2nd stage; 1 = only burner/boiler 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	PROJECT_RELEASE_1	Release version	0	0	9	---	Analog.	R	
V01	DIA_COMPILACION	Software version compilation day	0	1	31	---	Integer	R	
V01	MES_COMPILACION	Software release build month	0	1	12	---	Integer	R	
V01	ANO_COMPILACION	Software release compilation year	0	0	99	---	Integer	R	
V01	OsVersion	Board operating system version	0	0	999	---	Integer	R	
V01	BootVersion	Boot version	0	0	999	---	Integer	R	
V02	BoardTyp[1]	Board Type (µPC3)	0	0	99	---	Integer	R	
V02	BoardTyp[2]	Board size (Medium)	0	0	99	---	Integer	R	
V02	PrgCycleMs	Program cycle in ms	0	0	9999	---	Integer	R	
V02	CyclesPerSecond	Program cycles per second	0	-99999.9	99999.9	---	Analog.	R	

16.1. Main control board
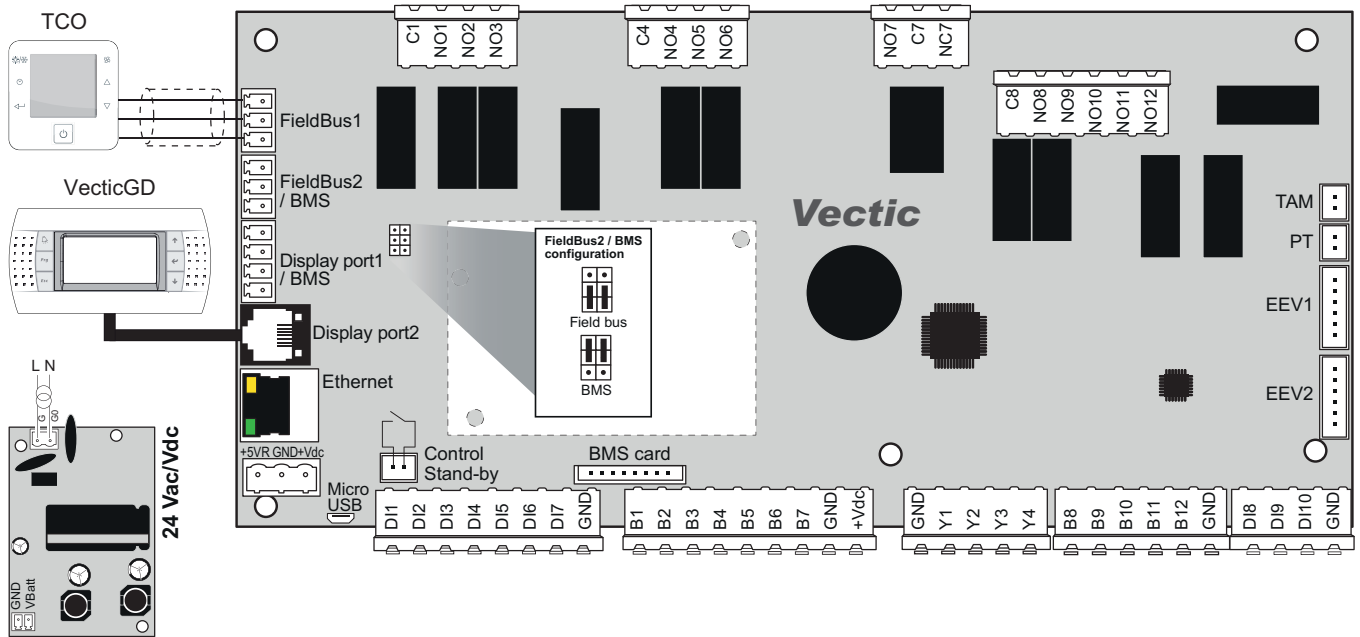
Analog inputs

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

B8: suction temperature probe circuit 1

B9: low pressure transducer circuit 2 (units with 2 circuits)

B10: air quality probe or differential air pressure sensor (optionals)

B11: suction temperature probe circuit 2 (units with 2 circuits) or outdoor coil probe (optional in units with 1 circuit)

B12: high pressure transducer circuit 2 (units with 2 circuits)

Digital inputs

Safety devices and failure indication:

DI1: supply fan protection

DI2: smoke detector (optional)

DI3: high pressure switch circuit 1

DI4: compressor and outdoor fan protection circuit 1

DI5: safety thermistor for the electrical heater or gas burner/boiler alarm signal (optionals)

DI6: clogged filter control (optional)

DI7: remote On / Off

DI8: antifreeze safety for the hot water coil

DI9: high pressure switch circuit 2 (units with 2 circuits) or level float of the condensate pump (optional in units with 1 circuit)

DI10: compressor and outdoor fan protection circuit 2 (units with 2 circuits)

Analog outputs

Proportional control of the unit components and optional elements:

Y1: control of the opening of the fresh air damper (optional)

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 or extraction air damper or proportional humidifier (optionals)

Y3: outdoor fan circuit 1: electronic fan (standard in PJ units) or high-speed (optional 2-speed fan in PJ units) or plug-fan

(standard in ISPV units)

Y4: outdoor fan circuit 1: electronic fan (standard in PJ units) or high-speed (optional 2-speed fan in PJ units) or plug-fan (standard in ISPV units)

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)

NO4: supply fan

NO5: 1st stage of electrical heater or gas burner/boiler (optionals)

NO6: 2nd stage of electrical heater (optional)

NO7: signal of remote general alarm or pump in the hot water coil circuit or pump in the boiler circuit or heat recovery coil or on-off humidifier or rotary heat exchanger (optionals)

Note: outputs NO1 or NO4 of the expansion card c.pCOe with address 8 can also be used to connect some of the above optional elements.

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) or condensate pump (optional in units with 1 circuit)

Electronic expansion valves

EEV1: valve of circuit 1

EEV2: valve of circuit 2 (units with 2 circuits)

Fieldbus1

Serial connection of TCO terminal, RS485 sensors, c.pCOe expansion cards (addresses 4, 8 and 9), SMALL board (address 11), driver EVDEVO (address 7, 71 or 72), etc

Display port2

Connection of VecticGD graphic terminal

Display port1/BMS

Connection of the pLAN local network
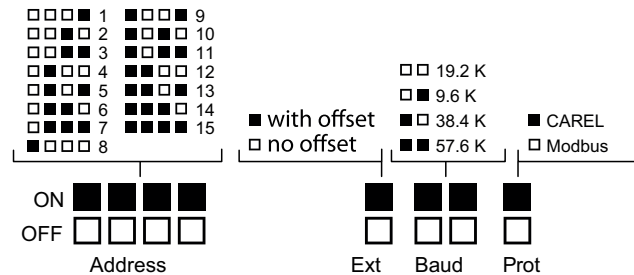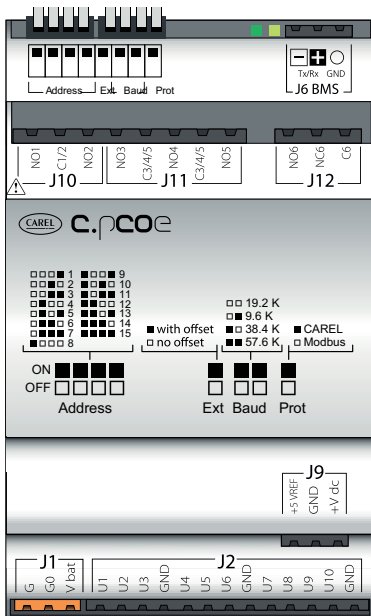
BMS card

Connection of the BMS communication card

Unit power supply

Power: 24 Vac

16.2. 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.

Connection of the TCO user 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 at 230Vac 50/60Hz (L&N): 2 wires (section 0.5 at 1.5 mm^2).

   Note: The power supply of the electrical cabinet (230 V) must be used for terminal power.

● 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 19200 bps.

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

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

16.3. Connection of the Basic c.pCOe expansion modules to the control board (optional)

Basic c.pCOe module, address 8: ■□□□ □□□□

This module is needed to manage the options:

- Low outdoor temperature (GREAT COLD).
- Remote COOLING / HEATING.
- Mechanical disconnection of stages.
- Proportional humidifier or overpressure control with exhaust damper.
- Active dehumidification with condensation coil.
- Unit with 100% fresh air.
- Failure signaling of compressors manual motor starters (MMS).

Analog inputs

U1: remote COOLING / HEATING

U2: ventilation mode with 100% fresh air

U3: temperature probe on the HWC inlet with GREAT COLD

U4: temperature probe on the HWC outlet with GREAT COLD

Digital inputs

U5: 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 or status of the manual motor starter (MMS) of compressor 1

U6: disconnection of 2 compressor stages or status of the manual motor starter (MMS) of compressor 1_2

U7: disconnection of 4 compressor stages or status of the manual motor starter (MMS) of compressor 2

U8: disconnection of electrical heaters or status of the manual motor starter (MMS) of compressor 2_2

U10: status of the manual motor starter (MMS) of the recovery compressor

Analog output

U9: proportional humidifier or exhaust damper or control of proportional 3WV of the condensation coil with actve dehumidification

Digital outputs

NO1: electical heating for the piping layout of the water circuit with GREAT COLD or configurable output (humidifier, HWC pump, general alarm, rotary heat exchanger, Preheater in fresh air for units with active dehumidification, compressor OFF by timing of crankcase heater, free-cooling ON on bypass damper of the rotary heat exchanger)

NO2: compressor with supplementary crankcase heater or ventilation mode with 100% fresh air

NO3: electrical heater for protection of fresh air damper or solenoid valve SV1 with actve dehumidification

NO4: configurable output (same outputs as NO1) or solenoid valve SV2 with actve dehumidification

Connection to µPC3 board

J9: connection on Fieldbus1

Power supply

J1: 24 Vac

16.3. Connection of the Basic c.pCOe expansion modules to the control board (optional)
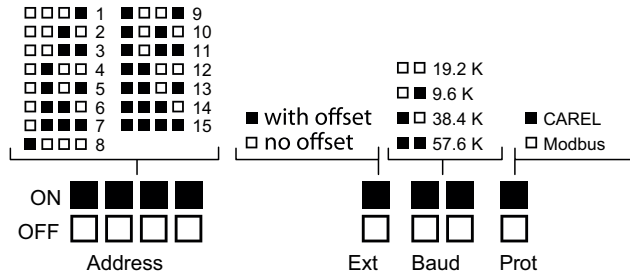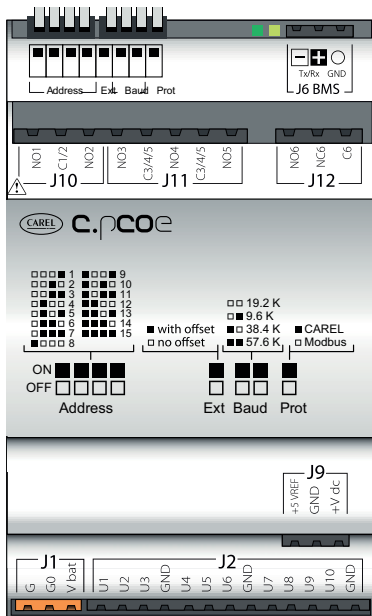
Basic c.pCOe module, address 9: ■□□■ □□□□

This module is needed to manage the options:

- Second air quality probe (CO_2) for installation in the environment or outdoor.
- 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).
- Constant supply pressure control or overpressure control with return fan or pressure control with supply damper.
- Control of air renewal through an external extractor.
- Failure signaling of compressors manual motor starters (MMS).

Analog inputs

U1:   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)

U2:   differential pressure sensor for constant supply pressure control or overpressure control with return fan or or pressure control with supply damper

U3:   exhaust temperature probe (prop. rotary heat exchanger)

U4:   exhaust temperature probe (prop. rotary heat exchanger)

Digital inputs

U5:   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 or status of the manual motor starter (MMS) of compressor 1

U6:   opening status of the supply damper of zone 2 or status of the manual motor starter (MMS) of compressor 1_2

U7:   opening status of the return damper of zone 1 or return damper external to the unit or status of the manual motor starter (MMS) of compressor 2

U8:   opening status of the return damper of zone 2 or status of the manual motor starter (MMS) of compressor 2_2

U10: status of the manual motor starter (MMS) of the recovery compressor or 0-10V signal for pressure control with supply damper or external extractor status

Analog output

U9:   0...10Vdc output for wheel control (prop. rotary heat exchanger) or preheater with electrical heater (100% fresh air)

Digital outputs

NO1: opening signal of supply damper of the zone 1 or supply damper (external to the unit) or ON/OFF signal of the electrical heater for preheating

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

Connection to µPC3 board

J9:   connection on Fieldbus1

Power supply

J1:   24 Vac

16.4. Connection of the Enhanced c.pCOe expansion module to the control board (optional)
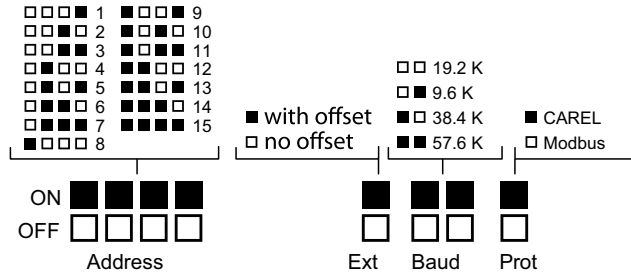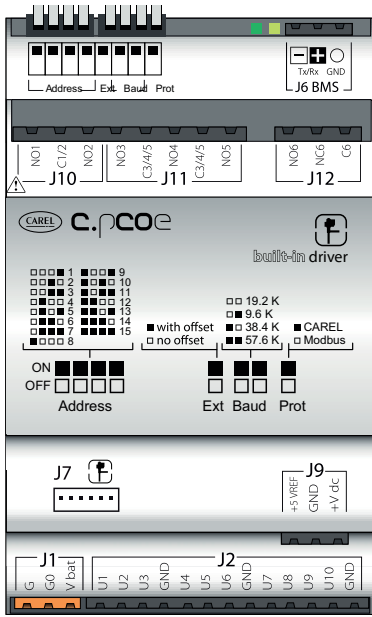
Enhanced c.pCOe module, address 4: □■□□ □□□□

The management of the cooling circuit for the recovery of the extracted air energy (optional) is done with this module.

It can also be used instead of modules with addresses 8 and 9 with the following optional:

● Low outdoor temperature (GREAT COLD).

● Remote COOLING / HEATING.

● Proportional humidifier or overpressure control with exhaust damper.

● Active dehumidification with condensation coil.

● Second air quality probe (CO_2) for installation in the environment or outdoor.

● Constant supply pressure controlor overpressure control with return fan.

Analog inputs

U5:   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)

U6:   differential pressure sensor for constant supply pressure control or overpressure control with return fan

U8:   suction temperature probe of the recovery circuit

U9:   low pressure transducer of the recovery circuit

U10: high pressure transducer of the recovery circuit

Digital inputs

U1:   remote off of the recovery circuit

U2:   high pressure switch of the recovery circuit

U3:   compressor thermal protection of the recovery circuit

U4:   remote COOLING / HEATING

Analog output

U7:   proportional humidifier or exhaust damper or control of the proportional 3WV of the condensation coil with actve dehumidification

Digital outputs

NO1: compressor of the recovery circuit

NO2: cycle reversing valve of the recovery circuit

NO3: compressor with supplementary crankcase heater

NO4: electrical heater for protection of fresh air damper or solenoid valve SV1 with actve dehumidification

NO5: configurable output (humidifier, HWC pump, alarm signal,...) or solenoid valve SV2 with actve dehumidification

NO7: signal of alarm of the recovery circuit

Electronic expansion valve

J7:   valve of the recovery circuit

Connection to µPC3 board

J9:   connection on Fieldbus1

Power supply

J1:   24 Vac

16.5. Connection of the SMALL board to the control board (optional)
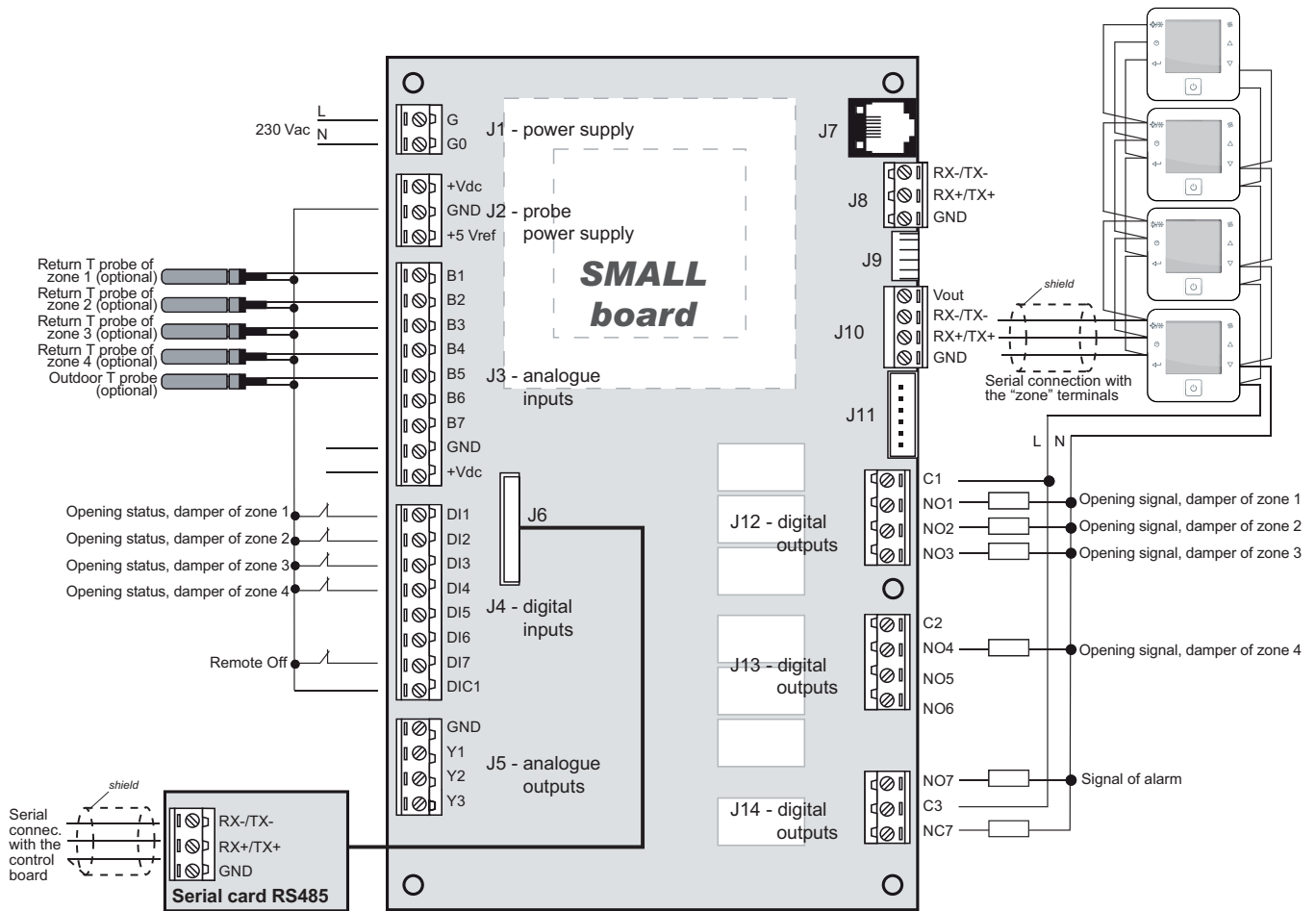
SMALL board with address 11

This plate is necessary for the management of the zoning of the air flow up to 4 different zones through dampers (optional).

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

DI4:   opening status of the supply damper of the zone 4
DI7:   remote off

Connector J6

RS485 Fieldbus serial connection with the µPC3 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

(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 (B2) is used by the control

16.6. 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, configured with different addresses:

● 1 to 4 probes of ambient temperature or temperature + humidity.

● RS485 enthalpy probes on the mixing air and the supply air. Combined with an energy meter, these probes allow the calculation of cooling and heating capacities, thermal and electrical energy, and seasonal energy efficiencies.
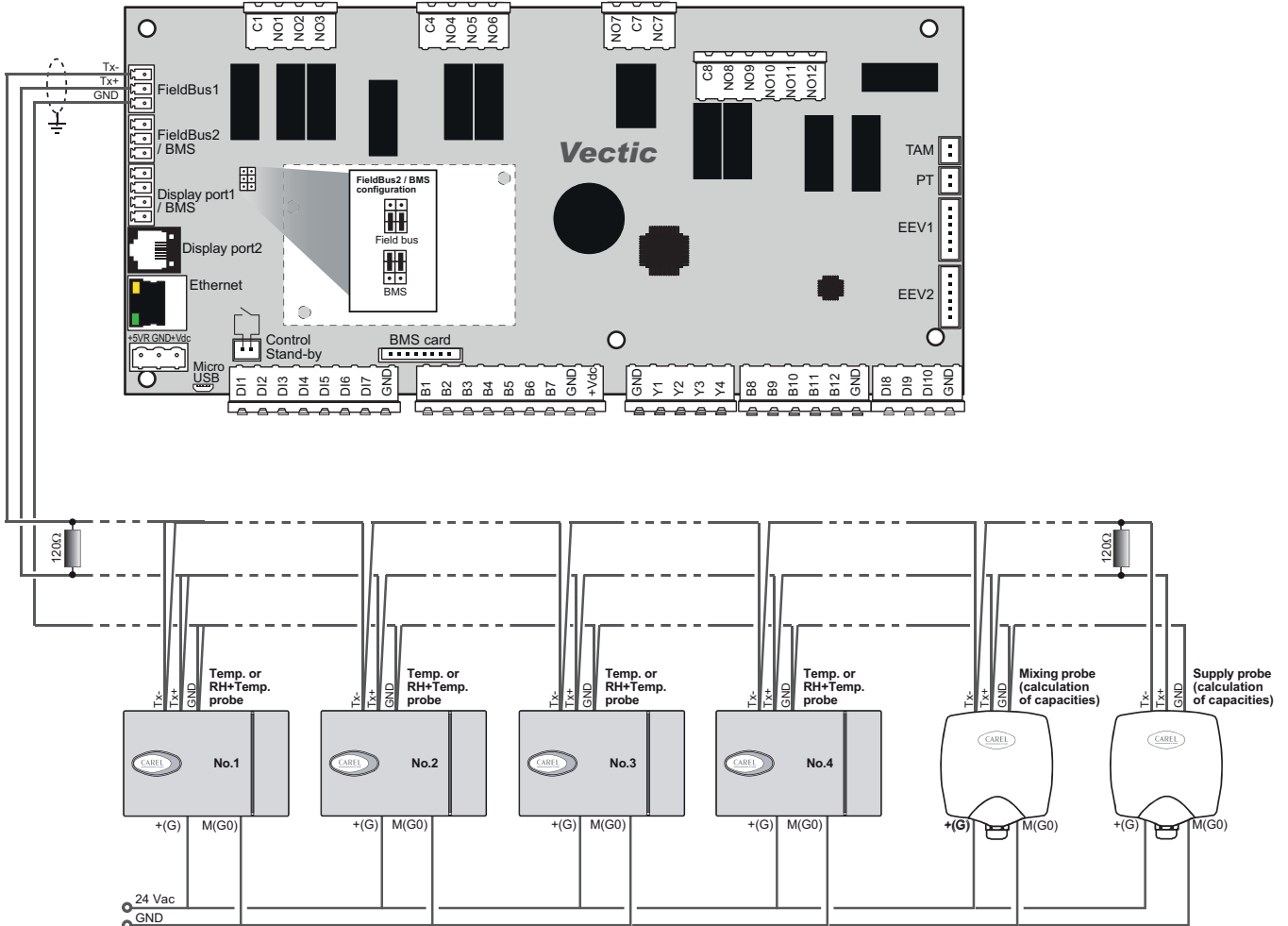
RS485 probes configuration:
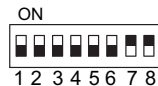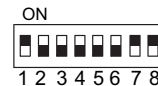
Dip 1-5 Address On (128-159)
Dip 6-7 Off-Off =Supv. Carel
Off-On =ModBus 1,8 N,2
On-Off =Auto (SupvC-ModBus)
On-On =ModBus 1,8,E,1
Dip 8 Off = 19200 bps
On = 9600 bps

Ambient probe of T or T+RH No.1:	Ambient probe of T or T+RH No.2:	Ambient probe of T or T+RH No.3:	Ambient probe of T or T+RH 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
19200 bps	19200 bps	19200 bps	19200 bps	19200 bps	19200 bps
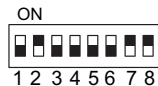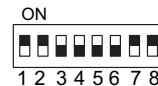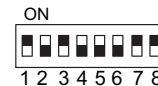
Important: It is recommended to insert an electrical resistance of 120Ω, between TX+ and TX- at the output of the control board and on the final component of the RS485 network, to avoid potential problems of communication.

17 - 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.

µPC3 control boad	
TECHNICAL CHARACTERISTICS	
Storage conditions / Operating conditions	-40T70 ºC; %HR 90 non-condensing / -40T60 ºC; %HR 90 non-condensing
Protection index	IP00
Environmental pollution	Category 3
Classification according to protection against electric shocks	To be incorporated in class I and/or II appliances
PTI of the insulating materials	PCB: PTI 250 V; insulating materials: PTI 175
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 III
Software class and structure	Class A
Dimensions: Length x height x width	228 x 113 x 72 mm
ELECTRICAL CHARACTERISTICS	
Power supply (controller with terminal connected)	230 Vca
Maximum current with the connected terminal	28 VA
Terminal strip	with removable male/female connectors
CPU	32 bit, 100 MHz
Data memory	FLASH memory: 128 MB Data memory: 16MB/8MB Battery type: Lithium button battery
Working cycle with applications of average complexity	0,2 s
Analogue inputs	
Maximum number	12 (B1...B12)
Input type: B1	NTC CAREL (-50T90°C; R/T 10 kΩ ±1% a 25°C), NTC HT (0T150°C) input type: free contact
Input type: B2, B3, B4	NTC CAREL (-50T90°C; R/T 10 kΩ ±1% a 25°C), NTC HT (0T150°C) input type: free contact
Input type: B5, B10	NTC CAREL (-50T90°C; R/T 10 kΩ ±1% a 25°C), NTC HT (0T150°C) input type: 0...20 mA /4...20 mA
Input type: B6, B7, B8, B9, B12	NTC CAREL (-50T90°C; R/T 10 kΩ ±1% a 25°C), NTC HT (0T150°C) 0...5 V radiometric pressure sensor
Input type: B11	NTC CAREL (-50T90°C; R/T 10 kΩ ±1% a 25°C), NTC HT (0T150°C) 0 ...10 Vdc
Time constant for each input	0.5 s
Input precision	± 1% of the complete scale
Digital inputs	
Number	10
Analogue outputs	
Maximum number	4
Type	0…10 Vdc
Precision	± 3% of the complete scale
Resolution	8 bit
Maximum current	2 mA
Digital outputs	
Combination of outputs	NO1, NO4: A, B, C NO2, NO3, NO5, NO8, NO9: A NO6/NC6, NO7/NC7: D, F, G NO10: A, B NO11, NO12: A, B, F, G
Type A (SPST)	EN60730: 3(1)A, NO, 230Vac, 100k cycles
Type B (SPST)	EN60730: 4A, NO, 230Vac, 100k cycles
Type C (SPST)	EN60730: 10A, 250Vac, NO, 100k cycles 5A (cosφ 0.4), NO, 250 Vac, 100k cycles
Type D (SPDT)	EN60730: 1A, NO,NC,CO, 230Vac, 100k cycles 1A (cosφ 0.5), NO, 250Vac, 30k cycles
Type F (SSR HV)	110/230 15VA
Type G (SSR LV)	24V 15VA

c.pCOe expansion modules	
TECHNICAL CHARACTERISTICS	
Storage conditions	-40T70 ºC; %HR 90 non-condensing
Operating conditions	-20T70 ºC; %HR 90 non-condensing
Protection index	IP40 only on the front panel
Environmental pollution	Level 3
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
Software class and structure	Class A
Dimensions: Length x height x width	110 x 70 x 60 mm (4 DIN modules)
ELECTRICAL CHARACTERISTICS	
Power supply	24 Vca +10/-15% 50/60 Hz, 28 to 36 Vdc +10/-15%, 15 VA / 6 W
Basic model maximum power consumption	15 VA / 6 W
Enhanced model maximum power consumption	30 VA / 12 W
Maximum connector voltage (NO1…C6)	250 Vac
Meaning of the LEDs	
Yellow LED	flashing when setting the address (setting the off set); on in the event of incorrect address setting
Green LED	flashing if BMS port communication online, on steady if offline.
Universal channels	
Number	10
Analogue / digital conversion	14 bits
Type of input selectable	NTC, PT1000, PT500, PT100, 4 to 20 mA, 0 to 1 V, 0 to 5 V, 0 to 10 V, 0 to 2 kHz (resolution ±1Hz) on/off or open collector digital input (2 kOhm)
Type of output selectable	PWM 0/3.3 V 100 Hz, PWM 0/3.3 V, 2 mA 2 kHz, 0 to 10 V analogue output
Maximum current output	2 mA
Precision of analogue input reading	± 0,3% of full scale
Analogue output precision	± 2% of full scale
Digital outputs	
Number	6
Group 1 (R1, R2); Group 2 (R3, R4, R5)	2(1) A (100,000 cycles); UL60730: 5 A resistive, 250 Vac, 30k cycles, 105°C,Defined Purpose, 1FLA, 6LRA, 250 Vac, 30k cycles, 105°C, pilot duty C300, 250 Vac, 30k cycles, 105°C.
Group 3 (R6)	1(1) A (100,000 cycles) Maximum switchable voltage: 250 Vac; UL 60730-1: 1 A resistive, 1 A FLA, 6 A LRA, 250 Vac, D300 pilot duty, 30,000 cycles.
Single-pole valve output (Enhanced model only)	
Number / type	1 / single-pole
Maximum output	8 W
Connector	6-pin, fixed sequence
Power supply	13 Vdc ±5%
Maximum current:	0.35 A for each winding
Minimum winding resistance	40 Ω

17 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

VecticGD terminal

TECHNICAL CHARACTERISTICS OF THE DISPLAY	
Type	FSTN graphic
Back-lighting	Blue LED (controlled using software)
Resolution	132 x 64 pixel
TECHNICAL CHARACTERISTICS OF THE POWER SUPPLY	
Voltage	Power supply through the telephone cable or external source 18/30 Vdc protected by an external 250 mAT fuse
Maximum power input	1.2 W
CONNECTION WITH THE microPC BOARD	
Type	asynchronous half duplex, 2 dedicated wires
Connector for the terminal	6-way telephone plug
Driver	CMR 7 V (type RS485) balanced differential
GENERAL CHARACTERISTICS	
Protection index	IP65 for assembly in panel / IP40 for wall assembly
UL	type 1
Operating conditions	-20T60 ºC, 90% RH non-condensing
Storage conditions	-20T70 ºC, 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

TCO terminal

TECHNICAL CHARACTERISTICS OF THE POWER SUPPLY	
Voltage	Power supply 230Vac(+10/-15) 50/60Hz
Maximum power	1 VA
CONNECTION WITH THE microPC BOARD	
Type	AGW20 or AGW22 with 1 braided pair + drainwire + shielding
GENERAL CHARACTERISTICS	
Protection index	IP20
Operating conditions	-10T60 ºC, 10 to 90% RH non-condensing
Storage conditions	-20T70 ºC, 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 ºC ± 1%
Dimensions: Length x Height x Depth	Model to fit: 86 x 86 x 51 mm Surface model: 86 x 142 x 23 mm or 142 x 86 x 23 mm

17.1. 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.
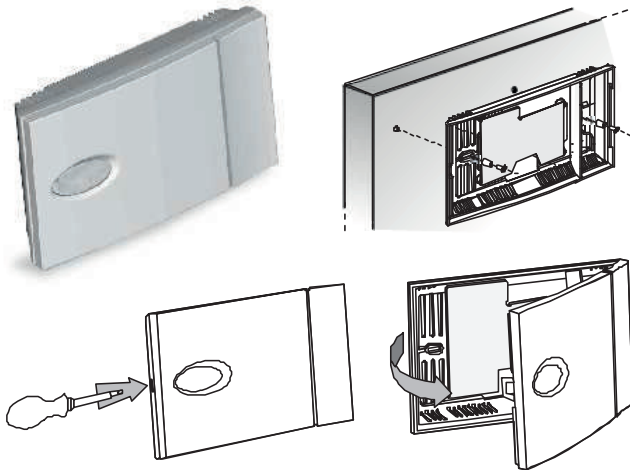
- Fasten the rear of the sensor case to the panel or the wall (for fastening the case, use the screws supplied with the fastening kit, paying attention to use the proper spacers, to not damage the sensor's electronics).

- The electrical connection must be carried out depending on the unit setting:

  - NTC probe S5a (B5): with 2 x 1,5 mm^2 section cable, within a maximum distance of 30 metres.

  - RS485 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.
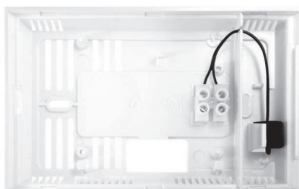
Inside view, bottom shell   *Inside view, top shell*

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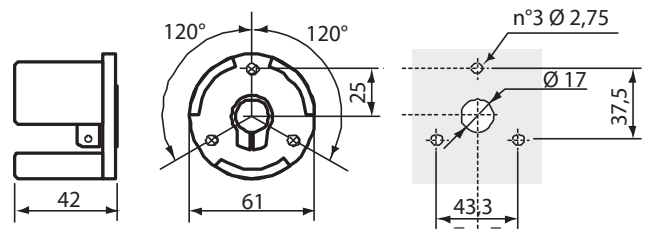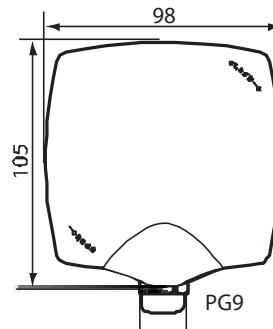
- For the electrical connections, remove the top cover of the sensor. Remove the cover by rotating it anticlockwise

View of sensor without cover   *Interior view*

Industrial environment version (DPP)

Case index of protection: IP55

Sensor index of protection: IP54.
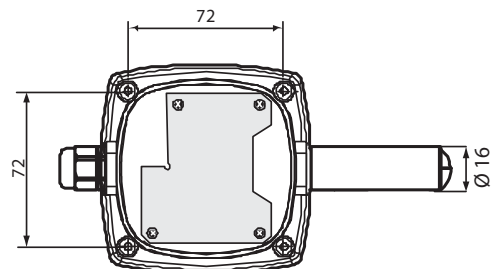
Assembly and setting instructions

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).

- 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).

(fig.1)   *(fig.2)*

(fig.3)   *(fig.4)*
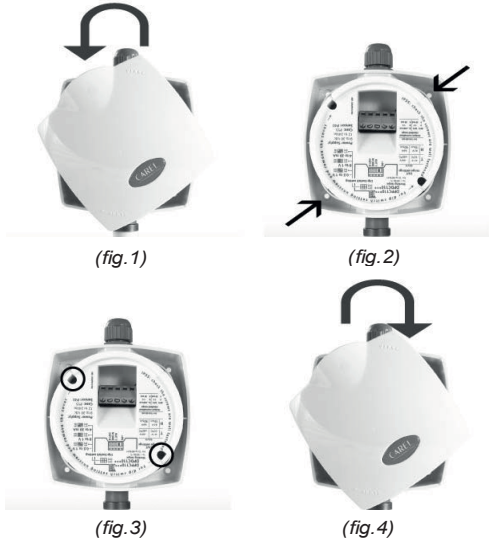
Cleaning and maintenance

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.

17.2. Air quality probe 4.. 20 mA

There are different options:

● Ambient air quality probe (intallation in the environment).

● Return air quality probe (duct-mounted).

● Probe installed on the "Lead" unit of the SHRD shared network.

● Double quality probe:

- two ambient air probes;

- one ambient air probe and one outdoor air probe;

- one return air probe (duct-mounted) and one outdoor air probe.

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.
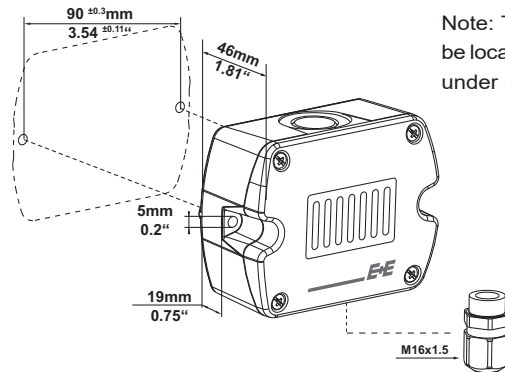
- In areas exposed to direct solar radiation.
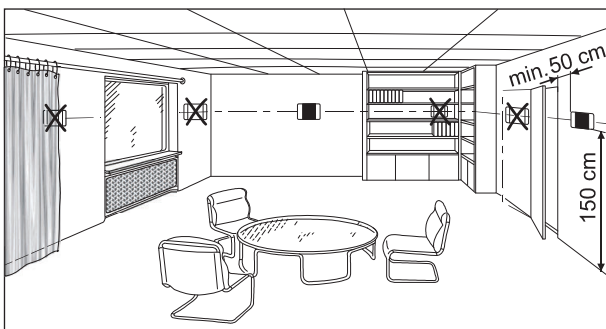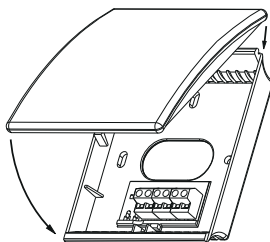
Duct-mounted

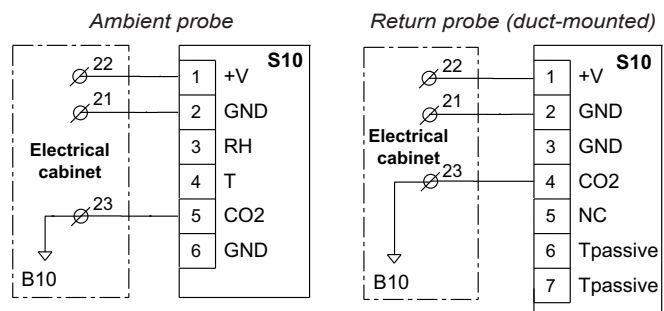This version can be connected to the air duct in these two ways:
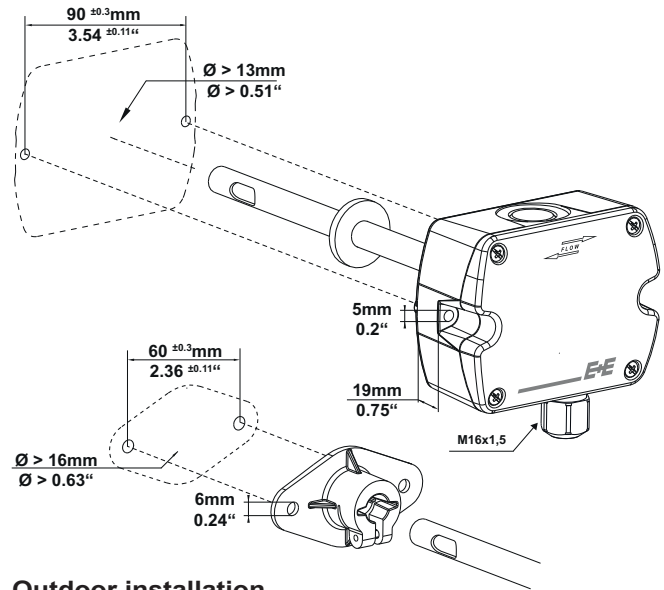
Outdoor installation

Note: This probe must be located outdoors but under cover.

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). Recommended cable section: 1,5 mm^2.

Ambient probe

	S10
1	+V
2	GND
3	RH
4	T
5	CO2
6	GND

Return probe (duct-mounted)

	S10
1	+V
2	GND
3	GND
4	CO2
5	NC
6	Tpassive
7	Tpassive

The second probe (S10-2) is confi gured as analogue output 4…20 mA (0..2000 ppm for ambient probe or 0..5000 ppp for outdoor probe) in the analogue input U1 of the expansion module c.pCOe with address 9 (connector J2). Recommended cable section: 1,5 mm^2.

Ambient or outdoor probe:

	S10-2
1	+V
2	GND
3	RH
4	T
5	CO2
6	GND
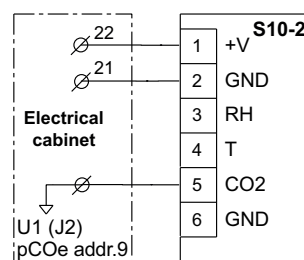
- *The unit does not switch on (the power LED on the main board is switched off).*

  Check:

  1. The presence of main power;

  2. The transformer output voltage;

  3. That the power supply connector 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 addresses of the µPC3 control board and the VecticGD terminal (check that they comply with the requirements of the current application);

  3. The connection between the VecticGD terminal and the µPC3 board.

- *Erroneous readings of the input signals.*

  Check:

  1. The correct power supply to the control board and probes;

  2. The separation between the power supply of the digital inputs and that of the control board;

  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 µPC3 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 0ºC/0% RH;

  Pressure sensors:

  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) x (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) x [7 - (-0.5)] / 0.016 + (-0.5) = 2.3 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 control 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.