USER BROCHURE
NA 17.91 A 11 - 2017

Electronic control

Vectic

CONTENTS

ORIGINAL TEXT: SPANISH VERSION

1 - GENERAL DESCRIPTION

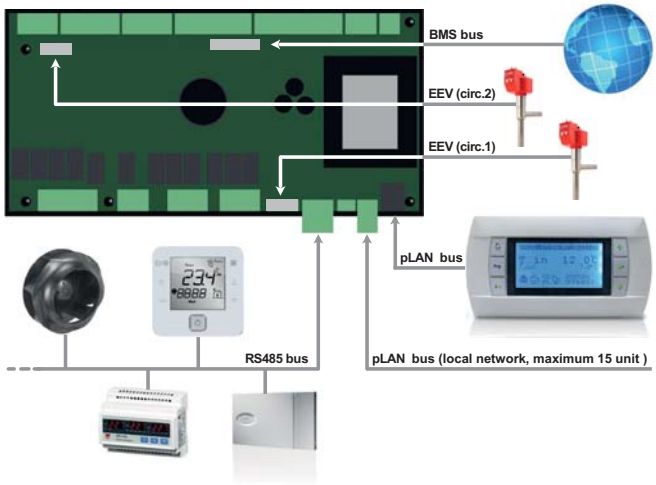
The **Vectic** control is an electronic module with microprocessor designed for the control and supervision of air-air units (especially rooftop models).

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

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

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

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



Main functions:

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

Optional functions:

This control is used to manage addition components such as:

- External air damper for the renewal of fresh air, depending on the temperature of the mixed air or depending on the air quality sensor.
- Mixing box for thermal, enthalpy or thermo-enthalpy free-cooling.
- Rotary heat exchanger. Wheel speed with on/off control or variable control.
- Cooling circuit for the recovery of the extracted air energy.
- Control of the overpressure.
- Zoning into 2 areas with dampers.
- 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.
- Humidifier with proportional or on/off control.
- Clogged filter pressostat.
- Smoke detection station.
- Refrigerant leak detector.
- Air quality sensor for measuring CO_2.
- Energy meter and calculation of the cooling and heating capacities.

1.1. VecticGD graphic terminal

This graphic terminal is used to:

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

1.2. TCO user terminal (optional)

This terminal is used to:

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

1.3. Sensors

Sensors included with the control:

The standard sensors connected to the control board are:

- Return air temperature probe (S1).
- Outdoor air temperature probe (S2).

  Note: If the unit is integrated in a pLAN network, it can read the value of outdoor temperature measured by the master unit probe.
- Supply air temperature probe (S3).
- Mixing air temperature probe (S4).
- Ambient air temperature probe, NTC type (S5a).

  Note: If the unit is integrated in a pLAN network, it can read the value of ambient temperature measured by the master unit probe.
- Transducers of low pressure: circuit 1 (S6) and circuit 2 (S11).
- Transducers of high pressure: circuit 1 (S7) and circuit 2 (S12).
- Suction temperature probes: circuit 1 (S8) and circuit 2 (S9).

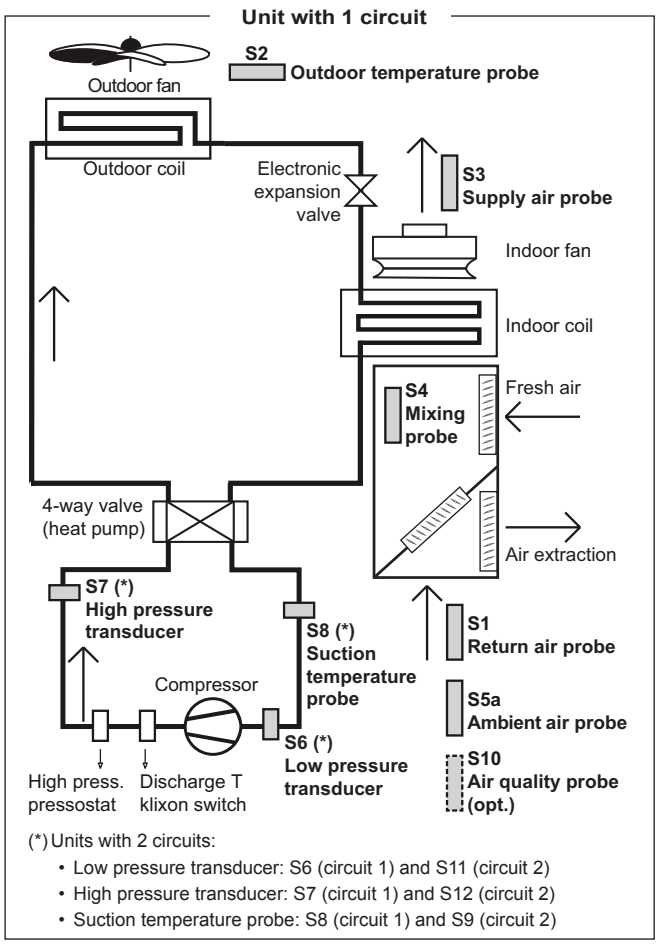
Optional sensors connected on the control board:

- Outdoor air relative humidity (S5h): this probe is used instead of the outdoor temperature probe and is necessary with the option of enthalpic or thermoenthalpic free-cooling.

  When the unit needs the outdoor humidity probe (S5h), this one is connected on the board in place of the NTC ambient temperature probe (S5a). In this case, it's necessary to use a RS485 ambient temperature probe connected on the Field-bus.

  Note: If the unit is integrated in a pLAN network, it can read the value of outdoor humidity measured by the master unit probe.
- Air quality sensor to enable measuring CO_2. This probe can be installed in the environment (S10a) or duct-mounted (S10c).

  Note: If the unit is integrated in a pLAN network, it can read the value of CO_2 measured by the master unit probe.



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

- RS485 ambient temperature probe (1 to 4 probes connected in series):
  - When the unit needs the outdoor humidity probe (with enthalpic or thermoenthalpic free-cooling), this one is connected on the board in place of the NTC ambient temperature probe (S5a). In this case, a RS485 ambient temperature probe is used.
  - An ambient temperature probe with RS485 communication is required for installation at distances up to 30 meters.

    Note: If the unit is integrated in a pLAN network, it can read the value of ambient temperature measured by the master unit probe(s).
- RS485 ambient T + RH probe (1 to 4 probes connected in series):
  - This probe is necessary with enthalpic or thermoenthalpic free-cooling. In this case, the outdoor humidity probe is also added.

    Note: If the unit is integrated in a pLAN network, it can read the value of ambient T + RH measured by the master unit probe(s).
- RS485 enthalpy probes on the mixing air and the supply air for calculation of the cooling and heating capacities.

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

Card with address 8:

This module is needed to manage the options:

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

Card with address 9:

This module is needed to manage the options:

- Zoning into 2 areas with dampers.
- Control of supply and return dampers (external to the unit).
- Rotary heat exchanger with variable speed.

1.5. SMALL board (optional)

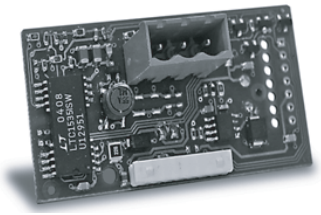
The management of the energy recovery circuit (optional) is done with a SMALL board connected in series on the Field-Bus. Address 4.

1.6. BMS communication

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

Carel and Modbus

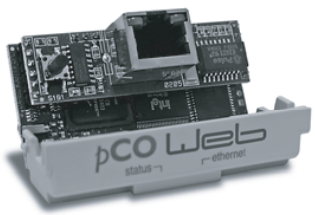
One RS485 serial card is connected for the supervisory network with both Carel and Modbus protocol.



Ethernet pCO Web

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

BACnet™ Ethernet: *Configuration by the integrator.*



LonWorks®

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

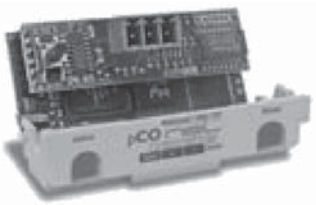
The supervisory program is stored in flash memory and can be programmed directly from the LonWorks® network by using tools such as LonMaker®.

BACnet™

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

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

Configuration by the integrator.

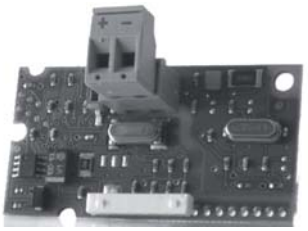


Konnex (KNX)

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

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

Configuration by the integrator.



Supervision solutions

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

pCO Web

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

PlantWatchPRO3

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

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

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

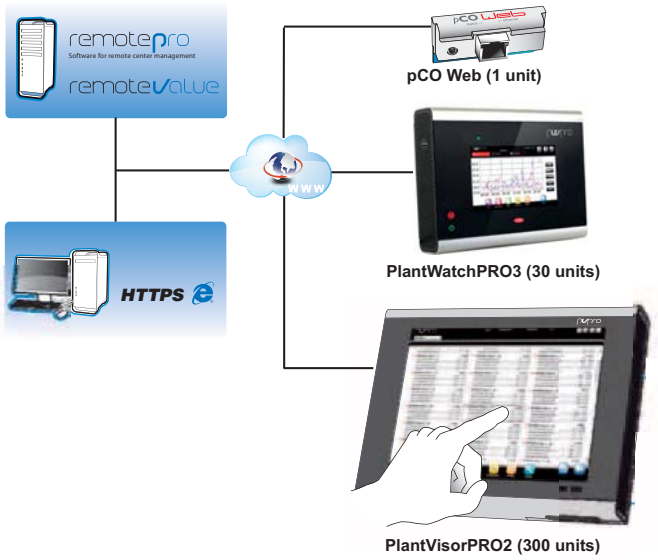
PlantVisorPRO2

This is the solution for the management and supervision of air-conditioning installations with up to 300 units. It offers advanced monitoring and maintenance functions and allows zones and groups to be created to simplify the management of the installation. It also allows energy meters to be integrated to monitor the installation electricity consumption.

PlantVisorPRO2 is available in two versions:

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

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



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

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

1.7. Communication in a pLAN network

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

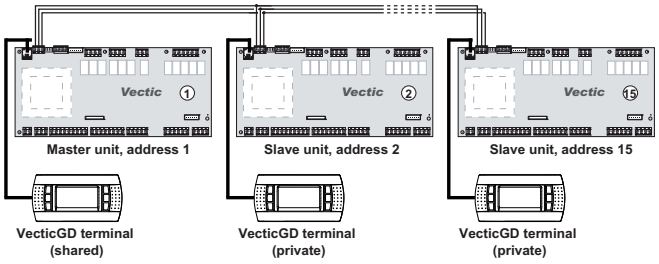
The pLAN network must be composed, at least, by the following components:

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

Additional components:

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

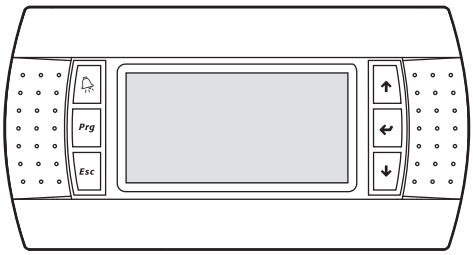
  These sensors are: outdoor temperature, ambient temperature, outdoor humidity, ambient humidity and CO_2 air quality.



2.1. VecticGD graphic terminal (standard)

Features

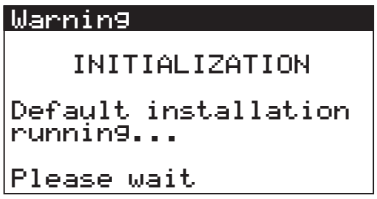
- LCD FSTN display (132 x 64 pixel), backlit in blue.
- The screen provides detailed explanations of control in easy to understand English. No decoding is required.
- Only 6, large, easy-to-use buttons are required to maneuver through the entire menus.



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

First run of the software

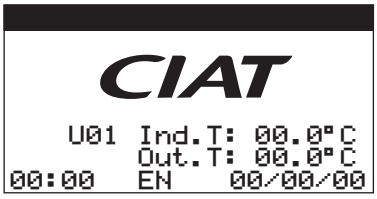
On the first run of the software installed on the control, the following screen appears on the terminal, informing about the installation of the values by default:



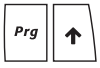
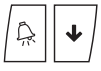
The screen that appears later indicates that it is necessary to reset the terminal to confirm installation:

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

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



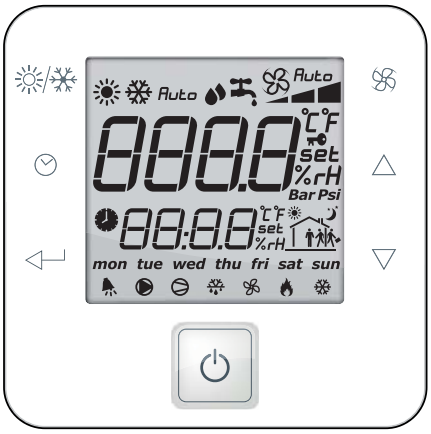
Keys and combinations (quick guide)

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 for a few seconds, it’s possible to change of unit in the pLAN network.
	**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

2.2. TCO user terminal (optional)

Features

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



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

Screen

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

Symbol	*Meaning*
	Selection of HEATING mode (winter)
	Selection of COOLING mode (summer)
Auto	Selection of AUTOMATIC mode
	Indoor fan in operation (3 possible speeds in plug-fan)
88.8 set %rH	Main indicator of: - Temperature (ºC or ºF) - Activated block 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 schedule programming
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
	Schedule programming	Short press: allows to activate the schedule programming stored in the TCO terminal Long press (3 secs): allows the time and the schedule programming 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, outdoor 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

2) Setpoint temp.

3) Ambient RH (opt)

4) Setpoint RH (opt)

5) Outdoor temperature

6) Supply temperature

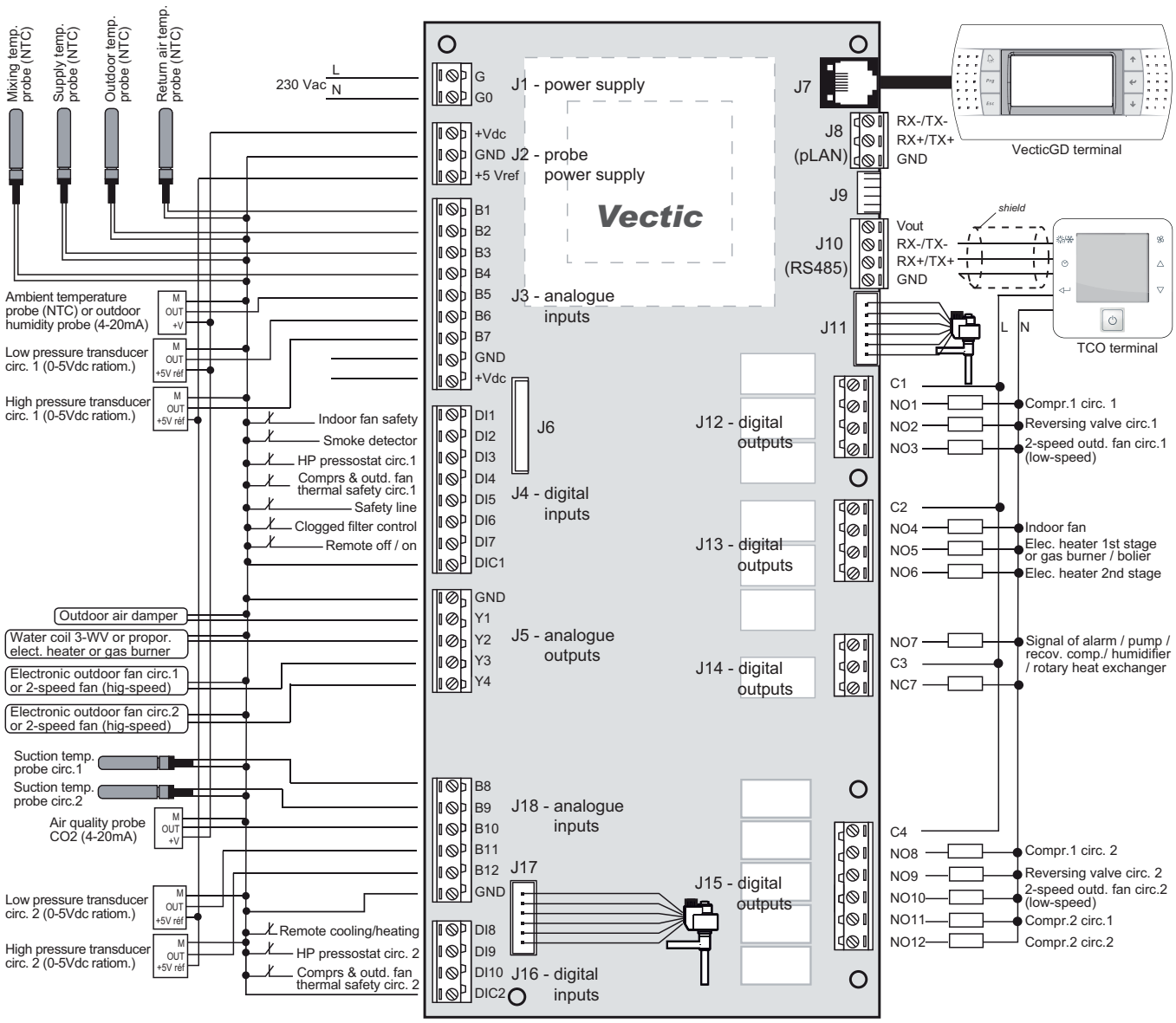
7) Active alarms

8) CO_2 measure (opt.)

9) Outd. damper (opt)

3 - CONNECTIONS

3.1. Main board



Connector J1

Unit power supply

Connector J2

Sensors power supply

Connector J3 (Analog inputs)

Temperature, pressure and humidity reading sensors:

B1: return air temperature probe

B2: outdoor air temperature probe

B3: supply air temperature probe

B4: mixing air temperature probe

B5: NTC ambient air temperature probe (by default) or outdoor air relative humidity probe (optional)

B6: low pressure transducer circuit 1

B7: high pressure transducer circuit 1

Connector J4 (Digital inputs)

Safety devices and failure indication:

DI1: indoor fan protection

DI2: smoke detector (optional)

DI3: high pressure pressostat circuit 1

DI4: compressor and outdoor fan protection circuit 1

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

DI6: clogged filter control (optional)

DI7: remote On / Off

Connector J5 (Analog outputs)

Proportional control of the unit components and optional elements:

Y1: control of the opening of the outdoor air damper

Y2: control of the 3-way valve of the hot water coil / proportional electrical heater / gas burner (or boiler)

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

Y4: outdoor fan circuit 1:electronic fan (standard) or high-speed (optional 2-speed fan)

Connector J6

Connection of the BMS communication card

3 - CONNECTIONS

Connector J7

Connection of the VecticGD graphic terminal

Connector J8

Connection of the pLAN network

Connector J10

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

Connector J11

Electronic expansion valve circuit 1

Connector J12 (Digital outputs)

On/off control of the unit components:

NO1: compressor 1 of circuit 1

NO2: cycle reversing valve circuit 1

NO3: low-speed outdoor fan circuit 1 (optional 2-speed fan)

Connector J13 (Digital outputs)

On/off control of the unit components:

NO4: indoor fan

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

NO6: 2nd stage of electrical heater

Connector J14 (Digital outputs)

On/off control of the unit components:

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

Connector J15 (Digital outputs)

On/off control of the unit components:

NO8: compressor 1 of circuit 2 (units with 2 circuits)

NO9: cycle reversing valve circuit 2 (units with 2 circuits)

NO10: low-speed outdoor fan circuit 2 (optional 2-speed fan)

NO11: compressor 2 of circuit 1

NO12: compressor 2 of circuit 2 (units with 2 circuits)

Connector J16 (Digital inputs)

Safety devices and failure indication:

DI8: remote cooling / heating

DI9: high pressure pressostat circuit 2 (units with 2 circuits)

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

Connector J17

Electronic expansion valve circuit 2 (units with 2 circuits)

Connector J18 (Analog inputs)

Temperature, pressure and humidity reading sensors:

B8: suction temperature probe circuit 1

B9: suction temperature probe circuit 2

B10: air quality probe (optionall)

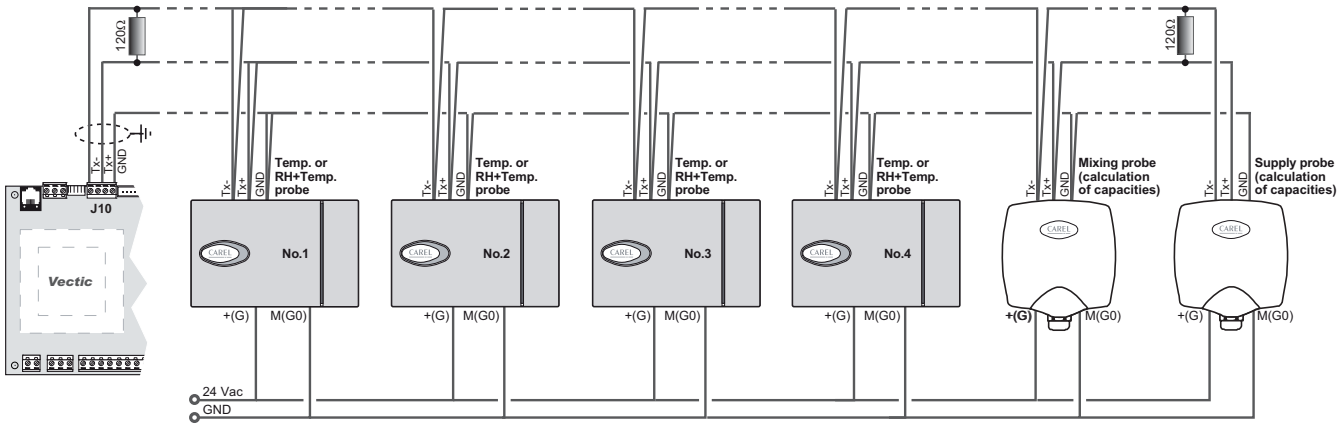
B11: low pressure transducer circuit 2

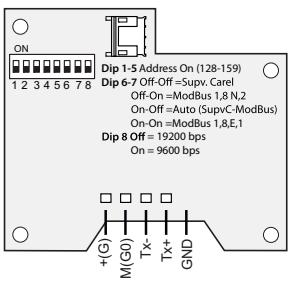
B12: high pressure transducer circuit 2

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

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

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





RS485 probes configuration:

Ambient probe No.1:
Address: 128
Modbus 1, 8, N, 2
9600 bps

Ambient probe No.2:
Address: 129
Modbus 1, 8, N, 2
9600 bps

Ambient probe No.3:
Address: 130
Modbus 1, 8, N, 2
9600 bps

Ambient probe No.4:
Address: 131
Modbus 1, 8, N, 2
9600 bps

Mixing enthalpic probe:
Address: 132
Modbus 1, 8, N, 2
9600 bps

Supply enthalpic probe:
Address: 133
Modbus 1, 8, N, 2
9600 bps

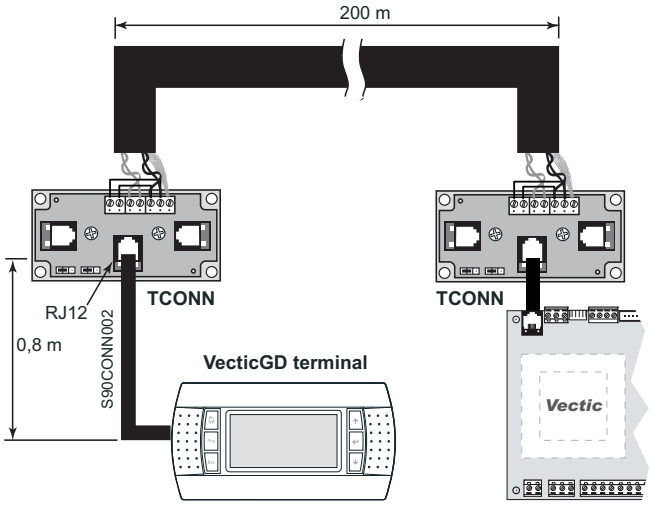
Important: It is recommended to insert an electrical resistance of 120Ω, between connectors TX+ and TX- of the µPC MEDIUM output (connector J10) and on the final component of the RS485 network, to avoid potential problems of communication.

3.3. Connection of terminals to the control board

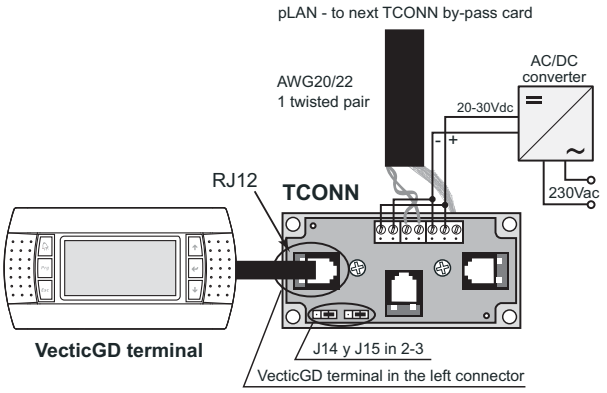
Connection of the VecticGD terminal (standard)

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

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



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



Configuration:

To ensure communication between the VecticGD terminal and the control board, the terminal must be configured with address 16.

In the event of a terminal supplied separately, this is not sent addressed and the following procedure must be carried out:

1) Simultaneously press the [↑] + [↓] + [↵] keys.
2) On the screen accessed, set address 16 in:
   `Display address setting.`

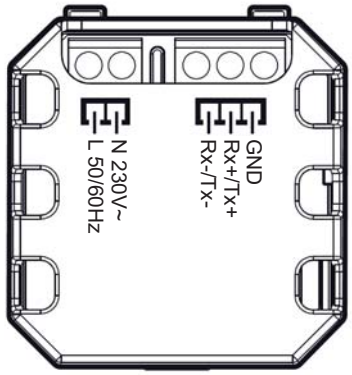
Note: If the terminal is going to be integrated into the pLAN, refer to the "Vectic control brochure", which explains the configuration of the terminals in the network.

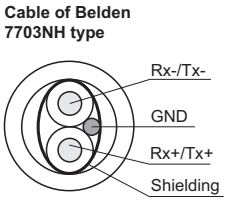
Connection of the TCO terminal (optional)

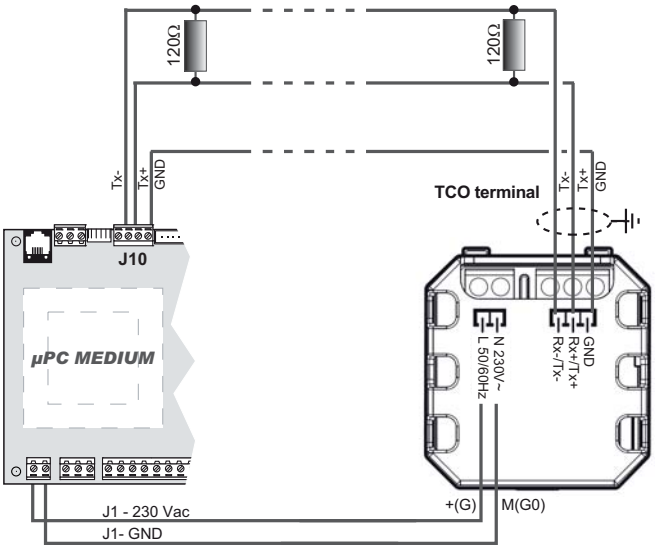
The terminal can be installed on the RS485 Filed-bus at a maximum distance of 100 metres from the control board.

The connection requires the following:

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







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

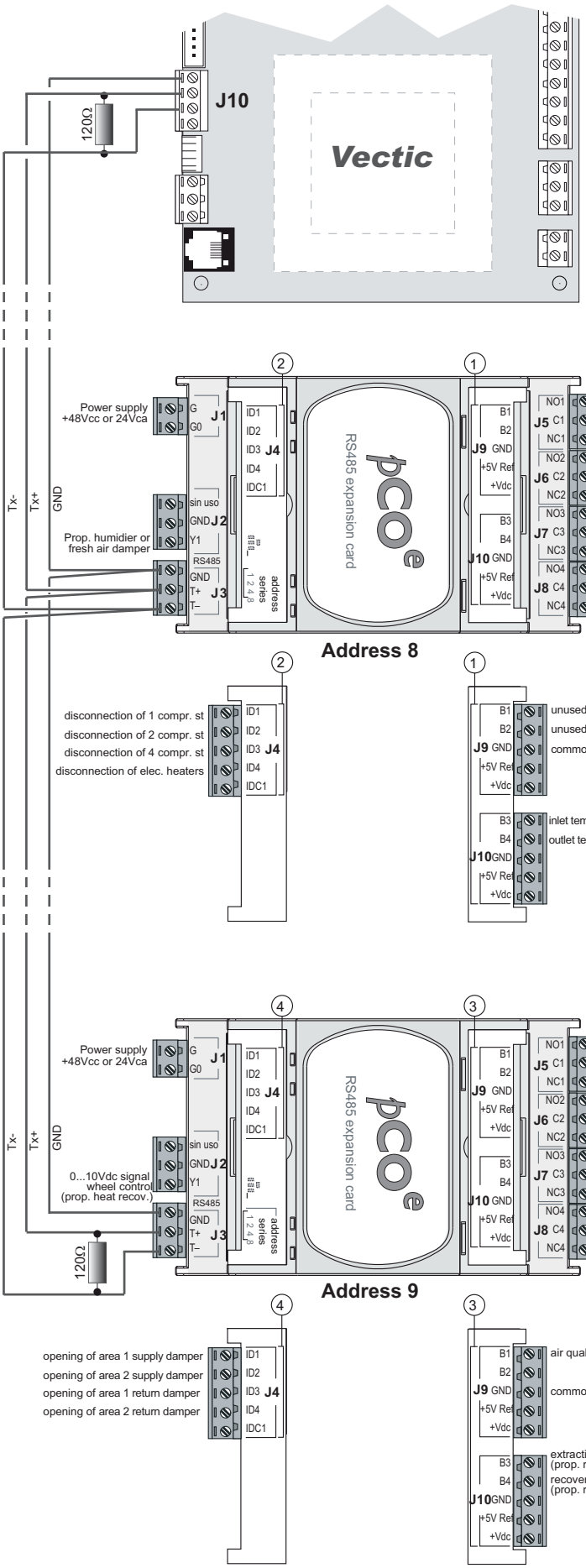
Configuration:

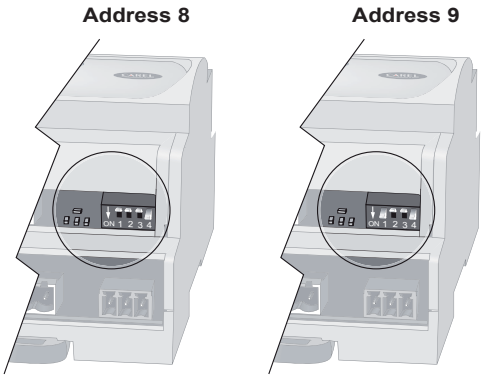
To ensure communication between the TCO terminal and the control board, the terminal must be configured with address 10 and speed 9600 bps.

The terminal is sent addressed, and on the power up, the screen should display the firmware version "1.1" on the power up and, then, the "`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.

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





pCOe card with address 8

Analog inputs

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

Digital inputs

DI1: 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 (optionals)
DI2: disconnection of 2 compressor stages
DI3: disconnection of 4 compressor stages
DI4: disconnection of electrical heaters

Digital outputs

NO1: electical heating for the piping layout of the water circuit with GREAT COLD or configurable output (humidifier, HWC pump, alarm signal,...)
NO2: compressor with supplementary crankcase heater and/or 1st stage of elec. heater in the electric panel
NO3: electrical heater for protection of outdoor damper
NO4: 1st stage of elec. heater in the electric panel or configurable output (humidifier, HWC pump, alarm signal,...)

Analog output

Y1: proportional humidifier or exhaust damper (optionals)

pCOe card with address 9

Analog inputs

B1: 4-20mA air quality probe for the area 2
B2: unused
B3: exhaust T probe (prop. rotary heat exchanger)
B4: recovery T probe (prop. rotary heat exchanger)

Digital inputs

DI1: opening of the supply damper of the area 1 / opening of the supply damper (external to the unit)
DI2: opening of the supply damper of the area 2
DI3: opening of the return damper of the area 1 opening of the return damper (external to the unit)
DI4: opening of the return damper of the area 2

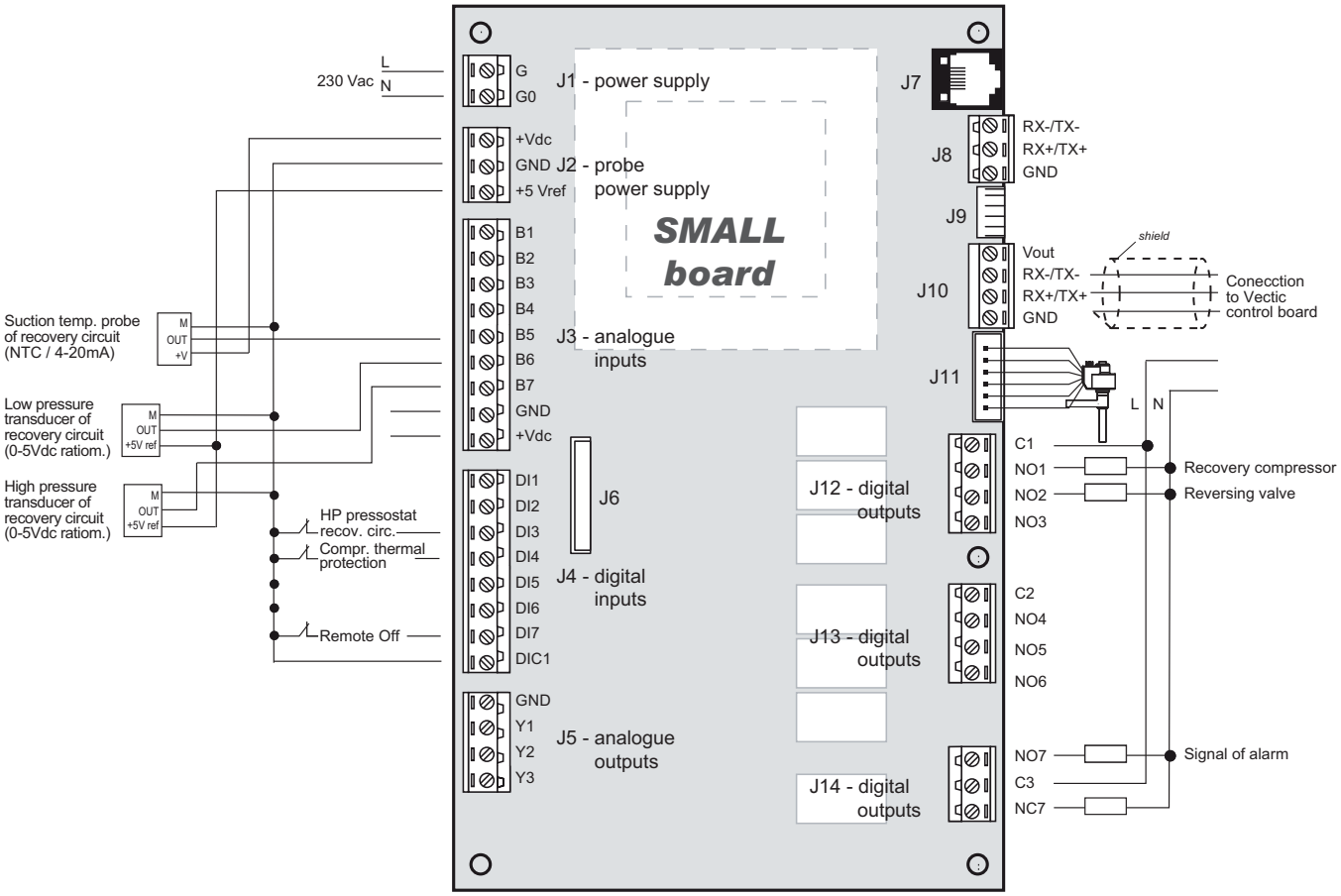
Digital outputs

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

Analog output

Y1: 0...10Vdc output for wheel control (proportional rotary heat exchanger)

3.5. Connection of the SMALL board to control the recovery circuit (optional)



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

Connector J1

Unit power supply

Connector J2

Sensors power supply

Connector J3 (Analog inputs)

Temperature and pressure reading sensors:

B5: suction temperature probe of the recovery circuit

B6: low pressure transducer of the recovery circuit

B7: high pressure transducer of the recovery circuit

Connector J4 (Digital inputs)

Safety devices and failure indication:

DI3: high pressure pressostat of the recovery circuit

DI4: compressor thermal protection of the recovery circuit

DI7: remote off

Connector J10

RS485 Fieldbus connection with the Vectic control board.

Board address = 4

Connector J11

Cycle reversing valve of the recovery circuit

Connector J12 (Digital outputs)

On/off control of the unit components:

NO1: recovery compressor

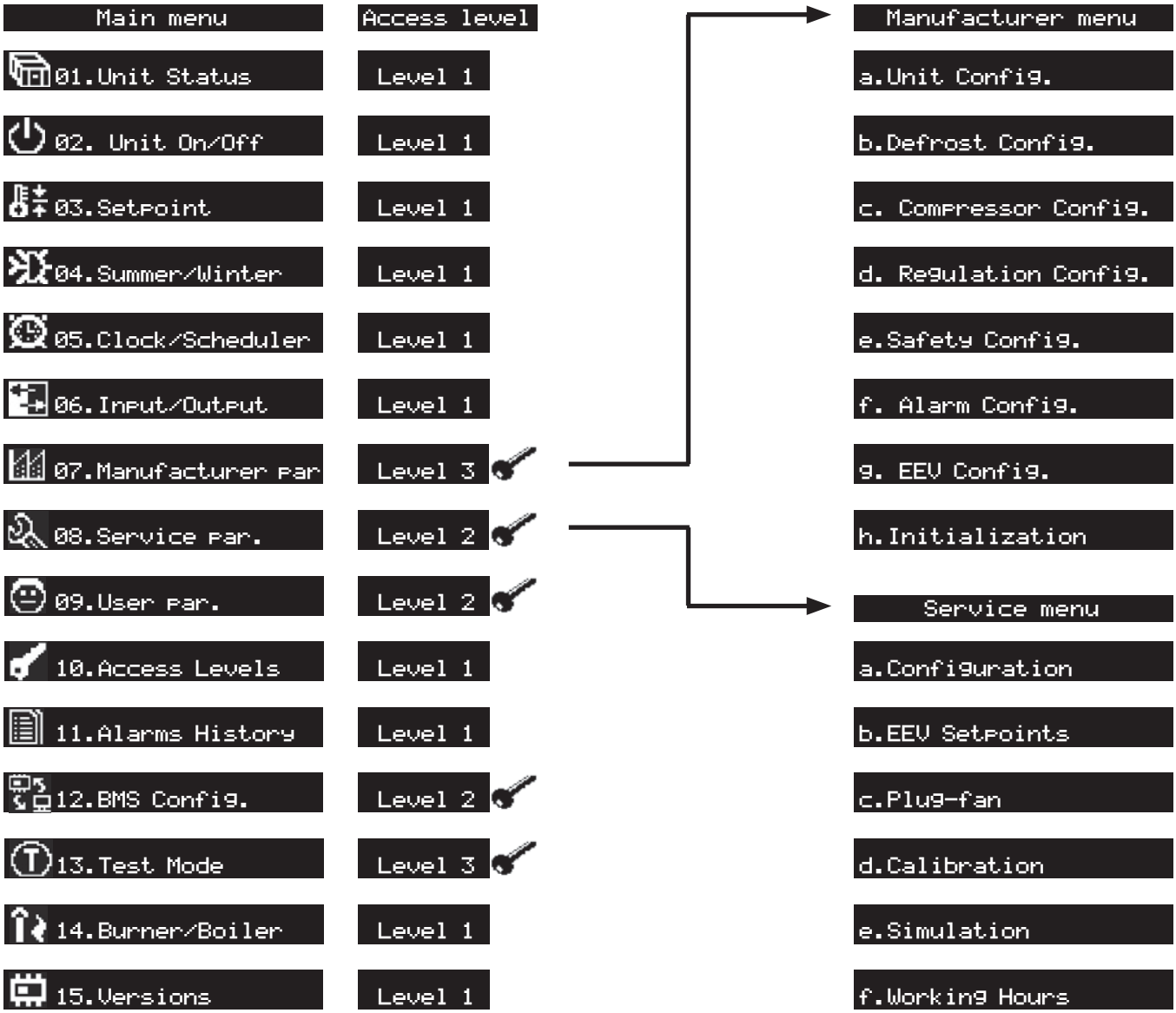
NO2: cycle reversing valve of the recovery circuit

Connector J14 (Digital outputs)

On/off control of the unit components:

NO7: signal of alarm

4 - VECTICGD TERMINAL MENU STRUCTURE



4.1. 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).

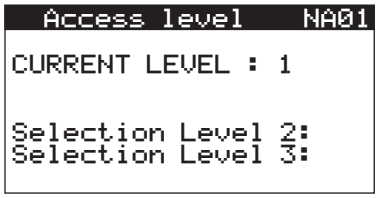
Level 3 password allows access to all level 2 screens.

Change in the level of access

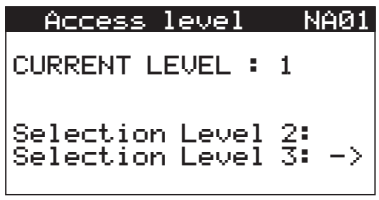
From the initial screen of the terminal, by pressing the Prg key, the **MAIN MENU** is acceded.

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:



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



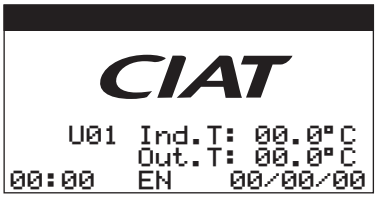
The screen to enter the password is visualised. If this password is needed, please consult.

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

5 - INFORMATION ABOUT THE UNIT STATUS

Initial screen

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



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

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

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

00:00: Time

00/00/00: Date

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

The language of the screens can be selected by pressing the keys + at the same time for a few seconds.

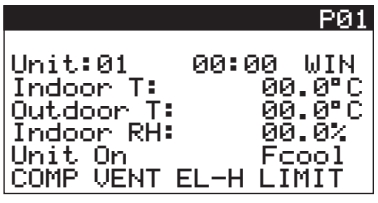
Unit status screens

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

They can be accessed in two ways:

- By pressing the key from the initial screen.
- By pressing the 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.

The first screen of this group collects the following information:



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

00:00: Indicates the time.

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

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

Outdoor T: This indicates the outdoor air temperature.

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

Unit: This indicates the OFF/ON status:

On Turned on.

Off Turned off.

Remote Off If enabled for a remote shutdown.

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

Machine status: Available options status:

Fcool Active free-cooling.

Comp Active compressors in summer in addition to free-cooling.

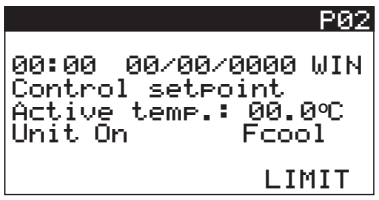
Deum Dehumidification.

Gas Gas burner/boiler operating above the minimum.

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

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

On the second screen of the group is shown:



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

WIN / SUM / AL: Operating mode.

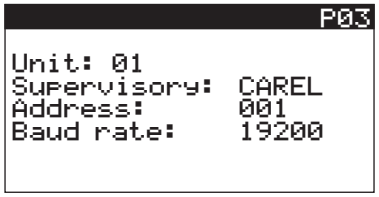
Active temp.: Setpoint temperature.

Unit: This indicates the OFF/ON status.

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

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

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



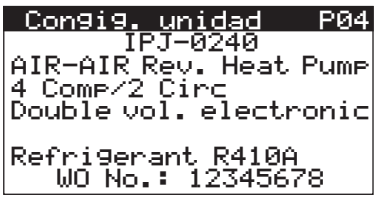
Unit: Unit No. in the pLAN network.

Supervisory: Type of protocol.

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

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

The last screen reports on the configuration of the unit.



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

6 - STARTING / STOPPING THE UNIT

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

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

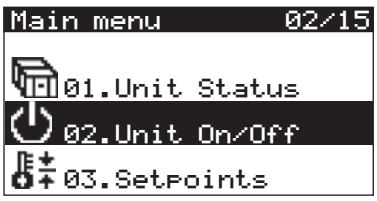
  This procedure is always valid. If the unit is stopped from the terminal, it cannot be started using any of the other procedures.

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

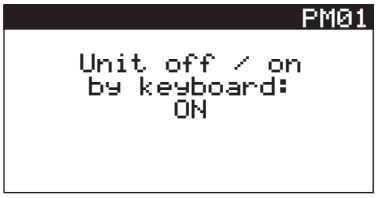
  The ON / OFF function can be carried out:

  * **On the VecticGD terminal:**

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



    Press the ↵ key, the following screen is reached:



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

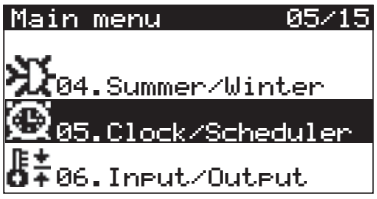
  * **On the TCO terminal (optional):**

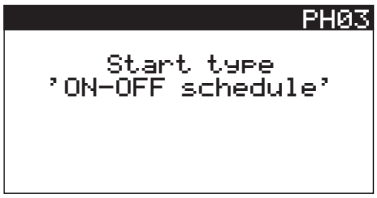
    By pressing the key ⏻.

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

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

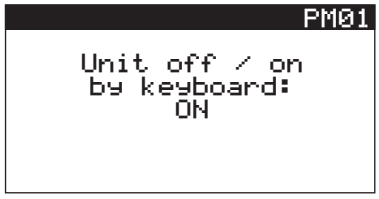
  From the MAIN MENU, in the group of screens **05. Clock/ Scheduler**, the unit can be stopped outside of the schedule.





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

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



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

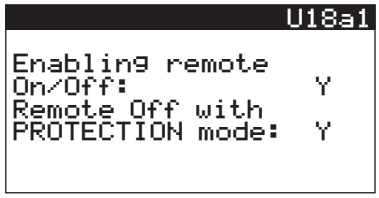
- **By digital input (remote On/Off):**

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

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

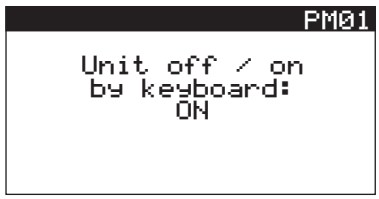
  Note: To activate the remote off/on the bridge made in this input must be eliminated (see wiring diagram)

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



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

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



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

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

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

7 - 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.).

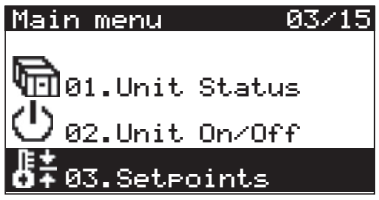
To do so, the control compares the temperature reading of the ambient air probe (or the return probe) with the setpoint value.

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:

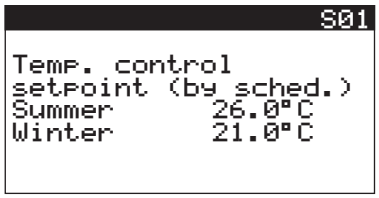
- **On the VecticGD terminal:**

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

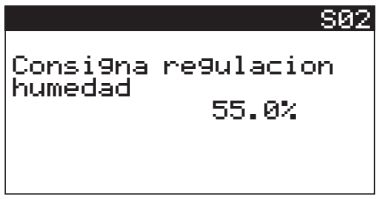


On the first screen of this group, the setpoints of temperature can be selected.

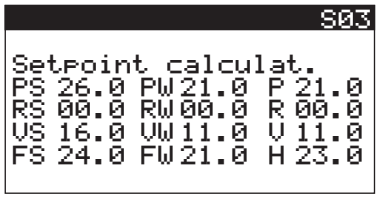
Note: if the indication “by schedule” appears on the screen, this means that the setpoints have been set in the schedule programming.



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



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



In which:

PS In COOLING mode (summer): Setpoint + Dead Zone / 2

PW In HEATING mode (winter): Setpoint + Dead Zone / 2

P Current selection of the setpoint

RS Setpoint of the electrical heaters in COOLING mode

RW Setpoint of the electrical heaters in HEATING mode

R Current selection of the setpoint for the electrical heaters

VS Setpoint of the auxiliary hot water coil in COOLING mode

VW Setpoint of the auxiliary hot water coil in HEATING mode

V Current selection of the setpoint for the auxiliary coil

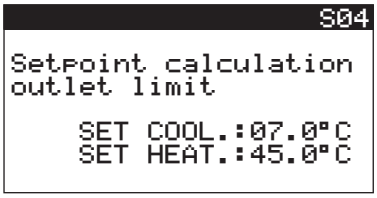
FV Setpoint of free-cooling in COOLING mode

FI Setpoint of free-cooling in HEATING mode

F Current selection of the setpoint for the free-cooling

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

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



- **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**.

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

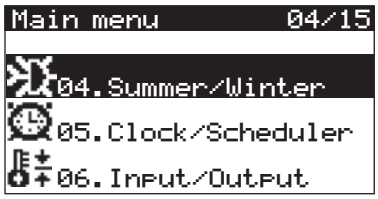
The selection of this probe can only be done from a screen of the Group **07. Manufacturer Par.** (protected by level 3 password).

8 - SELECTION OF THE OPERATING MODE

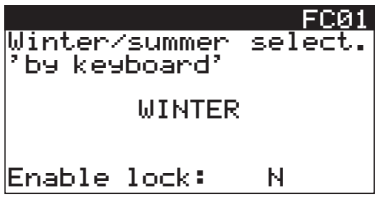
There are different procedures for the selection of the operating mode:

- **On the VecticGD terminal:**

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

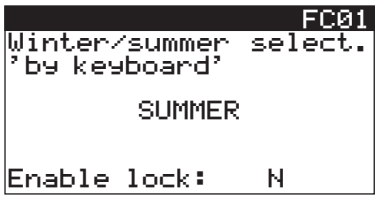


Press the ↵ key, the following screen is reached:



This screen allows to select 3 options:

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



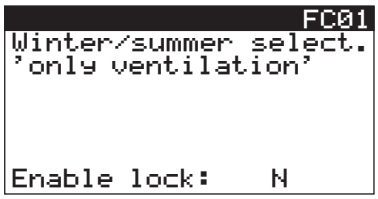
Note: When the parameter «Enable lock» is activated (Y), this screen is for information purposes only, so that the final user cannot change it. In this case, it has been blocked from a screen of the Group **08. Service Par.** (protected by level 2 password).

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

Prg ↑ : HEATING mode

Prg ↓ : COOLING mode

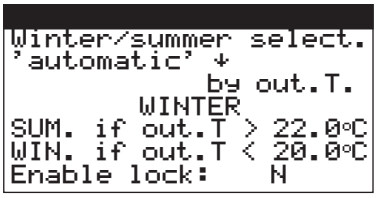
- **Only ventilation:** on this screen, it is possible to select the VENTILATION mode. It allows operation for only indoor fans and free-cooling/free-heating.



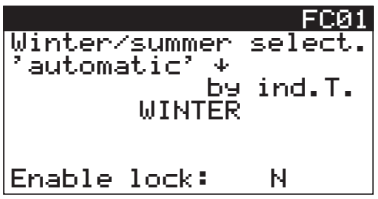
- **Automatic:** on this screen, it is possible to select two options for automatic mode:

  * *By outdoor temperature (by default):* The unit changes from operation in COOLING mode to HEATING mode or vice versa depending on the temperature measured by the outdoor air probe.

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



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



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

By pressing the ☀/❄ key, the operating mode of the unit can be selected. With each press, the icon corresponding to the operating mode selected will be lit up.

The availables modes are: HEATING ☀ - COOLING ❄ - AUTO Auto y VENTILATION (without icon).

- **By digital input (remote Cooling/Heating):**

The selection of the HEATING/COOLING operating mode is performed via a switch connected on digital input DI8 of connector J16:

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

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

8 - SELECTION OF THE OPERATING MODE

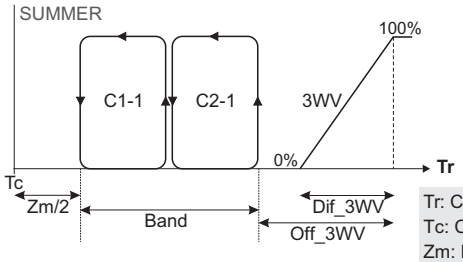
8.1. COOLING operating mode (summer)

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.

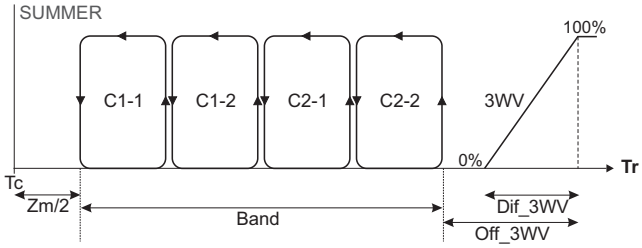
The input command of the various stages is the one featured on the chart.

• 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.

8.2. HEATING operating mode (winter)

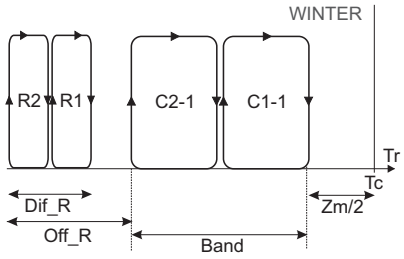
The control will compare the temperature reading of the ambient (or return) air probe with the value set by the HEATING setpoint and with the value of the control band.

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.

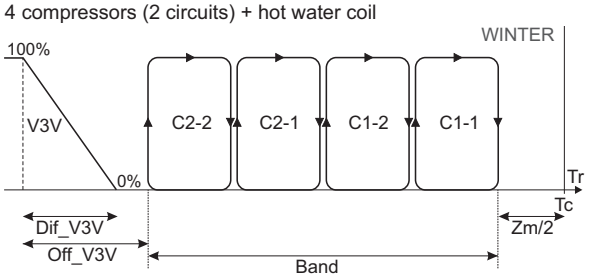
An example of input command of the various stages is the one featured on the chart.

• 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 stage without activating the compressor(s) for cases of compressor breakdown or blocking due to a low outdoor temperature.

Forced disconnection of stages

It is possible to disconnect compressor or electrical heater stages, by using parameters or mechanically through the digital inputs of the expansión card pCOe with address 8. This is useful for reducing electric consumption:

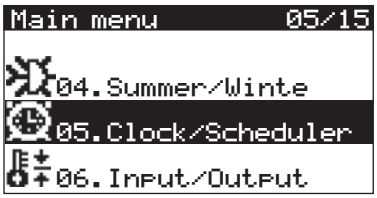
- In time bands when the electric price rate is high.
- With very low outdoor temperatures, in those cases where the electricity consumption or the section of the electrical outlet are limited.

9 - SCHEDULE PROGRAMMING

9.1. Schedule programming: VecticGD terminal

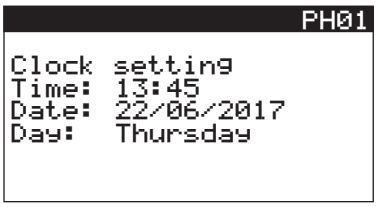
The VecticGD terminal incorporates a time scheduler with possibility of 3 different programs. It allows to choose for each day of the week one of these 3 programs.

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

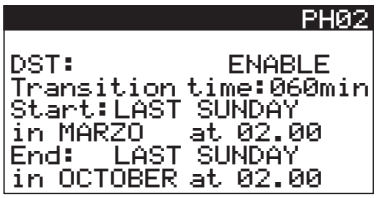


Date and time

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



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



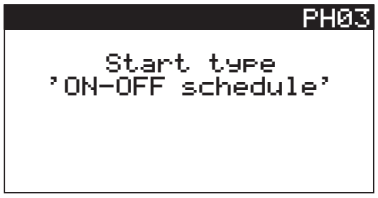
In this way, , from LAST SUNDAY IN MARCH at 2.00 hours until LAST SUNDAY IN OCTOBER a at 3.00 hours, to the normal schedule (winter schedule) it is necessary to add 60 minutes, thus obtaining the summer schedule.

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

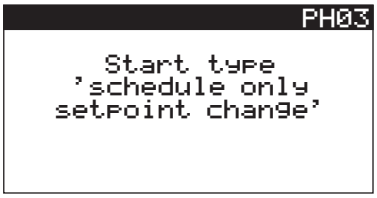
Start type

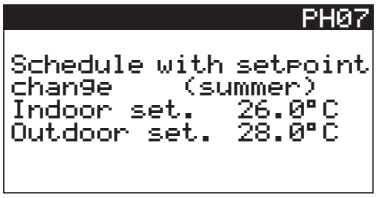
The start type and the condition of the unit outside of the schedule program will be selected on the screen PH03:

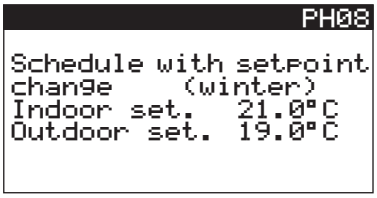
- **ON/OFF schedule:** within the program the unit will operate with the setpoint established on COOLING mode (summer) and HEATING mode (winter), whilst outside the schedule it will be stopped.



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



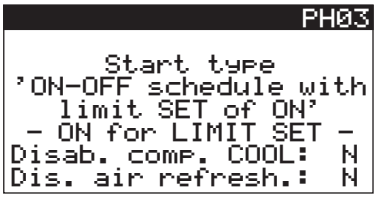




- **ON/OFF schedule with limit SET of ON:** outside the schedule program the unit is off, however a start safety device is established when the temperature goes above or below the limit setpoints introduced in PH09, PH10 and PH11.

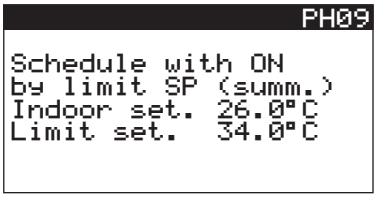
  With this type of start-up two new parameters are displayed on the screen:

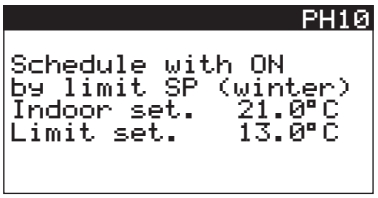
  * Disab.comp.COOL: when the unit is working with the safety limit setpoint in COOLING mode, the compressors can be disabled in order that if the conditions of the outdoor air are favourable, the unit carries out free-cooling.
  * Dis. air refresh.: when the unit is working with the safety limit setpoint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



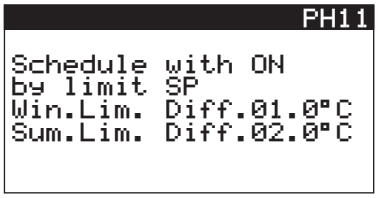
The regulation setpoint and safety limit setpoint are established on the screen PH09 (summer) and on the screen PH10 (winter):

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





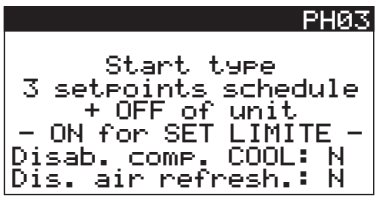
On the screen PH11 the differentials are established for the limit set:



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

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

  * `Disab.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.



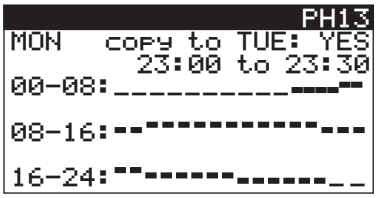
On the screen PH13 there will be assigned, for every day of the week, every 30 minutes, which will be the select setpoint.

The symbol that represents each setpoint is: _ OFF, ▬ PROTECTION, ▬ ECONOMY, ▬ COMFORT.

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

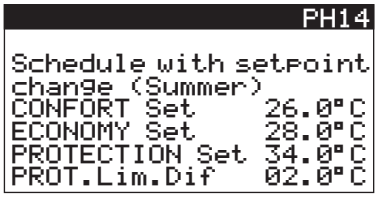
When it is created it is possible to copy in any other day of the week.

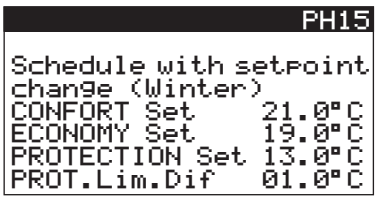
For example: it copies to Tuesday: YES (the Tuesday schedule will be the same that on Monday).



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

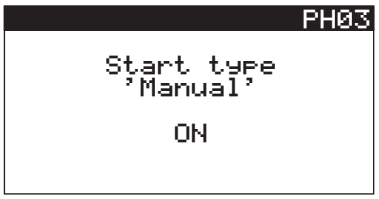
* `Set.CONFORT:` standard setpoint of the unit.
* `Set.ECONOMY:` setpoint more removed from the comfort point, used at times with low occupancy.
* `Set.PROTECTION:` setpoint of building protection, usually used at night, when the building is empty.
* `Dif.lim.PROT:` differential for the PROTECTION setpoint.

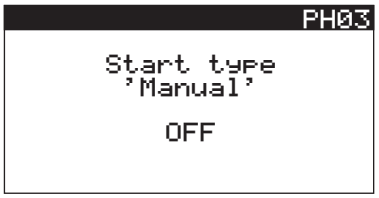




- **Manual:** by selecting this type of start the unit will be on or off without taking into account the schedule programming.

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

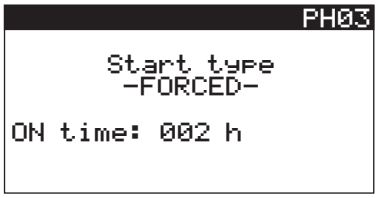




- **Forced:** this permits an occasional start-up or shutdown of the unit without modifying the set schedule program. When this period ends, the unit goes back to the start type that was programmed.

  To activate it press the key 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

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

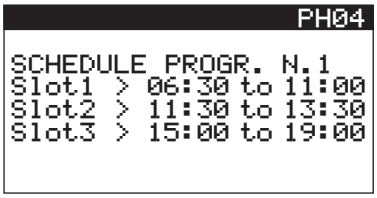
Outside of the slots, the unit will work with a different setpoint from the previous one or it will switch off, according to the start type selected on the screen PH03.

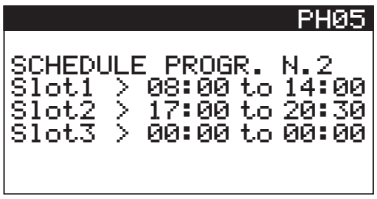
For example:

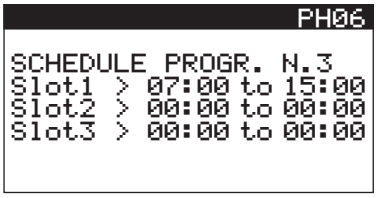
Program 1: Slot 1: morning from 06:30h to 11:00h
Slot 2: morning from 11:30h to 13:30h
Slot 3: evening from 17:00h to 19:00h

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

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







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.

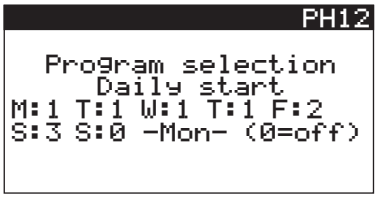
The available options are:

1: schedule program No.1

2: schedule program No.2

3: schedule program No.3

0: no programming

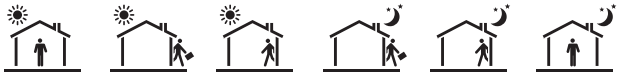


9.2. Schedule programming: TCO terminal

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

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

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

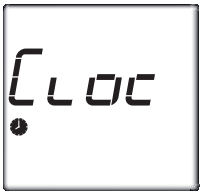


A change in the setpoint temperature or the disconnection of the unit can be scheduled in these time slots.

Clock setting of the terminal

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

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



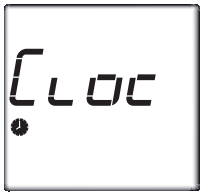
The current time appears intermittently and can be modified with the help of the keys. The new time can be validated with the key.

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

There are two ways of returning to the main display: by repeatedly pressing the 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).



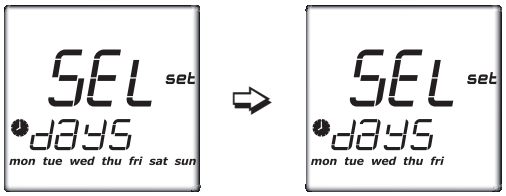
Next, by pressing the key, the terminal changes to the initial schedule program screen (TIME BAND).

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 .

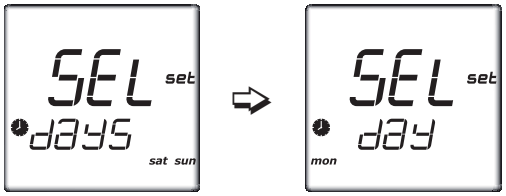
9 - SCHEDULE PROGRAMMING

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

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



Complete week ***Working days***

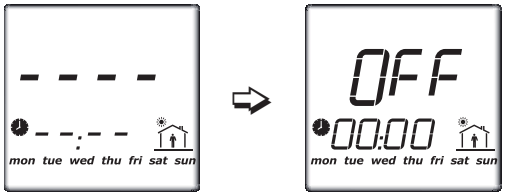


Weekend ***Day to day***

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

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

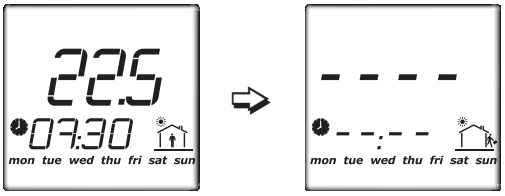
The first time slot will flicker on this display. If it desired to schedule this slot, the ◁┘ key will be pressed and automatically stop flickering, going on to appear as follows:



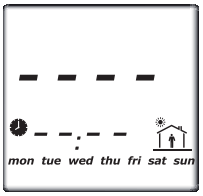
Next, with the ◁┘ key, the activation time of the program for the selected slot will be set, and then, whether the unit will remain stopped (OFF) or at the setpoint value.

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.

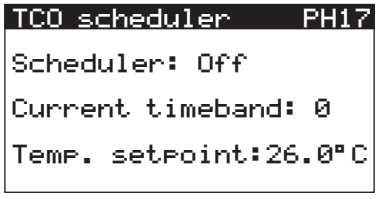
The symbol 🕐 and the active scheduling slot will always appear on the main display, both on stopped units and units in operation.

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.

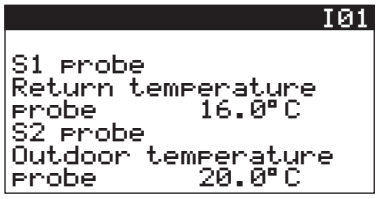


10 - DISPLAY OF THE INPUTS / OUTPUTS STATUS

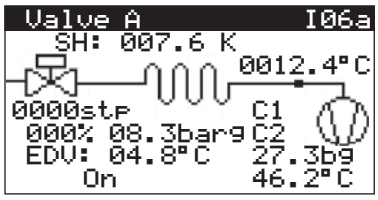
All variables which are controlled by the system are displayed in this group of screens, including the status of the digital inputs, the digital outputs and the analogue outputs, both the main board and the installed expansion cards.

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

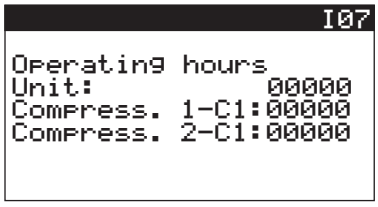
- Values measured by the sensors: screens I01, I01a, I01b, I02, I03, I03a, I03b, I03c, I04a, I04b, I05a, I05c, I05e.



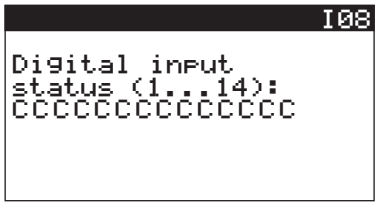
- Electronic expansion valve(s) reading: screens I06a, I06b, I06c1, I06e, I06f, I06g, I06h.



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

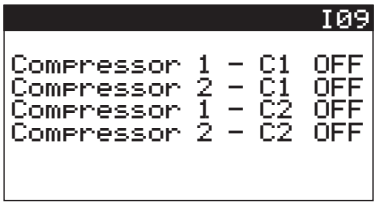


- Digital inputs status: screen I08 (main board), screen I08b (expansion card addr.8), screen I08c (expansion card addr.9).

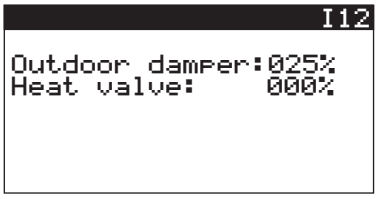


C: Closed contact
O: Open contact

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

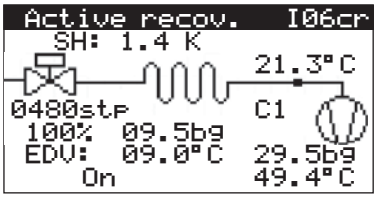


- Analogue outputs status: screens I12, I12a (main board), screen I12b (expansion card addr.8), screen I12c (expansion card addr.9).

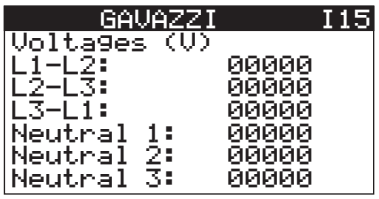


000%: opening percentage

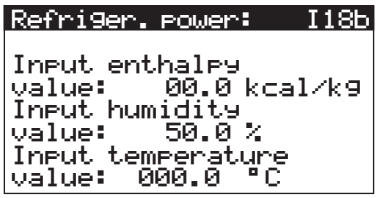
- Cooling recovery circuit reading (optional): screens I06cr, I06fr, I06er, I05ar, I08cr, I10cr.



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

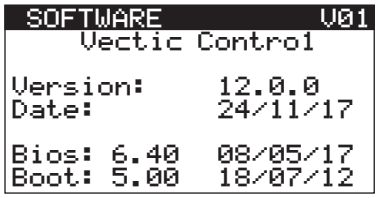


- Calculation of the cooling and heating capacities (optional): screens I18b, I18c, I18d, I18e.

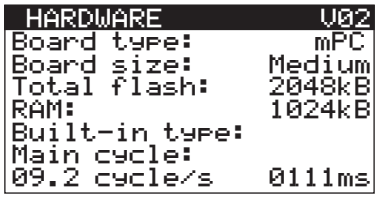


11 - VERSIONS OF SOFTWARE AND HARDWARE

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



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



12.1. Defrosting function

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

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

Defrosting is carried out in the following cases:

- **Defrosting by minimum pressure**

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

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

- **Defrosting by difference with the outdoor temperature**

  The defrosting function is activated if the difference between the outdoor temperature and the evaporation temperature exceeds 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.
  - 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.

Defrosting operation

- **Starting defrosting**

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

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

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

  - The indoor fan will continue to operate.
  - the outdoor fans will be connected when a set pressure of 35 bar is exceeded, if the outdoor temperature is greater than -5ºC. They will be disconnected if the pressure drops below 33 bar, 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.
  - The optional backup device incorporate by the unit can be enabled: electrical heaters, hot water coil, gas burner or boiler.
  - The outdoor air damper (optional) will remain closed.
  - The rotary heat exchanger (optional) will operate. In this case, the outdoor damper will remain open.

- **Ending defrosting**

  The following conditions must be met in order to end:

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

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

12.2. 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.

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

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

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

12.3. 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.

12.4. 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.

12.5. Protections against low temperature (optional)

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

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

12.6. Clogged filter detector (optional)

A clogged filter pressostat can be connected on the digital input DI6 (connector J4). This protection can be configured for only signalling on the terminal (by default) or to stop the unit.

12.7. Signalling of remote alarms (optional)

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

12 - SAFETY FUNCTIONS

12.8. Refrigerant leak detector (optional)

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

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

The counter of the number of operating hours and days for the refrigerant gas detector is accessed in the Group of screens **09. Service Par.** (protected by level 2 password).

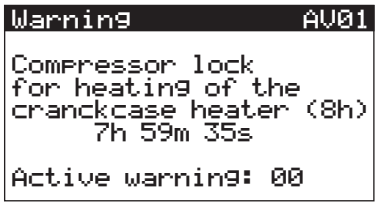
This information is very important to realize the maintenance tasks on the leakage detector:

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

12.9. Compressor lock

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

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



From a screen of the Group **09. Service Par.** (protected by level 2 password) allows to reset this lock of compressors, but this shall be recorded in the data register of the control.

13 - ALARMS

13.1. Alarm display

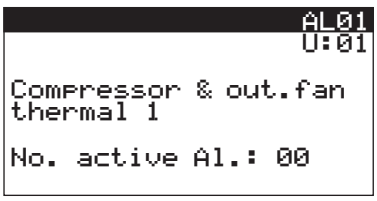
On the VecticGD terminal:

There is/are active alarm(s) if the key is illuminated red.

By pressing the key once, the description of the first alarm will be shown.

By using the keys, the other alarms stored in the memory can be consulted. For example:

For example:



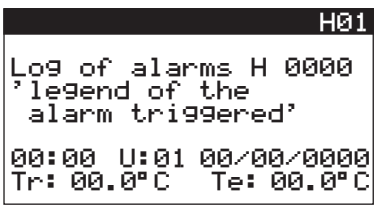
By pressing this key for a second time, the alarm(s) will be reset.

If no alarm is active, the message “No alarm active” appears.

Alarm History

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

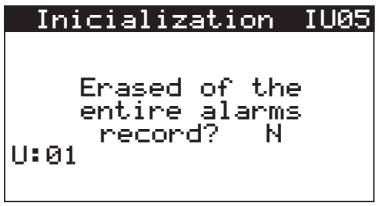
Each screen shows the description of the alarm, together with its date and time, the unit in which the VecticGD terminal is connected (U:01), as well as the ambient (or return) temperature (Tr) and the outdoor temperature existing at the time of the alarm.



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

The failures of electrical power supply also will remain registered.

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



On the TCO terminal (optional):

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

In addition to view in the ambient (or return) air temperature on the main display, it is possible to view other values through the set that is activated by pressing the key. One of those values may be an alarm code. If there is more than one alarm is indicated the code of the most important alarm, And below the symbol AL.

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

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

13.2. Alarm list

Controlled alarms	Shutdown unit	Shutdown affected circ.	Type of reset	Timing	Actuation	VecticGD	TCO	Addr.
Thermal protection of compressors and outdoor fan(s) of circuit 1 or recovery circuit	No	Yes	Auto (*)	No	Shutdown of circuit 1	AL01	AL1	27
Thermal protection of compressors and outdoor fan(s) of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	AL02	AL2	28
High pressure of circuit 1 or recovery circuit	No	Yes	Auto (*)	No	Shutdown of circuit 1	AL05	AL5	29
High pressure of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	AL06	AL6	30
Maintenance of the recovery compressor	No	No	Manual	No	Only indication	AL08	AL8	119
Anti-freeze alarm of hot water coil	Yes (in COOLING mode)	Yes (in COOLING mode)	Manual	Yes (2 s)	HEATING mode: this closes outdoor air damper and opens hot water coil valve COOLING mode: this stops compressors and closes outdoor damper	AL09	AL9	31
High indoor temperature	No	No	Manual	Yes (progr.)	Only indication	AL10	AL10	34
Low indoor temperature	No	No	Manual	Yes (progr.)	Only indication	AL11	AL11	35
Low pressure of circuit 1	No	Yes	Auto (*)	No	Shutdown of circuit 1	AL12	AL12	38
Low pressure of circuit 2	No	Yes	Auto (*)	No	Shutdown of circuit 2	AL13	AL13	39
Low pressure due to continuous defrosting by min. pressure of circ.1	No	Yes	Auto (*)	No	Shutdown of circuit 1	AL12b	AL1202	225
Low pressure due to continuous defrosting by min. pressure of circ.2	No	Yes	Auto (*)	No	Shutdown of circuit 2	AL12c	AL1203	226
Maintenance of compressor 1 - circuit 1	No	No	Manual	No	Only indication	AL16	AL16	36
Maintenance of compressor 1 - circuit 2	No	No	Manual	No	Only indication	AL17	AL17	37
Maintenance of compressor 2 - circuit 1	No	No	Manual	No	Only indication	AL18	AL18	122
Maintenance of compressor 2 - circuit 2	No	No	Manual	No	Only indication	AL19	AL19	123
Thermal protection of indoor fan	Yes	Yes	Manual	0 s	Serious alarm, unit shutdown	AL20	AL20	40
Failure of high pressure transducer of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	AL21	AL21	41
Failure of high pressure transducer of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	AL22	AL22	42
Failure of low pressure transducer of circuit 1	No	Yes	Auto	No	Shutdown of circuit 1	AL21b	AL2102	212
Failure of low pressure transducer of circuit 2	No	Yes	Auto	No	Shutdown of circuit 2	AL21c	AL2103	213
Failure of suction temperature probe of circuit 1 or recovery circuit	No	No	Auto	No	Only indication	AL21d	AL2104	
Failure of suction temperature probe of circuit 2	No	No	Auto	No	Only indication	AL22d	AL2204	
Clogged filters	No	No	Manual	Yes (5 s)	Only indication or unit shutdown (configurable by parameter)	AL23	AL23	43
Thermistor of electrical heaters	No	No	Auto (*)	No	Shutdown of heater	AL24	AL24	48
Gas burner or boiler	No	No	Manual	No	Only indication (safety into the burner/boiler)	AL24	AL24	48
Failure Eprom memory	No	No	Manual	No	Serious alarm, but only indication	AL26	AL26	32
Clock	No	No	Manual	No	Only indication	AL27	AL27	33
Unit maintenance	No	No	Manual	No	Only indication	AL28	AL28	108
Return temperature probe	Yes	Yes	Manual	No	Serious alarm, unit shutdown	AL29	AL29	109
Failure of ambient humidity probe No.1	No	No	Manual	No	Only indication	AL30a	AL3001	165
RS485 probe No.1 without communication	No	No	Auto	No	Only indication	AL30b	AL3002	163
Failure of ambient temperature probe No.1	No	No	Manual	No	Only indication	AL30c	AL3003	164
Failure of ambient humidity probe No.2	No	No	Manual	No	Only indication	AL30d	AL3004	177
RS485 probe No.2 without communication	No	No	Auto	No	Only indication	AL30e	AL3005	175
Failure of ambient temperature probe No.2	No	No	Manual	No	Only indication	AL30f	AL3006	176
Failure of ambient humidity probe No.3	No	No	Manual	No	Only indication	AL30g	AL3007	
RS485 probe No.3 without communication	No	No	Auto	No	Only indication	AL30h	AL3008	
Failure of ambient temperature probe No.3	No	No	Manual	No	Only indication	AL30i	AL3009	
Failure of ambient humidity probe No.4	No	No	Manual	No	Only indication	AL30j	AL3010	
RS485 probe No.4 without communication	No	No	Auto	No	Only indication	AL30k	AL3011	

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

13 - ALARMS

Controlled alarms	Shutdown unit	Shutdown affected circ.	Type of reset	Timing	Actuation	VecticGD	TCO	Addr.
Failure of ambient temperature probe No.4	No	No	Manual	No	Only indication	AL30l	AL3012	
pLAN network probe: T, RH or CO_2 without communication	No	No	Manual	No	Only indication	AL31	AL31	110
Failure of the outdoor temperature probe	No	No	Manual	No	Only indication	AL32	AL32	111
Failure of the indoor humidity probe	No	No	Manual	No	Only indication	AL33	AL33	112
Failure of the outdoor humidity probe	No	No	Manual	No	Only indication	AL34	AL34	113
Failure of the supply temperature probe	No	No	Manual	No	Only indication	AL35	AL35	114
Failure of the mixing temperature probe or the air quality probe	No	No	Manual	No	Only indication	AL35a	AL3501	130
COOLING setpoint < HEATING setpoint	Yes	Yes	Manual	No	Serious alarm, unit shutdown	AL36	AL36	115
Discharge temperature on compressors of circuit 1 exceeded	No	Yes	Auto	No	Shutdown of circuit 1	AL37	AL37	126
Discharge temperature on compressors of circuit 2 exceeded	No	Yes	Auto	No	Shutdown of circuit 2	AL38	AL38	127
Anti-fire safety device / smoke detection	Yes	Yes	Manual	No	Serious alarm, shut-down of the unit and outdoor damper open / closed (configurable by parameter)	AL39	AL39	136
Supply temperature limit exceeded	No	No	Manual	No	Shutdown of electrical heaters or gas burner/boiler	AL40	AL40	166
pCOe expansion card address 8 without communication	No	No	Auto	No	Only indication	AL45b	AL4502	211
pCOe expansion card address 8 fault alarm	No	No	Auto	No	Only indication	AL45g	AL4507	210
pCOe expansion card address 9 without communication	No	Yes	Auto	No	Unit shutdown and dampers on the previous position to the alarm	AL45c	AL4503	---
pCOe expansion card address 9 fault alarm	No	No	Auto	No	Unit shutdown and dampers on the previous position to the alarm	AL45h	AL4508	---
Energy meter without communication	No	No	Auto	No	Only indication	AL46	AL46	192
Supply plug-fan without communication	No	No	Auto	No	Only indication	AL47	AL47	201
Failure of the pressure sensor for air flow control (supply plug-fan)	No	No	Auto	No	Only indication	AL48	AL48	202
Return plug-fan without communication	No	No	Auto	No	Only indication	AL49	AL49	205
Failure of the pressure sensor for air flow control (return plug-fan)	No	No	Auto	No	Only indication	AL50	AL50	206
Failure of the leak detector sensor	Yes	Yes	Manual	Yes (60 s)	Unit shutdown	AL51a	AL5101	83
Gas leak detected	Yes	Yes	Manual	Yes (60 s)	Unit shutdown	AL51b	AL5102	82
Leak detector without communication	Yes	Yes	Manual	Yes (30 s)	Unit shutdown	AL51c	AL5103	81
TCO terminal without communication	No	No	Auto	No	Only indication	---	AL6301	---
TCO with failure in the internal temperature sensor	No	No	Auto	No	Only indication	---	AL6302	---
Water inlet T probe on the hot water coil (pCOe expansion card address 8)	No	No	Auto	No	Only indication	AL64	AL64	221
Anti-freeze alarm on the hot water coil (pCOe expansion card address 8)	Yes (in COOLING mode)	Yes (in COOLING mode)	Auto	No	The pump is activated and the hot water coil valve open to 100%	AL65	AL65	222
Water outlet T probe on the hot water coil (pCOe expansion card address 8)	Yes (in COOLING mode)	Yes (in COOLING mode)	Manual	No	Serious alarm, the pump is activated and the hot water coil valve open to 100%	AL66	AL66	223
Failure of the ambient air temperature probe (NTC)	No	No	Auto	No	Only indication	AL67	AL67	224
Failure of the recovery temp. probe on the wheel (recovery heat exchanger)	No	No	Auto	No	Shutdown of the rotary heat exchanger	AL69	AL69	
Failure in the supply damper (pCOe expansion card address 9)	Yes	Yes	Auto	Yes (150 s)	Unit shutdown	AL70	AL70	
Failure in the return damper (pCOe expansion card address 9)	Yes	Yes	Auto	Yes (150 s)	Unit shutdown	AL71	AL71	
SMALL board without communication (recovery circuit)	No	No	Auto	No	Only indication	AL99	AL99	
Power cut-off for a period longer than 2 hours	Yes	Yes	Auto	Yes (2 hours)	Blocking of compressors for 8 hours to ensure heating of the crankcase heater	AV01		
Warning whenever the supply fan speed limit (rpm) is exceeded	No	No	Auto	Yes (30 min)	Only indication Note: Unit shutdown by parameter	AV02		
Warning whenever the return fan speed limit (rpm) is exceeded	No	No	Auto	Yes (30 min)	Only indication Note: Unit shutdown by parameter	AV02		

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

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

Parameters of “Unit Status”

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

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Unit Status” (...continuation)

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

Parameters of “Unit On/Off”

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

Parameters of “Setpoint”

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
S01	SET_POINT_TEMP_FRIO	Temperature setpoint in COOLING mode (summer)	26.0	LIM_INF_ TEMP_FRIO	LIM_SUP_ TEMP_FRIO	°C	Analog.	R/W	15
S01	SET_POINT_TEMP_CALOR	Temperature setpoint in HEATING mode (winter)	21.0	LIM_INF_ TEMP_CALOR	LIM_SUP_ TEMP_CALOR	°C	Analog.	R/W	16
S02	SET_POINT_HUM	Indoor humidity setpoint	50.0	LIM_INF_HUM	LIM_SUP_HUM	%rH	Analog.	R/W	18
S02	HAB_SONDA_HUM_INT_ VIRTUAL	Enabling the pLAN indoor humidity probe	0			---	Digital	R	
S03	SET_COMPRESOR_EN_FRIO	Calculation of setpoints: Setpoint in COOLING mode (summer) + Dead Zone / 2	0.0	0.0	0.0	°C	Analog.	R	
S03	SET_COMPRESOR_EN_CALOR	Calculation of setpoints: Setpoint In HEATING mode (winter) + Dead Zone / 2	0.0	0.0	0.0	°C	Analog.	R	
S03	SET_TEMP_COMPRESOR	Current selection of the setpoint	0.0	0.0	0.0	°C	Analog.	R	
S03	SET_RES_EN_FRIO	Calculation of setpoints: Setpoint of the electrical heaters in COOLING mode	0.0	0.0	0.0	°C	Analog.	R	
S03	SET_RES_EN_CALOR	Calculation of setpoints: Setpoint of the electrical heaters in HEATING mode	0.0	0.0	0.0	°C	Analog.	R	
S03	SET_TEMP_RES	Current selection of setpoint for electrical heaters	0.0	0.0	0.0	°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	0.0	°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	0.0	°C	Analog.	R/W	
S03	SET_VLV_CALOR	Current selection of setpoint for the hot water coil	0.0	0.0	0.0	°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”

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Tipo	R/W	Add. BMS
FC01	SEL_FRIO_CALOR	Procedures for the selection of the COOLING/HEATING mode: 0: by keyboard 1: by digital input (remote) 2: auto 3: only ventilation	0	0	3	---	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			---	Digital	R/W	66

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Summer/Winter” (...continuation)

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
FC01	SET_TEMP_EXT_CAMBIO_FRIO	Outdoor temperature setpoint for change to COOLING mode (in AUTO mode)	22.0	99.9	99.9	°C	Analog.	R/W	223
FC01	SET_TEMP_EXT_CAMBIO_CALOR	Outdoor temperature setpoint for change to HEATING mode (in AUTO mode)	20.0	99.9	99.9	°C	Analog.	R/W	222
FC01	PGD1_bloqueado_SEL_FRIO_CALOR	Enabling of the blocking of summer / winter selection in the VecticGD (so that the final user cannot change it)	0	0	1	---	Digital	R/W	240

Parameters of “Clock/Scheduler”

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH01	TIPO_RELOJ	Type of clock (No, Actual, pLAN)	1	0	0	---	Integer	R/W	57
PH01	HORA	Setting the clock: hour	0	0	0	h	Integer	R/W	48
PH01	NEW_HOUR	Setting the clock: new hour	0	0	23	h	Integer	R/W	
PH01	NEW_MINUTE	Setting the clock: new minute	0	0	59	---	Integer	R/W	
PH01	MINUTO	Setting the clock: minute	0	0	0	min	Integer	R/W	47
PH01	NEW_DAY	Setting the clock: new day	0	0	31	---	Integer	R/W	
PH01	DIA	Setting the clock: day	0	0	0	day	Integer	R/W	49
PH01	NEW_MONTH	Setting the clock: new month	0	0	12	---	Integer	R/W	
PH01	MES	Setting the clock: month	0	0	0	month	Integer	R/W	50
PH01	ANO	Setting the clock: year	0	0	0	year	Integer	R/W	51
PH01	NEW_YEAR	Setting the clock: new year	0	0	99	---	Integer	R/W	
PH01	DIA_SEMANA	Day of the week	0	0	0	day	Integer	R/W	52
PH02	MOD_DST_CIAT_1.En_DST	Activation of the schedule programming	1	0	1	---	Digital	R/W	
PH02	MOD_DST_CIAT_1.DST_Minute	Transition time: it is necessary to add 60 minutes, thus obtaining the summer schedule (hourly changes in the European Union)	0	0	240	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.Srt_DST_MonthW	Starting date for the implementation of change: day of the month	0	0	4	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.Srt_DST_Week	Starting date for the implementation of change: week	0	0	7	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.Srt_DST_Month	Starting date for the implementation of change: month	0	0	12	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.Srt_DST_Hour	Starting date for the implementation of change: hour	0	0	23	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.End_DST_MonthW	Completion date for the implementation of change: day of the month	0	0	4	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.End_DST_Week	Completion date for the implementation of change: week	0	1	7	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.End_DST_Month	Completion date for the implementation of change: month	0	1	12	---	Integer	R/W	
PH02	MOD_DST_CIAT_1.End_DST_Hour	Completion date for the implementation of change: hour	0	0	23	---	Integer	R/W	
PH03	TIPO_PROG_HORARIA	Type of start-up: 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			---	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

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Clock/Scheduler” (...continuation)

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH05	H_PAR_2A	Stop hour of slot 1 - program 2	14	0	23	h	Integer	R/W	88
PH05	M_PAR_2A	Stop minute of slot 1 - program 2	0	0	59	min	Integer	R/W	89
PH05	H_ARR_2B	Start-up hour of slot 2 - program 2	17	0	23	h	Integer	R/W	90
PH05	M_ARR_2B	Start-up minute of slot 2 - program 2	0	0	59	min	Integer	R/W	91
PH05	H_PAR_2B	Stop hour of slot 2 - program 2	20	0	23	h	Integer	R/W	92
PH05	M_PAR_2B	Stop minute of slot 2 - program 2	30	0	59	min	Integer	R/W	93
PH05	H_ARR_2C	Start-up hour of slot 3 - program 2	0	0	23	h	Integer	R/W	94
PH05	M_ARR_2C	Start-up minute of slot 3 - program 2	0	0	59	min	Integer	R/W	95
PH05	H_PAR_2C	Stop hour of slot 3 - program 2	0	0	23	h	Integer	R/W	96
PH05	M_PAR_2C	Stop minute of slot 3 - program 2	0	0	59	min	Integer	R/W	97
PH06	H_ARR_3A	Start-up hour of slot 1 - program 3	7	0	23	h	Integer	R/W	98
PH06	M_ARR_3A	Start-up minute of slot 1 - program 3	0	0	59	min	Integer	R/W	99
PH06	H_PAR_3A	Stop hour of slot 1 - program 3	15	0	23	h	Integer	R/W	100
PH06	M_PAR_3A	Stop minute of slot 1 - program 3	0	0	59	min	Integer	R/W	101
PH06	H_ARR_3B	Start-up hour of slot 2 - program 3	0	0	23	h	Integer	R/W	102
PH06	M_ARR_3B	Start-up minute of slot 2 - program 3	0	0	59	min	Integer	R/W	103
PH06	H_PAR_3B	Stop hour of slot 2 - program 3	0	0	23	h	Integer	R/W	104
PH06	M_PAR_3B	Stop minute of slot 2 - program 3	0	0	59	min	Integer	R/W	105
PH06	H_ARR_3C	Start-up hour of slot 3 - program 3	0	0	23	h	Integer	R/W	106
PH06	M_ARR_3C	Start-up minute of slot 3 - program 3	0	0	59	min	Integer	R/W	107
PH06	H_PAR_3C	Stop hour of slot 3 - program 3	0	0	23	h	Integer	R/W	108
PH06	M_PAR_3C	Stop minute of slot 3 - program 3	0	0	59	min	Integer	R/W	109
PH07	SET_INT_FRIO	Schedule only setpoint change: internal Set in summer	26.0	-99.9	99.9	°C	Analog.	R/W	61
PH07	SET_EXT_FRIO	Schedule only setpoint change: external Set in summer	28.0	-99.9	99.9	°C	Analog.	R/W	59
PH08	SET_INT_CALOR	Schedule only setpoint change: internal Set in winter	21.0	-99.9	99.9	°C	Analog.	R/W	60
PH08	SET_EXT_CALOR	Schedule only setpoint change: external Set in winter	19.0	-99.9	99.9	°C	Analog.	R/W	58
PH09	SET_INT_LIM_FRIO	ON/OFF schedule with limit SET of ON (summer): internal Set	26.0	-99.9	99.9	°C	Analog.	R/W	79
PH09	SET_EXT_LIM_FRIO	ON/OFF schedule with limit SET of ON (summer): limit Set	34.0	-99.9	99.9	°C	Analog.	R/W	77
PH10	SET_INT_LIM_CALOR	ON/OFF schedule with limit SET of ON (winter): internal Set	21.0	-99.9	99.9	°C	Analog.	R/W	78
PH10	SET_EXT_LIM_CALOR	ON/OFF schedule with limit SET of ON (winter): limit Set	13.0	-99.9	99.9	°C	Analog.	R/W	76
PH11	DIF_LIM_CALOR	ON/OFF schedule with limit SET of ON (winter): differential	1.0	0.0	99.9	°C	Analog.	R/W	81
PH11	DIF_LIM_FRIO	ON/OFF schedule with limit SET of ON (summer): differential	2.0	0.0	99.9	°C	Analog.	R/W	80
PH12	LUN_A	Monday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	0	3	---	Integer	R/W	110
PH12	MAR_A	Tuesday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	0	3	---	Integer	R/W	111
PH12	MIE_A	Wednesday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	0	3	---	Integer	R/W	112
PH12	JUE_A	Thrusday schedule (0=off; 1=program1; 2=program2; 3=program3)	1	0	3	---	Integer	R/W	113
PH12	VIE_A	Friday schedule (0=off; 1=program1; 2=program2; 3=program3)	3	0	3	---	Integer	R/W	114
PH12	SAB_A	Saturday schedule (0=off; 1=program1; 2=program2; 3=program3)	0	0	3	---	Integer	R/W	115
PH12	DOM_A	Sunday schedule (0=off; 1=program1; 2=program2; 3=program3)	0	0	3	---	Integer	R/W	116
PH12	DIA_SEMANA	Weekday	0	0	0	day	Integer	R/W	52
PH13	MOD_SCHED_GRAPH_CIAT_1. FH1_Day_Prg	Schedule day FH1 -- 0=don - 6=sab	0	0	6	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1. FH1_Day_Copy	Day of copy FH1 -- 0=dom - 6=sab	0	0	6	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1. FH1_Copy	Enabling copy of the daily program	0	0	1	---	Digital	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1. Hour_Start_Pointer	Current start hour in programming	0	0	23	---	Integer	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. En_Pointer	Enabling graphic programming	0	0	1	---	Digital	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. Minute_Start_Pointer	Current start minute in programming	0	0	23	---	Integer	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. Hour_End_Pointer	Current end hour in programming	0	0	23	---	Integer	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. Minute_End_Pointer	Current end minute in programming	0	0	23	---	Integer	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. Loaded	Load of FH data	0	0	1	---	Digital	R	
PH13	MOD_SCHED_GRAPH_CIAT_1. Fh_00_00	Schedule 00:00	0	0	Set_ Limit	---	Integer	R/W	

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

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

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_00_30	Schedule 00:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_01_00	Schedule 01:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_01_30	Schedule 01:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_02_00	Schedule 02:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_02_30	Schedule 02:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_03_00	Schedule 03:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_03_30	Schedule 03:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_04_00	Schedule 04:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_04_30	Schedule 04:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_05_00	Schedule 05:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_05_30	Schedule 05:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_06_00	Schedule 06:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_06_30	Schedule 06:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_07_00	Schedule 07:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_07_30	Schedule 07:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Loaded	Load of FH data	0	0	1	---	Digital	R	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_08_00	Schedule 08:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_08_30	Schedule 08:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_09_00	Schedule 09:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_09_30	Schedule 09:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_10_00	Schedule 10:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_10_30	Schedule 10:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_11_00	Schedule 11:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_11_30	Schedule 11:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_12_00	Schedule 12:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_12_30	Schedule 12:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_13_00	Schedule 13:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_13_30	Schedule 13:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_14_00	Schedule 14:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_14_30	Schedule 14:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_15_00	Schedule 15:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_15_30	Schedule 15:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Loaded	Load of FH data	0	0	1	---	Digital	R	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_16_00	Schedule 16:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_16_30	Schedule 16:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_17_00	Schedule 17:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_17_30	Schedule 17:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_18_00	Schedule 18:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_18_30	Schedule 18:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_19_00	Schedule 19:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_19_30	Schedule 19:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_20_00	Schedule 20:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_20_30	Schedule 20:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_21_00	Schedule 21:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_21_30	Schedule 21:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_22_00	Schedule 22:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_22_30	Schedule 22:30	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_23_00	Schedule 23:00	0	0	Set_Limit	---	Integer	R/W	
PH13	MOD_SCHED_GRAPH_CIAT_1.Fh_23_30	Schedule 23:30	0	0	Set_Limit	---	Integer	R/W	
PH14	SET_INT_FRIO	Setpoint for COMFORT time slots in summer	26.0	-99.9	99.9	°C	Analog.	R/W	61
PH14	SET_EXT_FRIO	Setpoint for ECONOMY time slots in summer	28.0	-99.9	99.9	°C	Analog.	R/W	59
PH14	SET_EXT_LIM_FRIO	Setpoint for BUILDING PROTECTION time slots in summer	34.0	-99.9	99.9	°C	Analog.	R/W	77
PH14	DIF_LIM_FRIO	Differential for the 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

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Clock/Scheduler” (...continuation)

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
PH16	ThTune_clock_hours	Display of data from the TCO terminal: hour	0	0	99	---	Integer	R	
PH16	ThTune_clock_minutes	Display of data from the TCO terminal: minutes	0	0	99	---	Integer	R	
PH16	NEW_DAY	Display of data from the TCO terminal: day	0	0	31	---	Integer	R/W	
PH16	NEW_MONTH	Display of data from the TCO terminal: month	0	0	12	---	Integer	R/W	
PH16	NEW_YEAR	Display of data from the TCO terminal: year	0	0	99	---	Integer	R/W	
PH16	ThTune_clock_weekday	Display of data from the TCO terminal: weekday	0	1	7	---	Integer	R	
PH17	HAB_PROG_HORARIA_CLOCK_KEY	Display of data from the TCO terminal: ON/OFF schedule prog.	0	0	1	---	Digital	R	
PH17	ThTune_Temperature_setpoint	Display of data from the TCO terminal: temperature setpoint	0.0	0.0	99.9	---	Analog.	R/W	
PH17	Current_Timeband_Icon	Display of data from the TCO terminal: current band of schedule programming	0	0	6	---	Integer	R/W	

Parameters of “Input/Output”

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

Parameters of “Input/Output” (...continuation) 06. Input/Output

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I05e	TEMP_ASP_C2_AIN09	Display of the suction temperature of circuit 2	0.0	-99.9	99.9	---	Analog.	R	
I05e	SHTemp_B	Display of overheating of circuit 2	00.0	-99.9	99.9	---	Integer	R	
I06a	MOD_EVO_ONBOARD_SPEC_2.A10_SH_SH	Overheating on the expansion valve of circuit 1	0.0	-72.0	324.0	°C/°F	Analog.	R/W	
I06a	MOD_EVO_ONBOARD_SPEC_2.A5_SH_SUCT_TEMP	Suction temperature on the circuit 1 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06a	MOD_EVO_ONBOARD_SPEC_2.I4_EEV_POSITION_STEPS	Valve position for circuit 1	0	0	9999	steps	Integer	R/W	
I06a	COMPRESOR_1	Contactor of compressor 1 of circuit 1	0	0	1	---	Digital	R	16
I06a	MOD_EVO_ONBOARD_SPEC_2.A7_SH_EVAP_PRES	Evaporating pressure on the circuit 1 valve	0.0	-10.0	10.0	barg	Analog.	R/W	
I06a	COMPRESOR_1_2	Contactor of compressor 2 of circuit 1	0	0	1	---	Digital	R/W	
I06a	MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP	Evaporating temperature on the circuit 1 valve	0.0	-10.0	10.0	°C/°F	Analog.	R/W	
I06a	T_P_HP_C1	High pressure transducer of circuit 1	0.0	-99.9	99.9	bar	Analog.	R	3
I06a	MOD_EVO_ONBOARD_SPEC_2.I8_REG_STATUS	Status of EVD control on the circuit 1 valve	0	1	14	---	Integer	R/W	
I06a	TEMP_CAL_HP_C1	Calculated temperature for high pressure of circuit 1	0.0	-99.9	99.9	°C	Analog.	R	123
I06b	MOD_EVO_ONBOARD_SPEC_2.A68_SH_SH_2ND	Overheating on the expansion valve of circuit 2	0.0	-72.0	324.0	°C/°F	Analog.	R/W	
I06b	MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_2ND	Suction temperature on the circuit 2 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06b	MOD_EVO_ONBOARD_SPEC_2.I49_EEV_POSITION_STEPS_2ND	Valve position for circuit 2	0	0	999	steps	Integer	R/W	
I06b	COMPRESOR_2	Contactor of compressor 1 of circuit 2	0	0	1	---	Digital	R	17
I06b	MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_2ND	Evaporating pressure on the circuit 2 valve	0.0	-10.0	10.0	barg	Analog.	R/W	
I06b	COMPRESOR_2_2	Contactor of compressor 2 of circuit 2	0	0	1	---	Digital	R/W	
I06b	MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_2ND	Evaporating temperature on the circuit 2 valve	0.0	-10.0	10.0	°C/°F	Analog.	R/W	
I06b	T_P_HP_C2	High pressure transducer of circuit 2	0.0	-99.9	99.9	bar	Analog.	R	4
I06b	MOD_EVO_ONBOARD_SPEC_2.I51_REG_STATUS_2ND	Status of EVD control on the circuit 2 valve	0	1	17	---	Integer	R/W	
I06b	TEMP_CAL_HP_C2	Calculated temperature for high pressure of circuit 2	0.0	-99.9	99.9	°C	Analog.	R	124
I06cr	MOD_EVO_ONBOARD_SPEC_2.A68_SH_SH_CR	Overheating on the expansion valve of recovery circuit	0.0	-72.0	324.0	°C/°F	Analog.	R/W	
I06cr	MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_CR	Suction temperature on the recovery circuit valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06cr	MOD_EVO_ONBOARD_SPEC_2.I49_EEV_POSITION_STEPS_CR	Valve position for recovery circuit	0	0	999	steps	Integer	R/W	
I06cr	COMP_REC_1	Contactor of compressor 1 of recovery circuit	0	0	1	---	Digital	R	
I06cr	MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_CR	Evaporating pressure on the recovery circuit valve	0.0	-10.0	10.0	barg	Analog.	R/W	
I06cr	COMP_REC_2	Contactor of compressor 2 of recovery circuit	0	0	1	---	Digital	R/W	
I06cr	MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_CR	Evaporating temperature on the recovery circuit valve	0.0	-10.0	10.0	°C/°F	Analog.	R/W	
I06cr	T_P_HP_CR	High pressure transducer of recovery circuit	0.0	-99.9	99.9	BAR	Analog.	R	
I06cr	MOD_EVO_ONBOARD_SPEC_2.I51_REG_STATUS_CR	Status of EVD control on the recovery circuit valve	0	1	17	---	Integer	R/W	
I06cr	TEMP_CAL_HP_CR	Calculated temperature for high pressure of recovery circuit	0.0	-99.9	99.9	°C	Analog.	R	
I06c1	MOD_EVO_ONBOARD_SPEC_2.A104_DISCHARGE_SH	Overheating on the discharge	0.0	-72.0	324.0	°C/°F	Analog.	R/W	
I06c1	MOD_EVO_ONBOARD_SPEC_2.A105_DISCHARGE_TEMP	Discharge temperature	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06e	MOD_EVO_ONBOARD_SPEC_2.A7_SH_EVAP_PRES	Evaporating pressure on the circuit 1 valve	0.0	-2.0	29.0	barg	Analog.	R/W	
I06e	MOD_EVO_ONBOARD_SPEC_2.A19_POSITIONING_MODE_mAMPERE	Input value 4-20mA on the circuit 1 valve	4.0	4.0	20.0	mA	Analog.	R/W	
I06e	MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP	Evaporating temperature on the circuit 1 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06f	MOD_EVO_ONBOARD_SPEC_2.A5_SH_SUCT_TEMP	Suction temperature on the circuit 1 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06er	MOD_EVO_ONBOARD_SPEC_2_DUMMY	Evaporating pressure on the recovery circuit valve	0.0	-2.0	29.0	barg	Analog.	R/W	
I06er	MOD_EVO_ONBOARD_SPEC_2.A19_POSITIONING_MODE_mAMPERE	Input value 4-20mA on the recovery circuit valve	4.0	4.0	20.0	mA	Analog.	R/W	
I06er	MOD_EVO_ONBOARD_SPEC_2.A6_SH_EVAP_TEMP	Evaporating temperature on the recovery circuit valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06fr	TEMP_ASP_CR	Suction temperature on the recovery circuit valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06g	MOD_EVO_ONBOARD_SPEC_2.A71_SH_EVAP_PRES_2ND	Evaporating pressure on the circuit 2 valve	0.0	-2.0	29.0	barg	Analog.	R/W	
I06g	MOD_EVO_ONBOARD_SPEC_2.A78_POSITIONING_MODE_mAMPERE_2ND	Input value 4-20mA on the circuit 2 valve	0.0	4.0	20.0	mA	Analog.	R/W	
I06g	MOD_EVO_ONBOARD_SPEC_2.A70_SH_EVAP_TEMP_2ND	Evaporating temperature on the circuit 2 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	
I06h	MOD_EVO_ONBOARD_SPEC_2.A69_SH_SUCT_TEMP_2ND	Suction temperature on the circuit 2 valve	0.0	-76.0	392.0	°C/°F	Analog.	R/W	

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Input/Output” (...continuation)

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I07	N_HOR_ON_EQUIPO	Display of operating hours of unit	0	0	0	h	Integer	R/W	62
I07	N_HOR_COMP1	Display of operating hours of compressor 1 circuit 1	0	0	0	h	Integer	R/W	10
I07	N_HOR_COMP1_2	Display of operating hours of compressor 2 circuit 1	0	0	0	h	Integer	R/W	53
I07a	N_HOR_COMP2	Display of operating hours of compressor 1 circuit 2	0	0	0	h	Integer	R/W	11
I07a	N_HOR_COMP2_2	Display of operating hours of compressor 2 circuit 2	0	0	0	h	Integer	R/W	69
I07a	N_HOR_CR	Display of operating hours of recovery compressor	0	0	0	h	Integer	R/W	12
I08	DIN01_RTVI_VIRT	Status of digital input 1: indoor fan thermal protection	0	0	1	---	Digital	R/W	
I08	DIN02_INC_VIRT	Status of digital input 2: gas detector	0	0	1	---	Digital	R/W	
I08	DIN03_AP1_VIRT	Status of digital input 3: high pressure circuit 1	0	0	1	---	Digital	R/W	
I08	DIN04_TC1_VIRT	Status of digital input 4: thermal protection of compressors and outdoor fans of circuit 1	0	0	1	---	Digital	R/W	
I08	DIN05_TS_VIRT	Status of digital input 5: safety of el. heaters / burner / boiler	0	0	1	---	Digital	R/W	
I08	DIN06_FS_VIRT	Status of digital input 6: clogged filters detector	0	0	1	---	Digital	R/W	
I08	DIN07_ON_OFF_VIRT	Status of digital input 7: remote ON/OFF	0	0	1	---	Digital	R/W	
I08	DIN08_AH_BAC_VIRT	Status of digital input 8: HWC antifreeze	0	0	1	---	Digital	R/W	
I08	DIN09_AP2_VIRT	Status of digital input 9: high pressure circuit 2	0	0	1	---	Digital	R/W	
I08	DIN10_TC2_VIRT	Status of digital input 10: thermal protection of compressors and outdoor fans of circuit 2	0	0	1	---	Digital	R/W	
I08b	DIN21_OFF_1ET_VIRT	Status of digital input 21: disconnection of 1 compressor stage	0	0	1	---	Digital	R/W	
I08b	DIN22_OFF_2ET_VIRT	Status of digital input 22: disconnection of 2 compressor stages	0	0	1	---	Digital	R/W	
I08b	DIN23_OFF_4ET_VIRT	Status of digital input 23: disconnection of 4 compressor stages	0	0	1	---	Digital	R/W	
I08b	DIN24_OFF_RES_VIRT	Status of digital input 24: disconnection of electrical heaters	0	0	1	---	Digital	R/W	
I08c	DIN25_VIRT	Status of digital input 25: opening of supply damper of area 1	0	0	1	---	Digital	R/W	
I08c	DIN26_VIRT	Status of digital input 26: opening of supply damper of area 2	0	0	1	---	Digital	R/W	
I08c	DIN27_VIRT	Status of digital input 27: opening of return damper of area 1	0	0	1	---	Digital	R/W	
I08c	DIN28_VIRT	Status of digital input 28: opening of return damper of area 2	0	0	1	---	Digital	R/W	
I08cr	IN_DIG01_INTERBQ	Status of digital input 01 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG02_INC	Status of digital input 02 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG03_AP1	Status of digital input 03 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG04_TC_CR	Status of digital input 04 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG05_C_F	Status of digital input 05 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG06_FS	Status of digital input 06 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I08cr	IN_DIG07_ON_OFF	Status of digital input 07 of SMALL board: recovery circuit	0	0	1	---	Digital	R/W	
I09	COMPRESOR_1	Status of contactor of compressor 1 circuit 1	0			---	Digital	R/W	16
I09	COMPRESOR_1_2	Status of contactor of compressor 2 circuit 1	0			---	Digital	R/W	
I09	COMPRESOR_2	Status of contactor of compressor 1 circuit 2	0			---	Digital	R/W	17
I09	COMPRESOR_2_2	Status of contactor of compressor 2 circuit 2	0			---	Digital	R/W	
I09a	RES_ELECTRICA_1_O_VALV	Status of contactor of 1st stage of electrical heaters or gas burner or gas boiler or hot water coil valve	0			---	Digital	R/W	20
I09a	RES_ELECTRICA_2	Status of contactor of 2nd stage of electrical heaters	0			---	Digital	R/W	21
I10	OUT_VIC1	Status of cycle reversing valve of circuit 1	0	0	1	---	Digital	R/W	18
I10	OUT_VIC2	Status of cycle reversing valve of circuit 2	0	0	1	---	Digital	R/W	19
I10	VENTILADOR_EXT_1	Status of outdoor fan(s) of circuit 1	0	0	1	---	Digital	R/W	23
I10	VENTILADOR_EXT_2	Status of outdoor fan(s) of circuit 2	0			---	Digital	R/W	24
I10b	DOUT22_VIRT	Status of digital output 22: supply damper of area 1	0	0	1	---	Digital	R/W	
I10b	DOUT23_VIRT	Status of digital output 23: supply damper of area 2	0	0	1	---	Digital	R/W	
I10b	DOUT24_VIRT	Status of digital output 24: return damper of area 1	0	0	1	---	Digital	R/W	
I10b	DOUT25_VIRT	Status of digital output 25: return damper of area 2	0	0	1	---	Digital	R/W	
I10cr	COMP_REC_1	Status of contactor of compressor of recovery circuit	0	0	1	---	Digital	R/W	
I10cr	OUT_VIC_CR	Status of cycle reversing valve of recovery circuit	0	0	1	---	Digital	R/W	
I11	ON_VENTILADOR_INT	Status of indoor unit supply fan	0	0	1	---	Digital	R	15
I11	OUT_07	Status of humidifier or HWC pump or boiler pump or rotary heat exchanger	0			---	Digital	R/W	
I12	VIS_Y1_AOUT_COMPUERTA	Display of opening % of outdoor air damper	0	0	999	---	Integer	R	
I12	HAB_VALVULA_CALOR	Display of opening % of HWC valve	0			---	Digital	R/W	103
I12	HAB_QUEMADOR_GAS	Display of opening % of gas burner/boiler	0	0	1	---	Digital	R/W	86
I12	HAB_RESISTENCIA_PROP	Display of opening % of proportional electrical heater	0	0	1	---	Digital	R	
I12	HAB_OUT_COMP_INVERTER_OK	Display of inverter compressor status	0	0	1	---	Digital	R	
I12	HAB_AOUT2_CON_SOBREPRESION	Display of opening % of overpressure damper	0	0	1	---	Digital	R	
I12a	VIS_Y3	Display of operating % of electronic outdoor fan(s) of circuit 1	0	0	0	---	Integer	R/W	
I12a	VIS_Y4	Display of operating % of electronic outdoor fan(s) of circuit 2	0	0	0	---	Integer	R/W	
I12b	VIS_Y6	Display of % proportional humidifier or exhaust damper	0	0	999	---	Integer	R/W	
I12c	VIS_Y7	Display of operating % of the wheel (variable rotary heat exchanger)	0	0	999	---	Integer	R/W	

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

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

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Energy_Address_Msk	Reading of the energy meter: address	0	0	254	---	Integer	R/W	
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_L1_L2_L_SPV	Reading of the energy meter: voltage between phases L1-L2	0	0	99990	V	Integer	R	167
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_L2_L3_L_SPV	Reading of the energy meter: voltage between phases L2-L3	0	0	99990	V	Integer	R	168
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_L3_L1_L_SPV	Reading of the energy meter: voltage between phases L3-L1	0	0	99990	V	Integer	R	169
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_1_L_SPV	Reading of the energy meter: voltage between phase and neutral L1	0	0	99990	V	Integer	R	170
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_2_L_SPV	Reading of the energy meter: voltage between phase and neutral 2	0	0	99990	V	Integer	R	171
I15	MOD_MB_ENERGY_METERS_ CIAT_1.Voltage_3_L_SPV	Reading of the energy meter: voltage between phase and neutral 3	0	0	99990	V	Integer	R	172
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Energy_Address_Msk	Reading of the energy meter: address	0	0	254	---	Integer	R/W	
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Current_1_L_SPV	Reading of the energy meter: phase current L1	0.0	0.0	999.9	A	Analog.	R	131
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Current_2_L_SPV	Reading of the energy meter: phase current L2	0.0	0.0	999.9	A	Analog.	R	132
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Current_3_L_SPV	Reading of the energy meter: phase current L3	0.0	0.0	999.9	A	Analog.	R	133
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Power_Factor_L_MSK	Reading of the energy meter: power factor	0	0	9	---	Integer	R	
I16	MOD_MB_ENERGY_METERS_ CIAT_1.Frequency	Reading of the energy meter: frequency	0.0	0.0	99.9	Hz	Analog.	R	142
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Energy_Address_Msk	Reading of the energy meter: address	0	0	254	---	Integer	R/W	
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Apparent_Power_1_L_SPV	Reading of the energy meter: reactive power phase L1	0.0	0.0	999.9	kVAr	Analog.	R	134
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Apparent_Power_2_L_SPV	Reading of the energy meter: reactive power phase L2	0.0	0.0	999.9	kVAr	Analog.	R	135
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Apparent_Power_3_L_SPV	Reading of the energy meter: reactive power phase L3	0.0	0.0	999.9	kVAr	Analog.	R	136
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Apparent_Power_L_SPV	Reading of the energy meter: total reactive power	0000.0	0000.0	0999.9	---	Integer	R	
I17	MOD_MB_ENERGY_METERS_ CIAT_1.Apparent_Energy_M_MSK	Reading of the energy meter: equivalent reactive energy	0	0	999	---	Integer	R/W	
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Energy_Address_Msk	Reading of the energy meter: address	0	0	254	---	Integer	R/W	
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Power_1_L_SPV	Reading of the energy meter: phase power L1	0.0	0.0	999.9	kW	Analog.	R	137
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Power_2_L_SPV	Reading of the energy meter: phase power L2	0.0	0.0	999.9	kW	Analog.	R	138
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Power_3_L_SPV	Reading of the energy meter: phase power L3	0.0	0.0	999.9	kW	Analog.	R	139
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Power_L_SPV	Reading of the energy meter: total power	0.0	0.0	999.9	kW	Analog.	R	140
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Energy_M_MSK	Reading of the energy meter: energy	0	0	999	---	Integer	R	
I18	MOD_MB_ENERGY_METERS_ CIAT_1.MWh	Reading of the energy meter: MWh	0	0	1	---	Digital	R	
I18	MOD_MB_ENERGY_METERS_ CIAT_1.Hourmeter_M_MSK	Reading of the energy meter: time (hours)	0	0	999	---	Integer	R	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Detect_Device_Number_Tmp	Refrigerant gas detector number	1	1	247	---	Integer	R/W	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Concentration_Percent	Reading of the gas leak detector: concentration (%)	0	0	100	%	Integer	R	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Concentration_ppm	Reading of the gas leak detector: concentration (ppm)	0	0	32767	ppm	Integer	R	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Red_Led	Reading of the gas leak detector: red led (1: Active; 0: Off)	0	0	1	---	Digital	R	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Green_Led	Reading of the gas leak detector: green led (1: Active; 0: Off)	0	0	1	---	Digital	R	
I18a	MOD_MB_GAS_LEAKAGE_CIAT_1. Relay_Status	Reading of the gas leak detector: relay (1: Active; 0: Off)	0	0	1	---	Digital	R	
I18b	ENTALPIA_MEZCLA_KCAL	Calculation of cooling and heating capacities: display of the input enthalpy	0.0	0.0	99.9	Kcal/Kg	Analog.	R	237
I18b	SONDA_MEZCLA_HUM	Calculation of cooling and heating capacities: supply probe - display of the input humidity	50.0	0.0	99.9	%rH	Analog.	R/W	232
I18b	SONDA_MEZCLA_TEMP	Calculation of cooling and heating capacities: mixing probe RS485 - display of the input temperature	0.0	-999.9	999.9	°C	Analog.	R	231
I18c	ENTALPIA_IMPULSION_KCAL	Calculation of cooling and heating capacities: display of the output enthalpy	0.0	0.0	99.9	Kcal/Kg	Analog.	R	238
I18c	SONDA_IMPULSION_HUM	Calculation of cooling and heating capacities: supply probe - display of the output humidity	0.0	0.0	99.9	%rH	Analog.	R	235
I18c	SONDA_IMPULSION_TEMP	Calculation of cooling and heating capacities: mixing probe RS485 - display of the output temperature	0.0	-999.9	999.9	°C	Analog.	R	234
I18c	MODO_FRIO	Calculation of cooling and heating capacities: operating mode	0	0	1	---	Digital	R	
I18d	SET_CAUDAL_VINT_CALOR	Calculation of cooling and heating capacities: display of the supply flow	1200	0	9999	x10 m3/h	Integer	R/W	201

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Input/Output” (...continuation)

Screen	Parameter	Description of the parameter	Value	Min.	Max.	UOM	Type	R/W	Add. BMS
I18d	DIF_ENTALPIA_POT_ TERMICA_KCAL	Calculation of cooling and heating capacities: display of the input-output enthalpy difference	0.0	0.0	99.9	KJ/Kg	Analog.	R	
I18d	Densidad_aire_impulsion	Calculation of cooling and heating capacities: display of air density	0	0	9999	x10 g/m3	Integer	R	
I18d	Pot_termica	Calculation of cooling and heating capacities: display of total capacity	0.0	0.0	3276.7	KW	Analog.	R	239
I18d	MOD_MB_ENERGY_METERS_ CIAT_1.Power_L_SPV	Calculation of cooling and heating capacities: display of electric power	0.0	0.0	999.9	kW	Analog.	R	140
I18e	MODO_FRIO	Calculation of cooling and heating capacities: operating mode	0	0	1	---	Digital	R	
I18e	EER_COP	Calculation of cooling and heating capacities: display of EER / COP calculation	0.0	0.0	99.9	---	Analog.	R	240
I18e	ON_COMPRESOR	Calculation of cooling and heating capacities: display of the started compressors	0	0	1	---	Digital	R	186
I18e	PORC_COMPRESORES	Calculation of cooling and heating capacities: display of compressor stages (%)	0	0	999	%	Integer	R	
I18e	COMPRESOR_REC	Calculation of cooling and heating capacities: display of the recovery compressor	0	0	1	---	Digital	R/W	117
I18e	RENOVACION_CAL	Calculation of cooling and heating capacities: display of air renewal calculated depending on the mixing probe or the CO2 probe	0	0	99	%	Integer	R	124
I18e	TEMP_INT	Calculation of cooling and heating capacities: display of the indoor temperature used in the unit control	0.0	-99.9	99.9	°C	Analog.	R/W	
I18e	TEMP_EXT	Calculation of cooling and heating capacities: display of the outdoor temperature	0.0	-99.9	99.9	°C	Analog.	R/W	2

Parameters of “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”

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

Parameters of “Burner/Boiler”

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

14 - LIST OF CONTROL PARAMETERS WITH “LEVEL OF ACCESS 1”

Parameters of “Versions”

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

15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

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

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

microPC board	
ELECTRICAL FEATURES	
Power supply (controller with terminal connected)	230 Vac +10/-15% (by default) 24 Vac +10/-15% 50/60 Hz and 28 to 36 Vdc +10/-20% (optional)
Maximum current with the connected terminal	25 VA (Vac)
Terminal strip	with removable male/female connectors (250 Vac max.) connectors set with screws
Isolation between the power supply line and the control	double
Data memory	13 kB at 8 bits (max. limit: 400,000 writes per memory location)
Working cycle with applications of average complexity	0.2 s
Analogue inputs	
Analogue conversion	A/D converter to 10-bit integrated in CPU
Maximum number	7 in SMALL boards and 12 in MEDIUM boards
Input type: B1, B2, B3, B4, B8 and B9	low temperature NTC: 10kΩ ± 0.1% to 25ºC; -50/90°C high temperature NTC: 50kΩ to 25ºC; 0/150°C input: 0/1 Vdc
Input type: B5 and B10	low temperature NTC: 10kΩ to 25ºC; -50/90°C high temperature NTC: 50kΩ to 25ºC; 0/150°C input: 0/1 Vdc and 4/20 mA
Input type: B6, B7, B11 and B12	low temperature NTC: 10kΩ to 25ºC; -50/90°C high temperature NTC: 50kΩ to 25ºC; 0/150°C input: 0/1 Vdc radiometric pressure probe
Time constant for each input	0.5 s
Input precision	± 0.3% of the complete scale
Classification of the average circuits (IEC EN 61010-1)	Category I
Digital inputs	
No. of inputs on SMALL boards	7
No. of inputs on MEDIUM boards	10
Analogue outputs	
Maximum number	3 in SMALL boards and 4 in MEDIUM boards
Type	0 to 10Vdc
Precision	± 3% of the complete scale or ± 5% of the complete scale (maximum load 5mA)
Resolution	8-bit
Maximum charge	2 kΩ (5 mA)
Digital outputs	
Composition of groups	SMALL board: Group 1 (1 to 6); Group 2 (7)
	MEDIUM board: Group 1 (1 to 6); Group 2 (7); Group 3 (8 to 12)
Electrical contacts Note: relays of the same group with basic isolation must have the same power supply (24 Vdc or 230 Vac). Relays of the same group have basic isolation among themselves. The isolation between the various groups is double.	SMALL board (relays 1 to 7): EN60730-1: NO 1(1)A 250Vac cos φ =0.4; 100,000 $\chi\psi\chi\lambda\varepsilon\sigma$ UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles
	MEDIUM board (relays 1 to 12): EN60730-1: NO 1(1)A 250Vac cos φ =0.4; 100,000 $\chi\psi\chi\lambda\varepsilon\sigma$ UL-873: NO 1 A resistive 24 Vac, 30 Vdc; 100,000 cycles Test capacity: 24Vac; pulse 15A; continuous 1A 30,000 cycles
TECHNICAL CHARACTERISTICS	
Storage conditions / Operating conditions	-20T70 ºC; %RH 90 non-condensation / -10T60 ºC; %RH 90 non-condensation
Protection index	IP00
Environmental pollution	normal
Classification according to protection against electric shocks	To be incorporated in class I and/or II appliances
PTI of the insulating materials	250V
Period of electric stress across the insulating parts	Long
Type of relay action	1C
Type of disconnection or microswitching	Micro-switch for all of the relay outlets
Category of resistance to heat and fire	Category D (UL94 - V0)
Immunity from voltage surge	Category 1
Ageing specifications (operating hours)	80.000
Number of automatic operating cycles	100,000 (EN 60730-1); 30,000 (UL 873)
Software class and structure	Class A
Category of protection against discharges (IEC EN 61000-4-5)	Category III
Dimensions: Length x Height x Depth	SMALL board: 175 x 113 x 55 mm (10 DIN modules) MEDIUM board: 228 x 113 x 55 mm (13 DIN modules)

15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

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

15 - 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

15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

15.1. Ambient probe

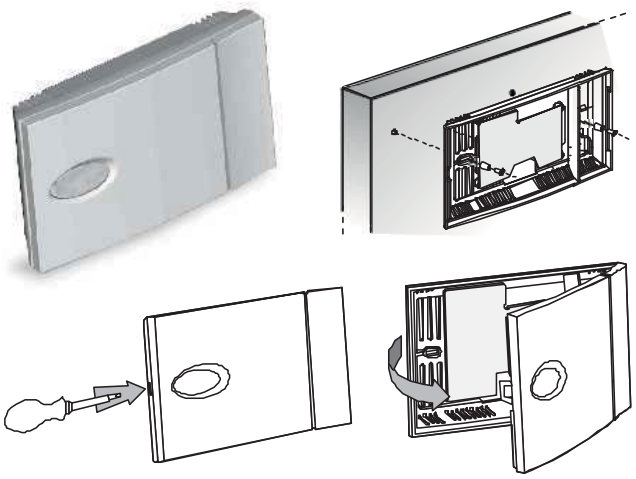
Wall version (DPW)

Case index of protection: IP30

Sensor index of protection: IP30.

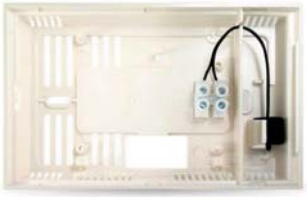
Assembly and setting instructions

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



- Fasten the rear of the sensor case to the panel or the wall (for fastening the case, use the screws supplied with the fastening kit, paying attention to use the proper spacers, to not damage the sensor's electronics).
- The electrical connection must be carried out depending on the unit setting:
  - NTC probe S5a: B5 (connector J3) : with 2 x 1,5 mm² section cable, within a maximum distance of 30 metres.
  - RS485 (connector J10): with AWG20 section cable, single braided pair preferably shielded with drain wire + Power supply 24 Vac (2 wires).
    - * Temperature: S21 to S24.
    - * Temperature + humidity: S31 to S34.

    Note: in the case of more than one probe, connection of the probes in series, in the RS485 network.
- Close the sensor with the top cover by pressing lightly.



Inside view, bottom shell

Inside view, top shell

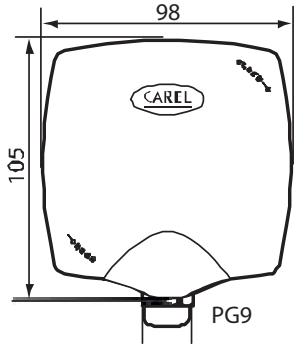
Duct version (DPD)

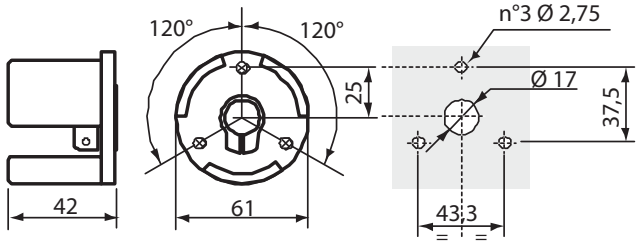
Case index of protection: IP55

Sensor index of protection: IP40.

Assembly and setting instructions

- The duct version is connected to the air duct using the special fastening bracket.
- Fasten the bracket to the air duct.
- Insert the rod on the bracket to the required depth.
- Tighten the screw on the bracket to fasten.





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

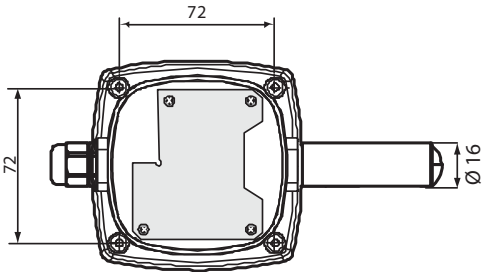
View of sensor without cover

Interior view

Industrial environment version (DPP)

Case index of protection: IP55

Sensor index of protection: IP54.



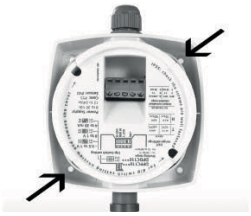
15 - TECHNICAL AND ELECTRICAL CHARACTERISTICS

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)

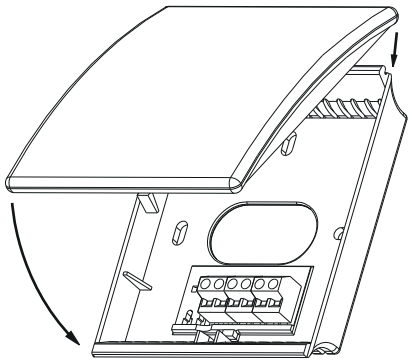
Cleaning and maintenance

When cleaning the instrument do not use ethyl alcohol, hydrocarbons (petrol), ammonia and derivatives. Use neutral detergents and water.

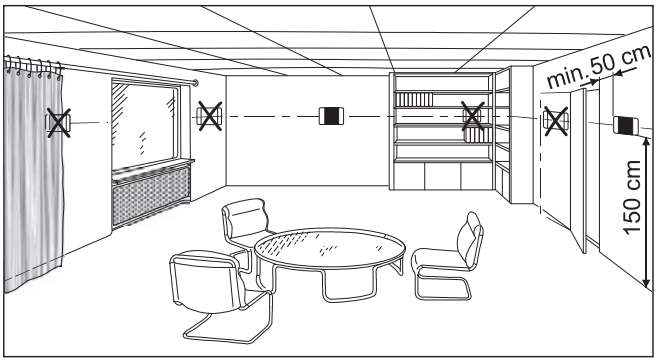
Periodically check the aeration slits on the sensor to make sure that air can flow freely through, without obstructions due to impurities or dust in the site of installation.

15.2. Air quality probe 4.. 20 mA

Installation in the environment

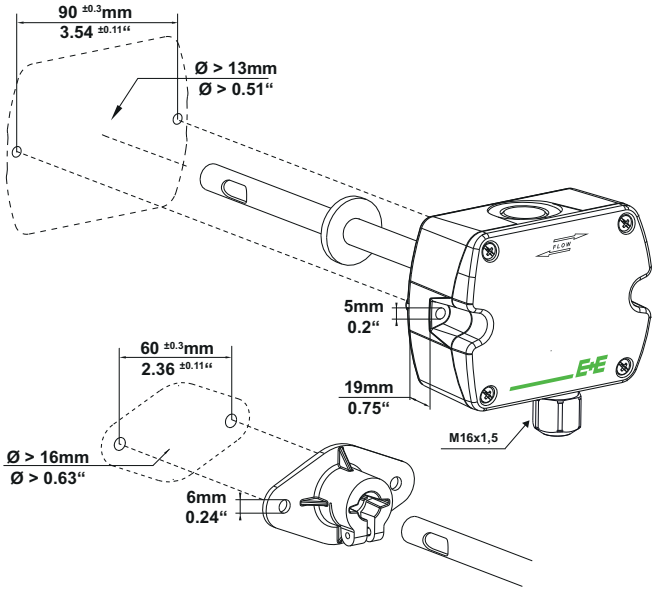


- This probe must be fixed to the interior wall of the room to be conditioned, at ca. 1.5 m height in the room and at least 50 cm from the next wall.
- It should never be mounted:
  - On outside walls.
  - In niches or behind curtains.
  - Above or near heat sources or shelves.
  - On walls covering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



Duct-mounted

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

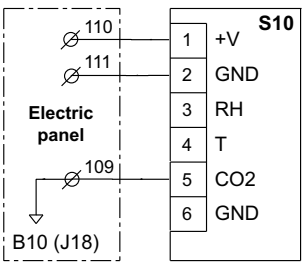


Electrical connection

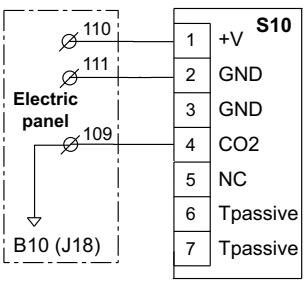
This probe (S10) is configured as analogue output 4…20 mA (0..2000 ppm), in the analogue input B10 of the control board (connector J18).

Recommended cable section : 1,5 mm^2.

Environment:



Duct-mounted:



16. TROUBLESHOOTING

- *The unit does not switch on (the power LED on the main board is switched off).*

  Check:

  1. The presence of main power;
  2. That the transformer output voltage is 24 Vac/Vdc;
  3. That the power supply connector at 24 Vac/Vdc is correctly inserted;
  4. That the overload fuse is intact.

- *When switching on, there are general problems with the LCD (strange characters, blank display).*

  Check:

  1. That the software in the flash is correct;
  2. The pLAN address of the pCOc and on the terminal (check that they comply with the requirements of the current application);
  3. The connection between the VecticGD terminal and the µPC MEDIUM board.

- *Erroneous readings of the input signals.*

  Check:

  1. The correct power supply to the µPC MEDIUM board and probes;
  2. The separation between the power supply of the digital inputs and that of the µPC MEDIUM board. A 24 Vac/24 Vac, 5 VA transformer can be used.
  3. That the cables from the probes are connected according to the instructions;
  4. That the probe cables are located far enough away from possible sources of magnetic interference (power cables, contactors, high voltage cables or cables connected to units with high current peaks);
  5. That there is not a high level of heat resistance between the probe and the sensor cap (if present). If necessary, apply conductive paste or oil into the caps to ensure good temperature transfer.
  6. If there is a probe error or µPC MEDIUM board conversion error, the checks to be carried out would vary depending on the type of probe:

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

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

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

     Pressure probes:

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

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

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

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

     Ps = (Vmed/100 - 0.004) 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 µPC MEDIUM board and perform the following measurements with a tester between the Bn and AVSS probe inputs:

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

- *Unusual alarm signal from the digital input.*

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

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

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