









Service control manual Smart HP

Application FLBB0mHPGU



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1. INTRODUCTION

1.1 Purpose of the manual

The purpose of this manual is to give all the information required for the Assistance Centres concerning the use of the control within the application on the Epsilon Echos + units, with the FLBBomHPGU application.

Information concerning installation of the units, and the relative checks and inspections for first commissioning, are not shown in this manual; please refer to the unit's installation for use and maintenance manual.

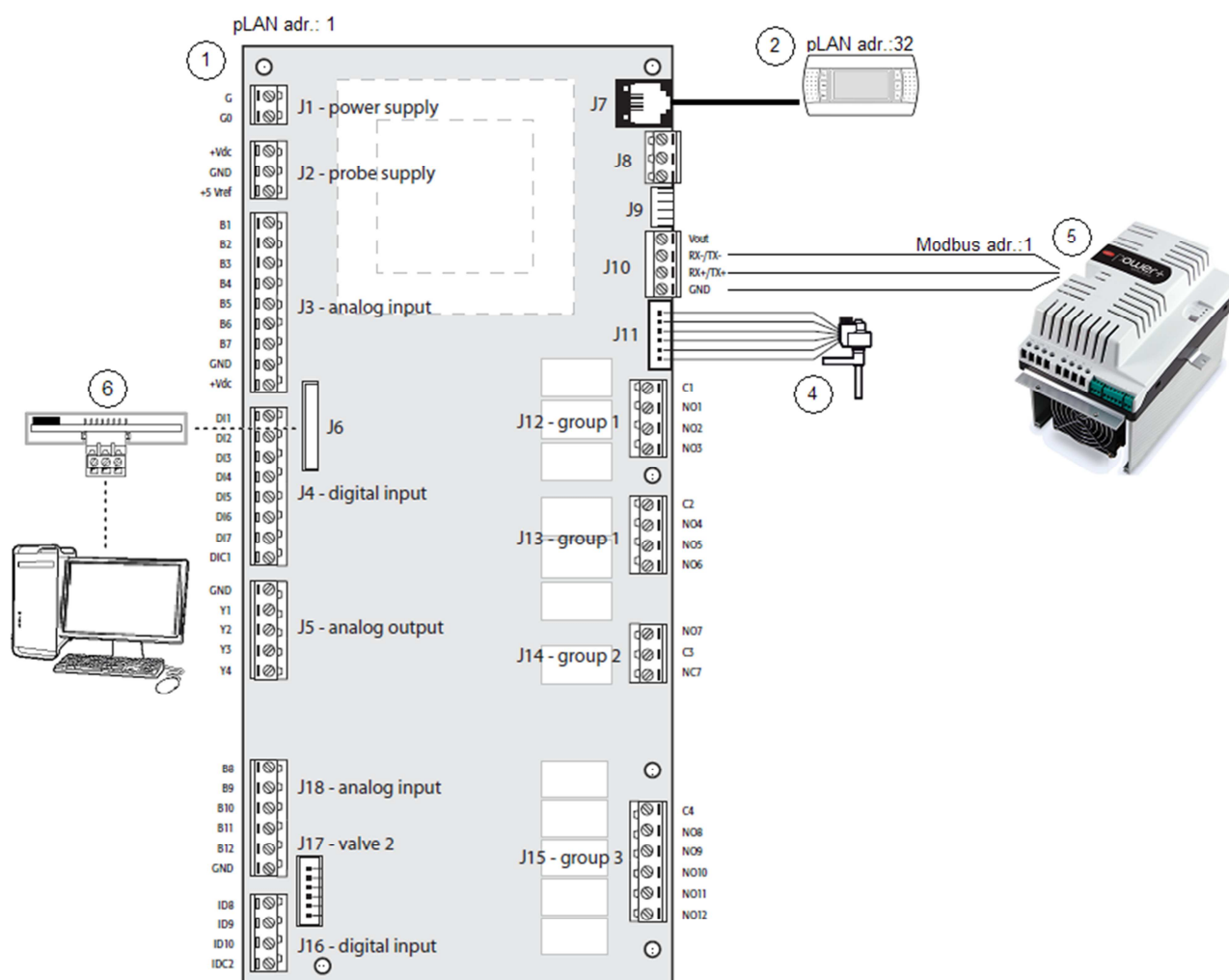
It goes without saying that correct installation of the unit, performance of checks and controls before start-up and routine maintenance will be performed according to Blue Box information in the relative manual.

We would like to thank in advance anyone collaborating by signalling errors, parts that require further explanation or functioning modes not stated.

2. SYSTEM ARCHITECTURE

2.1 Main control components

The following figure illustrates the system's architecture formed by the μ PC programmable board on which the FLBB0mHPGU application is installed and the main components connected to it, which, however, depend on the unit's configuration.



	Description
1	μ PC Board
2	pDG1 terminal + telephone cable
4	Unipolar electronic expansion valve (with driver integrated into the μ PC board)
5	Inverter Power+ to drive the BLDC compressor
6	Serial board for BMS

3. USER INTERFACE

3.1 Terminal

The user interface consists of a display with 8 rows and 22 columns with 6 keys. Through this interface, you can start and stop the unit, set the parameters and check the operation.



The functions of the six keys are:



The “**up arrow**” key: used to scroll the masks of the various sections, which are modified by increasing the selected values.



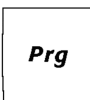
The “**down arrow**” key: used to scroll the masks of the various sections, which are modified by decreasing the selected values.



The “**enter**” key: confirms the selection made to access the various sections, provides access to the values that are to be modified with the arrow keys and confirms the modification made.



The “**alarm**” key: lights up if an anomaly or alarm is signalled; all the active alarms are displayed and possibly deleted when pressed.



The “**Prg**” key: provides access to the loop of masks of the various branches.



The “**Esc**” key: is used to return to the upper mask level.

4. PROGRAMMING OF THE CONTROL

4.1 PROGRAMMING BOARDS



During work phases on the unit it is essential to pay attention to the safety devices prescribed by the company for accident prevention and safety regulations in force.

Boards are programmed via computer.



Before electrically powering the μ PC board, make the connection between the μ PC board and the computer and start the programming software.



Disconnect all the serials connected to the μ PC board before programming. The serials are to be reconnected after programming completion and before turning on the unit.

Before installing the files in the "Application" drop-down, check that the "bios" on the board has the same version as that with which the software was approved.

If not, update the "bios" before downloading the "Application" drop-down files:



The boards must be programmed by individually powering them.

If more boards are present, set the addressing in the manual before connecting them via serial.

4.2 Programming description with PCO manager

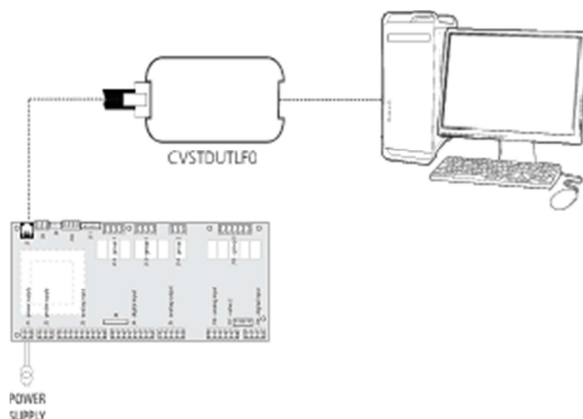
PCO Manager is a program that supervises all configuration, debugging, and maintenance operation of the CAREL PCO system devices.

4.2.1 PCO Manager installation

On the website <http://ksa.carel.com>, in the PCO system section, select PCO_manager. After accepting the general licence terms for free use of the software, a window opens with the option to download the file PCO_manager.zip. Install the program on the computer.

4.2.2 PC Connection - μ PC control

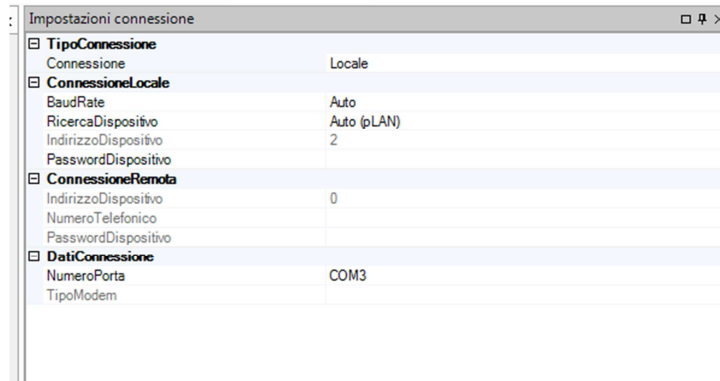
The computer's USB port must be connected with an enabled cable for the cable USB/RS485 converter and this must be connected with a telephone cable to the μ PC's pLAN port.



When the PCO_manager program opens, a screen appears in the upper right part the connection settings appear. Select:

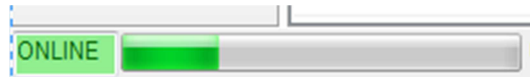
- 1) local connection;
- 2) baud rate: Auto;
- 3) find device: Auto (pLAN).

With reference to the port number, follow the wizard's instructions for automatic identification (for example COM4).



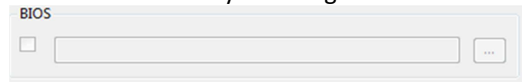
Use the mouse to click on the icon  to start the connection and power the μ PC* board.


When the word "ONLINE" appears in the bottom left corner, the connection between the μ PC* board and the computer is enabled.



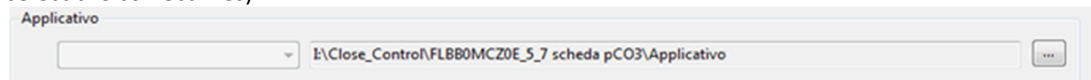
4.2.3 Board programming


Select the bios file by checking the BIOS field box



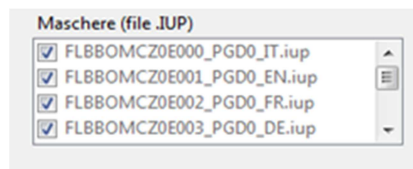
and search for the file in the path selected for saving through the key 

At this point, select the application (Caution: the paths shown in the pictures below serve only as a guide, carefully select the correct files):

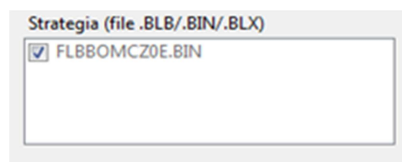


and search for the file in the path selected for saving through the key 

In the drop down menu select the *iup checking the box for the language required.

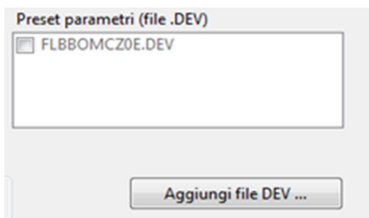


Now select the *BIN file.

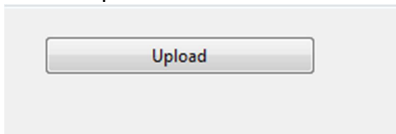


Select the *DEV file.

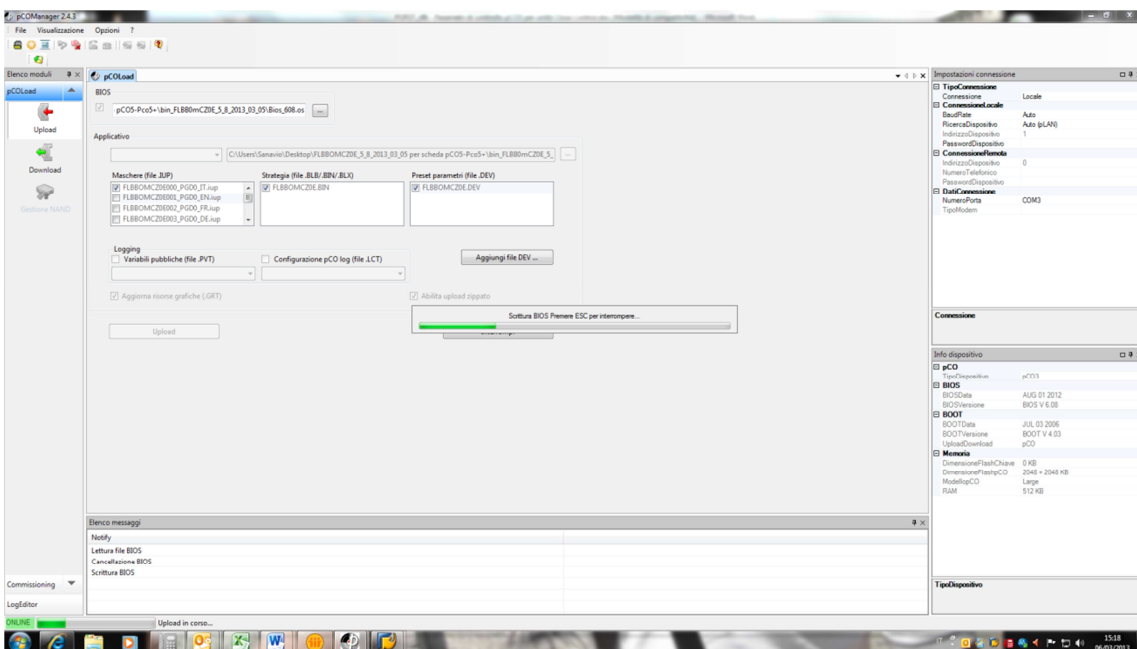
The *DEV file in the application inserts the default file, but the operator can download the most suitable *DEV file for the machine to be programmed by selecting via the key "Add DEV file..."



Now it is possible to start the download procedure clicking on the "Upload" key.



Wait for the procedure to finish.



Once programming is complete remove power from the μ PC board and disconnect the RS485 converter.

4.2.4 Addressing the terminal




The terminal's address must be set to 32.

It is impossible to configure the terminal's address only after having supplied power to it through the FJ12 connector. To enter configuration mode simultaneously press **↑**, **↓** and **←** for at least 5 seconds; the terminal will display a mask similar to the following, with the cursor flashing in the upper left corner:

```
Display address
setting.....:32
I/O Board address:01
```

To change the terminal address ("Display address setting"), the following operations must be performed in sequence.

1. Press once **←**: the cursor will move to field "Display address setting".

2. Select the desired value through  and , confirm pressing  again
3. If the value selected is different from the one stored, the following mask and the new value will be stored in the display's permanent memory.

```
Display address
changed
```



Note: if during functioning the terminal detects the μ PC board's idle state of which output is being displayed, it will completely erase the display and the following message (or similar) will appear:

```
I/O board 01 fault
```

If the terminal detects the inactivity of the entire pLAN network, that is it does not receive any message from the network for 10 consecutive seconds, it will completely erase the display and the following message will appear:

```
NO LINK
```

4.2.5 Addressing of the μ PC board

To complete the installation procedure, the pLAN address must be set on the μ PC board; the μ PC/ μ PC^{xs} controllers do not have dipswitches for network pLAN addressing: the pLAN address change is made through any gGD1 terminal.

1. Set the address to 0 on the terminal, (refer to the previous sections for details on how to select such address).
2. Remove power from the μ PC.
3. Remove any pLAN connections with other boards from the μ PC board.
4. Connect the terminal to the μ PC.
5. Power the μ PC, by simultaneously pressing the UP and ALARM keys on the terminal. After a few seconds, the μ PC begins a start sequence and a screen similar to the following will appear on the display:


```
#####
selftest
please wait...
#####
```

Wait 10 seconds after the screen appears and then release the keys.

The μ PC interrupts the start sequence and shows a configuration screen similar to the following:

```
PLan address: 0
UP: increase
DOWN: decrease
ENTER: save & exit
```

At this point, change the pLAN address via the terminal keys  and .

1. Confirm the address pressing the key : the μ PC board completes the start sequence and uses the address specified.
2. Set the PGD1's address to 32



Attention: if the settings are not correct, the text and images on the display will appear incorrect.



5. DESCRIPTION OF THE MENU

5.1 Control menu

The series of information that appears on the display is collected in masks which, in turn, are grouped into homogeneous groups.

You can access some functions at any time through the keys, while others are present only when there are the necessary conditions (e.g. signal and alarm conditions).

The masks that can be accessed at any time are organised in a flow chart, with a main menu and various subgroups. Some menus are accessible only via password and are reserved for Assistance or for the Manufacturer.

Some control functions are not active, but the name is only present on the menu with its masks.

5.1.1 Main screen

The rows of the main screen display are organised as follows:



1- indications of date and time;

2- main parameters and active request:

	No active request
	Cold water request from the main circuit (hydronic) or cold operation (direct expansion)
	Cold water request from the main circuit (hydronic) or cold operation (direct expansion); for reversible heat pump units only

3- main active components:


	Compressor switched on
	Main circuit pump switched on (if present)
	Active integration system (heater or boiler) (if present)
	Defrost in progress (for reversible heat pump units only)
Smartlink	Machine connected to Swegon unit is controlled with Smartlink

4- unit status:

The states in which the unit can be found are as follows:

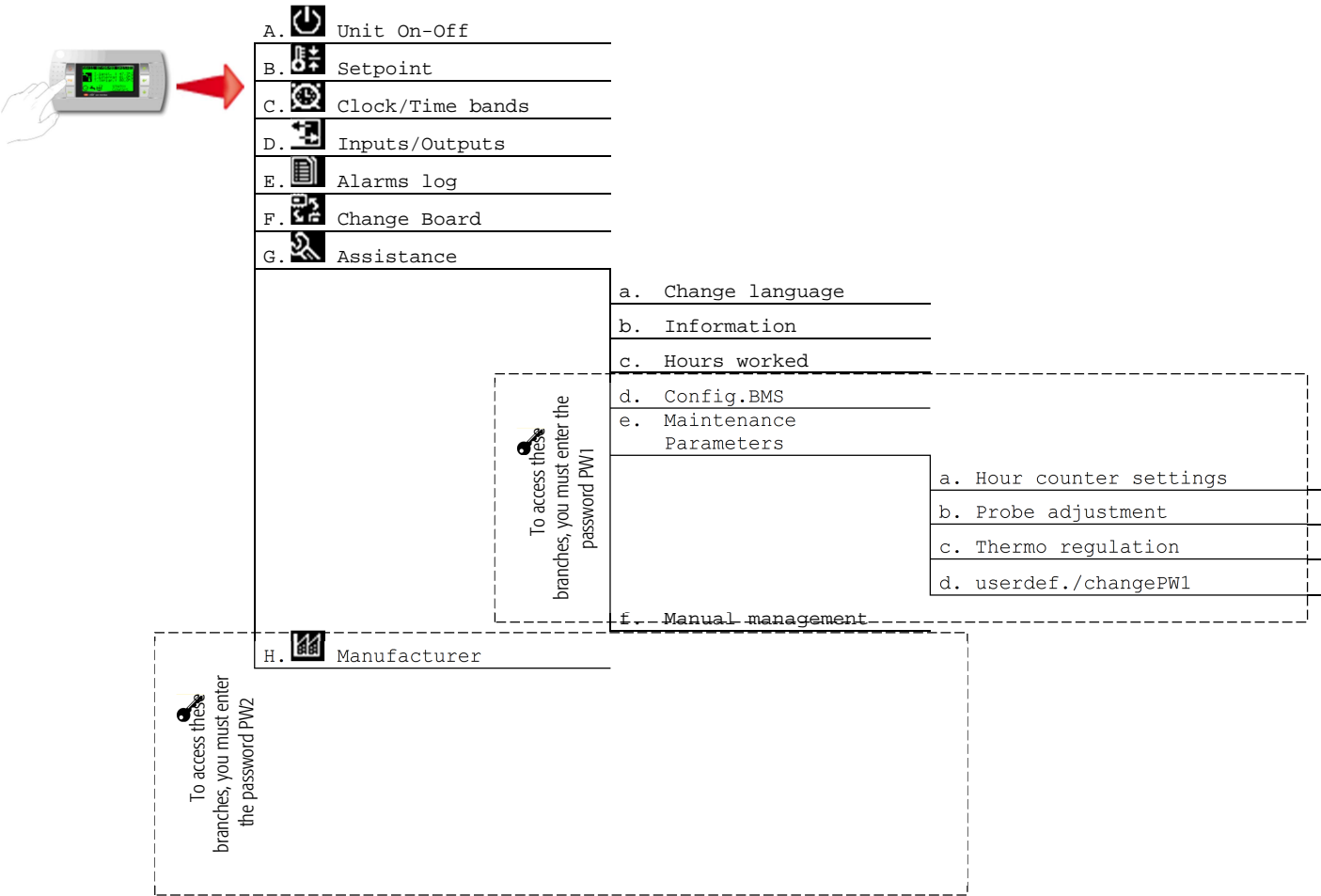
ON	Unit switched on (standard setpoint)
ENERGY SAVE	Unit switched on (energy save setpoint)
OFF	Unit switched off from the keyboard
Auto-ON	Unit switched on (time band operation, standard setpoint)
Auto-E.S.	Unit switched on (time band operation, energy save setpoint)
Auto-OFF	Unit switched off (time band operation)
BMS-OFF or Din-OFF	Unit switched off remotely
Alarm-OFF	Unit switched off due to alarm
Protect	Unit in stand-by for temporary Unit Off enabling

5.1.2 Structure of the menus

By pressing the  key, you will access the navigation screen of the main menu:



The following are the eight menus with their respective sub-menus:




Access to password-protected branches is reserved to authorised Service Centres or to the Manufacturer.



6. USER MENU

6.1 Introduction

This chapter describes the unit's main functions, which can be accessed from the user menu without password use.


6.2 A. On/Off Unit

From the main screen, press the  key

With the arrows, move the cursor over menu A. Unit On/Off  and press the  key
The following screen will appear:

```
+-----+
| Unit On/Off      A01 |
| Hydronic unit    |
| Summer           |
| ON               |
+-----+
```

The first row shows the unit type (not editable).

By pressing the  key, the cursor will blink on the second row (only if unit is OFF) where you can select the unit status with the arrows:




SUMMER

WINTER

The WINTER status is only available if the unit is a heat pump or a reversible condensing unit.

The change of the status can be carried out only if the unit is OFF.

The status change can also be carried out by an external controller via a digital input; this function inhibits the status change from keyboard and must be enabled by an authorised Service Centre.


By pressing the  key, the cursor blinks on the third row where, by pressing the  and  keys, you can turn the unit on or off by selecting one of the available modes:

ON = unit switched on


OFF = unit in stand-by

ENERGY SAVING = unit switched on with a setpoint different than the standard ones, for energy saving (function not available for condensing unit and reversible condensing unit)

AUTO = the switching on-off of the unit is determined according to the time bands set with the scheduler.

Once the mode is selected, press the  key to confirm.

Note: the unit's switching on and off is time-controlled.


By pressing , you will pass to the next mask A02 (for hydronic units only), where you can enable or disable the temporary unit function OFF; this function allows you to stop the unit, setting it in the OFF mode, to then let it start again at the set time (date and time).



```



+-----+
| On/Off Unit      A02 |
|                  |
| Off temporary unit|
| enabling:        NO |
| Restart the:     00/00/00 |
| Time:           00:00 |
|                  |
| Enable the function: NO |
+-----+


```

To enable the function:

Press the  key and, with the arrows, select YES in the "temporary unit enabling Off" row.

By pressing the  key, the cursor will blink on the unit reboot date; set the date with the arrows and press  to confirm.

By pressing the  key, the cursor will blink on the unit reboot time; set the desired time with the arrows and press  to confirm (Note: you can only set the hour, not the minutes).

Press the  key and select YES with the arrows in the "Start function" row.

The unit status displayed on the main screen will change into "Protect" (see par. 3.1.1); the unit will enter the stand-by mode and will reboot at the set date and time.

Warning: before activating this function, make sure that the unit's clock (date and time) is correctly set (see par. 4.4).

Add.	Message displayed	Description	Default	U.M.	Min	Max	Possible values
A01	Hydronic unit Condensing unit (depending on the type of unit selected)	Summer/Winter selection (for reversible units)	Summer	---			0: Inverno 1: Estate
		On/Off time bands if enabled	OFF	---			0: OFF 1: ON 2: ENERGY SAVE 3: AUTO
A02	Enabling Off temporary unit:	Enable function "Restart the"	NO				0: NO 1: SI
		Day restart function "Restart the"	---	dd			
		Month restart function "Restart the"	---	mm			
		Year restart function "Restart the"	---	yy			
		Hour restart function "Restart the"	---	h			
	Enable the function:	Start the function "Restart the"	0	---			0: NO 1: SI

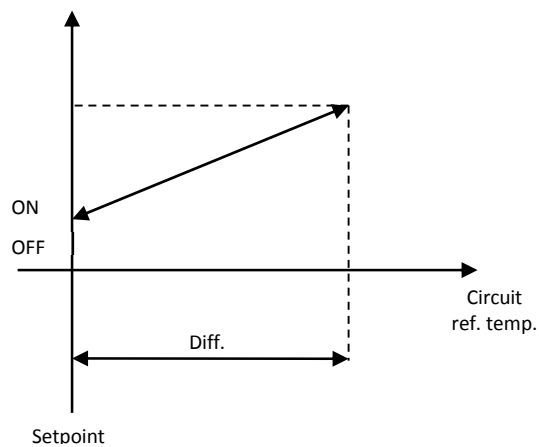
6.3 B. Setpoint

The menu allows setting the setpoint for the chiller and heat pump units; you cannot set the setpoint for the condensing and reversible condensing units because the request originates from the connected external unit

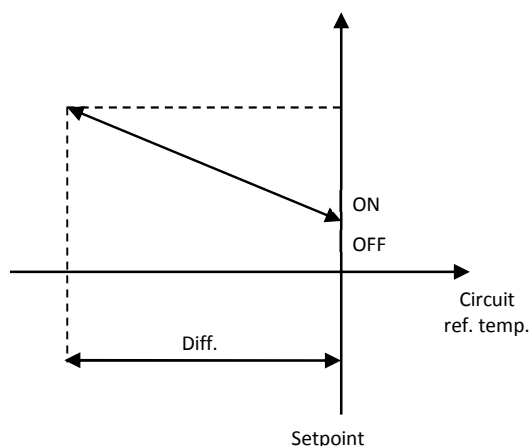
For hydronic units, the main adjustment handled by the control is carried out on the water temperature at the water circuit infeed.

The adjustment band and the type of adjustment are established by the manufacturer, any winter temperature compensation (accessory) and temperature limits are set in the Assistance branch.


The following diagram shows the summer thermostat control for the compressor, referring to the chiller working setpoint:





Instead, the following diagram shows the winter thermostat control for the compressor, referring to the heat pump's working setpoint (for reversible units):



In the winter operational mode, electrical heaters inserted in the heat exchanger or boiler which receives a remote on-off and works with its own set setpoint can be used as system integration or replacement for the heat pump. The activation of the integrated source occurs for external air temperature; this setting is performed in the appropriate mask in the Assistance branch.


To set the setpoints, press the  key from the main screen

With the arrows, move the cursor over menu B. Setpoint  and press 
The following mask will appear to set the nominal operating setpoint in chiller and in heat pump modes (the latter, if unit is reversible):

```

+-----+
| Heat regulat. Unit B01 |
| Temp.PdC               |
|                         |
| Nominal setpoints (ON) |
|   Cooling:  7.0°C      |
|   Heating:  45.0°C     |
|                         |
+-----+



```

To pass to the mask with the energy save setpoints, press the  key

```

+-----+
| Heat regulat. Unit B02 |
| Temp.PdC               |
|                         |
| Setpoint energy save   |
|   Cooling: 10.0°C      |
|   Heating:  40.0°C     |
|                         |
+-----+

```

In both masks, by pressing the  key, the cursor highlights the setpoint values to be edited from time to time; set the desired value using the arrows and press the  key to confirm the set value and move to the next value.

The table describes the different branch mask fields.

Add.	Message displayed	Description	Default	U.M.	Min	Max	Possible values
B01	Temp.PdC Setpoint nominali (ON) Raffrescamento:	Comfort temperature setpoint (summer)	7.0	°C	5.0	18.0	
	Riscaldamento:	Comfort temperature setpoint (winter) only in reversible units	45.0	°C	30.0	50.0	
B02	Temp.PdC Setpoint energy save Raffrescamento:	Economy temperature setpoint (summer)	10.0	°C	5.0	18.0	
	Riscaldamento:	Economy temperature setpoint (winter) only in reversible units	40.0	°C	30.0	50.0	

NOTE: LE motocondensing units and LE/HP reversible motocondensing do not have values that can be set in the Setpoint menu, for these branch B. units, Setpoint only appears for the B03 mask that shows the percentage of required power to the compressor (display only), coming from the external signal.






```

+-----+
| Heat regulat. B03 Unit |
|                         |
| Power required at      |
| compressor:            |
|                         |
|                         |
|                         |
|                         |
|                         |
|                         |
+-----+

```

6.4 C. Clock/Time bands


The control is equipped with an internal clock with backup battery that keeps the date and time even with the machine is switched off. The setting of the date and time is carried out through the first mask of the object menu: by

pressing the  key, the cursor highlights the fields to edit from time to time by pressing the  and  keys; set the values by pressing the  key to confirm the set value and you will pass to the next field.

```

+-----+
| Clock                C01 |
|                         |
| Day:                 Monday |
|                         |
|                         |
|                         |
| Date:                dd/mm/yy |
|                         |
|                         |
| Time:                00:00 |
|                         |
+-----+

```

Once date and time are set, press the  key to pass to the screen where you can set the time bands.




The setting of time bands allows 4 operating ranges to be set for each day of the week. It is possible to set time bands for start-up/shutdown, and the status of unit operation from those available.

Warning: setting the time bands is possible only if the unit is in AUTO mode (see par. 4.2).

```

+-----+
| Clock                C02 |
|                         |
| Day MONDAY           |
| Copy in TUESDAY      NO |
| F1 08:30 ON          |
| F2 12:30 ENERGY SAVE |
| F3 13:30 ON          |
| F4 17:30 OFF         |
+-----+


```


For each day of the week, there are 4 programmable time bands (F1, F2, F3, F4). By pressing the  key and the  key, you can select the day of the week on which to programme the time bands; by pressing the  key, you can pass to the next rows allowing you to select the desired values with the arrows.


For each band, you must set:

- The starting hour of the time band;
- The status of the considered unit, which can be: ON, OFF, ENERGY SAVE (see par. Setpoint).

Once you have set the 4 time bands for a day, if you want to use them for other days of the week, you can copy them:

by pressing the  key, move the cursor on the second row and select the day of the week on which you want to

copy the programmed time bands with the arrows; press  and select Yes with the arrows; after a few seconds, if the operation was successful, the message <<SUCCESSFUL COPY>> will appear on the second row, which will disappear after about 5 seconds. Repeat this procedure if you want to copy the programmed day on other days of the week.

The key  will move you to the next screen where holiday periods (maximum 3) and their relative unit status (ON, OFF, SAVE ENERGY) can be enabled and set. The starting date Start and the end date Stop, expressed as dd/mm must be

set


for

each



period.

The holiday periods are enabled by selecting YES from the first row, select NO for disabled.

```
+-----+
| Clock          C03 |
|Enab.holiday periods:NO |
|Start1 --/-- ON    |
|Stop1  --/--      |
|Start2 --/-- OFF   |
|Stop2  --/--      |
|Start3 --/-- ENERGY S. |
|Stop3  --/--      |
+-----+
```

The key  will move you to the next screen where special days (maximum 6), and their relative unit status (ON, OFF, SAVE ENERGY) can be enabled and set; other than those scheduled in time bands or during holiday periods. The date is expressed as dd/mm. The special days are enabled by selecting YES from the first row, select NO to disable the function.

```
+-----+
| Clock          C04 |
|Enab.special days: NO |
|SD1 --/-- OFF      |
|SD2 --/-- OFF      |
|SD3 --/-- OFF      |
|SD4 --/-- OFF      |
|SD5 --/-- OFF      |
|SD6 --/-- OFF      |
+-----+
```

The key  will move you to the next screen where daylight saving time can be enabled and set. Press the key  and the arrows to enable or disable the automatic switch to and from daylight saving time. The other parameters are set by default.

```
+-----+
| Clock          C05 |
|
|Daylight saving time:  ENABLE|
|Transit. time:  60min  |
|Start.:LAST SUNDAY|
|in MARCH      at 03.00|
|End:  LAST SUNDAY|
|in OCTOBER    at 03.00|
+-----+
```

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
C01	Giorno:	Day of the week calculated on the basis at the actual date		---			0: IT 1: Lunedì 2: Martedì 3: Mercoledì 4: Giovedì 5: Venerdì 6: Sabato 7: Domenica
	Data:	Day Setting (dd)		dd			
		Month setting (mm)		mm			
		Year setting (yy)		yy			
	Ora:	Hour setting		h			
		Minute setting		m			
C02 (fields enabled if "AUTO" enabled in the A01 mask)	Giorno	Setting of the day		---			0: LUNEDÌ 1: MARTEDÌ 2: MERCOLEDÌ 3: GIOVEDÌ 4: VENERDÌ 5: SABATO 6: DOMENICA
	Copia in	Day to be copied for time bands		---			0: LUNEDÌ 1: MARTEDÌ 2: MERCOLEDÌ 3: GIOVEDÌ 4: VENERDÌ 5: SABATO 6: DOMENICA
		Begin copy of the time bands for the actual day.		---			0: NO 1: SI
	F1	Hour setting start band 1		h			
		Minutes setting start band 1		m			
		Setpoint type setting band 1		---			0: OFF 1: ON 2: ENERGY SAVE
	F2	Hour setting start band 2		h			
		Minute setting start band 2		m			
		Setpoint type setting band 2		---			0: OFF 1: ON 2: ENERGY SAVE
	F3	Hour setting start band 3		h			
		Minute setting start band 3		m			
		Setpoint type setting band 3		---			0: OFF 1: ON 2: ENERGY SAVE
	F4	Hour setting start band 4		h			
		Minute setting start band 4		m			
		Setpoint type setting band 4		---			0: OFF 1: ON 2: ENERGY SAVE
C03	Abil.Periodi fest.:	Enabling of machine holiday periods.		---			0: NO 1: YES
	Start1	Day setting start period 1		dd			
		Month setting start period 1		mm			
		Setpoint type setting period 1		---			0: OFF 1: ON 2: ENERGY S.
	Stop1	Day setting end period 1		dd			
		Month setting end period 1		mm			
	Start2	Day setting start period 2		---			
		Month setting start period 2		---			

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
		Setpoint type setting period 2		---			0: OFF 1: ON 2: ENERGY S.
	Stop2	Day setting end period 2		dd			
		Month setting end period 2		mm			
	Start3	Day setting start period 3		dd			
		Month setting start period 3		mm			
		Setpoint type setting period 3		---			0: OFF 1: ON 2: ENERGY S.
	Stop3	Day setting end period 3		dd			
		Month setting end period 3		mm			
C04	Abil.giorni spec.:	Enabling of machine special days		---			0: NO 1: SI
	SD1	Day setting, special day 1		dd			
		Month setting, special day 1		mm			
		Setpoint type setting special day 1		---			0: OFF 1: ON 2: ENERGY SAVE
	SD2	Day setting, special day 2		dd			
		Month setting, special day 2		mm			
		Setpoint type setting special day 2		---			0: OFF 1: ON 2: ENERGY SAVE
	SD3	Day setting, special day 3		dd			
		Month setting, special day 3		mm			
		Setpoint type setting special day 3		---			0: OFF 1: ON 2: ENERGY SAVE
	SD4	Day setting, special day 4		dd			
		Month setting, special day 4		mm			
		Setpoint type setting special day 4		---			0: OFF 1: ON 2: ENERGY SAVE
	SD5	Day setting, special day 5		dd			
		Month setting, special day 5		mm			
		Setpoint type setting special day 5		---			0: OFF 1: ON 2: ENERGY SAVE
	SD6	Day setting, special day 6		dd			
		Month setting, special day 6		mm			
		Setpoint type setting special day 6		---			0: OFF 1: ON 2: ENERGY SAVE
C05	Ora legale:	Enable daylight saving time		---			0: DISABILITA 1: ABILITA
	Tempo transiz.:	Offset time		m			
	Iniz.:	Week of the month daylight saving starts		---			0: ULTIMA 1: PRIMA 2: SECONDA 3: TERZA 4: QUARTA

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
		Day of the week daylight saving starts		dd			0: *** 1: LUNEDI 2: MARTEDI 3: MERCOLEDI 4: GIOVEDI 5: VENERDI 6: SABATO 7: DOMENICA
	in	Month daylight saving starts		mm			0: 1: GENNAIO 2: FEBBRAIO 3: MARZO 4: APRILE 5: MAGGIO 6: GIUGNO 7: LUGLIO 8: AGOSTO 9: SETTEMBRE 10: OTTOBRE 11: NOVEMBRE 12: DICEMBRE
	alle	Hour of the day, daylight saving starts		h			
	Fine:	Week of the month daylight saving ends		---			: ULTIMA 1: PRIMA 2: SECONDA 3: TERZA 4: QUARTA
		Day of the week daylight savings ends		dd			0: *** 1: LUNEDI 2: MARTEDI 3: MERCOLEDI 4: GIOVEDI 5: VENERDI 6: SABATO 7: DOMENICA
	in	Month daylight savings ends		mm			0: 1: GENNAIO 2: FEBBRAIO 3: MARZO 4: APRILE 5: MAGGIO 6: GIUGNO 7: LUGLIO 8: AGOSTO 9: SETTEMBRE 10: OTTOBRE 11: NOVEMBRE 12: DICEMBRE
	alle	Hour of the day, daylight savings ends		h			

6.5 D. Inputs/Outputs

From this menu, you can view, in sequence:

- The values read by the probes connected to the analogue inputs;
- the physical state of the digital inputs;
- the physical state of the digital outputs;
- the values of the analogue outputs;
- the operating parameters of the cooling unit;
- the operating parameters of the inverter.

Inputs and outputs change according to the model and the unit's configuration. If the inputs or outputs have not been set (no device or probe connected) a symbol will appear "-" or the item relating to the mask will not be present.

Add.	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
D01	01 =Temp.scamb.aria:	Temperature of the external heat exchanger (finned-coil)	---	°C			
	02 =-						
D02	03 =-						
	04 =Temp.ritorno primario:	Main return water temperature (only for CH and HP units)	---	°C			
D03	05 =-						
	06 =Temp.aria esterna:	External air temperature	---	°C			
D04	07 =Mandata primario:	Main flow water temperature (only CH and HP unit)	---	°C			

Add.	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
	08 = -						
D05	09 =Mandata comp.:	Compressor discharge temperature	---	°C			
	10 =Aspiraz. comp.:	Compressor intake temperature	---	°C			
D06	11 =Condensazione:	Condensing pressure read by the high pressure transducer	---	barg			
	+	High pressure converted into temperature	---	°C			
	12 =Evaporazione:	Evaporation pressure read by the low pressure transducer	---	barg			
	+	Low pressure converted into temperature	---	°C			
D07	01=Term.ventilat.:	ID1= Fan circuit breaker	---	---			0: Nc 1: Na
	02=Estate/Inverno:	ID2=Summer/winter	---	---			0: Nc 1: Na
	03=Pressost. alta:	ID3=High pressure switch	---	---			0: Nc 1: Na
	04=Termici Pompe:	ID4= Thermal pump	---	---			0: Nc 1: Na
D08	07=A1.cald.integ:	ID7= Boiler alarm/electrical heater system integration	---	---			0: Nc 1: Na
	08=On/Off remoto:	ID8= On/off remote	---	---			0: Nc 1: Na
	09=-	-					
	10=Fluss.Primario:	ID10= Main circuit flow switch	---	---			0: Nc 1: Na
D10	01=Compres.:	NO1= Compressor 1	---	---			0: Off 1: On
	02=-	NO2= -	---	---			0: Off 1: On
	03=Pompa Primario:	NO3= Main circuit pump	---	---			0: Off 1: On
	04=-	NO4= -	---	---			0: Off 1: On
D11	05=Sbrinamento	NO5= Defrost (only for reversible unit)	---	---			0: Off 1: On
	06=Caldaia/res.:	NO6= Boiler/integrated electrical heater (if enabled)	---	---			0: Off 1: On
	07=A1.generale:	NO7= General alarm	---	---			0: Off 1: On
	08=-	NO8= -	---	---			0: Off 1: On
D12	09=-	NO9= -					
	10=Valvola 4 vie:	NO10= 4 way valve (only for reversible unit)	---	---			0: Off 1: On
	11=Summer/Winter	NO11= status change summer/winter (only for reversible unit)	---	---			0: Off 1: On
D13	01=-	Y1= -	---	%			
	02=-	Y2= -	---	%			
	03=-	Y3= -	---	%			
	04=Vent.bat.est.:	Y4= external battery fan percentages	---	%			
D14	SH:	Actual overheating	---	K			
		Intake temperature	---	°C			
		EEV Position	---	steps			
		Valve A percentage open	---	%			
	EVD:	EVD electronic expansion valve status		---			0: --- 1: Chius. 2: Chius. 3: Std-by 4: Pos 5: Pos 6: Att. 7: On 8: On 9: On 10: On 11: On 12: On 13: On 14: Iniz.

Add.	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
		Evaporation pressure	---	barg			
		Evaporation temperature;	---	°C			
D15	Stato ingresso dig. ID1:	External DI1 EVO EVD status (not utilised)	---	---			0: Aperto 1: Chiuso
	DI2:	External DI2 EVO EVD status (not utilised)	---	---			0: Aperto 1: Chiuso
D16	Regol. compressore Capacità rich.:	BLDC compressor power required from thermo regulation	---	%			
	Capacità reale:	BLDC compressor power limited by management envelope	---	%			
	Veloc.compr.:	Instantaneous speed of the compressor	---	rps			
	> Equalizzazione <	View pressure balance status (flashing)	---	---			
	> Zona 90rps <	Work area 1c - max speed 90 rps (only Siam)	---	---			
D17	Surriscaldamento gas scarico	Compressor discharge gas overheating	---	°C			
	Temperatura gas di scarico:	Compressor discharge gas temperature	---	°C			
D18	Capacità richiesta	Ability to request Power+	---	%			
	Capacità reale	Capacity actually delivered by the compressor	---	%			
	Veloc.compressore	Actual rotational speed of the compressor	---	rps			
	(status)	Operating status of the compressor (envelope area, start up alarm, etc.).	---	text			
D19	Dati involucro Press.cond.:	Discharge pressure	---	barg			
	Press.evap.:	Intake temperature		barg			
	Zona involucro:	Envelope area and description		---			0: 1: Dentro involucro 2: Alto rapp.compressione 3: Alta press.condens. 4: Alta corrente 5: Alta press.evapor. 6: Basso rapp.compression. 7: Basso delta P 8: Basso press.condens. 9: Basso press.evapor.
	Allarme tra:	Count time outside envelope	0	s			
D20	Dati involucro Diff.press.:	Delta pressure value	---	barg			
	Rapporto press.:	Pressure ratio calculated	---	---			
	>Bassa Diff.Press.<	Displays Delta P low status (flashing)	---	text			
	AL basso DP tra:	Count low delta pressure alarm time	---	s			
D21	Controllo gas di scarico Temperatura gas di scarico:	Compressor gas discharge temperature	---	°C			
	Stato:	Status of the exhaust gas temperature compressor, with reference to the envelope	---	text			Ok Controllata Limitata
	Zona:	Maximum exhaust temperature for the envelope area of the compressor where the working point is located	---	text			Massimo 120°C Massimo 110°C
D22	Regolazione EEV Surriscaldamento gas di scarico:	Discharge overheating (EVD)	---	K			
	Regolazione attiva:	Indicates whether overheating adjustment is enabled on the overheating discharge or on the intake one.	---	text			
D23	Power+ n°1 Stato drive [104]	Indicates the driver's status (inverter)	---	text			
	Codice allarme [105]	Indicates if the drive's alarm code is present	---	text			

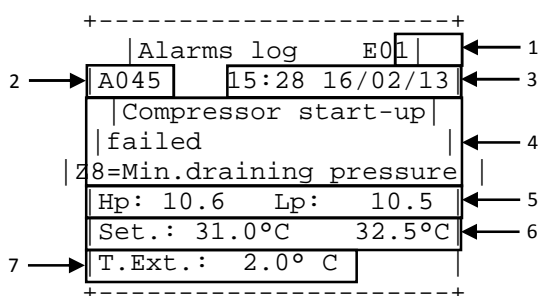
Add.	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
D24	Power+ n°1 Velocità motore [102]	Rotational speed of the BLDC compressor motor	---	Hz			
	Riferimento velocità [125]		---	Hz			
	Setp.frequ.effettivo [132]		---	rpm/Hz			
D25	Power+ n°1 Corrente motore: [109]	Motor current (instantaneous reading at the inverter terminals)	---	Arms			
	Tensione motore: [111]	Motor voltage (instantaneous reading at the inverter terminals)	---	Vrms			
D26	Power+ n°1 Potenza motore: [110]	Motor power (instantaneous reading at the inverter terminals)	---	kW			
D27	Power+ n°1 Tensione DC bus: [113]	DC bus voltage	---	Vdc			
	Ondulazione DC bus: [134]	Displays DC bus ripple variation	---	Vdc			
	Temperatura drive: [114]	Temperature Power+	---	°C			
D26	Power+ n°1 Freq.switch effettiva: [124]	Displays the actual PWM switching frequency	---	kHz			
	Registro di stato: [106]	Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Alarm drive	---	---			
		Reserved	---	---			
		A power phase is missing	---	---			
		Motor overcurrent	---	---			
		Self-tuning enabled	---	---			
		Reserved	---	---			
		Reduce switching frequency	---	---			
		Internal fan status 0: off 1: on	---	---			
		Undervoltage	---	---			
		Thermistor motor overtemperature	---	---			
		Relay status	---	---			
		Digital input safety status (Safety Torque Off)	---	---			
	Registro velocità: [107]	Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			
		Reserved	---	---			

Add.	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
		Reserved	---	---			
		Control flag to turn on - turn off the drive	---	---			
		Automatic speed reduction	---	---			
		Speed profile completed at least once	---	---			

6.6 E. Alarms log

To view the active alarms and for the alarm description, refer to ch. 5.

From this menu, you can view the sequence of the alarms log by scrolling them with the arrows.



The information contained in this mask is as follows:

1. the number of the logged alarm;
2. the alarm code (v. cap. dedicated to the alarms);
3. the time and date of the alarm
4. brief description of the logged alarm
5. the pressure values in bar (high Hp and low Lp) of the cooling circuit when the alarm occurred;
6. the evaporator water inlet and outlet temperature values in °C of the plate heat exchanger when the alarm occurred (for hydronic units only);
7. the value external air temperature in °C when the alarm occurred.

Note: The maximum number of alarms that can be logged is 50; exceeded this number, newer events are overwritten on the older ones and are therefore deleted.

The alarm can only be reset by an authorised Service Centre, from the path G.Service →f.Parameter service→d.Def.user/changePW1 (refer to the paragraph dedicated to the Assistance menu).

Index	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
E0	Storico Allarmi E0	Alarm code	---	---			0: --- 1: ALXXX ecc.
		Alarm hour	---	h			
		Alarm minutes	---	m			

Index	Message displayed	Description	Def.	U.M.	Min	Max	Possible values
		Alarm description	---	---			---- Flus. Impianto Termico Pompe Termico P. Imp. Termico Comp. 1 Alta Pressione 1 Bassa Pressione Antigelo Imp. Sonda B1 Guasta Sonda B2 Guasta Sonda B3 Guasta Sonda B4 Guasta Sonda B5 Guasta Sonda B6 Guasta Sonda B7 Guasta Sonda B8 Guasta Sonda B9 Guasta Sonda B10 Guasta Alta Pres.Tras. Bassa Pres.Tras. Termico Ventilatore Errore involucro Sbrinam. tempo max Inverter compressore/i Power Plus AL generico Power Plus off-line
	Prim.:	Input main circuit temperature when the alarm has been enabled	---	°C			
	Usc.:	Output main circuit temperature when the alarm has been enabled	---	°C			
	Geoth: Ingr.	Geothermal input temperature when the alarm has been enabled (displayed on if WW machine)	---	°C			
	Usc.	Geothermal output temperature when the alarm has been enabled (displayed only on WW machine)	---	°C			
	T.est.:	External battery temperature when the alarm has been enabled (displayed only on AW machine)	---	°C			
	ACS:	Domestic hot water temperature when the alarm has been enabled	---	°C			
	Press: HP	High pressure when the alarm has been activated	---	barg			
	LP	Low pressure when the alarm has been activated	---	barg			

6.7 F. Change Board

This branch has only a mask for reference where you can see all the devices connected in pLAN with its address:

- function board;
- display.

7. ASSISTANCE MENU

7.1 G. Assistance


This chapter describes the main functions which can be accessed from the Assistance menu. Some submenu's are accessible only with a password.




Attention: improper modification of some parameters may cause a malfunction or failure of some components or unit.

From this menu, you can access the submenu for Assistance, divided into two parts; the first (submenu **a, b, c, d**) is not password-protected, the second (submenu **e, f, g**) is password-protected and allows access to authorised Service Centres only.

7.2 G.a. Change language

The group of masks in this branch allows the selection of one of the available languages. Press the  key to change language.

The key  will display the next screen, where the language selection mask can be enabled or disabled at unit start-up and set the display time of such mask. This function is disabled by default.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Ga01	Lingua: ITALIANO ENTER per cambiare	Allows the selection of the control language	Factory setting according to customer requirements	---			ITALIANO ENGLISH FRANCAIS DEUTSCH
Ga02	Disabilitazione maschera di selezione lingua all'avvio:	Allows the language change mask to be disabled on start-up	YES	---			0: NO 1: SI
	Tempo visualizz.:	Count starting value, language change mask persistence time	60	s			

7.3 G.b. Information

The branch consists of 4 masks, for reference only:

- in the first mask of the branch, you can find information concerning the application's code and its version;
- the second mask lists the information concerning the control board hardware;
- the third one lists the versions of the driver software of the electronic expansion valve;
- the fourth mask displays the inverter software versions.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gb01	Carel Industries S rl Codice: FLSTDmH PGU Ver.:	Code, version and application data	---	---			
	Manual code: Bios:	Carel manual code Bios number-version	---	---			
	Boot:	Boot number-version	---	---			
Gb02	Tipo scheda:	Type of control pCO	---	---			0: pCO2 1: pCO1 2: pCO2 3: pCOC 4: pCOxs 5: pCO OEM 6: --- 7: pCO3 8: SuperNode 9: --- 10: pCO5 11: pCOCompact
	Ta9lia scheda:	Type of board	---	---			

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
	Memoria flash:	Indicates the size of the memory bank 0 of the control (KB)	2048	KB			
	Memoria RAM:	Indicates the size of the memory bank 1 of the control (KB)	512	KB			
	Tipo built-in:	Type of built-in display	0	---			0: None 1: PGD0 2: PGD0 3: PGD1
	Ciclo macchina:	Application program cycles per second	---	cycles/s			
	cicli/s	Application program running cycle time	---	ms			
Gb04	Power+ n°1 Versione firmw.:	Firmware Power+ Version	---	---			
	Service version:	Power+ assistance version	---	---			
Gb05	Power+ n°1 Versione boot:	Boot loader Power+ Version	---	---			
	FW Release:	Software Power+ version	---	---			
	FW Chekcsu:	CRC Software Power+	---	---			
	MC versione:	Power+ motor version	---	---			
	Hardware ID:	Carel Power+ ID HW	---	---			
Gb07	Serial Number:	Unit's serial number	---	---			
	Test Date:	Date in which the test was carried out in the factory	---	---			
	Tester Code:	Code of the tester who carried out the test	---	---			

7.4 G.c. Heat regulator unit

The branch is empty.

7.5 G.d. Hours worked

View the working hours of the main moving parts (pumps, compressors, fans) present in the unit and that depend on the configuration type and number of defrost cycles. The moving parts may require periodic maintenance; in regards to this, please refer to the installation, operation, and service manual.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gd01	Compressore 1:	Compressor 1 hour counter	---	---	0	999999	
	Pompa Primario:	Main circuit pump hour counter	---	---	0	999999	
	Vent.Batt.Ext.:	Fan external battery hour counter (AW machines)	---	---	0	999999	
Gd02	Num.defrost:	Defrosting number for reverse cycle	---	---	0	32767	

IMPORTANT NOTE: from this branch on an access password is required; the password for the Assistance menu's protected branches is 0200.

7.6 G.e. Config. BMS

The branch allows the parameters to be set for the unit's management in the network: communication protocols, communication speed, network address.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Ge01	Prot. comunicazione:	BMS protocol setting	ModBus RS485 Or protocol required by the customer	---			0: --- 1: CAREL RS485 2: ModBus RS485 3: PCoload local
	Velocità :	BMS speed setting	38400	baud			1200 2400 4800 9600 19200 38400
	Indirizzo:	Selection no. address for BMS	1 Or network address required by the customer	---			

7.7 G.f. Assistance Parameters

The branch allows the main parameters for Assistance The limits for some parameters are established in the Manufacturer's menu



7.7.1 Hour counter settings

 ->  **G.Assistenza**
 ↳ **f.Parametri assistenza**
 ↳ **a.Impostaz. contatore**

From this menu the threshold for the hour counter for the different devices can be set as well as resetting the hour counter.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfa01	Soglie componenti (h) Compressori:	Compressor hour counter threshold	0	---	0	999	
	Pompe:	Pump hour counter threshold	0	---	0	999	
	Ventilatori:	External fan hour counter threshold	0	---	0	999	
Gfa02	Reset Contatore Compressore 1:	Reset compressor 1 hour counter	NO	---			0: NO 1: SI
	Pompa Primario:	Main circuit pump hour counter	NO	---			0: NO 1: SI
	Vent.batteria ext:	Reset external fan hour counter	NO	---			0: NO 1: SI
	Num.sbrinamenti:	Reset defrosting number hour counter	NO	---			0: NO 1: SI

7.7.2 Probe calibration

 ->  **G.Assistenza**
 ↳ **f.Parametri assistenza**
 ↳ **b.Taratura sonde**

From this menu it is possible to enable and disable the unit's probes, as well as calibrate the probe's reading through the calibration of an offset setting, if the values detected from one or more probes differ from the values measured with other precision tools.

Depending on the unit type, version, and accessories, the probes will be different.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfb01	B1:	Enable/Disable B1 analogue input Air temp. exchange (external battery) Always enabled	YES	---			NO SI
	Ofs:	Offset calibration of B1 probe	0.0	°C			
	Snd:	Value read by the probe + offset	---	°C			
	B4:	Enable/Disable B4 analogue input Main return water temperature Enabled only for hydronic units (only for CH and HP units)	YES (CH and HP) NO (LE and LE/HP)	---			NO SI
	Ofs:	Offset calibration of B2 probe	0.0	°C			
	Snd:	Value read by the probe + offset	---	°C			
Gfb02	B5:	Enable/Disable B5 analogue input External power Enabled only for LE and LE/HP units	NO (CH and HP) YES (LE and LE/HP)	---			NO SI
	Ofs:	Offset calibration of B5 probe	0.0	°C			
	Snd:	Value read by the probe + offset	---				
	B6:	Enable/Disable B6 analogue input External air temperature Always enabled	YES	---			NO SI
	Ofs:	Offset calibration of B6 probe	0.0	°C			
	Snd:	Value read by the probe + offset	---	°C			
Gfb03 (mask enabled only for CH and HP)	B7:	Enable/Disable B7 analogue input Flow temp. main circuit Enabled only for hydronic CH and HP units	YES (CH and HP)	---			NO SI
	Ofs:	Offset calibration of B5 probe	0.0	°C			
	Snd:	Value read by the probe + offset	---	°C			
Gfb06 (mask enabled if EVO integrated)	S1 offset:	Internal EVD: offset low pressure	0.0	barg			
	S1 sonda:	Value read by the probe + offset	---	barg			
	S2 offset:	Internal EVD: offset intake temperature	0.0	°C			
	S2 sonda:	Value read by the probe + offset	---	°C			
Gfb07 (mask enabled if EVO integrated)	S3 offset:	Internal EVD: offset probe S3 (high pressure transducer)	0.0	barg			
	S3 sonda:	Value read by the probe + offset	---	barg			
	S4 offset:	S4 probe offset calibration (T compressor discharge)	0.0	°C			
	S4 sonda:	Value read by the probe + offset	---	°C			

7.7.3 Thermo regulation



G.Assistenza

↳ **f.Parametri assistenza**

↳ **c.Termoregolazione**

From this menu the main parameters for thermo regulation of the unit can be set.

7.7.3.1 Change summer/winter selection

The Gfc01 mask is required to change summer/winter selection from the keyboard or from digital input.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc01	Controllo ambiente Estate/inverno selezione da:	Enable status change selection from the keyboard or from the digital input (only HP and LE/HP)	KEYBOARD DIGITAL INPUT if required	---			TASTIERA INGRESSO DIGITALE

7.7.3.2 Integrated devices to the main heat pump

The following group of masks is required to set the heat pump's integration devices (boiler or electric heaters).

If the integration devices selected are electric heaters, the activation of the heaters themselves can take place as a function of external air temperature.

If the integration device selected is the boiler, it is possible to set its activation as a function of the external air temperature as well as economical convenience between the boiler and the heat pump.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc03	Main integration	Select integration device at main (where present) (only HP and LE/HP)	NONE Enabled BOILER or EL. HEATER if required	---			0: NESSUNA 1: CALDAIA 2: RESISTENZE EL.
	Richiesta come:	Type of integration intervention at the main (only HP and LE/HP)	ENABLED PDC REPLACEMENT Selectable only if the integration device is the boiler	---			0: INTEGRAZIONE A Pdc 1: SOSTITUZIONE A Pdc Selectable only if the integration device is the boiler
Gfc04 (mask enabled if boiler enabled)	Enabling the boiler depending on the:	Integrative boiler enabling mode	EXTERNAL AIR T.	---			0: T.ARIA ESTERNA 1: CONVENIENZA ECONOMICA
	Ritardo attivazione caldaia:	Time delay for enabling the boiler	5	min	0	999	
Gfc05 (mask enabled if boiler enabled + economical convenience)	Convenienza economica		0	---			0: 1: >> No sonda esterna <<
	Rendim. caldaia: %	Boiler performance setting	0	%	0	110	
	Combustibile:	Select type of FUEL Methane LPG	1	---			0: METANO 1: GPL
		Cost in Euro cents for m3 or litre of fuel	80	c€	0	999	0: Costo metano/m3 : c€ 1: Costo GPL/l : c€
	Temp.Di cambio:	Resulting calculation of the temperature change between heat pump and boiler	0.0	°C			
Gfc06 (mask enabled if boiler enabled + economical convenience)	Costo energia elettr. Giorno ---	Day setting for the time band's consumption of electric energy	0	---			0: LUNEDI 1: MARTEDI 2: MERCOLEDI 3: GIOVEDI 4: VENERDI 5: SABATO 6: DOMENICA
	Copia in--- --	Allows the copy of the time bands for single days.	1	---			0: LUNEDI 1: MARTEDI 2: MERCOLEDI 3: GIOVEDI 4: VENERDI 5: SABATO 6: DOMENICA

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
	F1 ---:-- cent/kWh=	Hour setting start band 1	0	---	0	24	
		Minutes setting start time band 1	0	---	0	60	
		Cost setting time band 1	0	---	0	999	
	F2 ---:-- cent/kWh=	Hour setting start time band 2	0	---	0	24	
		Minute setting start time band 2	0	---	0	60	
		Cost setting time band 2	0	---	0	999	
	F3 ---:-- cent/kWh=	Hour setting start time band 3	0	---	0	24	
		Minute setting start time band 3	0	---	0	60	
		Cost setting time band 3	0	---	0	999	
	F4 ---:-- cent/kWh=	Hour setting start time band 4	0	---	0	24	
		Minute setting start time band 4	0	---	0	60	
		Cost setting time band 4	0	---	0	999	
Gfc07 (mask enabled if boiler enabled + economical convenience)	Abil.Giorni Speciali	Enable energy cost special days	0	---			0: NO 1: SI
	SD1 --/-- cent/kWh =	Day setting, special day 1	0	---	0	31	
		Month setting, special day 1	0	---	0	12	
		Cost setting special day 1	0	---	0	999	
	SD2 --/-- cent/kWh =	Day setting, special day 2	0	---	0	31	
		Month setting, special day 2	0	---	0	12	
		Cost setting special day 2	0	---	0	999	
	SD3 --/-- cent/kWh =	Day setting, special day 3	0	---	0	31	
		Month setting, special day 3	0	---	0	12	
		Cost setting special day 3	0	---	0	999	
	SD4 --/-- cent/kWh =	Day setting, special day 4	0	---	0	31	
		Month setting, special day 4	0	---	0	12	
		Cost setting special day 4	0	---	0	999	
	SD5 --/-- cent/kWh =	Day setting, special day 5	0	---	0	31	
		Month setting, special day 5	0	---	0	12	
		Cost setting special day 5	0	---	0	999	
	SD6 --/-- cent/kWh =	Day setting, special day 6	0	---	0	31	
		Month setting, special day 6	0	---	0	12	
		Cost setting special day 6	0	---	0	999	
Gfc08 (mask enabled if boiler enabled)	Impostazioni caldaia Setpoint att.:	Boiler activation setpoint for integration to the main circuit	5.0	°C			
	Differenziale:	Boiler differential activation for integration to the main circuit	3.0	°C	0.0		
Gfc09 (mask enabled if electrical heater enabled)	Imposta Resistenze Diff.on Primar.:	Differential with respect to the working setpoint to enable the main circuit's electrical heater integration.	8.0	°C	0.0		

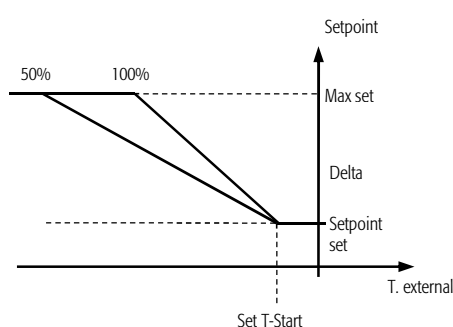
Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
	Diff.off Primar.:	Differential with respect to the working setpoint to disable the main circuit's electrical heater integration.	5.0	---	0.0		
	Ritardo On: s	Time delay for enabling of the systems electrical heaters	60	s	0	999	

7.7.3.3 Compensation setpoint to the main (only in hydronic heat pump units)

In winter operation (heat pump), the hydronic circuit's input setpoint can be positively compensated depending on the external temperature.

This function is enabled by selecting the dynamic function on the Gfc10 mask and fixing an enabling setpoint on external temperature with a related gradient to be expressed in percentage, for example, if selecting a gradient of 50%, at a reduction of 1°C from the external temperature a setpoint flow increase of 0.5°C is attained.

The following diagram illustrates the function:



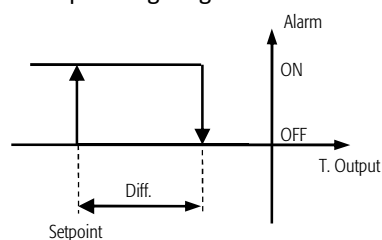
Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc10	Compensazione Primario Regolazione temp. circ.Primario:	Temperature control output from main circuit	FIXED POINT DYNAMIC selected if compensation setpoint requested in the MAC	---			0: PUNTO FISSO 1: DINAMICA
	Set T.ext comp:	Temperature setpoint for external probe compensation (B6)	7.0	°C			
	Compensazione:	Compensation ramp gradient	80	%	0	100	

7.7.3.4 Anti-freeze

The following group of masks are required to set the main anti-freeze parameters.

This function allows the achievement of potentially dangerous temperatures both for the system and the geothermic probes to be avoided. Detection is carried out by the relevant temperature probes (of the geothermal circuit and main system), and setting a setpoint and an anti-freeze differential for individual circuits.

Anti-freeze alarms are severe alarms that block the heat pump, reset is manual (refer to the alarm table).
The operating diagram is the following:



It is possible to enable the operation of the corresponding pump to avoid excessive temperature decreases for the hydronic circuit. Detection occurs via the temperature flow probe, setting a setpoint and a differential for pump activation.

Mask fields and related default values are included in the following table

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc16	C.to Primario Set allarme anti- gelo c.to Primario:	Alarm setpoint anti-freeze main circuit	4.0	°C			
	Diff.attivaz.allar- me antigelo:	Differential alarm activation main anti-freeze circuit	3.0	°C			
Gfc17	C.to Primario Reset allarme anti- gelo c.to Primario :	Reset type alarm for main anti-freeze circuit	MANUAL	---			0: AUTO 1: MANUALE
Gfc18	C.to Primario Attiva Pompa circu- ito Primario:	Main circuit pump enabled	ON UNIT	---			0: ON UNITA 1: SU RICHIESTA
	Pompa per antigelo :	Enable pump for anti- freeze prevention on main circuit	YES	---			0: NO 1: SI
Gfc19 (mask enabled if anti-freeze pump enabled)	C.to Primario Set Pompa antigelo c.to Primario:	Anti-freeze pump setpoint main circuit	4.0	°C			
	Diff.attivaz.Pompa antigelo:	Differential anti-freeze pump activation main circuit	2.0	°C			

7.7.3.5 General relay alarm

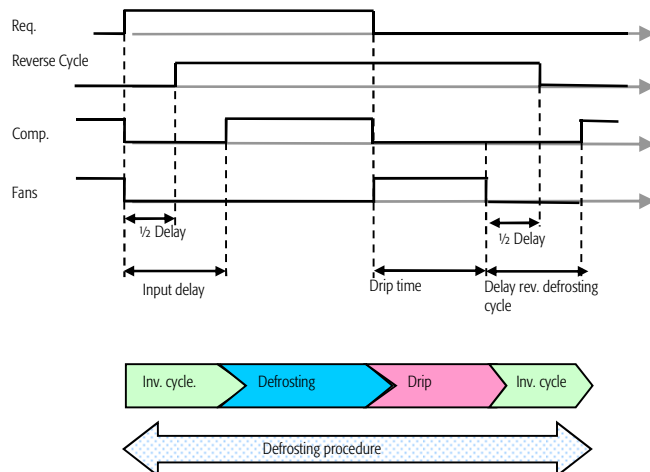
The Gfc10 mask is required to enable turning on the general relay alarm also with minor alarms. Di default is disabled.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc20	Gestione allarmi Abilita accensione uscita digitale N 07 con allarmi min- ori:	Enables GENERAL RELAY ALARM to be switched on even with minor alarms	NO	---			0: NO 1: SI

7.7.3.6 Defrosting

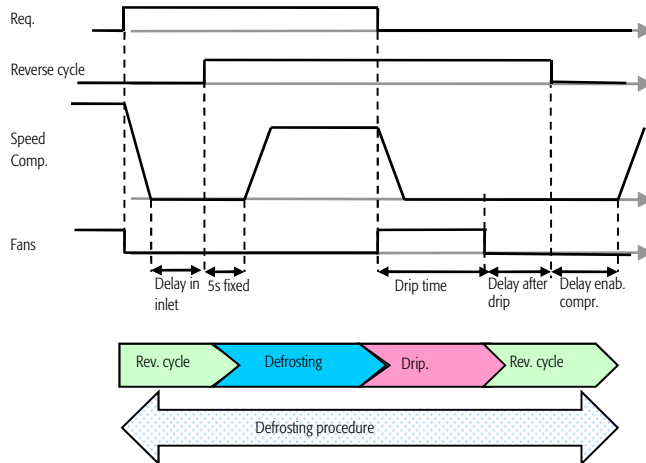
The following group of masks are required to set the main defrosting parameters (only for HP and LE/LP units).
Defrosting mode is enabled from the Manufacturer branch, while the set, start, end defrosting parameters, times etc,
are found in this menu.

The following figure illustrates the management of various circuit components and the defrosting phases:



The reverse cycle occurs by default with the compressor running, if it is desired when the compressor is off, simply set the Gfc30 mask parameter to "YES". Defrosting with compressor on, the compressor is forced to minimum speed + delta value set in the Gfc31 mask with the maximum possible deceleration, then after a time delay it reverses to 4-way valve and after a fixed time of 5 seconds the compressor is forced to the speed of defrosting with the acceleration indicated (Gfc31).

Once the defrosting phase is completed, the dripping phase begins, bringing the compressor to minimum power and forcing the fans to maximum speed. At the end of this phase, wait for the "After dripping" (Gfc32) delay, finally the 4-way valve is reversed and the compressor is returned to the speed required for thermo regulation for HP units or by external request for LE/HP units.



The defrosting mode set by the Manufacturer is based on the pressure. Once low pressure at the start of defrosting is reached, the minimum time control set on the Gfc29 starts counting.

If low pressure continues for the whole duration of this minimum time, the defrosting cycle is started. Exit from the cycle is controlled by the value read by the pressure probe and if, for some reason the setting set is not reached, the cycle terminates as it has exceeded maximum time. This is recorded on the alarm log.

Control can manage the integration device (electrical heaters or boiler) during the defrosting phases, if enabled by the appropriate mask (Gfc39). Integration is enabled during the whole defrosting cycle, regardless of the defrosting type selected.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc21	Impostazioni sbrinam. Temp. esterna abilita Sbrinamento:	Enables the defrosting function on external air temperature (only HP and LE/HP)	NO	---			0: NO 1: SI
	Setpoint T. esterna:	External temperature set for the enabling of defrosting intervention	12.0	°C			
Gfc22 (mask enabled if defrosting temperature selected)	Impostazioni sbrinam. Set temperatura in izio sbrinamento:	Temperature set for defrosting control start (only HP and LE/HP)	2.0	°C			
	Set temperatura fine sbrinamento:	Temperature set for end (with control in temperature only)	15.0	°C			
Gfc27	Impostazioni sbrinam. Set bassa press. fine sbrinam.:	Low pressure control setting for defrosting (only HP and LE/HP)	4.0	barg			
	Set alta press. fine sbrinam.:	High pressure control setting for defrosting cycle end (only HP and LE/HP)	27.0	barg			
Gfc28	Impostazioni sbrinam. Set bassa forzatura sbrinam.:	Low pressure setting to force defrosting cycle (only HP and LE/HP)	3.8	barg			
	Ritardo forzatura:	Time delay intervention from defrosting being forced by low pressure (only HP and LE/HP)	5	s	0	999	
Gfc29	Impostazioni sbrinam. Tempo minimo controllo inizio sbrinam.:	Low pressure, minimum time control temperature, DewPoint to begin defrosting (only HP and LE/HP)	20	s	0	999	
Gfc30	Impostazioni sbrinam. Abilita stop compr. per inversione ciclo in defrost in entrata	Enable compressor stop during reverse cycle for defrosting start (only HP and LE/HP)	NO	---			0: NO 1: SI
	Impostazioni sbrinam. Abilita stop compr. per inversione ciclo in defrost in uscita	Enable compressor stop during reverse cycle for defrosting end (only HP and LE/HP)	NO	---			0: NO 1: SI
Gfc31 (mask enabled if compressor stop not selected in Gfc30 mask)	Impostazioni sbrinam. Delta di velocità:	Delta for speed increase during defrosting reverse cycle (only HP and LE/HP)	50.0	rps			
	Velocità compressore in sbrinam.:	Compressor speed during the defrosting phase (only HP and LE/HP)	90.0	rps	0.0	120.0	
	Accelerazione compr. in sbrinam.:	Acceleration to reach desired defrosting speed (only HP and LE/HP)	2.0	rps/s	0.0	9.9	
Gfc32 (mask enabled if compressor stop not selected in Gfc30 mask)	Delay valv. ON:	Delay between the achievement of the compressor's minimum speed and start up of the 4-way valve for defrosting start. (only HP and LE/HP)	5	s	0	99	
	Delay valv. OFF:	Delay between the achievement of the compressor's minimum speed and start up of the 4-way valve for defrosting end.	20	s	0	99	
	Delay defr. OFF:	Delay between the start up of the 4-way valve and normal heat pump thermo regulation being enabled.	60	s	0	180	
Gfc33	Impostazioni sbrinam. Ritardo allarme fuori involucro durante sbrinamento:	Alarm delay for envelope output during defrosting phase (only HP and LE/HP)	180	s	0	999	
Gfc34	Impostazioni sbrinam. Tempo sgocciolamento	Drip time following defrosting (only HP and LE/HP)	15	s	6	999	

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
	to fine sbrinament o:						
Gfc35 (mask enabled if compressor stop selected in Gfc30 mask)	Impostazioni sbrinam. Tempo fermata comp r. start sbrinamen to:	Time delay before defrosting (only HP and LE/HP)	30	s	6	999	
	Tempo fermata comp r. stop sbrinament o:	Time delay after defrosting	30	s	6	999	
Gfc36	Impostazioni sbrinam. Durata massima sbr inamento:	Maximum defrosting cycle time (only HP and LE/HP)	240	s	0	999	
	Ritardo tra due sb rinamenti:	Delay between two defrosting requests	30	m	0	180	
Gfc37	Impostazioni sbrinam. Bypass bassa press ione durante sbrin am.:	Parameter that enables low pressure bypass at defrosting (only HP and LE/HP)	YES	---			0: NO 1: SI
	Max vel.ventilator i dopo sbrinam.:	Parameter that enables maximum fan speed at defrosting end (only HP and LE/HP)	YES	---			0: NO 1: SI
Gfc38	Impostazioni sbrinam. Controllo alta pre ss. in sbrinamento :	High pressure control enabled in defrosting after which the fan restarts. (only HP and LE/HP)	YES	---			0: NO 1: SI
	Set contr.:	High pressure control setting for fan reset	22.0	barg			0: NO 1: SI
Gfc39	Impostazioni sbrinam. Integrazione impia nto durante sbrina m.:	Enable integration system ON in defrosting phase (only HP and LE/HP)	NO Set YES if integrative electrical heaters or boilers are present	---			0: NO 1: SI
Gfc40	Impostazioni sbrinam. Fine sbrinam.super ato tempo max:	Enable the mask alarm at defrosting end due to maximum time exceeded (only HP and LE/HP)	LOG	---			0: STORICO 1: STORICO+ALLARM E

7.7.3.7 External battery ventilation

The following group of masks is used to set the parameters for the fan on the unit's external battery.

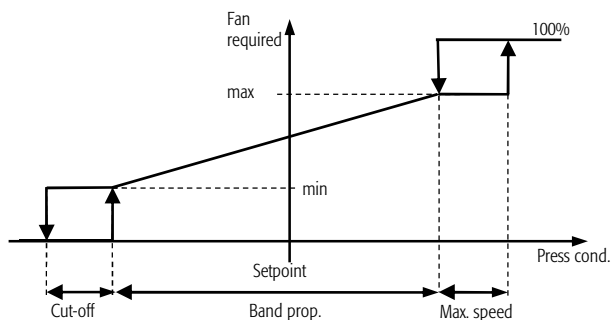
Adjustment is a function of evaporation pressure during the winter cycle and is a function of the condensation pressure during the summer cycle, is of a proportional type with central setpoint and band. The setpoint is set from the Assistance menu, while the proportional band as well as the fan's minimum and maximum speed is established by the manufacturer.

If pressure continues to fall, the fan stops when the cut-off threshold is reached once the pressure value is back within the adjustment band, it resumes ventilation, by adjusting the speed as a function of the new pressure detected.

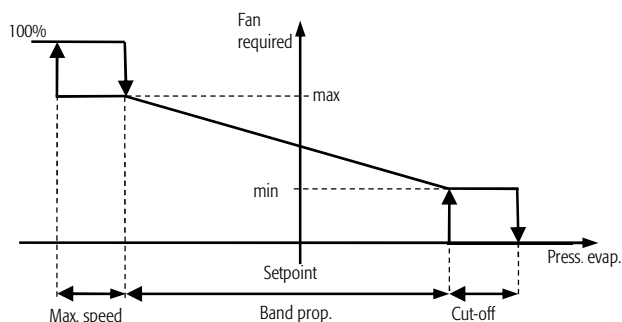
If instead the pressure value continues to rise until it reaches an upper threshold, the fan is enabled at 100% to allow the pressure value to retract within the band value.

Speed up time at fan start up is set by the Manufacturer.

Mode of operation in condensation mode (summer):



Operating mode in evaporation (winter only for reversible units):



Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc41	Impostazioni ventilaz. Set di condensazione:	Condensation setting	25.0	barg	Lim_Min_Set_Press_Cond	Lim_Max_Set_Press_Cond	
	Set di evaporazione:	Evaporation setting (only HP and LE/HP)	10.0	barg	Lim_Min_Set_Press_Evap	Lim_Max_Set_Press_Evap	

7.7.3.8 Overheating management and related alarms

The following mask groups are required to set the overheating setpoint, the low overheating (LowSH) alarm threshold, low evaporation temperature (LOP), high evaporation temperature (MOP),

Overheating is governed on compressor intake and is measured via a temperature and evaporation pressure probe, the difference between intake temperature measured and evaporation (converted by evaporation pressure) determines the overheating measured.

The unit is equipped with an electronic expansion valve, that maintains the overheating value set in every operation.

The valve's parameters are set in the Manufacturer's menu

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfc42	Setpoint SH:	Overheating setpoint	6.0	K			
	Soglia LowSH:	LowSH: low overheating threshold	1.5	°C			
	Soglia LOP:	LOP: low evaporation temperature threshold	-22.0	°C			
	Soglia MOP:	MOP: high evaporation temperature threshold	22.0	°C		392.0	

7.7.4 Reset alarm log and change Assistance password

 ->  **G.Assistenza**
↳ **f.Parametri assistenza**
↳ **d.Def.utente/cambioPW1**

The Gfd01 mask resets the alarm log to change the Assistance branch password.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gfd01	Psw assistenza/ Reset Cancella storico al larmi:	Cancels log data	NO	---			0: NO 1: SI
	Ins.nuova Password di servizio (PW1):	New assistance password	0200	---			

7.8 G.g. Manual management

 ->  **G.Assistenza**
↳ **g.Gestione manuale**

The branch for manual operation for: hydronic circuit pump, external fan battery, defrosting cycle, electronic expansion valve.

Some devices/functions can work in manual mode even with the machine OFF, hence they can be used to check the operation of single components, without switching the compressor on.



Use of the device's manual operation must occur with care, as some of the devices can be forced to operate manually even with the unit OFF. The unit must be closed with all protections installed. If used incorrectly, manual operation of the devices may cause malfunction or breakage and generate significantly dangerous situations.

Once manual operation is complete, return related parameters to the default values.

Index	Message displayed	Description	Default	U.M.	Min	Max	Possible values
Gg01	NO3 Pompa Primario:	Main circuit manual pump start up	AUT	---			0: AUT 1: MAN
Gg02	Vel.ventilatori:	Manual start up of external fan battery	AUT	---			0: AUT 1: MAN
	Potenza richiesta: %	Power required to the fan in manual mode	0	%			
Gg03	Avvia ciclo di sbrinamento:	Defrosting cycle start up in manual mode (only LE and LE/HP)	NO	---			0: NO 1: SI
Gg04	Abilita Posizione manuale valvola:	Enable manual valve positioning	NO	---			0: NO 1: SI
	Posizione valvola manuale:	Manual valve position	0	step	0	480	

7.9 H. MANUFACTURER'S MENU

Access to the Manufacturer menu is password-protected and is exclusively reserved for the Manufacturer.

8. ALARMS

8.1 View and reset alarms



When a critical event occurs, the key will flash red: this will indicate that the unit is in alarm.

Alarms can be divided into three categories:

1. serious unit alarms, which stop the machine or some of the essential components of the unit itself (the unit status in the main mask will be Alarm-Off);
2. non-serious alarms, which will stop one or more of the unit's functions;
3. other alarms (only reports or "warnings") which will not stop any of the unit's functions but that will warn the user, for example when exceeding certain thresholds.



By pressing the key (brief pressure), when flashing red, the active alarms in progress are displayed scrolling through them with the arrows, and then directly enter the alarm log (NOTE: the log is also accessible from the appropriate menu). The alarm log is resettable only by the authorised Service Centres (please refer to the dedicated section in the Assistance menu)

The resetting of the alarms log can be:

- automatic, reserved for non-serious alarms that are reset automatically as soon as the alarm condition has ended;
- manual, reserved for alarms that may affect the operation of the unit and which must be reset manually after having found the cause that triggered the alarm and after the alarm condition has ended.



By pressing the key (long press) for a few seconds, the alarm in progress will be reset manually if the alarm condition no longer exists; if the alarm is still in progress, the alarm will be triggered again even after resetting.



The manual resetting of an alarm is an operation that must be carried out only after verifying the cause of the alarm and after having solved the problem that caused it.

8.2 Table of alarms

The following is the table with the alarms. The displayed alarms depend on the unit's configuration.

Alarm code	Message displayed	Reset	Meaning	Action	Possible solutions
A001	Alarms A001 Position: B1 Alarm probes B1 damaged or disconnected	Automatic	Failure of the external battery temperature probe	Stop the machine	Check probe connection and operation.
A002	Alarms A002 Position: B2 Alarm probes B2 damaged or disconnected	Automatic	Not used		
A003	Alarms A003 Position: B3 Alarm probes B3 damaged or disconnected	Automatic	Not used		
A004	Alarms A004 Position: B4 Alarm probes B4 damaged or disconnected	Automatic	Failure of the water temperature probe of the primary input (hydronic)	Stop the machine	Check probe connection and operation.
A005	Alarms A005 Position: B5 Alarm probes B5 damaged or disconnected	Automatic	Failure of the device for the external control signal (direct expansion only)	Stop the machine	Check device wiring, its configuration and operation.

Alarm code	Message displayed	Reset	Meaning	Action	Possible solutions
A006	Alarms A006 Position: B6 Alarm probes B6 damaged or disconnected	Automatic	Failure of the external air temperature probe	It blocks the functions enabled by the external probe	Check probe connection and operation. Check that the probes sensitive element is clean.
A007	Alarms A007 Position: B7 Alarm probes B7 damaged or disconnected	Automatic	Failure of the water temperature probe of the primary output (hydronic)	Stop the machine	Check probe connection and operation.
A008	Alarms A008 Position: B8 Alarm probes B8 damaged or disconnected	Automatic	Not used		
A009	Alarms A009 Position: B9 Alarm probes B9 damaged or disconnected	Automatic	Compressor discharge temperature probe failure	Stop the machine	Check probe connection and operation.
A010	Alarms A010 Position: B10 Alarm probe B10 damaged or disconnected	Automatic	Failure of the intake temperature probe	Stop the machine	Check probe connection and operation.
A011	Alarms A011 Position: B11 Alarm probes B11 damaged or disconnected	Automatic	Failure of the high pressure transducer or intervention to the high pressure transducer	Stop the machine	Check transducer connection and operation. Check pressures in the refrigerant circuit Check and possibly adjust the refrigerant fluid Check the operation of the fans and cleanness of the external battery Check air flows. Check water flows (for hydronic). Check operating temperature.
A012	Alarms A012 Position: B12 Alarm probes B12 damaged or disconnected	Automatic	Failure of the low pressure transducer or intervention to the low pressure transducer	Stop the machine	Check transducer connection and operation. Check pressures in the refrigerant circuit Check for any refrigerant liquid losses. Check and possibly adjust the refrigerant fluid Check the correct operation of the electronic expansion valve Check air flows. Check water flows (for hydronic). Check operating temperature.
A013	Alarms A013 Position: ID3 High pressure compressor from pressure switch	Manual	Operation of the high pressure switch	Stop the machine	Check transducer connection and operation. Check pressures in the refrigerant circuit Check and possibly adjust the refrigerant fluid Check the operation of the fans and cleanness of the external battery Check air flows. Check water flows (for hydronic). Check operating temperature. Manually reset the high pressure switch.
A014	Alarms A014 Transducer high pressure compressor	Manual	Operation of the high pressure transducer	Stop the machine	Check pressures in the refrigerant circuit. Check and possibly adjust the refrigerant fluid. Check the operation of the fans and cleanness of the external battery. Check air flows. Check water flows (for hydronic). Check operating temperature.

Alarm code	Message displayed	Reset	Meaning	Action	Possible solutions
A015	Alarms A015 Transducer low pressure compressor	Automatic	Operation of the low pressure transducer	Stop the machine	Check pressures in the refrigerant circuit. Check for any refrigerant liquid losses and refill to original level. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.
A016	Alarms A016 Unit stopped safety alarm!	Manual	Main alarm coming from external signal	Stop the machine	Check the alarm cause.
A020	Alarms A020 Position: ID4 Thermal pump	Manual	Protection of the pump's electric motor (only for pump unit)	Stop the machine	Check the pump's electric motor protection. Check that the pump is not blocked.
A021	Alarms A021 Position: ID10 Utility main water circuit meter	Manual	No air flow (only for hydronic units)	Stop the machine	Check that there is water in the primary circuit. Check the flow meter's operation and its electrical connections.
A022	Alarms A022 Position: ID7 Boiler alarm/add. system heater	Automatic	The system's additional heater is in alarm (only if it is integrative source enabled)	Interrupts boiler/electrical heater operation, main circuit integration	Check the cause of the alarm from the integrative source
A023	Alarm A023 Position: ID1 fan circuit breaker	Manual	Fan motor thermal protection alarm	Stop the machine	Check the operation of the fan wiring. Check the operation of the thermal protection wiring.
A024	Alarms A024 Reached the compressor's working hours threshold	Manual	The threshold of hours worked for the compressor has been reached	Only signal	Replace the component. Reset the hour counter.
A025	Alarms A025 Reached the primary pump's working hours threshold	Manual	The threshold of hours worked for the primary pump has been reached	Only signal	Replace the component. Reset the hour counter.
A026	Alarms A026 Reached the fan battery's working hours threshold	Manual	The threshold of hours worked for the fan battery has been reached	Only signal	Replace the component. Reset the hour counter.
A027	Alarms A027 System exchanger anti-freeze	Manual	On reaching the anti-freeze threshold temperature limit of the main exchanger (only hydronic units)	Stop the machine	Check water flow. Check setpoint. Check the correct operation of the electronic expansion valve. Clean and replace the exchanger.
A028	Alarms A028 Maximum time defrosting output	Automatic	Defrosting ended due to the reaching of the maximum time instead of the reaching of the set condition	Only signal	None.
A029	Alarms A029 EEPROM Alarm	Manual	Memory board alarm	Stop the machine	Check the control board.
A030	Alarms A030 Position: Alarm probe S1 damaged or disconnected	Manual	Operation of the low pressure transducer	Stop the machine	Check pressures in the refrigerant circuit. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.

Alarm code	Message displayed	Reset	Meaning	Action	Possible solutions
A031	Alarms A031 Position: Alarm probes S2 damaged or disconnected	Manual	Failure of the intake temperature probe or intake temperature below the minimum limit	Stop the machine	Check probe connection and its operation. Check pressures in the refrigerant circuit. Check the suction temperature. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.
A032	Alarms A032 Position: Alarm probes S3 damaged or disconnected	Manual	Operation of the high pressure transducer	Stop the machine	Check transducer connection and its operation. Check pressures in the refrigerant circuit. Check and possibly adjust the refrigerant fluid level. Check the operation of the fans and cleanness of the external battery. Check operating temperature. Check air flows. Check water flows (for hydronic).
A033	Alarms A033 Position: Alarm probes S4 damaged or disconnected	Manual	Failure of the drain temperature probe or drain temperature above the maximum limit	Stop the machine	Check probe connection and its operation. Check pressures in the refrigerant circuit. Check overheating. Check and possibly adjust the refrigerant fluid level. Check the operation of the fans and cleanness of the external battery. Check air flows. Check water flows (for hydronic). Check operating temperature.
A034	Alarms A034 Valve motor error	Manual	Electronic expansion valve motor error	Stop the machine	Check the valve's motor and its wiring.
A035	Alarms A035 Low overheating (LowSH)	Manual	Intake overheating below the minimum limit	Stop the machine	Check pressures in the refrigerant circuit. Check the suction temperature. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.
A036	Alarms A036 Low intake temperature	Manual	Intake temperature below the minimum limit	Stop the machine	Check pressures in the refrigerant circuit. Check the intake temperature. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.
A037	Alarms A037 Low evaporation temperature (LOP)	Manual	Evaporation temperature below minimum limit	Stop the machine	Check pressures in the refrigerant circuit. Check the intake temperature. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve. Check air flows. Check water flows (for hydronic). Check operating temperature.

Alarm code	Message displayed	Reset	Meaning	Action	Possible solutions
A038	Alarms A038 High evaporation temperature (MOP)	Manual	Evaporation temperature above the maximum limit	Stop the machine	Check pressures in the refrigerant circuit. Check the intake temperature. Check for any refrigerant liquid losses and refill. Check the correct operation of the electronic expansion valve Check air flows. Check water flows (for hydronic). Check operating temperature.
A039	Alarms A039 High condensation temperature	Manual	Condensing temperature above the maximum limit	Stop the machine	Check pressures in the refrigerant circuit. Check the condensation temperature. Check and possibly adjust the refrigerant fluid level. Check the operation of the fans and cleanness of the external battery. Check air flows. Check water flows (for hydronic). Check operating temperature.
A040	Alarms A040 EEV driver offline	Manual	EEV driver alarm (only if present)	Stop the machine	Not present.
A041	Alarms A041 Power+ n°1 Offline device	Manual	Power+ inverter is not communicating with the control (it also appears when the high pressure switch is triggered)	Stop the machine	Check that the high pressure switch is triggered and possibly reset it after checking the causes of the intervention. Check the connection between the inverter and the control board.
A042	Alarms A042 Power+ n°1	Manual	Power+ inverter alarm	Stop the machine	Refer to the table below for alarm codes.
A043	Alarms A043 Inverter type not compatible (Power+ type only)	Automatic	Inverter not compatible with the control	Stop the machine	Check the inverter's wiring. Check the connection between the inverter and the control board.
A044	Alarms A044 Envelope Zone alarm:	Manual	The compressor is working outside the envelope	Stop the machine	Check pressures in the refrigerant circuit. Check the condensation and evaporation temperatures. Check and possibly adjust the refrigerant fluid level. Check air flows. Check water flows (for hydronic). Check operating temperature.
A045	Alarms A045 Compressor start-up failed (attempts: / max.:)	Automatic, it becomes manual after 5 attempts	The compressor failed start-up	Only signal; Machine is stopped after 5 failed attempts	Check the compressor's rotation direction. Check pressures in the refrigerant circuit. Check the condensation and evaporation temperatures. Check and possibly adjust the refrigerant fluid level. Check operating temperature.
A046	Alarms A046 High discharge gas temperature	Manual	Exceeded maximum compressor discharge gas temperature	Stop the machine	Check probe connection and its operation. Check pressures in the refrigerant circuit Check and possibly adjust the refrigerant fluid level. Check the condensation temperature. Check overheating. Check the operation of the fans and cleanness of the external battery. Check air flows. Check water flows (for hydronic). Check operating temperature.
A047	Alarms A047 Low pressure differential (insuff. lubrication)	Manual	Low Δp for the compressor's lubrication	Stop the machine	Check pressures in the refrigerant circuit. Check and possibly adjust the refrigerant fluid level. Check operating temperature.
A100	Alarms A100 Press ENTER for the alarms LOG	Manual	Access to the alarms log		

The table below shows the description of the alarms codes of the Power+ inverter, viewable from the alarm A042 mask. For further information, refer to the inverter Power+ manual.

Alarm code A042	Description	Possible solutions
0: No error		
1: Overcurrent	The drive has detected that the current delivered is too high for: - sudden heavy load increase; - acceleration is too high; - Unsuitable motor.	Check the operating conditions and the parameters set.
2: Motor overload	The current delivered has exceeded nominal current over the maximum time allowed.	Check the operating conditions.
3: Overvoltage	The intermediate circuit tension in DC has exceeded limits established for: - Deceleration too high; - high surge peaks on the mains power supply.	Check the power supply voltage.
4: Undervoltage	The intermediate circuit tension in DC under the limits established for: - power supply voltage insufficient; - internal drive failure.	In the event of momentary power supply interruption reset the alarms and restart the drive. Check the power supply voltage.
5: Over temperature	The drive's internal temperature has exceeded the maximum allowed level	Check the correct amount and flow of cooling air. Check that there is no dust or dirt in the heat dissipater. Check room temperature and operating conditions.
6: Under-heating	The drive's internal temperature has exceeded the minimum level allowed.	Check room temperature.
7: HW overcurrent	The drive has detected that the current delivered is too high for: - sudden heavy load increase; - short circuit of the motor cables; - Unsuitable motor.	Check the operating conditions and the parameters set. Check motor cabling.
8: Motor over-heating	The temperature detected by the PTC thermistor corresponds to electrical heater of > 600 ohm.	Reduce motor load. Check motor cooling.
9: Drive failure	Generic inverter failure	Switch the unit off and on again. If the problem persists, check the serial connection and possibly replace the inverter.
10: Cpu Error	Loss of stored data	Switch the unit off and on again. If the problem persists, check the serial connection and possibly replace the inverter.
11: Default parameters	Parameter error	Switch the unit off and on again. If the problem persists, check the serial connection and possibly replace the inverter.
12: DC bus ripple voltage	No input phase	Check the inverter's power input phases
13: Serial communication timeout	Communication error between the inverter and control	Check serial connection. Switch the unit off and on again.

14: Thermistor error	Internal Thermistor failure	Switch the unit off and on again. If the problem persists, check the serial connection and possibly replace the inverter.
15: Autotuning Error	Error in inverter autotuning	Switch the unit off and on again. If the problem persists, check the serial connection and possibly replace the inverter.
16: Drive disabled	Inverter disabled as a result of opening safety torque off entrance (for eg. following inspection of the high pressure switch)	Check the opening of the safety torque off entrance cause (eg. triggering of the high pressure switch) and restore
17: Motor phase missing	A phase between the compressor's motor and inverter is missing	Check the electrical connections.
18: Fan failure	Failure of the inverter cooling fan	Check and possibly replace the fan
19: Motor stalled	BLDC compressor motor stalled	Switch the unit off and on again.
20: PFC module failure	Power factor correction module failure	Switch the unit on and off again and check that the parameters are correct. Check motor load.
21: alarm code 21	Reserved	
22: PFC undervoltage	Reserved	
23: STO reading error	Reserved	
24: STO reading error	Reserved	
25: alarm code 25	Reserved	
26: alarm code 26	Reserved	
27: alarm code 27	Reserved	
28: alarm code 28	Reserved	
29: alarm code 29	Reserved	
30: alarm code 30	Reserved	

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