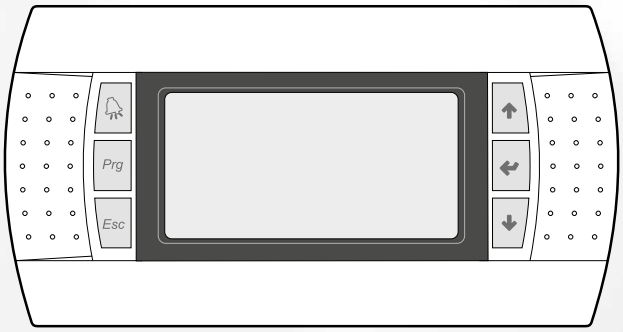
EN

25/05 – 5094810_01
Translation of Original instructions

PRM

User manual



PCO5 BOARD - PGD1 CONTROL PANEL

AERMEC

www.aermec.com

Dear Customer,

Thank you for wanting to learn about a product Aermec. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies.

The manual you are about to read is meant to present the product and help you select the unit that best meets the needs of your system.

However, please note that for a more accurate selection, you can also use the Magellano selection program, available on our website.

Aermec, always attentive to the continuous changes in the market and its regulations, reserves the right to make all the changes deemed necessary for improving the product, including technical data.

Thank you again.

Aermec S.p.A.

CERTIFICATIONS

COMPANY CERTIFICATIONS

SAFETY CERTIFICATIONS

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled disposal of Waste Electrical and Electronic Equipment (WEEE), please return the device using appropriate collection systems, or contact the retailer where the product was purchased. Please contact your local authority for further details. Illegal dumping of the product by the user entails the application of administrative sanctions provided by law.

In accordance with Italian Legislative Decree 116 / 2020, the machine's packaging is marked; for unmarked packaging parts, the composition is as follows: **Expanded polystyrene - PS 6**

ADDRESSEES OF THE INSTRUCTIONS IN THE MANUAL

Each chapter is marked with icons that identify the professional figures who must read and understand the content of the specific chapter.
The table associates each subject with the corresponding icon, and the chapters that must be read and understand.

The MANUFACTURER

The CONTRACTOR

The PLANT MANAGER

The PLANT DESIGNER

THE INSTALLER

The END USER

The MAINTENANCE TECHNICIAN

The AUTHORISED TECHNICAL SUPPORT SERVICE

TABLE OF CONTENTS

1 REFERENCES TO AERMEC DOCUMENTATION

1.1 QR CODE - INSTALLATION MANUAL

Download the last version

http://www.aermec.com/qrcode.asp?q=21701

1.2 QR CODE - USER MANUAL

Download the last version

http://www.aermec.com/qrcode.asp?q=21162

1.3 QR CODE - TECHNICAL MANUAL

Download the last version

http://www.aermec.com/qrcode.asp?q=21706

1.4 QR CODE - MAINTENANCE MANUAL

Download the last version

http://www.aermec.com/qrcode.asp?q=21696

1.5 QR CODE - MAGELLANO (SELECTION SOFTWARE)

Download the last version

https://global.aermec.com/en/download/product-selection/

1.6 QR CODE - AERMEC TOOLS (SELECTION SOFTWARE)

Download the last version

https://tools.aermec.com/app_module/prodotti_ricambi

NOTICE

Check monthly if a newer version of the documentation and manual is available.

Ma Pr Sat Fa Re In Co Uf

2 LEGAL ENTITIES AND THEIR RESPONSIBILITIES FOR SECURITY

The main legal entities that may operate on the unit for various reasons are defined below.
These entities are described in the following paragraphs. Each entity is matched with an identification icon.

Each chapter is marked with icons that identify the professional figures who must read and understand the content of the specific chapter.
The table associates each subject with the corresponding icon, and the chapters that must be read and understand.

Fa The MANUFACTURER

Co The CONTRACTOR

Re The PLANT MANAGER

Pr The PLANT DESIGNER

In THE INSTALLER

Ppi The PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD

Uf The END USER

Ma The MAINTENANCE TECHNICIAN

Sat The AUTHORISED TECHNICAL SUPPORT SERVICE

2.1 THE MANUFACTURER

The MANUFACTURER is the natural or legal person who designs and manufactures a unit and is responsible for compliance of the machine with European Directives and Regulations for the purpose of placing it on the market under their own name or trademark.

The MANUFACTURER issues an EC declaration of conformity indicating the references of the design standards, European Directives and Regulations with which the unit complies.

The MANUFACTURER is responsible for the design, construction, testing and packaging of the unit in order to place it on the market. The MANUFACTURER guarantees that the unit is designed, built, tested and packaged in compliance with the essential requirements set out in the applicable Community directives and that an appropriate conformity assessment has been carried out in this regard.

If the unit is not modified by others, the MANUFACTURER is Aermec.

Unpacking, installation, commissioning, maintenance, disassembly and disposal are not the responsibility of the MANUFACTURER, who provides as much useful information as possible in these instructions for the aforementioned phases of the life of the unit.

No guarantee of safety and/or operation can be given if the units are used under conditions of use not explicitly provided for by the MANUFACTURER and therefore are prohibited.

The installation, use, maintenance and/or disposal of the unit in conditions that are prohibited, not foreseen and/or in any case different from those foreseen by the MANUFACTURER, release it from any possible consequence or liability.

2.2 THE CONTRACTOR

The PROJECT CONTRACTOR is the natural or legal person who entrusts the design, installation, transformation, expansion, maintenance or dismantling of a plant or equipment, generally incurring the cost of the intervention carried out.

This figure can subsequently assume the role of plant manager.

The PROJECT CONTRACTOR is responsible for entrusting the plant design to a professional with the necessary skills according to the regulations and laws in force (PLANT DESIGNER).

For the correct selection of the site of installation, the positioning of the unit, the design and construction of the plant and the building, the CONTRACTOR is responsible for entrusting experienced and qualified professionals with the execution of the fire risk assessment and the risk generated by the presence of explosive atmospheres (PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD).

The PROJECT CONTRACTOR is responsible for entrusting the installation, transformation, expansion, ordinary and extraordinary maintenance, or dismantling of the plant and its equipment to companies that meet the necessary technical, professional and administrative requirements in accordance with the regulations and legislation in force.

The CONTRACTOR is obligated to check, obtaining and storing the documentation required by the regulations in force (which includes, but is not limited to, the declaration of conformity of the system), that the system or unit has been installed in a workmanlike manner and that all the expansion, modification, maintenance or dismantling work has been carried out in accordance with good practices and the standards and laws in force.

2.3 THE PLANT MANAGER

The PLANT MANAGER is the natural or legal person who is responsible for the operation, running, control and maintenance of the plant. This figure could also be, by way of example but not limited to, the plant owner, its user or the person in charge of the activity for which the system is supplied.

The PLANT MANAGER is responsible for ensuring that the safety conditions of the plant are maintained by carrying out the control and maintenance tasks of the plant and the equipment that are part of it.

If necessary, the PLANT MANAGER delegates these activities to companies that are authorised and in possession of the necessary requirements in accordance with the regulations and laws in force.

The PLANT MANAGER is responsible for acquiring and maintaining all the documentation certifying the conformity of the work (documentation and manual of the MANUFACTURER, declaration of conformity of the plant issued by the INSTALLER and professionals involved in the construction of the plant).

The PLANT MANAGER is responsible for ensuring compliance with the safety conditions of the plant at the installation site as described by the MANUFACTURER, the PLANT DESIGNER, the INSTALLER and/or by the PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD.

The PLANT MANAGER is responsible for ensuring the correct use and maintenance of the unit, possibly entrusting these activities to competent personnel (see definition of MAINTENANCE TECHNICIAN, AUTHORISED TECHNICAL SUPPORT SERVICE).

2.4 THE PLANT DESIGNER

The PLANT DESIGNER is a professional in possession of the specific technical skills required for the design of the system, for the choice of the unit and its conditions of installation and use. The PLANT DESIGNER must be a qualified and authorised professional according to the necessary requirements in accordance with the regulations and laws in force (for example, registration in the national professional register).

The preparation of the PLANT DESIGNER must be adequate in order to understand the content of this manual and any other technical-commercial documents related to the unit.

The PLANT DESIGNER and the INSTALLER are obliged to assess the risks, prepare emergency, alarm, signalling and protective means and systems and must also prepare the overall instructions for the refrigeration plant/system of which the unit is part, as specified in standard EN 378-3 and EN 378-4.

In order to assess the fire risk and the flammability risk generated by the refrigerant used by the unit, a risk assessment is required by a PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD.

The incorrect assessment of the risks by the PLANT DESIGNER and/or the INSTALLER or an inadequate choice of the site of installation, of the relative safety spaces of the equipment and of the emergency, alarm, signalling and protection systems exempt Aermec from any possible consequence and liability.

2.5 THE INSTALLER

The INSTALLER is the person who builds the plant, in accordance with the plant design prepared by the PLANT DESIGNER, in a workmanlike manner, and in accordance with the specifications of the components defined by their manufacturers.

The preparation of the INSTALLER must be adequate in order to understand the content of this manual and any other technical-commercial documents related to the unit.

The expertise of the INSTALLER must be suitable for assessing the risks arising from the refrigerant used by the unit.

The PLANT DESIGNER and the INSTALLER are obliged to assess the risks, prepare emergency, alarm, signalling and protective means and systems and must also prepare the overall instructions for the refrigeration plant/system of which the unit is part, as specified in standard EN 378-3 and EN 378-4.

2.6 THE PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD

The PROFESSIONAL EXPERIENCED AND QUALIFIED IN FIRE PREVENTION AND AREAS WITH AN EXPLOSION HAZARD is a qualified and certified professional with technical skills related to fire prevention methods and measures, flammability risk management and the definition and classification of hazardous areas with an explosion hazard.

2.7 THE END USER

The END USER is the person authorised to use the unit and the system by means of controls placed in an easily accessible position in a safe manner and in a remote position defined by the INSTALLER; They are authorised to carry out only command, on/off operations and the setting of certain system or unit operating parameters within the limits established by the MANUFACTURER and/or the INSTALLER of the system as specified in the technical documentation expressly reserved for the END USER.

2.8 THE MAINTENANCE TECHNICIAN

The MAINTENANCE TECHNICIAN is the natural or legal person in possession of the appropriate requirements for carrying out the maintenance operations required of them (verification, ordinary maintenance, extraordinary maintenance, repair) according to the regulations and legislation in force where the plant is located.

The figure of the MAINTENANCE TECHNICIAN must coincide, for particular operations or in some specific cases identified contractually (including, but not limited to, for unit repairs) with the AUTHORISED TECHNICAL SUPPORT SERVICE.

The MAINTENANCE TECHNICIAN is obliged to use only competent, trained and certified personnel, equipped with the necessary personal protective equipment, during the control, maintenance, repair, emergency and disposal phases of the unit.

2.9 THE AUTHORISED TECHNICAL SUPPORT SERVICE

The AUTHORISED TECHNICAL AFTER-SALES SERVICE/ASSISTANCE is a company in possession of suitable requisites for carrying out all maintenance operations on the unit in accordance with the regulations and legislation in force, and authorised by the MANUFACTURER by contract to carry out, on an exclusive basis with respect to other maintenance operators operating in the territory, certain particular operations (by way of example but not limited to commissioning and repair).

The following is a list of the authorised technical assistance services and foreign distributors who will direct you to the local authorised technical support services:

Personnel involved in the various stages of installation and commissioning of the unit must be competent and trained to the extent relevant.

3 WARNING AND HAZARD TERMS

Before proceeding with any assessment or operation on the unit, carefully read this manual and all of its notes marked with the following symbols, which indicate the various levels of hazard or situations that are potentially hazardous to prevent malfunctioning or physical damage to property or personal injury:

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

MANDATORY

This indicates a mandatory action that, if not carried out, could cause death or serious injuries.

PROHIBITION

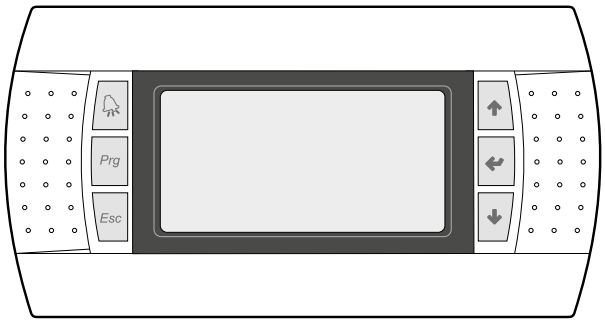
Indicates a prohibited action which, if not avoided, could result in death or serious injury.

NOTICE

IMPORTANT additional information on how to use the product

Ma Pr Sat Fa Re In Co Uf

4 CONTROL PANEL (PGD1)



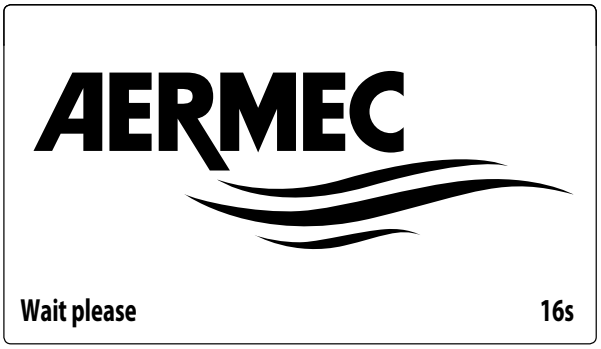
The command panel of the unit allows the rapid setting of the working parameters of the machine, and their visualisation. The card stores all the default settings and any modifications.
With the installation of the remote control panel PGD1 it is possible to remotely replicate all functions and settings available from the unit/machine.
After the absence of voltage for any period of time, the unit is able to start up again automatically, maintaining the original settings.
The user interface is represented by a graphical display with six keys for navigation. The displays are organised via a menu hierarchy, which can be activated by pressing the navigation keys. The display default of these menus is represented by the main menu. Navigation through the various parameters takes place using the arrow keys positioned on the right of the control panel. These keys are also used to modify the parameters selected.

4.1 START-UP PROCEDURE

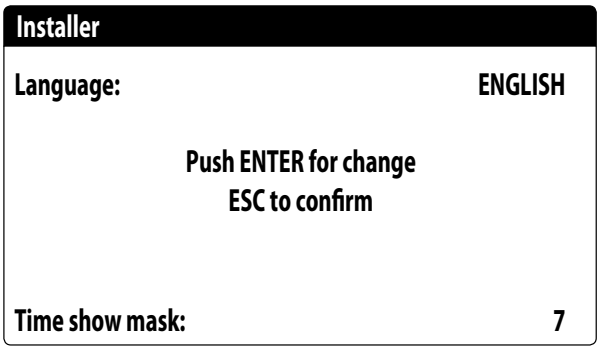
After powering up the unit, the control board will perform some preliminary operations before it is ready for use; these initial procedures take about 30 to 60 seconds to complete; two windows (one for start-up and one for system language selection) are displayed during the initial loading procedures; these windows are specified in the table below.

NOTICE

The system language can be set in the window shown at start-up, or at any moment by changing the window contained in the installer menu.



This window indicates the seconds remaining until the software loaded in the unit starts up (switching to the system language selection);



This window makes it possible to select the language with which the system is started.

4.2 FUNCTION OF THE PGD1 CONTROL PANEL KEYS

: Displays the list of active and historical alarms (red LED on = active alarm);
: Pressing this button activates menu navigation (orange LED lit = winter operation mode active; orange LED flashing = defrosting in progress);
: Pressing this key returns to the previous window;
: Pressing this key can have different functions:
— Pressing this key when navigating menus/parameters passes to the next menu/parameter;
— Pressing this key when changing a parameter increases the value of the selected parameter;
: Pressing this key can have different functions:
— Pressing this key when navigating menus enters the selected menu;
— Pressing this key when navigating parameters selects the displayed parameter and enters change mode;
— Pressing this key when changing a parameter confirms the change to the value of the selected parameter;
: Pressing this key can have different functions:
— Pressing this key when navigating menus/parameters passes to the previous menu/parameter;

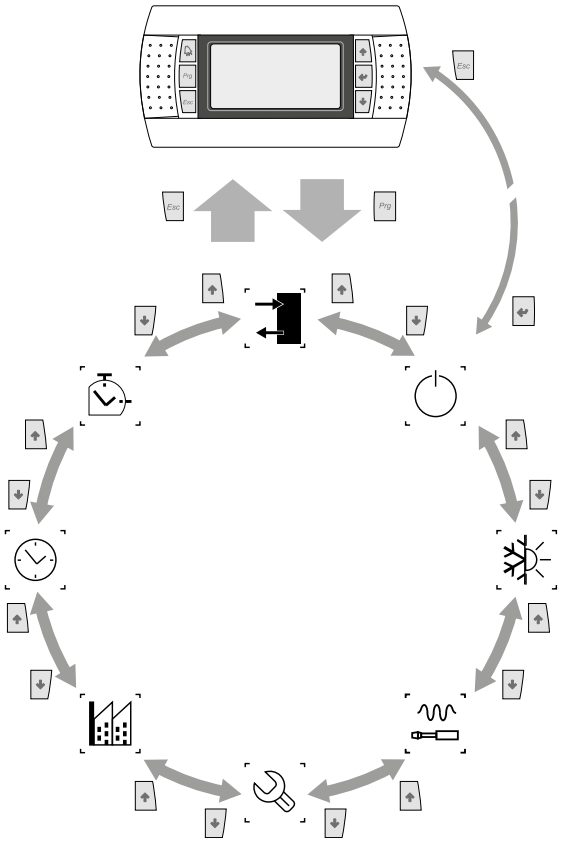
— Pressing this key when changing a parameter decreases the value of the selected parameter;

4.3 MENU STRUCTURE

All the functions for managing the unit as well as the information about its operation are displayed on the unit control panel; all the functions and information are organised into windows, which are in turn grouped in to menus.
When the unit is operating normally, a main menu is displayed, which is used to select other operating menus.
The menus are displayed via the rotation of the icons that represent them; once the desired icon is selected, the select menu opens, and it is possible to display or change the corresponding parameters. The procedure for navigating the menus, or changing the parameters, is explained in detail in the chapter "Operational utilisation procedures", to which reference is made for more information.
The image shows the relationships between the various menus and the keys used for navigation.

NOTICE

The following pages show all the masks contained in the menus available to the user; Tampering with the parameters in the installer menu could cause the unit to malfunction, therefore it is recommended to have these parameters changed only by personnel assigned to unit installation and configuration;



4.3.1 Menu icons

IN/OUT: This menu contains advanced information about operating the unit;

ON/OFF: This menu allows you to activate or deactivate the unit, change the season and any time periods;

SYSTEM: System parameters (chiller, heat pump) in the machine, enabling, nominal and second setpoint, time periods;

INSTALLER: This menu contains settings useful for the installer (Digital input enabling, BMS configuration, adjustments, pumps, etc ...);

NOTICE

This menu is password protected. The value to be set for access is: 0000.

ASSISTANCE: This menu is not accessible except by authorized staff;

MANUFACTURER: This menu is not accessible except by authorized staff;

CLOCK: This menu contains the time settings for system management (date and time, calendar);

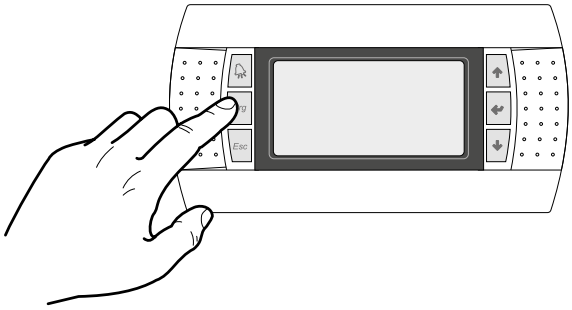
COUNTERS: This menu contains the counter values of the unit's components.

4.4 USER OPERATING PROCEDURES

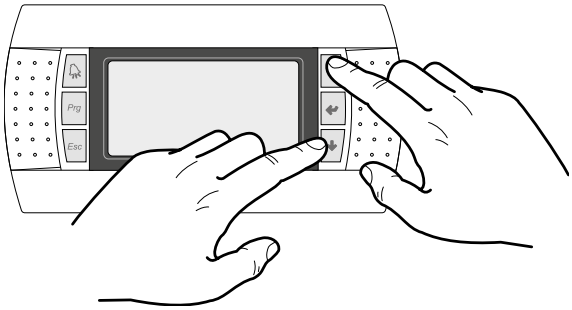
To check or modify the operating parameters of the unit it is necessary to use the interface of the control panel on the unit.
The basic operations that the user must be capable of, for the correct use of the unit, are:
— Moving between menus;
— Selecting and modifying a menu.

4.4.1 Moving between menus

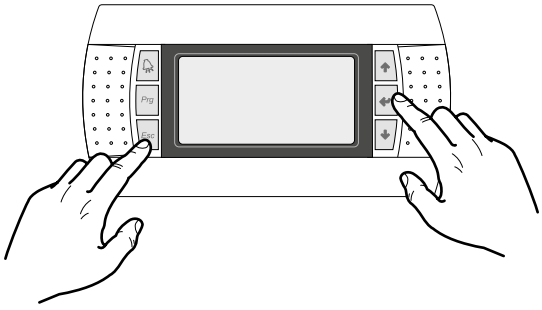
To move between the menus, the order in which they are displayed is shown in the previous page, enter the menu selection mode by pressing the key Prg;



Once in the menu selection mode it is possible to move between menus using the arrow keys: the key ↑ to move to the previous menu, and the key ↓ to move to the next menu:

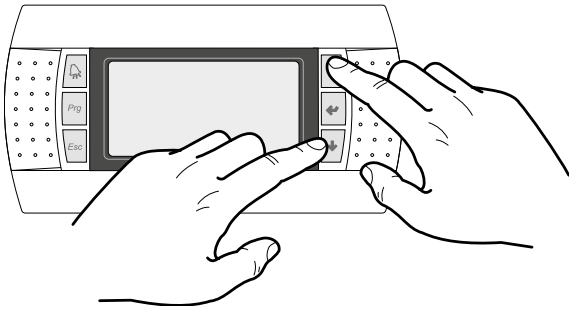


When the desired menu is seen press the key ↵ to enter the menu. Press the key Esc to return to the menu selection mode:



4.4.2 Selecting and modifying a menu

Once in the menu selected, by following the procedure, it is possible to move between the screens using the arrow keys: the key ↑ to move to the previous parameter, and the key ↓ to move to the next parameter:



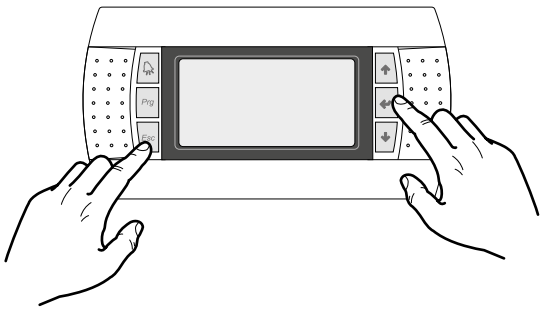
When the desired parameter is seen press the key ↵ to enter the parameter. To exit the parameter and return to the parameter selection mode press the key Esc.

NOTICE

Once a parameter is selected by pressing the key ↵, the parameter selection mode is automatically accessed.

In this mode the desired parameter values can be set with the following procedure:

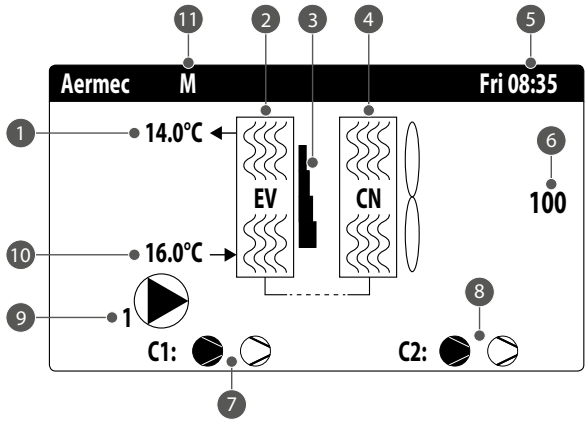
1. Pressing the key ↵ causes a flashing cursor to appear on the first modifiable field of the parameter. If no modifiable fields are displayed then the cursor will not appear.
2. Pressing the key ↑ or the key ↓, the value of the field can be increased or decreased;
3. Pressing the key ↵ confirms the modification of the field value, saving it in memory.



NOTICE

On the basis of the type of parameter selected the number of modifiable fields can change.

5 MAIN MASKS



1 System water outlet temperature;
2 System exchanger (EV=evaporator);
3 Percentage of power (displayed graphically with a bar to the right of the evaporator) requested by the system;
4 Coil (CN=condenser);
5 Current date and time
6 Fan speed percentage (0..100);
7 Circuit 1 on-off compressor status;
8 Circuit 2 on-off compressor status;
9 Pump active: this icon appears if the unit's pump is running; if the unit has several pumps, the number next to the icon indicates which one is active;
10 System water inlet temperature.
11 If the unit is configured as Master/Slave, it will display **M** to indicate the Master unit or **S** to indicate the Slave unit.

NOTICE

Some icons can appear in the window, indicating certain system states::

— : anti-freeze heater activation;
— (LT): Indicates that low output temperature anti-freeze prevention is active (turns off the compressors)
— (HT): Indicates that the dynamic force off for low outside temperature has tripped;
— (F): Indicates that the flow switch is open. The compressors are turned off and the pumps release the flow switch
— : indicates that the compressor is off;
— : indicates that the compressor is on;
— : indicates a compressor alarm;

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

C1 / C2: The system is active and running
Unit off by alarm: There is a serious alarm that stops the system (check the alarm list);
General off by key: The system is off by terminal, check ON/OFF mask;
Off by supervisor: The supervision system has prevented unit start-up;
Off by time periods: The time periods set switch the whole system off;
Off by digital input: The digital input closed switches the system OFF;
Off by display: the system is off by terminal, check chiller mask;
Manual mode: not envisioned;
Off by master: The system is off by master;
Outside operational limits: The system is out of operational limits.

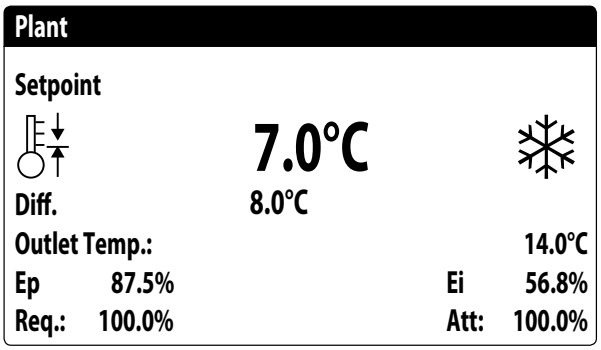
5.1 MASTER OR SLAVE UNIT SETTING

In the case of two units set as Master/Slave, the installation of only one remote control panel is sufficient PGD1.
After Master/Slave configuration (see paragraph "12.24 Configure Master Slave *on page 38*" for the configuration procedure), it is possible to set the display of the entire Master or Slave unit in two modes:

1. **Manual**: press keys and simultaneously to change the display of the Master or Slave unit.
2. **Automatic**: each time an alarm occurs, the display of the Master or Slave unit changes according to the unit in which the alarm occurred.

5.2 SYSTEM MONITOR

This mask is used to display the system's general status:



— Current working setpoint;
— Current working differential (visible with PI adjustment);
— Temperature probe for machine regulation;
— If a PI regulation is active, also the proportional factor "Ep" and the integral factor "Ei" will be displayed;
— Requested percentage of power and percentage of power actually active on the system side;

NOTICE

Some icons can appear in the window, indicating certain system states::

— : system chilled water production;
— : system hot water production;
— : time bands active;
— (M) : multifunction input;

5.3 MASTER UNIT MONITOR

This mask is used to display the data related to the system's total power demand and the relative power percentages divided among the units connected to the system:

Master

Common Outlet:	**---°C**
Total require	**100.0%**
Circuit 1:	**100.0%**
Circuit 2:	**100.0%**

— **Common output (optional)**: water temperature probe located on the common between the system outputs of the master and slave unit;
— **Demand**: power calculated by the Master unit thermostat that will be distributed between the two units;
— **Unit 1**: percentage power requested of the Master unit;
— **Unit 2**: percentage power requested of the Slave unit;

NOTICE

This mask is only available on the Master unit if the system provides a Master/Slave configuration between two units.

5.4 CIRCUIT MONITORS

This mask is used to display the cooling circuit's general status; if the unit has multiple circuits, each will have a dedicated window:

Circuit 1

HP:	**15.8bar**	→	**Tc**	**49.1°C**
LP:	**5.0bar**	→	**Te**	**7.9°C**
Disch.T CP1A				**117.4°C**
Disch.T CP1B				**76.9°C**
CP1:			**0s**	
CP2:			**0s**	

Circuit 2

HP:	**11.1bar**	→	**Tc**	**34.7°C**
LP:	**5.0bar**	→	**Te**	**7.9°C**
Disch.T CP2A				**118.6°C**
Disch.T CP2B				**67.7°C**
CP1:			**0s**	
CP2:			**0s**	

— **AP**: high pressure
— **BP**: low pressure
— **Tc**: condensation temperature
— **Te**: evaporating temperature
— **T.Liquid**: liquid temperature
— **Pressing line Gas T.**: compressor pressing line gas temperature

The status of the compressors can be:

— : indicates that the compressor is off, the (remaining) time to satisfy the minimum OFF time is indicated to the side;

If flashing = Compressor switched off but will soon be switched on.

— : indicates that the compressor is on, the (remaining) time to satisfy the minimum ON time is indicated to the side;
— : indicates a compressor alarm;

5.5 POWER DEMAND MONITOR

This mask is used to display the data related to the power demand on the indicated circuit; if the unit has multiple circuits, each will have a dedicated window:

Circuits

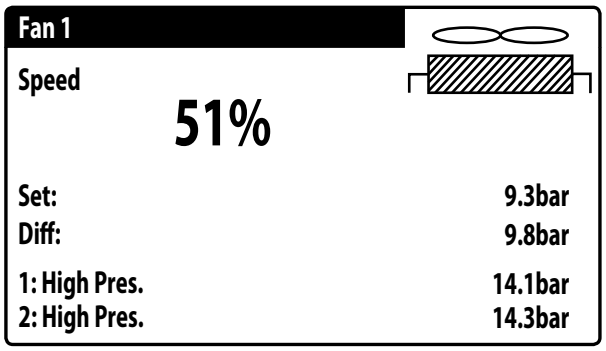
Total require	**100.0%**
Circuit 1:	**50.0%**
Circuit 2:	**50.0%**
Time between starts:	**0s**

— Total thermostat request;
— Power delivered by circuit 1 and 2;
— Seconds remaining until the next compressor is switched on.

6 INPUT/OUTPUT MENU

6.1 FAN MONITOR

This window summarises the state of the fans and the utilised setpoints:



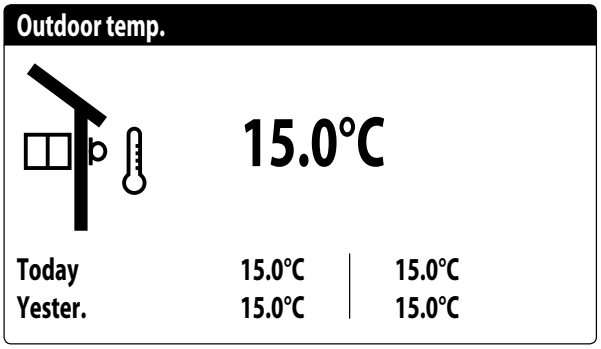
— **Speed**: this value indicates the current speed (as a percentage) at which the concerned fans are operating (common, circuit 1 or circuit 2);
— **Set**: Fan setpoint: this value indicates the current ventilation setpoint;
— **Diff**: Ventilation setpoint differential: this value indicates the current differential applied to the ventilation setpoint;

The state of the fans (displayed on the row at the bottom of the window), can be:

— **OFF**: fans off;
— **PREVENTILATION**: the fans switch on earlier than the compressors;
— **high pressure**: control based on high pressure;
— **POSTVENTILATION**: ventilation after the compressors switch-off;
— **ANTI-FREEZE**: ventilation phase to prevent the accumulation of snow or the formation of ice;
— **DEFROSTING**: defrosting phase in progress;
— **Equalisation**: control based on low temperature;
— **MAXIMUM SPEED**: fans at maximum speed;
— **SILENCED**: speed reduced to reduce noise

6.2 OUTSIDE TEMPERATURE MONITOR

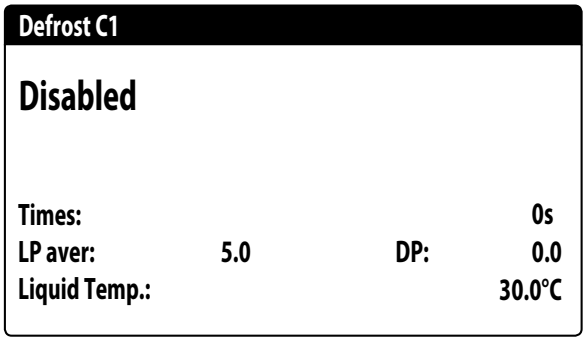
This window indicates the value of the outside temperature detected by the unit:

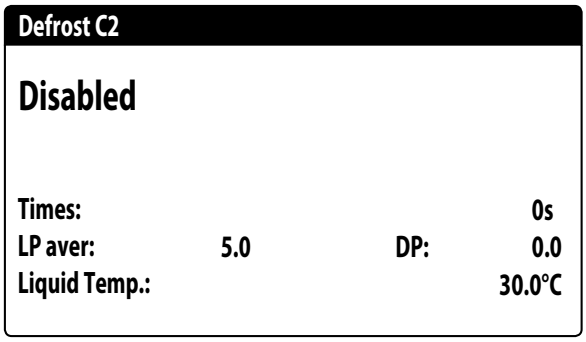


The last two lines show the minimum and maximum temperatures recorded during the current day and during the previous day.

6.3 DEFROSTING MONITOR

This window contains the information concerning the state of defrosting on the unit:





The state of defrosting is divided between two rows, the first can have the following states:
— **Disabled**: defrosting is disabled;
— **Bypass**: bypass phase after the compressor start;
— **Decreasing calculation**: phase calculating the decrease of pressure;
— **Wait for cycle inversion**: pause before inversion of the cycle valve;
— **Defrosting start**: defrosting during the start phase;

— **Defrosting in progress**: defrosting phase;
— **End of defrosting**: conclusion of defrosting;
— **First defrost**: shows the first defrost phase after a power loss.

The second row can have the following states:

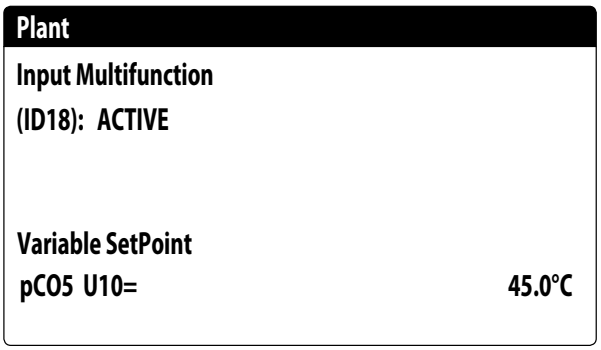
— **High outside temperature**: the air temperature is above the defrosting enabling threshold;
— **Circuit off**: all the compressors of the circuit are off; defrost is disabled;
— **LP above the limit threshold**: the low pressure is above the limit threshold to trigger defrosting;
— **Min times between defrosting procedures**: the defrosting is disabled to respect the minimum time between defrosting procedures;
— **Start CP**: compressor just started, wait for defrosting bypass time;
— **New LP reference**: a new low pressure value has been taken as reference for the calculation of decreasing pressure;
— **Start for LP limit**: start of the defrosting due to exceeding the low pressure limit threshold;
— **Start for Delta P**: start of defrost to overcome the decreasing value of low pressure;
— **Liquid Temp OK**: the temperature of the liquid exceeded the threshold for determining the end of defrosting;
— **Min defrosting times**: defrosting continues until exceeding the minimum defrosting time even if the output conditions were already reached;
— **Awaiting other circuit**: occurs if the fans are common to both circuits and the first circuit to finish defrost awaits the second circuit to finish;
— **Bypass first start**: the first defrost after a power loss can only occur after the compressor has run for the determined time;
— **Liquid temp. Low**: liquid temperature below the level that determines the end of defrost;
— **Start for TGP**: defrosting was activated due to exceeding the temperature threshold of the discharge gas;
— **Forced**: defrosting was forced by the user;

The following data is available in the lower part of the window:

— **Times**: displays the seconds related to the defrosting times;
— **Low average pressure**: shows the average low pressure in the last minute;
— **Delta pressure**: shows the accumulated delta pressure to determine activation of defrost;
— **T.Liquid**: temperature of the liquid to determine the defrosting output.

6.4 MULTIFUNCTION INPUT MONITOR

This window contains the information concerning the state of the multifunction input:



Digital Input ID18: this value indicates the state of the digital input connected to multifunction input (U10) enabling, whose states can be:
— OPEN: multifunction input (U10) NOT ENABLED;
— CLOSED: multifunction input (U10) ENABLED;

NOTICE

The functions currently selected for the multifunction input U10 are displayed at the bottom of the window; to set that function, refer to the dedicated paragraph in the installer menu.

6.5 I/O MONITOR

The status of the available inputs and outputs will be shown on the display, divided into successive pages;the following paragraphs will contain the tables with the various analogue and digital inputs and outputs (in the order in which they will be listed on the display of the unit) available on the software;

The order in which the masks will be available will be as follows:
— Analogue inputs;
— Digital inputs;
— Digital outputs;
— Analogue outputs;
— Analogue inputs (EVD1 and EVD2 expansions);
— Inputs and outputs (pCOE Expansion).

NOTICE

The displays may or may not be present (or change) depending on the model of the unit.

7 INPUT AND OUTPUT

7.1 ANALOGUE INPUTS

Analogue inputs	Code	Description	Note
U1	SIW	evaporator water inlet probe	
U2	SUW	evaporator water outlet probe	
U3	SAE	External air sensor	
U4	SGP1A	Compressor 1 Circuit 1 discharge gas probe	
U5	TAP1	High pressure transducer circuit 1	
U6	SGP1B	Compressor 2 Circuit 1 discharge gas probe	
U7	SGP2A	Compressor 1 Circuit 2 discharge gas probe	
U8	TAP2	High pressure circuit 2 transducer	
U9	SGP2B	Compressor 2 Circuit 2 discharge gas probe	
U10	MULTI IN	Multi-function input	
	Common outlet probe	Common output with Master/Slave	

7.2 DIGITAL INPUTS

Digital inputs	Code	Description	Note
ID1	FL	Evaporator flow switch	
ID2	AP1	Circuit 1 high pressure switch	
ID3	QMF1	Thermal switch fan 1	
ID4	RCS	Phase monitor	
ID5	QM1A	Overload compressor 1 circuit 1	
ID6	QM1B	Overload compressor 2 circuit 1	
ID7	BP1	Circuit 1 low pressure pressure switch	
ID8	AP2	Circuit 2 high pressure switch	
ID9	TV1	Fans thermal switch series	
ID10	SET2	Second setpoint	
ID11	QM2A	Overload compressor 1 circuit 2	
ID12	QM2B	Overload compressor 2 circuit 2	
ID13	BP2	Circuit 2 low pressure pressure switch	
ID14	TMP1	Pump 1 circuit breaker	
ID15	TMP2 / FLS	Pump 2 circuit breaker / Flow switch/flow meter secondary side	FLS with pump option 09
ID16	C/F	Remote season contact (closed = summer mode)	
ID17	ON/OFF	Remote ON/OFF contact (closed = ON)	
ID18	EMF	Multifunction input enabling	

The possible status for each digital input or output can be:
OPEN: load not active;
CLOSED: load active;

7.3 DIGITAL OUTPUTS

Digital outputs	Code	Description	Note
NO1	CP1A	Compressor 1 Circuit 1	
NO2	CP1B	Compressor 2 Circuit 1	
NO3			
NO4			
NO5	RB	Electric heater for the base.	
NO6	VIC1	Circuit 1 reverse cycle valve	Reverse logic
NO7	MV1	Ventilation group 1	
NO8	AE	Alarm summary	
NO9	CP2A	Compressor 1 Circuit 2	
NO10	CP2B	Compressor 2 Circuit 2	
NO11			Freecooling
NO12			

Digital outputs	Code	Description	Note
NO13			
NO14	VIC2	Circuit 2 reverse cycle valve	Reverse logic
NO15			
NO16	MPO1	Pump 1 evaporator	
NO17	RE	Heater exchanger	
NO18	MPO2	Pump 2 evaporator	

The possible status for each digital input or output can be:
OPEN: load not active;
CLOSED: load active;

7.4 ANALOGUE OUTPUTS

Analogue outputs	Code	Description	Note
Y1	FAN1	Ventilation group 1	
Y2	V2V	Evaporator Valve	PRM modular
Y3	V2VA	Freecooling valve (1=freecooling enabled) **Freecooling function currently not available**	Freecooling
Y4			
Y5			
Y6			

7.5 ANALOGUE INPUTS (EVD MONO 1 EXPANSION)

Analogue inputs	Code	Description	Note
S1	TBP1	Low pressure transducer circuit 1	
S2	SGA1	Circuit 1 suction probe	
S3			
S4			

7.6 ANALOGUE INPUTS (EVD MONO 2 EXPANSION)

Analogue inputs	Code	Description	Note
S1	TBP2	Low pressure transducer circuit 2	
S2	SGA2	Circuit 2 suction probe	
S3			
S4			

7.7 ANALOGUE INPUTS (PCOE EXPANSION)

Analogue inputs	Code	Description	Note
B1	SL1	Circuit 1 Liquid temperature probe	Heat pump
	SFC	Free cooling inlet probe **Freecooling function currently not available**	Freecooling
B2	SL2	Circuit 2 Liquid temperature probe	Heat pump
B3			
B4			

7.8 DIGITAL INPUTS (PCOE EXPANSION)

Digital inputs	Code	Description	Note
ID1	GD	Gas detector	
ID2	MVA	Refrigeration circuit box ventilation fan monitoring	
ID3	SPE	Series of fuse boxes	
ID4	FANR	Remote shutdown and fan activation	

The possible status for each digital input or output can be:
OPEN: load not active;
CLOSED: load active;

7.9 DIGITAL OUTPUTS (PCOE EXPANSION)

Digital outputs	Code	Description	Note
NO1	LMS	Empty unit/machine LED	
NO2			
NO3			
NO4			

The possible status for each digital input or output can be:
OPEN: load not active;
CLOSED: load active;

7.10 ANALOGUE OUTPUTS (PCOE EXPANSION)

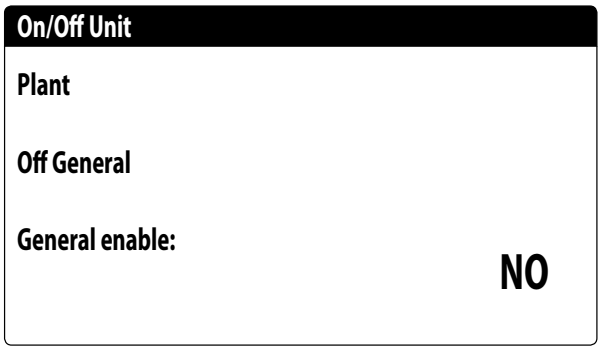
Analogue outputs	Code	Description	Note
Y1			

Ma Pr Sat Fa Re In Co Uf

8 ON/OFF MENU

8.1 GENERAL ON/OFF

This window makes it possible to view the general state of the system as well as to turn the unit on or off:



Display of the general system state:

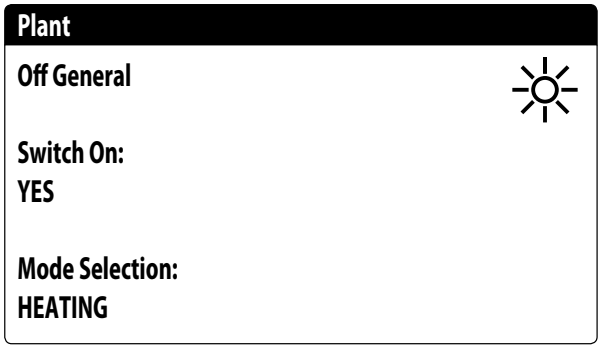
- **Enabled**: the system regulates via the main probe based on the system setpoint;
- **Off due to alarm**: system off due to serious alarm;
- **General off**: system turned off by general enabling (see the paragraph described below "General enabling");
- **Off by BMS**: system turned off by the supervision system;
- **Off by clock**: system turned off by time bands;
- **Off by dig. input**: system turned off by digital input (ID17);
- **Off by display**: system turned off by terminal, control system screen;
- **Out of operating limits**: system out of machine operating limits;

It is possible to change the unit state in the last row. If NO is selected, the entire system will be put in stand-by mode, if YES is selected the machine is turned on.

9 SYSTEM MENU

9.1 SELECTING THE SYSTEM OPERATING MODE

This mask is used to display the current unit state, to turn the unit on or off and to select the operating mode:



Enable: allows to select the mode with which to turn the unit on or off; the available options are:

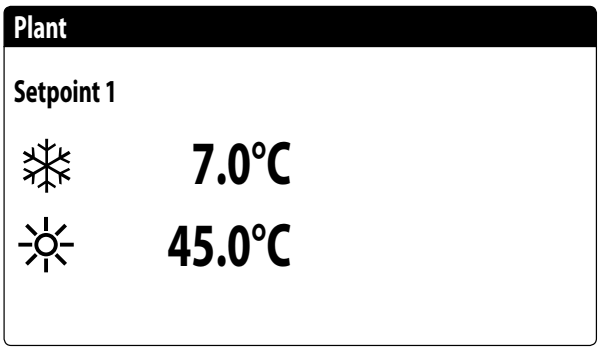
— **OFF**: the system does not produce hot/chilled water;
— **YES**: the system regulates via the main probe based on the system setpoint;
— **YES WITH SET2**: the system regulates via the main probe based on setpoint 2;
— **BY CLOCK**: the system regulates only when time bands are active;

Mode selection: allows to select the operating mode used to operate the unit; the available options are:

— **COOLING**: the system is in cooling mode;
— **HEATING**: the system is in heating mode;
— **FROM OUTSIDE TEMP.**: summer or winter mode is selected based on the outside temperature;
— **FROM DIG. INPUT**: if the digital contact closes, the hot mode is selected;
— **BY SUPERVIS.**: the BMS system controls remotely;
— **BY CALENDAR**: hot mode is selected by the calendar;

9.2 SETTING THE VALUES FOR THE PRIMARY SETS

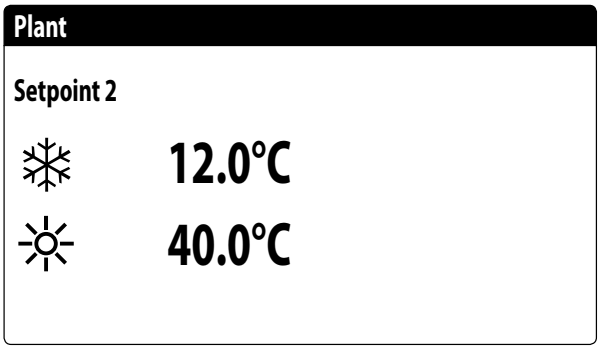
This mask is used to set the values to assign to the primary working setpoints:



The primary working setpoints are:
— ❄ : setpoint 1 for cooling mode;
— ☼ : setpoint 1 for heating mode;

9.3 SETTING THE VALUES FOR THE SECONDARY SETPOINTS

This mask is used to set the values to assign to the secondary working setpoints:



The secondary working setpoints are:
— ❄: setpoint 2 for cooling mode;
— ☼: setpoint 2 for heating mode;

NOTICE

There are two possibilities for using the secondary setpoint of the system:

— Enable the system with the secondary setpoint as an option (ON CON SET 2) in the first screen of the System menu;
— Use the digital input ID10, which activates the secondary setpoint when closed.

9.4 SETTING THE TIME BANDS (A) AND (B)

This mask is used to set the times and action to assign to the time bands (a) and (b):

Plant

Timezone

Day **MONDAY**

			SEL
a	08:00	12:00	ON
b	16:00	22:00	ON

It is possible to assign up to four time bands (a, b, c, d) for each day of the week, during which a specific action can be selected:
— **ON**: system on with setpoint 1 (nominal);
— **SET2**: system on with setpoint 2;
— **OFF**: system off;

NOTICE

The system keeps the system off outside the time bands.

All the screens for time-clock programming are only visible if activated in the main screen of the System menu (Enabling = FROM CLOCK).

9.5 SET THE TIME BANDS (C) AND (D)

This mask is used to set the times and action to assign to the time bands (c) and (d):

Plant

Timezone

Day **MONDAY**

			SEL
c	08:00	12:00	ON
d	16:00	22:00	ON

It is possible to assign up to four time bands (a, b, c, d) for each day of the week, during which a specific action can be selected:
— **ON**: system on with setpoint 1 (nominal);
— **SET2**: system on with setpoint 2;
— **OFF**: system off;

NOTICE

The system keeps the system off outside the time bands.

All the screens for time-clock programming are only visible if activated in the main screen of the System menu (Enabling = FROM CLOCK).

9.6 COPY/PASTE TIME BANDS

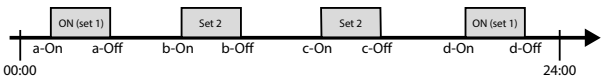
This mask is used to copy and paste the time bands set for a day of the week to another (or to all other days):

Plant

Timezone

Day **MONDAY**
Copy to **---** **NO**

Each program has 8 days and each day has four time periods at which the switch-on and switch-off time, set point 2 or switch-on/switch-off can be set.
Outside these 4 time periods the program will switch the system off:



NOTICE

All the screens for time-clock programming are only visible if activated in the main screen of the System menu (Enabling = FROM CLOCK).

9.7 SETTING THE SEASON CHANGE

This mask allows you to select at which outside temperature to activate heating or cooling:

Cooling/Heating	
Select Cool/Heat with Outdoor temperature	
Set ON cooling	27.0°C
Set ON heating	13.0°C

NOTICE

This screen for automatic control based on external air temperature is only visible if activated in the main screen of the System menu (Selection mode = BY EXT. TEMP.).

9.8 SETTING THE SEASON CHANGE FROM THE CALENDAR

This mask allows you to select on which day of the year to change the operating mode. If the machine is not in heating mode (winter) then it is in cooling mode (summer):

Cooling/Heating	
Select Cool/Heat with Calendar	
Start Heating	0/---
Finish Heating	0/---

NOTICE

This screen for automatic control based on calender is only visible if activated in the main screen of the System menu (Selection mode = BY CALENDAR)

Ma Pr Sat Fa Re In Co Uf

10 CLOCK MENU

10.1 SETTING SYSTEM DATE AND TIME

This mask is used to set the system date and time:

Clock

Day:	**MONDAY**
Time:	**16 MARZ 2020**
Hour:	**16:29**

10.2 SETTING THE AUTOMATIC SUMMER/WINTER TIME CHANGE

This mask is used to set the automatic change between summer and winter time, it is also possible to define the day the change is made:

Clock

Automatic change			
Hour solar/legal:			**YES**
Start:			
	LAST	**SUNDAY**	
in	**March**	**alle**	**02:00**
End:	**LAST**	**SUNDAY**	
in	**October**	**alle**	**03:00**

10.3 SETTING THE PUBLIC HOLIDAYS ON THE CALENDAR

This mask is used to set the days (up to 5 intervals) to mark as "holidays" (therefore to activate the relative time programming previously specified for the holiday time band), or set the off mode for the system:

Calendar

Start	Finish	Action
25/DIC.	26/DIC.	---
15/LUGL	15/LUGL	---
0/---	0/---	---
0/---	0/---	---
0/---	0/---	---

This mask displays:
Start date: shows the date of the start of the holiday. The calender can control a maximum of 5 days defined as hlidays, during which time specific actions are carried out.
End date: shows the date of the end of the holiday. The calender can control a maximum of 5 days defined as holidays, during which time specific actions are carried out.
Action to associate with holiday: shows which action the unit will take during the holiday, which may be:
— OFF: unit will be off during the days selected;
— FEST.: unit will be controlled as specified in the time-clock programme called HOLIDAY (for further information refer to the function of the time-clock);
— --- : if no action is specified the unit will be controlled by the manual settings.

11 COUNTER MENU

This menu displays the values of the various unit component counters (hours of functioning, number of starts, component ageing).

MANDATORY

The SYSTEM MANAGER MUST periodically view the progress of the COUNTERS indicating the ageing of the unit's components and record them in the MAINTENANCE REGISTER (refer to the unit's instruction manual).

11.1 COMPRESSOR COUNTER MONITOR

This window displays data on the operating hours and number of compressor starts on the unit:

Counters	
Circuit 1	
Compressor 1:	000h
Compressor 2:	000h
Number of starts	
Compressor 1:	000
Compressor 2:	000

Circuit 1

Counters	
Circuit 2	
Compressor 1:	000h
Compressor 2:	000h
Number of starts	
Compressor 1:	000
Compressor 2:	000

Circuit 2

11.2 UNIT COUNTER MONITOR

This window displays data on the operating hours in cooling mode and heating mode, the hours of functioning of the pumps, the number of mode changes and the number of defrosts performed on the unit:

Counters	
Cool:	000h
Heat:	000h
Circuit 1:	000h
Circuit 2:	000h
Pump 1:	000h
Pump 2:	000h

— **Cold**: hours of unit functioning in cooling mode with at least one compressor on
— **Hot**: hours of unit functioning in heating mode with at least one compressor on
— **Cooling circuit 1**: hours of functioning of cooling circuit 1 with at least one compressor on
— **Cooling circuit 2**: hours of functioning of cooling circuit 2 with at least one compressor on
— **Pump 1**: hours of functioning system pump 1
— **Pump 2**: hours of functioning system pump 2

Counters	
Mode changes:	000
Defrost:	000
VIC 1:	000
VIC 2:	000
Fans:	000h

— **Mode changes**: number of functioning mode changes
— **Defrosts**: number of defrosts performed by the unit
— **VIC 1**: number of cycle reverse valve state changes circuit 1
— **VIC 2**: number of cycle reverse valve state changes circuit 2
— **Fans**: fan unit hours of functioning

Counters	
Board:	0001h
Atex fans:	0001h
Status lights:	0001h

The following counters are displayed in this mask:
— Control board operating hours
— Ventilation fan in the cooling circuit compartment operating hours
— Functioning hours status lights

The following masks display the total counters, which are useful for calculating ageing indices:

Total counters	
Circuit 1 Number of starts	
Compressor 1:	13500
Compressor 2:	13500
VIC 1:	15000

— Number of peaks made by the compressor 1 circuit 1
— Number of peaks made by the compressor 2 circuit 1
— Number of circuit 1 cycle reversing valve startups

Total counters	
Circuit 2 Number of starts	
Compressor 1:	13500
Compressor 2:	13500
VIC 2:	15000

— Number of peaks of compressor 1 circuit 2
— Number of peaks of compressor 2 circuit 2
— Number of circuit 2 cycle reversing valve startups

11.3 COMPONENT AGEING MONITOR

This window displays the ageing status of the unit's circuits and components:

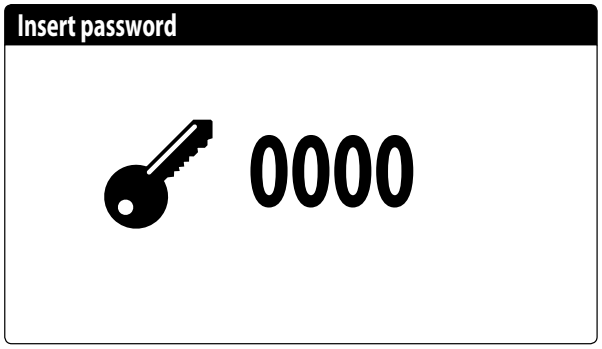
Aging	
Circuit 1:	0.0%
Circuit 2:	0.0%
Coil 1:	0.0%
Coil 2:	0.0%
Exchanger:	0.0%

— **Cooling circuit 1**: ageing percentage cooling circuit 1
— **Cooling circuit 2**: ageing percentage cooling circuit 2
— **Finned coil 1**: ageing percentage finned coil 1
— **Finned coil 2**: ageing percentage finned coil 2
— **Hydronic heat exchanger**: ageing percentage

12 INSTALLER MENU

12.1 PASSWORD TO ACCESS THE INSTALLER MENU (0000)

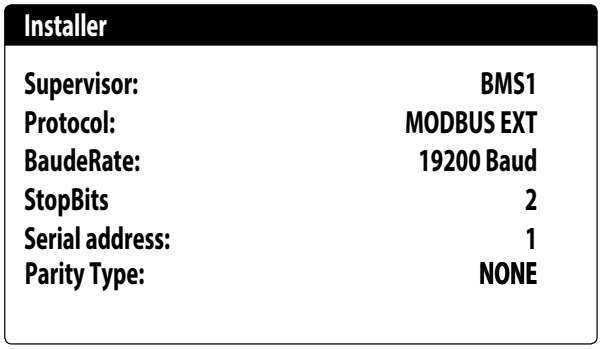
This mask is used to enter the password necessary for accessing the installer menu (the password is 0000):



12.2 SETTING THE BMS 1 PARAMETERS

This mask is used to set the parameters related to the serial communication dedicated to BMS1:

I3



Protocol: this value indicates which protocol is used to communicate with the BMS supervision system; the support protocols are:
— 0: CAREL: protocol for expansions;
— 1: MODBUS: Modbus/RS485 supervisor;
— 2: pCOWeb: protocol for pCOWeb expansion;
— 3: LON: protocol for LON expansion;
— 4: MODBUS EXT: Modbus in extended version with several addresses available.

Speed: this value indicates which speed is set for serial communication; the possible selections are:
— 0: 1200 baud;
— 1: 2400 baud;
— 2: 4800 baud;
— 3: 9600 baud;
— 4: 19200 baud;
— 5: 38400 baud;

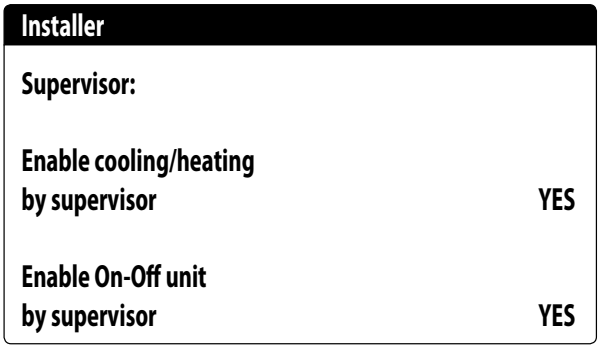
Stopbits: this value indicates the number of bits used to indicate the bitstop in serial communication;

Address: this value indicates the address assigned to the BMS supervision system towards which communication will be made;
Parity: indicates the actual value assigned to the number of parity bits for communication between the unit and the BMS1 supervision system; the values that can be set are:
0. None
1. Even
2. Odd

12.3 ENABLE CHANGE OVER AND ON/OFF BY SUPERVISOR

This mask is used to enable or disable the change over (season change) and unit on/off via BMS:

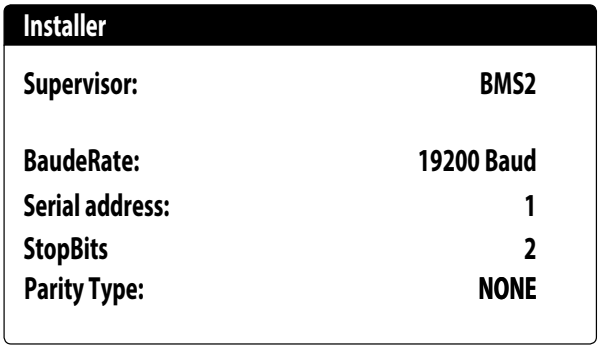
I6



12.4 SETS THE BMS2 PARAMETERS

This mask is used to set the parameters related to the serial communication dedicated to BMS2:

I9



Protocol: this value indicates which protocol is used to communicate with the BMS supervision system; the support protocols are:
— 0: CAREL: protocol for expansions;
— 1: MODBUS: Modbus/RS485 supervisor;
— 2: pCOWeb: protocol for pCOWeb expansion;
— 3: LON: protocol for LON expansion;
— 4: MODBUS EXT: Modbus in extended version with several addresses available.

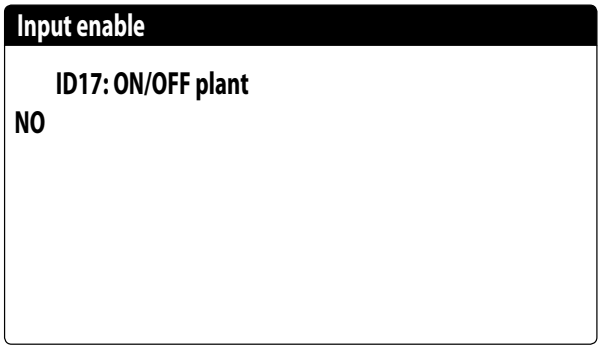
Speed: this value indicates which speed is set for serial communication; the possible selections are:
— 0: 1200 baud;
— 1: 2400 baud;
— 2: 4800 baud;
— 3: 9600 baud;
— 4: 19200 baud;
— 5: 38400 baud;

Address: this value indicates the address assigned to the BMS supervision system towards which communication will be made;
Stopbits: this value indicates the number of bits used to indicate the bitstop in serial communication;
Parity: indicates the actual value assigned to the number of parity bits for communication between the unit and the BMS2 supervision system; the values that can be set are:
0. None
1. Even
2. Odd

12.5 ENABLES SYSTEM ON/OFF FROM DIGITAL INPUT (ID17)

This mask is used to enable unit on/off via the digital input (ID17):

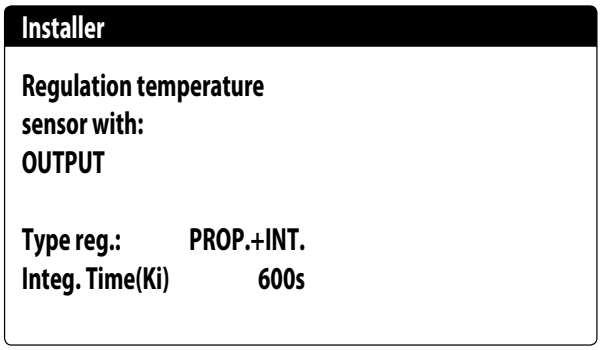
I12



12.6 SETTING THERMOSTAT REGULATION

This mask is used to select the parameters for managing the operating thermostat:

I15



Regulation with temperature probe: this value indicates on which probe the system bases its adjustment when producing water; The possible values are:
— INPUT (U1): the probe used for adjusting the production of water is the one at the input of the plate heat exchanger;
— OUTPUT (U2): the probe used for adjusting the production of water is the one at the output of the plate heat exchanger;
— COMMON OUTPUT PROBE(U1): the probe used to regulate water production is the one located at the common outlet if there are two plate exchangers;
— STORAGE TANK (U1): evaporator inlet probe remotely mounted on storage tank. In this way, when the thermostat does not require the compressor to be switched on, the pump is switched off.

NOTICE

If selecting input based adjustment, in order to set a correct work setpoint, keep in mind the addition or the subtraction (based on if hot or cold operation) of the water production differential to or from the work setpoint.

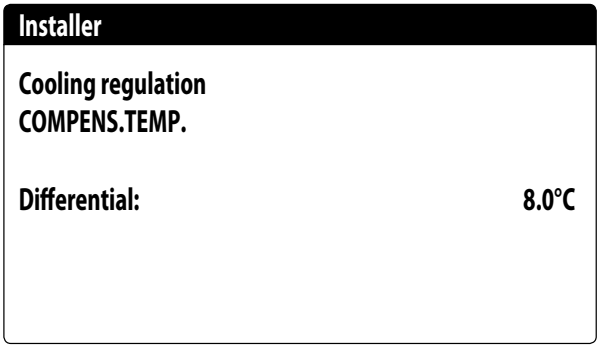
Type of reg.: this value indicates which logic is used for managing the adjustment; The possible values are:
— PROP: applies only proportional control;
— PROP+INT: applies proportional control + integral;

Integ. time (Ki): this value indicates the integral time to add to the proportional control (if the regulation type proportional + integral was selected);

12.7 SETS THE LOGIC FOR THE SETPOINT AND DIFFERENTIAL IN COOLING MODE

This mask allows you to select the logic to be applied to the working setpoint and the value to be assigned to the differential for cooling operation:

I18



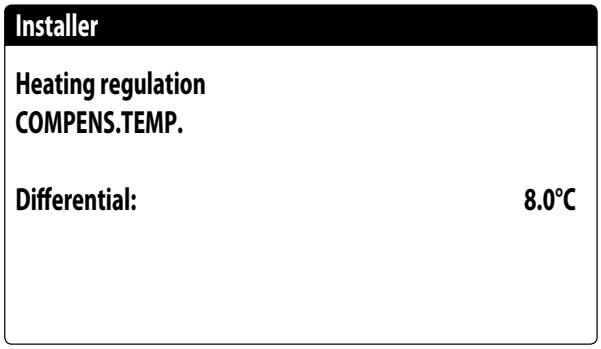
The type of setpoint indicates which logic is used for managing the working setpoint; the possible states are:

— **FIXED SETPOINT**: the system uses the values set by the user in the windows of the set menu as the work set-point (main and secondary setpoints);
— **CLIMATIC CURVE**: the working setpoint is calculated automatically based on the data entered in the climatic curve;
— **Differential**: this value indicates the differential applied between the water input and output; this value depends on the flow rate value at which the system operates;

12.8 SETS THE LOGIC FOR THE SETPOINT AND DIFFERENTIAL IN HEATING MODE

This mask allows you to select the logic to be applied to the working setpoint and the value to be assigned to the differential for heating operation:

I21

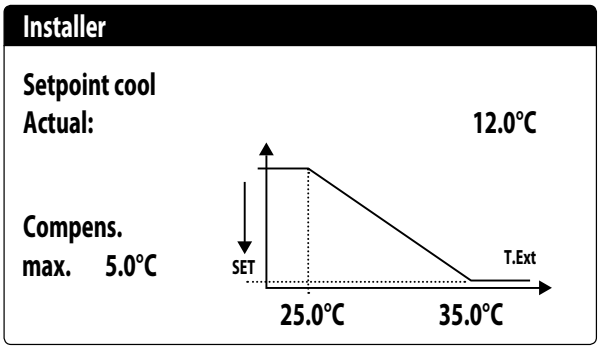


The type of setpoint indicates which logic is used for managing the working setpoint; the possible states are:
— **FIXED SETPOINT**: the system uses the values set by the user in the windows of the set menu as the work set-point (main and secondary setpoints);
— **CLIMATIC CURVE**: the working setpoint is calculated automatically based on the data entered in the climatic curve;
— **Differential**: this value indicates the differential applied between the water input and output; this value depends on the flow rate value at which the system operates;

12.9 CLIMATIC CURVE CONFIGURATION IN COOLING MODE

This window allows you to set the temperatures (minimum and maximum) and the maximum differential that will be applied to the cooling working set according to the minimum outside air temperature:

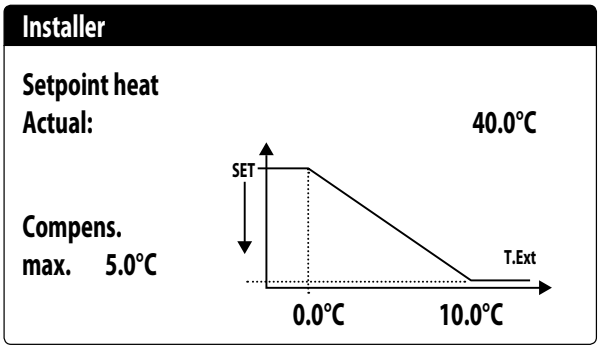
I24



12.10 CLIMATIC CURVE CONFIGURATION IN HEATING MODE

This window allows you to set the temperatures (minimum and maximum) and the maximum differential that will be applied to the heating working set according to the minimum outside air temperature:

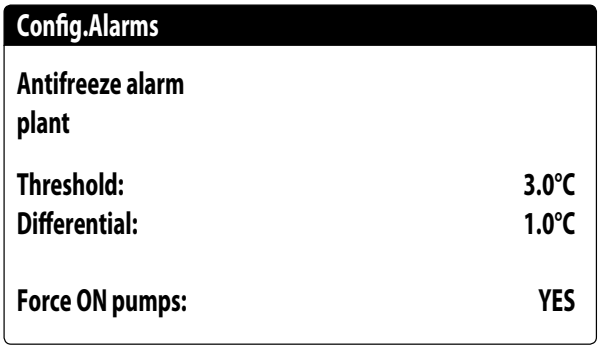
I27



12.11 ANTI-FREEZE ALARM CONFIGURATION

This window is used to configure the system anti-freeze alarm:

I30



Threshold: this value indicates the temperature of the inlet or outlet water (based on the type of regulation selected), below which the anti-free alarm activates;

NOTICE

The threshold is not modifiable. In the case of glycol water, the threshold is the result of the calculation obtained from: freezing temperature of the mixture with anti-freeze + 3°C.

Differential: this value indicates the differential to apply to the anti-freeze activation threshold; when the water temperature (inlet or outlet) is higher than the threshold value plus the differential, the anti-freeze alarm is deactivated;
Pump ON power: by changing this value, it is possible to decide whether to automatically activate or deactivate the pumps during the anti-freeze alarm;

12.12 MANAGING THE PUMPS

This mask is used to manage the pumps inside and outside the unit:

I33

Installer	
Number of Pumps:	0
Idle time:	168h
Delay switch-off:	5s

Number of pumps: this parameter indicates if there are pumps outside the unit;
Off time: this value indicates the off time for a pump, after which the pump is activated (if there are several pumps installed on the unit this prevents limescale build-up in the pump in the case of an extended stop);
Delay off: this value indicates the pump turn off delay after deactivating the compressors;

12.13 CONFIGURE ANTI-FREEZE MANAGEMENT VIA THE PUMP

This mask is used to configure the cyclical activation of the pump for the anti-freeze function:

I36

Installer	
Cycles pump start Antifreeze Enable:	N
Cycle time	30min
Pulse time	2min
Min.Extern.Air Temp.	5.0°C

Enable pump cyclical start-up for anti-freeze: this value indicates whether to enable the pump start-up cycle for the anti-freeze function;
Cycle time: this value indicates the interval time between pump activation periods;
Forced duration: this value indicates the time the pumps will be made to operate for the anti-freeze function;
Outside temp threshold: this value indicates the temperature for the outside air below which the anti-freeze cycle activates (if enabled);

12.14 CONFIGURE FANS AT LOW TEMPERATURES

This mask is used to configure the cyclical start-up of the fans to eliminate any accumulation of snow:

I39

Fans	
Fan antifreezer/snow function enable	YES
Ext.Air temp.:	1.0°C
Pulse time Off:	120min
Pulse time On :	30s

Enable: this value indicates whether to enable the anti-freeze function on the fans,
Outside Temp: this value indicates the temperature for the outside air below which the anti-freeze cycle activates on the fans (if enabled);
Off period: this value indicates the interval time between fan activation periods during the anti-freeze function;
On period: this value indicates the time for which the fans will be made to operate for the anti-freeze function

12.15 SETS PUMP START-UP FOR ANTI-FREEZE

This mask is used to set pump start-up if the electric heater turns on:

I42

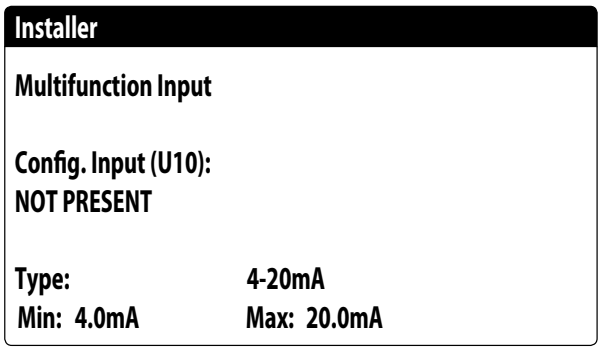
Installer	
Antifreeze Heater	
Force ON pumps:	YES

Pump ON power: this value indicates whether or not to activate the system pumps during operation of the anti-freeze electric heater;

12.16 MULTI-FUNCTION INPUT CONFIGURATION (U10)

This mask is used to set the function associated with multifunction input U10:

I45



U10: this value indicates which function to assign to the multifunction input U10; the possible states are:
— NOT PRESENT: the multifunction input is disabled;
— POWER LIMITATION: input U10 is used to limit the unit power proportionally to the signal applied to input U10 (the configuration of the managed power range is available on the next window if this option is active);
— VARIABLE SETPOINT: input U10 is used to vary the unit work setpoint proportionally to the signal applied to input U10 (the configuration of the range for setpoint variation is available on the next window if this option is active);

Type: this value indicates the type of signal applied to the multifunction input; the possible states are:
— 0-10V: input signal 0-10V;
— 4-20mA: input signal 4-20mA
— NTC: input signal NTC;

NOTICE

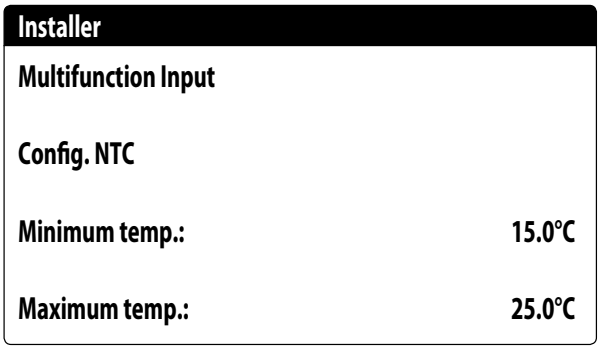
If option (1) or (2) is selected as "Type", it will be possible to set the minimum and maximum signal value;

To use this function, close the contact on input ID18.

12.17 CONFIGURATION OF THE NTC SIGNAL FOR INPUT (U10)

This mask is used to set the "NTC" function (for the type) on input U10:

I48

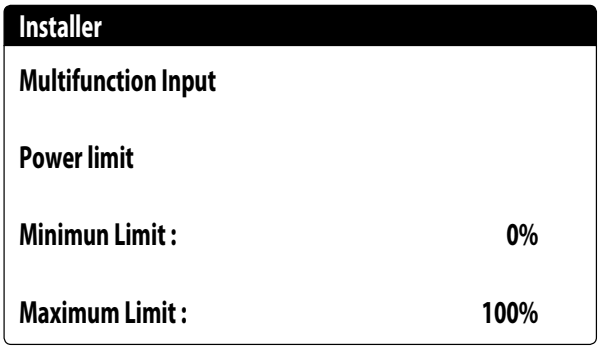


Minimum temp.: this value indicates the minimum temperature (NTC signal) to assign to the minimum value for the function set on the multifunction input (power limitation or variable setpoint);
Maximum temp: this value indicates the maximum temperature (NTC signal) to assign to the maximum value for the function set on the multifunction input (power limitation or variable setpoint);

12.18 CONFIGURATION OF POWER LIMITATION FOR INPUT (U10)

This mask is used to set the "POWER LIMITATION" function for input U10:

I51



Minimum limit: this value indicates the minimum power level that can be reached based on the input signal;
Maximum limit: this value indicates the maximum power level that can be reached based on the input signal;

12.19 CONFIGURATION OF VARIABLE SETPOINT FOR INPUT (U10)

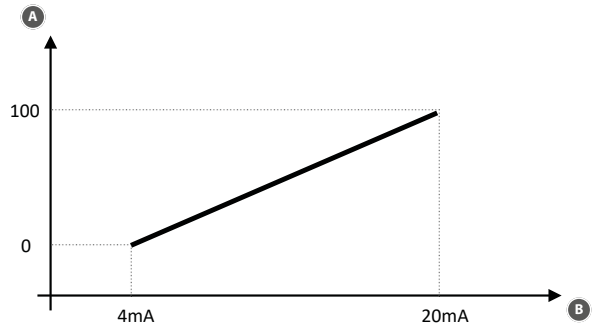
This mask is used to set the "VARIABLE SETPOINT" function for input U10:

I54

Installer		
Multifunction Input		
Variable SetPoint Mode :		
	COOLING	**HEATING**
Min:	**7.0°C**	**45.0°C**
Max:	**11.0°C**	**50.0°C**

On this mask it will be possible to set the minimum and maximum setpoint limits (cooling and heating) based on the U10 input signal;
To configure the multi-function input, therefore, you must select which type of input you want to use, set the minimum and maximum limits that the input can have, and set the minimum and maximum limits of the function you want to use accordingly.

Example: to use the 4-20mA input to limit the unit/machine's power, set the desired functionality as "POWER LIMITATION" and the input type as "4-20mA". In addition, the minimum demand limit to which the 4mA will correspond and the maximum demand limit to which the 20mA will correspond must be set.



A Power requested (%)
B Multi-function input

12.20 CONFIGURE NIGHT MODE CONTROL

This mask is used to set the night mode function to lower the noise level of the fans:

I57

Fans	
Condensation mode overnight	**NO**
On:	**21:00**
Off:	**8:00**
Cooling VMax:	**6.0V**
FreeCool. VMax:	**6.0V**

Night-time silenced control: this value indicates if the night mode function should be activated; this function enables silenced operation during the time band specified in the following parameters;
Control on: if night-time silenced operation is active, this parameter indicates the time after which this operation will be activated;
Control off: if night-time silenced operation is active, this parameter indicates the time after which this operation will be deactivated;
Cooling VMax: if night-time silenced operation is active, this parameter indicates the maximum Volt applied to the cold condensation control;
FC VMax: Maximum volts in free cooling operation with night mode control;

NOTICE

Freecooling function currently not available.

12.21 CONFIGURATION OF FUNCTION "NOISE DEMAND LIMIT"

This mask allows the "Noise Demand Limit" function to be set:

I60

Noise demand limit	
Enable:	**No**
On:	**21:00**
Off:	**8:00**
Demand limit:	**100.0%**
Water temperature	
Max cooling:	**15.0°C**
Min heating:	**35.0°C**

This function limits the compressors within a time slot. Depending on the functioning, cooling or heating, the respective optimised algorithm for ventilation, HP or floating LP must be enabled:
— **Enable**:
◦ No: disables functioning

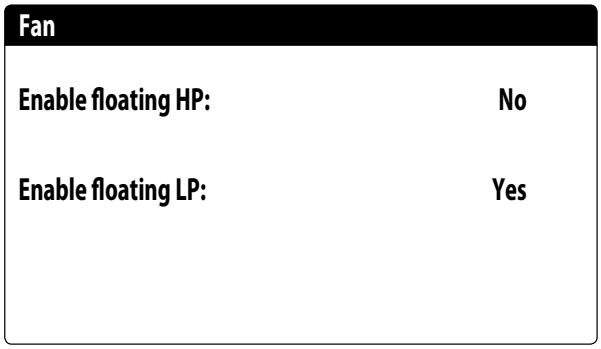
- Yes: Enables the function within the set time slot

— **Control on**: time of activation of the function "Noise Demand Limit"
— **Control off**: end time of function "Noise Demand Limit"
— **Demand limit**: Compressor power limitation within the time slot with activated function
— **Max cold**: If the water outlet temperature exceeds this threshold during cooling mode functioning, the noise demand limit is deactivated. The minimum and maximum limits are equal to the cold setpoint limits.
— **Min. hot**: If the water outlet temperature falls below this threshold during heating mode functioning, the noise demand limit is deactivated. The minimum and maximum limits are equal to the hot setpoint limits.

12.22 FAN ADJUSTMENT CONFIGURATION

This mask enables the optimisation of fan adjustment: HP and floating LP.

I63



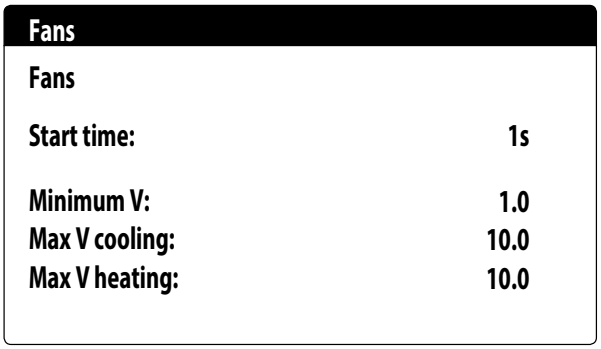
The "noise limit demand" requires the respective optimised functioning of the fans, cold and hot, to be enabled:
— **Enables floating HP**:
- No: standard adjustment (set+band)
- Yes: floating HP adjustment enabling

— **Enables floating LP**:
- No: standard adjustment
- Yes: floating LP adjustment enabling

12.23 CONFIGURATION OF THE FAN SPEED

This window is used to configure the inverter fan signals:

I66

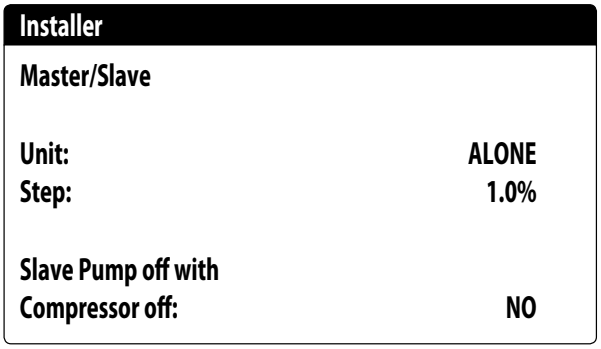


Peak duration: this value indicates the peak duration at fan start-up;
Min volt: this value indicates the voltage at minimum speed before shutdown;
Max volt cold: this value indicates the voltage at maximum speed during cooling mode;
Max volt hot: this value indicates the voltage at maximum speed during heating mode;

12.24 CONFIGURE MASTER SLAVE

This window is used to configure the parameters for unit Master/Slave management:

I69

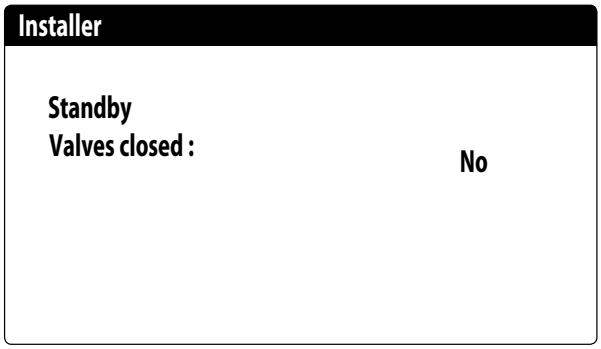


(**Unit**: this value indicates the type of setting for the unit; this type can be:
— SINGLE: unit without Master/Slave connection;
— MASTER: identifies the master unit;
— SLAVE: identifies the slave unit;
Power step: the required power calculated by the thermostat is divided between the master and slave units based on this parameter; (E.G.: 1% = the units work in parallel; 100%= the units work in sequential mode (first all the power of one is used and then all the power of the other is used);
Slave pump Off with CP Off: this value indicates management of the pump on the slave unit; this management can be:
— YES: the slave pump turns off if there is no request on the slave;
— NO: the slave pump turns on and shuts down together with the master;

12.25 VALVE MANAGEMENT

This mask allows you to manage the evaporator valves (only if the unit is configured as modular):

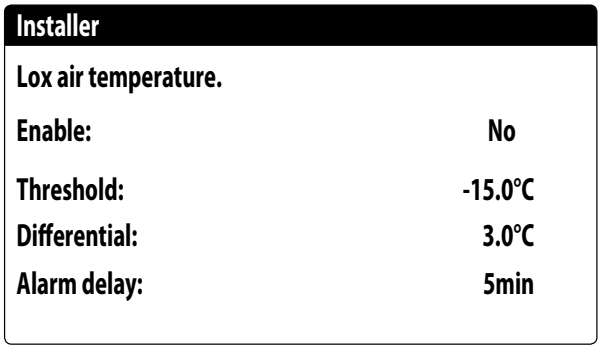
I78



— **No**: there is water flowing through the evaporator when the machine is in standby;
— **Yes**: there is no water flowing through the evaporator when the machine is in standby.

12.26 LOW OUTDOOR AIR TEMPERATURE ALARM CONFIGURATION

I81

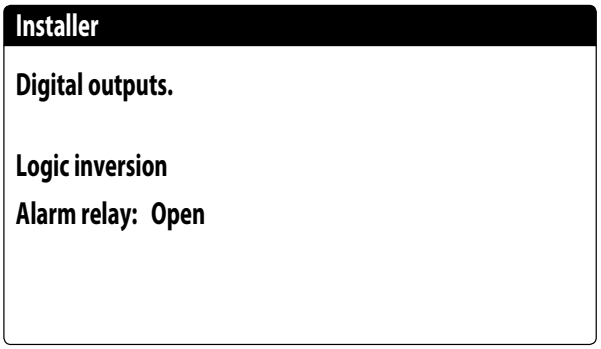


— **Enable**:
  ◦ No: alarm disabled
  ◦ Yes: alarm enabled with automatic reset
— **Threshold**: threshold of outdoor air below which, after a time equal to "alarm delay", the unit/machine switches off the compressors.
— **Differential**: alarm reset differential, the unit/machine can restart when the outdoor air is equal to its value is "Differential".
— **Alarm delay**: delay for alarm intervention from the moment the outdoor air value falls below "threshold".

12.27 ALARM RELAY LOGIC

Alarm relay logic digital output NO8.

I93

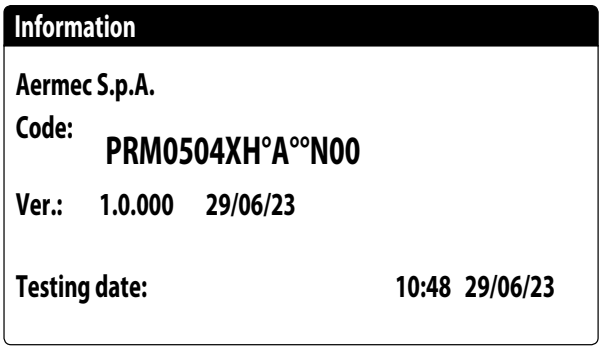


◦ Open (if there are no alarms, the relay is closed)
◦ Closed (if there are no alarms, the relay is open)

12.28 UNIT INFORMATION MONITOR

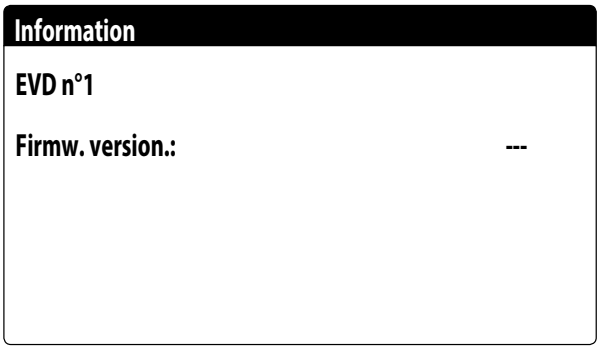
This window contains information concerning the unit code, the software version and the machine test date:

I99



12.29 EVD VALVE INFORMATION MONITOR

I102



This mask displays information concerning the EVD valve connected in Modbus (if present).
The same mask is also present for the mono EVD driver of circuit 2.

12.30 SETS THE INTERFACE LANGUAGE

This window is used to select the display language. Press "ENTER" to cycle the available languages:

Installer

Language: ENGLISH

Push ENTER for change

12.31 CONFIGURATION OF THE UNITS OF MEASURE

This window is used to set the units of measure to use in the system:

I108

Options

Type of measurem.unit
STANDARD [°C/bar]

Supervisor BMS
STANDARD [°C/bar]

Type of units of measure: indicates the units of measure shown on the display; the possible states are:
— STANDARD [°C/bar]
— ANGLO-SAXON [°F/psi]

BMS supervisor: indicates the units of measure read by the supervisor; the possible states are:
— STANDARD [°C/bar]
— ANGLO-SAXON [°F/psi]

12.32 CONFIGURES THE INSTALLER MENU PASSWORD

This window is used to change the "Installer" menu access parameter:

Password

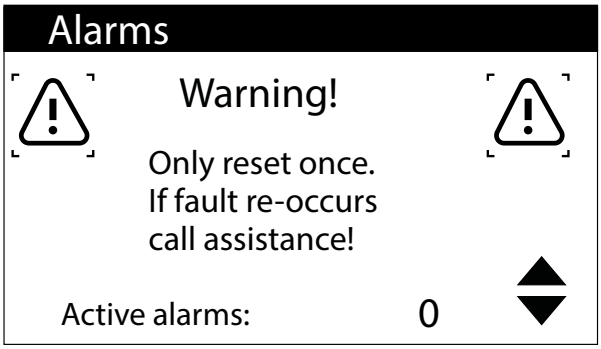
New password
Installer: 0000

Ma Pr Sat Fa Re In Co Uf

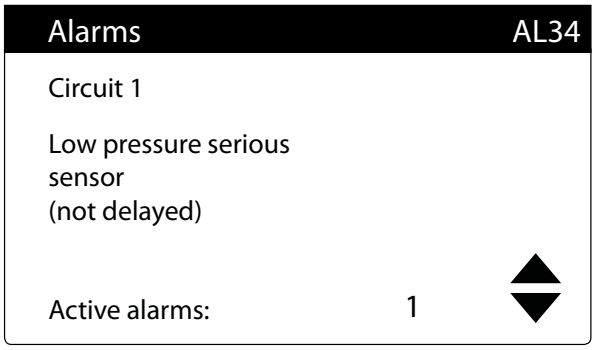
13 ALARM

13.1 CONTROL OF ALARMS

By pressing the key the following screen will be displayed:



With keys and you can scroll through the list of active alarms:



This mask displays the alarm management logic.
The last line shows how many alarms are active at that moment.
The alarm status remain in memory even after power failure.

13.2 ALARM RESET

WARNING

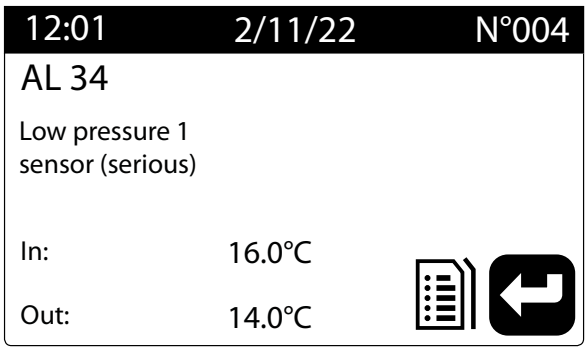
The alarm reset procedure is reserved only for authorised technical personnel. If an alarm occurs, it is necessary to contact the AUTHORISED TECHNICAL SUPPORT SERVICE.

MANDATORY

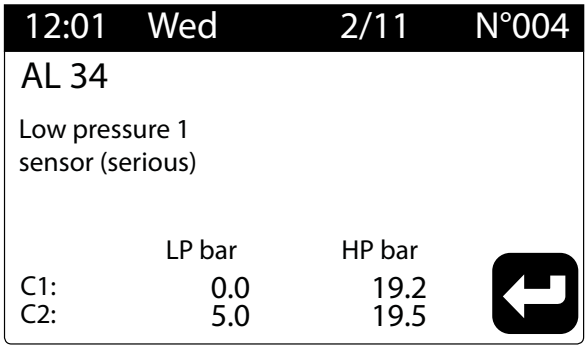
In the event of an alarm, it is necessary to contact the AUTHORISED TECHNICAL AFTER-SALES SERVICE/ASSISTANCE so that they can intervene to resolve the malfunctioning of the unit and carry out the password reset procedure.

13.3 ALARM HISTORY

To view the alarm history, press the key , scroll with the key to the last screen and press Enter.
Each alarm is uniquely identified by a 4-digit alarm code, this code can be found on the follow pages.
At any time it is possible to view the history of the last 100 alarms that have occurred in the system.



This mask displays:
— Date and time of intervention (alarm start)
— Alarm number and brief description
— Input/output temperature



This mask displays:
— Date and time of intervention (alarm start)
— Alarm number and brief description
— High pressure in both circuits
— Low pressure in both circuits

When the last position in the alarm history is reached, the software will overwrite the first one with the last one that occurred.

NOTICE

It is not possible for a end user to reset the alarm history.

14 LIST OF ALARMS

WARNING

The alarm reset procedure is reserved only for authorised technical personnel. If an alarm occurs, it is necessary to contact the AUTHORISED TECHNICAL SUPPORT SERVICE.

MANDATORY

Before resetting an alarm, it is necessary to contact the AUTHORISED TECHNICAL SUPPORT SERVICE. In the event of alarms with "manual reset from the control panel", it is necessary to request the AUTHORISED TECHNICAL SUPPORT SERVICE to intervene in order to resolve the unit malfunction and perform the reset procedure using a password.

There are three types of alarm resets:

— **Auto**: automatic, when the event causing the alarm stops, also the alarm disappears.

— **Manual**: manual, to restart normal operation manual acknowledgement is necessary.

— **Semi-auto**: semi-automatic, the alarm is automatic but if it is present more than "n" times, it then becomes manual. The interventions are decreased by one unit every hour. Furthermore, there is a "timeout", after which the alarm becomes manual, even if the maximum number of interventions is reached.

Example: taking the Phase monitor alarm, the maximum number of times the alarm can intervene is 3. This is the maximum number the alarm can do in one hour, but considering that every hour the count is decreased by one unit it follows that: the phase monitor alarm can intervene, without assuming the level of manual reset, a maximum of 3 times in one hour or 4 times in 2 hours or 5 times in 3 hours and so on. Semi-auto reset can switch to manual reset without reaching the maximum number of interventions, if it remains for a time equal to the Timeout Time.

14.1 ALARM TYPES

There are three types of alarms:

— **Unit alarms**: these are a category of alarms that do not involve the turning of a particular light, therefore the green light indicating the unit if active will remain ON. In the event of alarms with "manual reset from the control panel", it is necessary to request the AUTHORISED TECHNICAL SUPPORT SERVICE to intervene in order to resolve the unit malfunction and perform the reset procedure using a password.

— **Component not working alarms**: they are a category of alarms that cause the yellow light to turn on. In this case it is necessary to press the RESET button on the unit and request the AUTHORISED TECHNICAL SUPPORT SERVICE to intervene to resolve the unit malfunction and perform the reset procedure using a password.

— **Serious gas leak alarms**: they are a category of alarms that causes the right light to turn on. In this case it is necessary to press the RESET button on the unit and request the AUTHORISED TECHNICAL SUPPORT SERVICE to intervene to resolve the unit malfunction and perform the reset procedure using a password.

List of alarms

Code	Description	Alarm light	Reset		N.int.	Timeout(s)
AL30	Circ. 1 low pressure switch alarm	Red	Manual on the control panel	Manual with the RESET button	1	
AL32	Circ. 1 high pressure switch alarm	Red	Manual on the control panel	Manual with the RESET button	1	
AL60	Refrigerant gas detector alarm	Red	Manual on the control panel	Manual with the RESET button	1	
AL64	Circ. 2 low pressure switch alarm	Red	Manual on the control panel	Manual with the RESET button	1	
AL66	Circ. 2 high pressure switch alarm	Red	Manual on the control panel	Manual with the RESET button	1	

Code	Description	Alarm light	Reset		N.int.	Timeout(s)
AL79	Alarm refrigerant gas discharge circuit 1	Red	Manual on the control panel	Manual with the RESET button	1	
AL80	Alarm refrigerant gas discharge circuit 2	Red	Manual on the control panel	Manual with the RESET button	1	
AL28	Fan 1 circuit breaker alarm	Yellow	Manual on the control panel	Manual with the RESET button	1	
AL29	Circuit 1 fans circuit breaker series (chain)	Yellow	Manual on the control panel	Manual with the RESET button	1	
AL93	Refrigeration circuit box ventilation fan monitoring	Yellow	Manual on the control panel	Manual with the RESET button	1	
AL94	Series of electrical protections	Yellow	Manual on the control panel	Manual with the RESET button	1	
* AL95	Remote shutdown and fan activation	Yellow Green White	Auto	Manual with the RESET button		
AL01	Clock battery flat alarm	Green	Auto	-		
AL03	Phase monitor alarm	Green	Semi-auto	-	3	300
AL04	Display alarm reset	Green	-	-		
AL05	Circuit 1 high pressure faulty transducer alarm	Green	Manual on the control panel	-	1	
AL06	Circuit 2 high pressure faulty transducer alarm	Green	Manual on the control panel	-	1	
AL07	Circuit 1 low pressure faulty transducer alarm	Green	Manual on the control panel	-	1	
AL08	Circuit 2 low pressure faulty transducer alarm	Green	Manual on the control panel	-	1	
AL09	Evaporator 1 input faulty probe alarm	Green	Manual on the control panel	-	1	
AL10	Evaporator 1 output faulty probe alarm	Green	Manual on the control panel	-	1	
AL11	Evaporator common outlet faulty probe alarm	Green	Manual on the control panel	-	1	
AL16	Outside temperature faulty probe alarm	Green	Manual on the control panel	-	1	
AL17	Faulty liquid probe alarm circuit 1	Green	Manual on the control panel	-	1	
AL18	Circuit 2 liquid probe failure alarm	Green	Manual on the control panel	-	1	
AL19	Circuit 1 compressor 1 maintenance request	Green	Auto	-		
AL22	Evap pumps 1 hours maintenance alarm	Green	Auto	-		
AL23	Circ. 1 compressor 1 technical alarm	Green	Manual on the control panel	-	1	
AL24	Evaporator 1 pump thermal alarm	Green	Manual on the control panel	-	1	
AL25	Evaporator 2 pump thermal alarm	Green	Manual on the control panel	-	1	
AL26	Coil 1 fluid failure probe alarm	Green	Manual on the control panel	-	1	
AL27	Coil 2 fluid failure probe alarm	Green	Manual on the control panel	-	1	
AL31	Circ. 1 low pressure alarm	Green	Manual on the control panel	-	1	
AL33	Circ. 1 high pressure alarm	Green	Manual on the control panel	-	1	

Code	Description	Alarm light	Reset		N.int.	Timeout(s)
AL34	Circ. 1 serious low pressure alarm	Green	Manual on the control panel	-	1	
AL35	Circ. 2 serious low pressure alarm	Green	Manual on the control panel	-	1	
AL36	Maintenance request cycle reverse valve circuit 1	Green	Auto			
AL37	Maintenance request cycle reverse valve circuit 2	Green	Auto			
AL38	Evaporator flow switch alarm	Green	Manual on the control panel	-	1	
AL39	Secondary side flow switch alarm	Green	Auto			
AL40	Evaporator anti-freeze alarm	Green	Manual on the control panel	-	1	
AL41	Common evaporator antifreeze alarm	Green	Manual on the control panel	-	1	
AL42	Low water content force off alarm	Green	Auto	-	1	
AL43	Maintenance request fan group 1	Green	Auto			
AL44	Low external air temperature alarm	Green	Auto	-	1	
AL45	High outside air temperature alarm	Green	Auto	-	1	
AL46	Pressing line CP1A gas temp. faulty probe alarm	Green	Manual on the control panel	-	1	
AL47	Pressing line CP1B gas temp. faulty probe alarm	Green	Manual on the control panel	-	1	
AL48	Pressing line CP2A gas temp. faulty probe alarm	Green	Manual on the control panel	-	1	
AL49	Pressing line CP2B gas temp. faulty probe alarm	Green	Manual on the control panel	-	1	
AL51	Circuit 1 compressor 2 maintenance request	Green	Auto	-		
AL53	Circuit 2 compressor 1 maintenance request	Green	Auto	-		
AL54	Circuit 2 compressor 2 maintenance request	Green	Auto	-		
AL57	Maintenance request control board	Green	Auto			
AL58	Maintenance request evap. pump 2	Green	Auto	-		
AL59	Circ. 1 compressor 2 technical alarm	Green	Manual on the control panel	-	1	
AL61	Circ. 2 compressor 1 technical alarm	Green	Manual on the control panel	-	1	
AL62	Circ. 2 compressor 2 technical alarm	Green	Manual on the control panel	-	1	
AL65	Circ. 2 low pressure alarm	Green	Manual on the control panel	-	1	
AL67	Circ. 2 high pressure alarm	Green	Manual on the control panel	-	1	
AL68	Maintenance request ventilation fans	Green	Auto			
AL69	Maintenance request status lights	Green	Auto			
AL70	Alarm: gas probe discrepancy in the pressurizing circuit 1	Green	Semi-auto	-	3	60
AL71	Alarm: gas probe discrepancy in the pressurizing circuit 2	Green	Semi-auto	-	3	60
AL72	Circuit 1 overheating high alarm	Green	Manual on the control panel	-	1	
AL73	Circuit 2 overheating high alarm	Green	Manual on the control panel	-	1	
AL74	Circuit 1 low overheating alarm	Green	Semi-auto	-	3	60
AL75	Circuit 2 low overheating alarm	Green	Semi-auto	-	3	60
AL76	Air-water envelope alarm	Green	Semi-auto	-	5	300
AL77	Circuit 1 envelope alarm	Green	Semi-auto	-	5	300
AL78	Envelope alarm circuit 2	Green	Semi-auto	-	5	300

Code	Description	Alarm light	Reset		N.int.	Timeout(s)
AL81	Pressing line CP1A gas high temp. alarm	Green	Manual on the control panel	-	1	
AL82	Pressing line CP1B gas high temp. alarm	Green	Manual on the control panel	-	1	
AL83	Pressing line CP2A gas high temp. alarm	Green	Manual on the control panel	-	1	
AL84	Pressing line CP2B gas high temp. alarm	Green	Manual on the control panel	-	1	
AL85	System high temperature	Green	Manual on the control panel	-	1	
AL87	Master offline	Green	Auto	-		
AL88	Slave offline	Green	Auto	-		
AL89	Incorrect master/slave SW version	Green	Auto	-		
AL90	Freecooling alarm (Freecooling function currently not available)	Green	Manual on the control panel	-	1	
AL91	Slave alarm summary	Green	Auto	-		
AL97	Freecooling input faulty probe alarm (Freecooling function not currently available)	Green	Manual on the control panel	-	1	
AL99	EVD circuit 1 alarm summary	Green	Manual on the control panel	-	1	
AL100	EVD circuit 2 alarm summary	Green	Manual on the control panel	-	1	
AL101	Expansion (pCOe) Off-line	Green	Semi-auto	-	3	60
AL102	Water inlet temperature outside operating limits	Green	Manual on the control panel	-	1	
AL103	DeltaP alarm Circuit 1	Green	Manual on the control panel	-	1	
AL104	DeltaP alarm Circuit 2	Green	Manual on the control panel	-	1	
AL105	EVD error valve motor circuit 1	Green	Manual on the control panel	-	1	
AL106	EVD low evap. temp. (LOP) circuit 1	Green	Manual on the control panel	-	1	
AL107	EVD high temp. evap. (MOP) circuit 1	Green	Manual on the control panel	-	1	
AL108	EVD low overheating (LowSH) circuit 1	Green	Manual on the control panel	-	1	
AL109	EVD low suction temp. circuit 1	Green	Manual on the control panel	-	1	
AL110	EVD high temp. condensation circuit 1	Green	Manual on the control panel	-	1	
AL116	EVD 1 probe error S1	Green	Manual on the control panel	-	1	
AL117	EVD 1 probe error S2	Green	Manual on the control panel	-	1	
AL120	EVD 1 EEPROM alarm	Green	Manual on the control panel	-	1	
AL121	EVD 1 driver offline	Green	Manual on the control panel	-	1	
AL122	EVD 1 low battery	Green	Manual on the control panel	-	1	
AL123	EVD 1 parameter transmission error	Green	Manual on the control panel	-	1	
AL124	EVD 1 firmware not compatible	Green	Manual on the control panel	-	1	
AL125	EVD valve motor error circuit 2	Green	Manual on the control panel	-	1	
AL126	EVD low evap. temp. (LOP) circuit 2	Green	Manual on the control panel	-	1	
AL127	EVD high temp. evap. (MOP) circuit 2	Green	Manual on the control panel	-	1	

Code	Description	Alarm light	Reset		N.int.	Timeout(s)
AL128	EVD low overheating (LowSH) circuit 2	Green	Manual on the control panel	-	1	
AL129	EVD low suction temp. circuit 2	Green	Manual on the control panel	-	1	
AL130	EVD high temp. condensation circuit 2	Green	Manual on the control panel	-	1	
AL136	EVD 2 probe error S1	Green	Manual on the control panel	-	1	
AL137	EVD 2 probe error S2	Green	Manual on the control panel	-	1	
AL140	EVD 2 EEPROM alarm	Green	Manual on the control panel	-	1	
AL141	EVD 2 offline drivers	Green	Manual on the control panel	-	1	
AL142	EVD 2 coil low	Green	Manual on the control panel	-	1	
AL143	EVD 2 parameter transmission error	Green	Manual on the control panel	-	1	
AL144	EVD 2 firmware not compatible	Green	Manual on the control panel	-	1	
AL145	Maintenance request aging circuit 1	Green	Auto			
AL146	Maintenance request aging circuit 2	Green	Auto			
AL147	Maintenance request aging battery 1	Green	Auto			
AL148	Maintenance request aging battery 2	Green	Auto			
AL149	Maintenance request aging hydronic exchanger	Green	Auto			

* For this function, refer to the paragraph related to unit operation in the installation manual

Aermec S.p.A.
Via Roma, 996 - 37040 Bevilacqua (VR) - Italia
Tel. +39 0442 633 111 - Fax +39 0442 93577
marketing@aermec.com - www.aermec.com