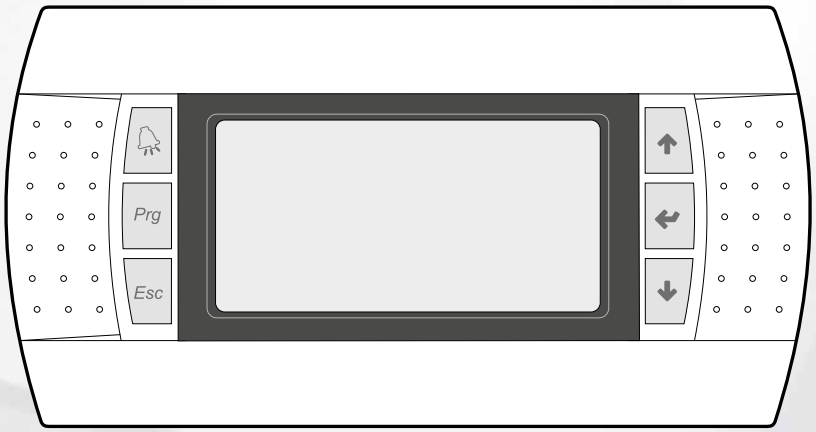
EN

25/02 - 5723410_04
Translation of Original instructions

NRGI

User manual



CARD PCO5 - PANEL PGD1

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**

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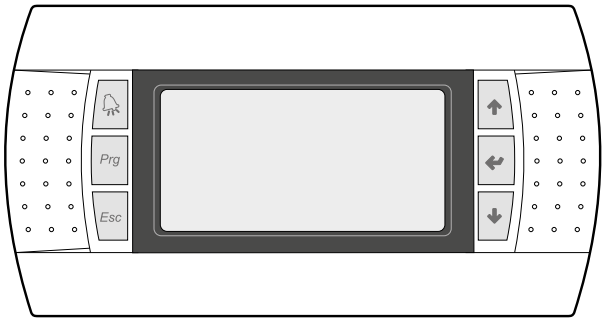
1 USER INTERFACE (PGD1)



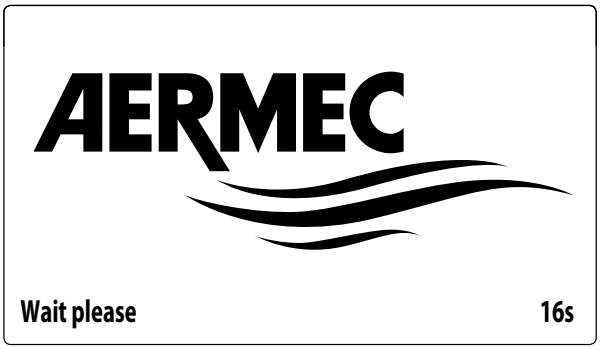
The command panel of the unit allows the rapid setting of the working parameters of the machine, and their visualisation. The card stores all the default settings and any modifications.
The installation of the remote panel PGD1 makes it possible to copy from remote all the functions and settings available on the 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 main user interface is a graphic monitor with six navigation keys; the displays are organised with a menu hierarchy, which is activated by pressing the navigation keys. The default view of these menus is represented by the main menu; you can navigate between the various parameters by using the arrow keys on the right-hand side of the panel; these keys are also used to change the selected parameters.

1.1 START-UP PROCEDURE

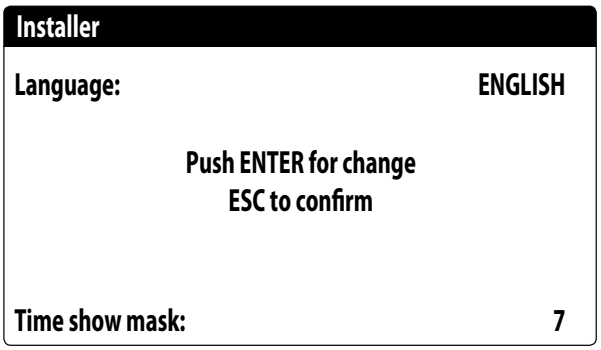
After powering the unit, the control card will perform preliminary operations before it is ready to be used; these initial procedures last about 60 seconds before they are complete; two windows are displayed during the initial loading procedures (a start window and one for selecting the system language); these windows are specified below in the table.

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.

1.2 FUNCTION OF THE PGD1 CONTROL PANEL KEYS

: Displays the list of active alarms and the alarm log

: Pressing this key activates navigation between the menus (orange LED on = winter operating mode active);

: 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;

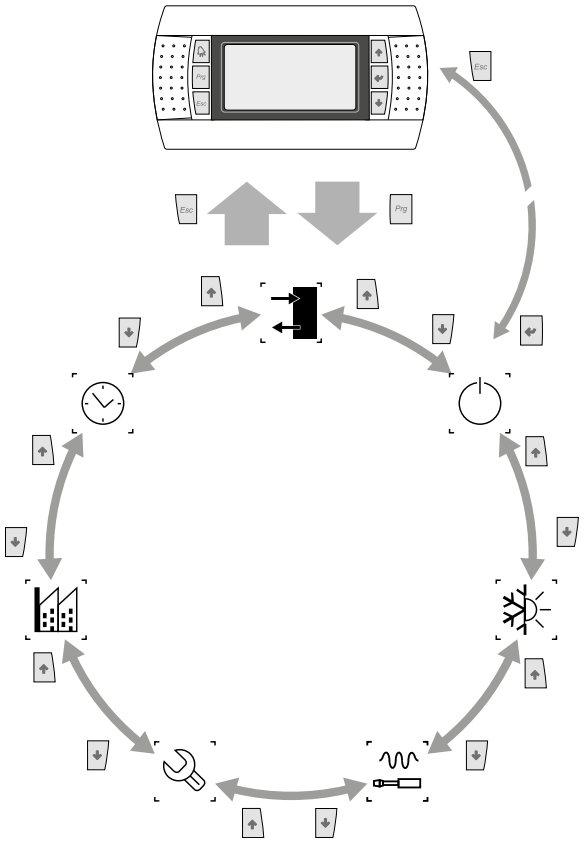
— Pressing this key when changing a parameter decreases the value of the selected parameter;

1.3 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;



Menu icons:

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

ON/OFF: This menu is used to activate or deactivate the unit; it also provides state information;

System: This menu is used to set the operating mode, the setpoints for water production and the time bands to be applied to the system;

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;

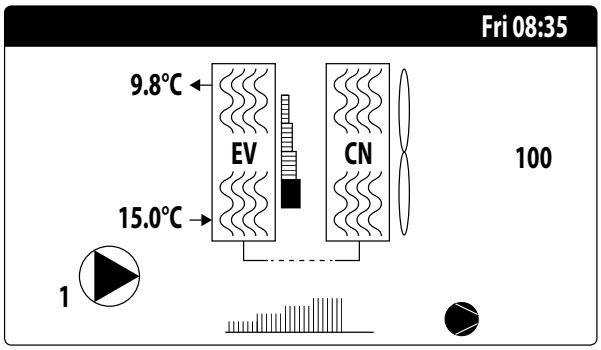
MANUFACTURER: This menu is not accessible except by authorized staff;

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

2 MAIN MENU

2.1 GENERAL MONITOR

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



— Current date and time
— Evaporator (EV) output temperature;
— Evaporator (EV) input temperature; when it is just below the value relative to the evaporator input temperature, the icon of the currently active pump will appear (with the relative number);
— Percentage of power (displayed graphically with a bar to the right of the evaporator) requested by the system;
— Fan speed; percentage value displayed to the right of the condenser;
— Inverter compressor speed; value displayed as a percentage by a graphic bar below the heat exchangers;

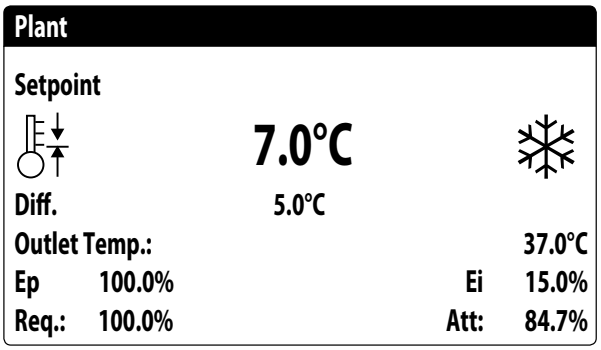
NOTICE

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)
— (LC): indicates that the low charge function is active;
— (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 on;
— : indicates that the compressor is off;
— : indicates a compressor alarm;
— AP: Indicates that high pressure capacity control is active;

2.2 SYSTEM MONITOR

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



— Current working setpoint;
— Current working differential;
— Temperature probe for machine regulation;
— If a PI function 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;

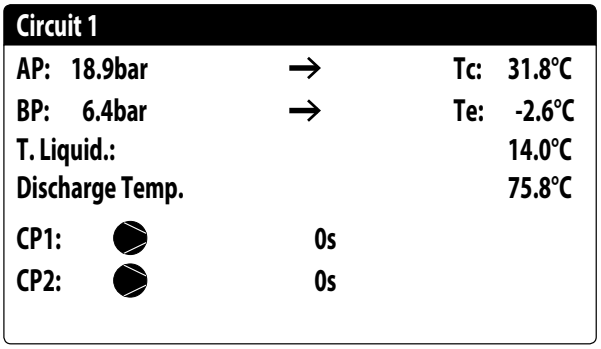
NOTICE

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;

2.3 CIRCUIT MONITOR

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



— AP: high pressure
— BP: low pressure
— Tc: condensation temperature
— Te: evaporating temperature
— T.Liquid: liquid temperature
— T.discharge gas: inverter compressor discharge gas temperature
— T.discharge gas 2: ON/OFF compressor discharge 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;
— ◔: indicates that the compressor is on, the (remaining) time to satisfy the minimum ON time is indicated to the side;

NOTICE

If the card is restarted, there will be a 60 second wait to guarantee the minimum shut-off time necessary for the inverter compressor driver.

2.4 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:

Circuit 1	
Total require	100.0%
Circuit 1:	50.0%
Needed speed:	4500rpm
Inverter speed:	4500rpm

— Total thermostat request;
— Power delivered by circuit 1;
— Calculated speed (in rpm) for satisfying the thermostatic request at the current operating conditions;
— Current speed of the inverter compressor (in rpm);

2.5 MASTER UNIT MONITOR

NOTICE

This mask is only available on the Master unit, if the system has a Master/Slave configuration with multiple units.

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)**: probe water temperature on the common output of the two master and slave unit outputs;
— **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;

2.6 PEC PRESSURE CONTROL MONITOR

This mask is used to display the result of the control on the machine pressure delta, controlled by the PEC card:

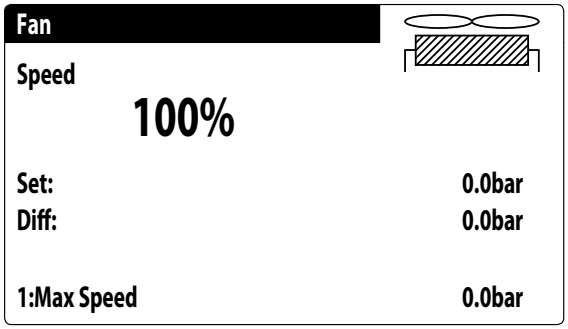
Circuit 1
PEC Pressure delta control in progress...

If the result of the pressure delta control is greater than 15 bar (and the 4-way must switch), the valves must be controlled without the activation of the compressors to reduce the pressure delta; Alarms (warnings) are not generated in this situation).
If the control is less than 3 bar (hot/cold operation or a 4-way must switch), the compressors are started without the valve control in order to create the pressure delta; after 300s in this situation an alarm is generated with a machine block.

3 INPUT/OUTPUT MENU

3.1 FAN MONITOR

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

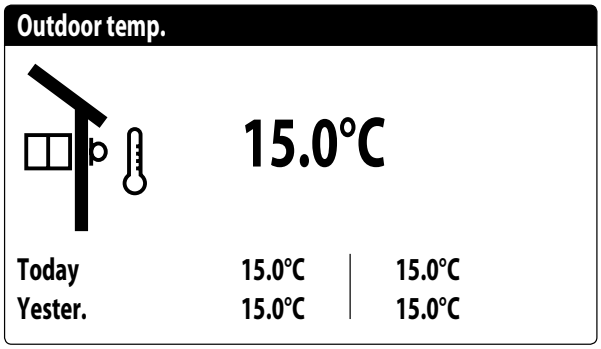


— **Speed**: this value indicates the current speed (as a percentage) at which the concerned fans are operating
— **Set**: Fan setpoint: this value indicates the current ventilation setpoint;
— **Diff**: Ventilation setpoint differential: this value indicates the current differential applied to the ventilation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

The state of the fans (displayed on the row at the bottom of the window), can be:
— **OFF**: fans off;
— **PREVENTILATION**: fans ON before the compressors;
— **high pressure**: control based on high pressure;
— **POSTVENTILATION**: ventilation after compressor 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

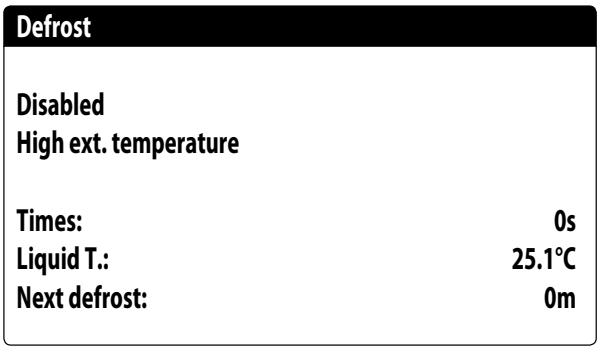
3.2 OUTSIDE TEMPERATURE MONITOR

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



3.3 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;
— **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;

The second row can have the following states:
— **High outside temperature**: the air temperature is above the defrosting enabling threshold;
— **Start CP**: compressor just started, wait for defrosting bypass time;
— **Start for LP limit**: start of the defrosting due to exceeding the low pressure limit threshold;
— **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;
— **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;
— **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;
— **T.Liquid**: temperature of the liquid to determine the defrosting output;
— **Next defrosting**: displays the minutes until the next defrosting;

3.4 MULTIFUNCTION INPUT MONITOR

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

Plant

Input Multifunction
(ID18): ACTIVE

Variable SetPoint
pCO5 U10= 45.0°C

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;
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.

3.5 ANALOGUE INPUT MONITOR (U1) - (U2)

Inputs pCO5

U1= Inlet Temp.water evap.: 25.8°C

U2= Outlet Temp.water evap.: 37.8°C

U1: shows the heat exchanger inlet water temperature;
U2: this value represents the temperature of the water leaving the heat exchanger;

3.6 ANALOGUE INPUT MONITOR (U3) - (U4)

Inputs pCO5

U3= Differential pressure: 647mbar

U4= Boiler temp.: 20.3°C

U3: this value represents the differential pressure;
U4: this value represents the storage tank temperature (if present);

3.7 ANALOGUE INPUT MONITOR (U8) - (U9)

Inputs pCO5

U8= Liquid temp. 1 25.2°C

U9= Liquid temp. 2 25.1°C

U8: this value represents the temperature of the liquid on coil 1
U9: this value represents the temperature of the liquid on coil 2

3.8 PEC ANALOGUE INPUT MONITOR (P1) - (P2)

Inputs PEC

P1= Low press.circ.1 9.0bar

P2= High press.circ.1 20.0bar

P1: this value represents the low pressure detected by the transducer;

P2: this value represents the high pressure detected by the transducer;

3.9 PEC ANALOGUE INPUT MONITOR PEC (T1) - (T2) - (T3)

Inputs PEC

T1= ---
T2= Suction temp.
6.0°C
T3= External temp.
15.0°C

T1: currently not used;
T2: this value represents the intake temperature;
T3: this value represents the outside air temperature;

3.10 PEC ANALOGUE INPUT MONITOR (T4) - (T5)

Inputs PEC

T4= Liquid temp.
25.0°C
T5= Discharge temp.
CP1 **50.0°C**

T4: this value represents the temperature of the liquid;
T5: this value represents the temperature of the discharge gas on compressor 1;

3.11 PEC ANALOGUE INPUT MONITOR (T6)

Inputs PEC

T6= Discharge temp.
CP1A **50.0°C**

T6: this value represents the temperature of the discharge gas on compressor 1A;

3.12 DIGITAL INPUT MONITOR (ID1) - (ID2) - (ID3)

Inputs pCO5

ID1:Flow switch
Closed
ID2:High press. C1
Closed
ID3:Fan overload 1
Closed

ID1: this value represents the state of the digital input connected to the evaporator flow switch:
— OPEN: flow switch alarm;
— CLOSED: normal operation;

ID2: this value represents the state of the digital input connected to the circuit 1 high pressure switch:
— OPEN: high pressure pressostat alarm;
— CLOSED: normal operation;

ID3: this value represents the state of the digital input connected to the circuit 1 fan thermomagnetic switch:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

3.13 DIGITAL INPUT MONITOR (ID4) - (ID5) - (ID6)

Inputs pCO5

ID4:Al. phase monitor
Closed
ID5:Overl.comp1 circ1
Closed
ID6:Overl.comp2 circ1
Closed

ID4: shows the binary status read from the input of the phase control device, which can be:
— OPEN: phase control device in alarm;
— CLOSED: normal operation;

ID5: this value represents the state of the digital input connected to compressor thermomagnetic switch 1 on circuit 1:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

ID6: this value represents the state of the digital input connected to compressor thermomagnetic switch 2 on circuit 1:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

3.14 DIGITAL INPUT MONITOR (ID7) - (ID8) - (ID9)

Inputs pCO5

ID7:Low press C1
Closed
ID8:Leak detector
Closed
ID9:Fans ovrl series
Closed

ID7: this value represents the state of the digital input connected to the low pressure switch on circuit 1:
— OPEN: low pressure switch alarm;
— CLOSED: normal operation;

ID8: this value represents the state of the digital input connected to the gas leak control:
— OPEN: leak detector alarm;
— CLOSED: normal operation;

ID9: this value represents the state of the digital input connected to fan thermomagnetic fan switch on circuit 1:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

3.15 DIGITAL INPUT MONITOR (ID10) - (ID11) - (ID12)

Inputs pCO5

ID10:2nd Set enable
Open
ID11: ---
ID12: ---

ID10: this value represents the state of the digital input connected to the secondary setpoint:
— OPEN: secondary setpoint active;
— CLOSED: secondary setpoint not active;

3.16 DIGITAL INPUT MONITOR (ID13) - (ID14) - (ID15)

Inputs pCO5

ID13: ---
ID14:Overl.pump1 plant
Closed
ID15:Overl.pump2 plant
Closed

ID14: this value represents the state of the digital input connected to pump 1:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

ID15: this value represents the state of the digital input connected to pump 2:
— OPEN: circuit breaker alarm;
— CLOSED: normal operation;

3.17 DIGITAL INPUT MONITOR (ID16) - (ID17) - (ID18)

Inputs pCO5

ID16:Remote Cool/Heat
Closed
ID17:Remote On-Off
Closed
ID18:Multifunct. Enable
Closed

ID16: this value represents the state of the digital input connected to the remote season change function:
— OPEN: remote season change not active;
— CLOSED: remote season change active;

ID17: this value represents the state of the digital input connected to the remote ON/OFF function:
— OPEN: remote ON/OFF not active;
— CLOSED: remote ON/OFF active;

ID18: this value represents the state of the digital input connected to the function specified for the multifunction input U10 (this function is specified in the installer menu):
— OPEN: multifunction contact not enabled;
— CLOSED: multifunction contact active;

3.18 DIGITAL INPUT MONITOR (NO1) - (NO2) - (NO3)

Output pCO5
NO1:Pump 1
Closed
NO2:Inverter contactor
Closed
NO3:Sanitary V3V
Closed

NO1: this value represents the state of the digital output connected to activation of the pump on circuit 1:
— OPEN: load not active;
— CLOSED: load active;

NO2: this value represents the state of the digital output connected to the inverter contactor:
— OPEN: load not active;
— CLOSED: load active;

NO3: this value represents the state of the digital output connected to activation of the 3-way plumbing valve:
— OPEN: load not active;
— CLOSED: load active;

3.19 DIGITAL INPUT MONITOR (NO4) - (NO5) - (NO6)

Output pCO5
NO4:Int.res.1/Boiler
Open
NO5:Integ.resistance 2
Open
NO6:Crankcase resist.
Closed

NO4: this value represents the state of the digital output connected to activation of the supplementary heater 1 or boiler:
— OPEN: load not active;
— CLOSED: load active;

NO5: this value represents the state of the digital output connected to activation of the supplementary heater 2 or boiler:
— OPEN: load not active;
— CLOSED: load active;

NO6: this value represents the state of the digital output connected to activation of the carter heater:
— OPEN: load not active;
— CLOSED: load active;

3.20 DIGITAL INPUT MONITOR (NO7) - (NO8) - (NO9)

Output pCO5
NO7:Fan 1
Closed
NO8:Serious alarm
Open
NO9: ---

NO7: this value represents the state of the digital output connected to activation of fan 1:
— OPEN: load not active;
— CLOSED: load active;

NO8: this value represents the state of the digital output connected to the presence of a serious alarm:
— OPEN: load not active;
— CLOSED: load active;

3.21 DIGITAL INPUT MONITOR (NO13) - (NO14) - (NO15)

Output pCO5
NO13: ---
NO14: Flow switch alarm
Closed
NO15:Base resistance 1
Open

NO14: this value represents the state of the digital output linked to the activation of the flow switch alarm:
— OPEN: load not active;
— CLOSED: load active;

NO15: this value represents the state of the digital output connected to activation of the heater on base 1:
— OPEN: load not active;
— CLOSED: load active;

3.22 DIGITAL INPUT MONITOR (NO16) - (NO17) - (NO18)

Output pCO5

NO16:Base resistance 2
Open
NO17:Antifreeze Heater
Open
NO18:Pump 2
Open

NO16: this value represents the state of the digital output connected to activation of the heater on base 2:
— OPEN: load not active;
— CLOSED: load active;

NO17: this value represents the state of the digital output connected to activation of the anti-freeze heater:
— OPEN: load not active;
— CLOSED: load active;

NO18: this value represents the state of the digital output connected to activation of pump 2:
— OPEN: load not active;
— CLOSED: load active;

3.23 PEC DIGITAL INPUT MONITOR (NO1) ~ (NO5)

Output PEC

NO1: ----
NO2: ----
NO3: ----
NO4: ----
NO5: VIC circuit 1
Open

NO5: this value represents the state of the digital output connected to activation of the reverse cycle valve on circuit 1:
— OPEN: load not active;
— CLOSED: load active;

3.24 PEC DIGITAL INPUT MONITOR (NO6) - (NO7) - (NO8)

Output PEC

NO6: ----
NO7: comp. 2 circ. 1
(fixed speed)
Open
NO8: ----

NO7: this value represents the state of the digital output connected to activation of compressor 2 on circuit 1:
— OPEN: load not active;
— CLOSED: load active;

3.25 ANALOGUE OUTPUT MONITOR (Y1) ~ (Y5)

Output pCO5

Y1= DCP1 **0**
Y2= V3V VPF **0**

Y3= ----
Y4= ----
Y5= ----

Y1: this value indicates the current value of the analogue output connected to modulating fan group 1;
Y2: this value indicates the current value of the analogue output connected to the variable flow rate modulating valve;

4 INPUT AND OUTPUT

4.1 ANALOGUE INPUTS

Analogue inputs	Code	Description	Note
U1	SIW	evaporator water inlet probe	
U2	SUW	evaporator water outlet probe	
U3	TDPW	Water differential transducer	Pump W1-W2-W3-W4
U4	SAC	Storage tank probe	Supplementary heater
U5	---	---	
U6	---	---	
U7	---	---	
U8	SLB1	Battery 1 liquid temperature probe	Heat pump
U9	SLB2	Battery 2 liquid temperature probe	Heat pump
U10	MULTI IN	Multi-function input	
	Common outlet probe	Common output with Master/Slave	

4.2 DIGITAL INPUTS

Digital inputs	Code	Description	Note
ID1	FL	Flow switch	
ID2	AP1	Circuit 1 high pressure switch	
ID3	QMF1	Circuit 1 Thermomagnetic fan switch	
ID4	RCS	Phase monitor	
ID5	QM1	Compressor 1 circuit 1 thermomagnetic switch (Inverter)	
ID6	QM2	Compressor 2 circuit 1 thermomagnetic switch (ON/OFF)	Bicompressor
ID7	BP1	Circuit 1 low pressure pressure switch	
ID8	LD1	Leak detector	
ID9	TV1	Circuit 1 fan thermal series	
ID10	2° SET	Second setpoint	
ID11	---	---	
ID12	---	---	
ID13	---	---	
ID14	QM11	Pump 1 thermomagnetic switch	
ID15	QM12	Pump 2 thermomagnetic switch	
ID16	C/F	Remote season contact (closed = summer mode)	Heat pump
ID17	0/1	Remote ON/OFF contact (closed = ON)	
ID18	EMF	Multifunction input enabling	

4.3 DIGITAL OUTPUTS

Digital outputs	Code	Description	Note
NO1	MPE1	Pump 1 evaporator	
NO2	KMCP1A	Inverter switch activation	
NO3	V3V	3 way valve	Domestic water
NO4	RI1	Output 1 supplementary resistors/replacement boiler	Supplementary heaters / replacement boiler
NO5	RI2/RI3	Output 2 supplementary heaters	Supplementary heater
NO6	RC	Carter resistance	Bicompressor
NO7	MV1	Ventilation group 1	
NO8	AE	Alarm summary	
NO9	---	---	
NO10	---	---	
NO11	---	---	
NO12	---	---	
NO13	---	---	

Digital outputs	Code	Description	Note
NO14	AF	Flow meter alarm	
NO15	RB1	Tray heater 1	
NO16	RB2	Tray heater 2	
NO17	RE	Heater exchanger	
NO18	MPE2	Pump 2 evaporator	

4.4 ANALOGUE OUTPUTS

Analogue outputs	Code	Description	Note
Y1	FAN1	Modulating fans unit 1	
Y2	V.MOD O-10V	Variable flow rate modulating valve	Pump W1-W2-W3-W4
Y3	---	---	
Y4	---	---	
Y5	---	---	
Y6	---	---	

4.5 ANALOGUE INPUTS (PEC)

Analogue inputs	Code	Description	Note
P1	TBP1	Low pressure transducer	Sanhua 4÷20mA
P2	TAP1	High pressure transducer	Sanhua 4÷20mA
T1	---	---	
T2	SGA1	Intake temperature probe	Shibaura NTC 10K L=3m
T3	SAE	External air sensor	Shibaura NTC 10K L=3m
T4	SL1	Liquid temperature probe	Shibaura NTC 10K L=3m
T5	SGP1A	Discharge gas probe 1	Shibaura NTC 10K L=4m
T6	SGP1B	Discharge gas probe 2	Shibaura NTC 10K L=4m
T7	---	---	
P3	---	---	
P4	---	---	
T8	---	---	
T9	---	---	
T10	---	---	
T11	---	---	
T12	---	---	
T13	---	---	

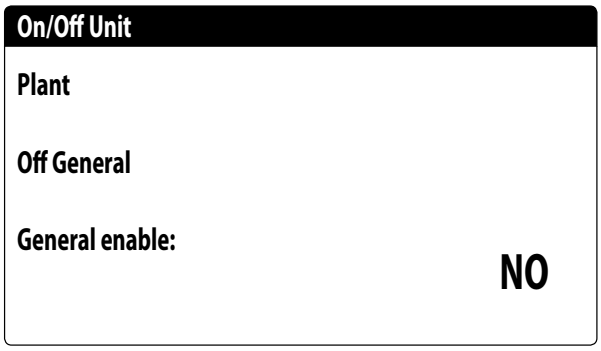
4.6 DIGITAL OUTPUT (PEC)

Digital outputs	Code	Description	Note
NO1	VIC1	Circuit 1 reverse cycle valve	Only if heat pump
NO2	---	---	
NO3	CP1B	Compressor 2 Circuit 1	Compressor ON/OFF
NO4	---	---	
NO5	---	---	
NO6	---	---	
NO7	---	---	
NO8	---	---	

5 ON/OFF MENU

5.1 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:



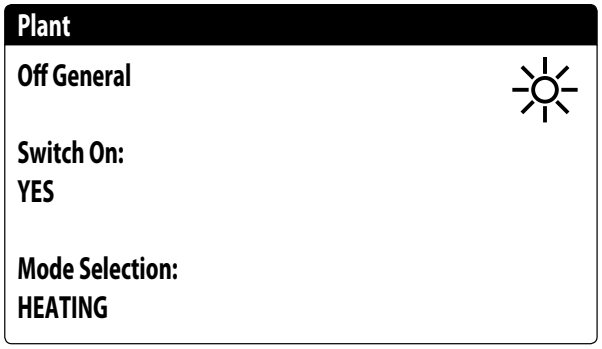
Display of the general system state:
- **Enabled**: the system regulates via the main probe based on the system setpoint;
- **Off due to alarm**: system off due to serious alarm;
- **General off**: system turned off by general enabling (see the paragraph described below "General enabling");
- **Off by 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;
- **Off by master**: system turned off by master in master/slave configuration;
- **Out of operating limits**: system out of machine operating limits;
- **Replacement boiler**: replacement boiler active;

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.

6 SYSTEM MENU

6.1 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:

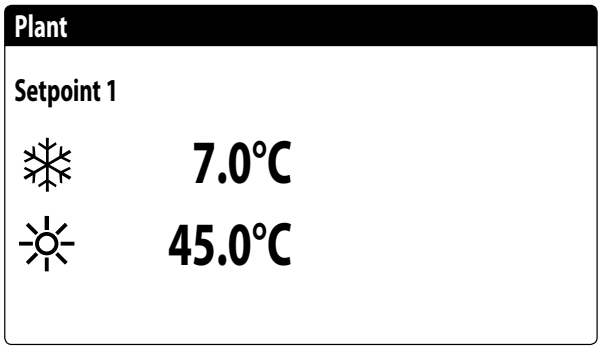


Enable: allows to select the mode with which to turn the unit on or off; the available options are:
— OFF: the system does not produce hot/chilled water;
— YES: the system regulates via the main probe based on the system setpoint;
— YES WITH SET2: the system regulates via the main probe based on setpoint 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;

6.2 SETTING THE VALUES FOR THE PRIMARY SETS

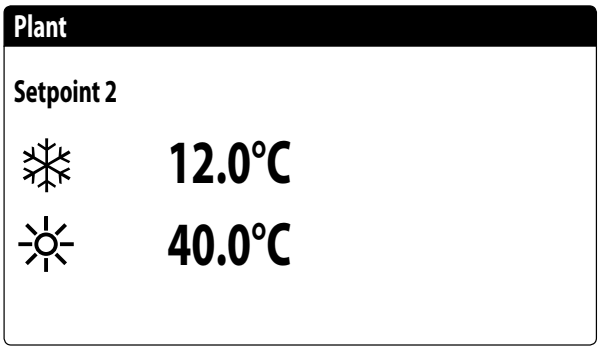
This mask is used to set the values to assign to the primary working setpoints:



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

6.3 SETTING THE VALUES FOR THE SECONDARY SETPOINTS

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



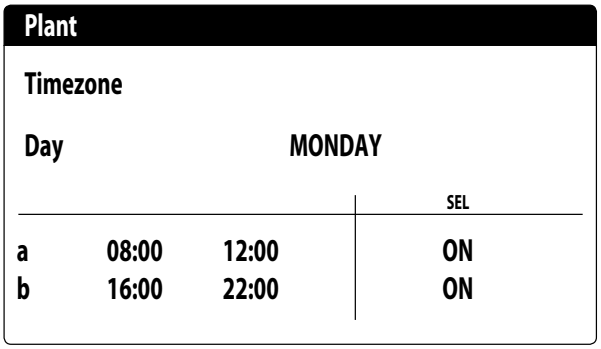
The secondary working setpoints are:
— ❄: setpoint 2 for cooling mode;
— ☼: setpoint 2 for heating mode;

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

NOTICE

This mask is only visible if "BY CLOCK" is selected on the page "Selecting the system operating mode".

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



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.

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

NOTICE

This mask is only visible if "BY CLOCK" is selected on the page "Selecting the system operating mode".

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.

6.6 COPY/PASTE TIME BANDS

NOTICE

This mask is only visible if "BY CLOCK" is selected on the page "Selecting the system operating mode".

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**

6.7 SETTING THE SEASON CHANGE FROM THE CALENDAR (HEATING)

NOTICE

This mask is only visible if "BY CALENDAR" is selected on the page "Selecting the system operating mode".

This mask is used to set the start and end date for heating mode:

Cooling/Heating

Select Cool/Heat with Calendar

Start Heating **0/---**
Finish Heating **0/---**

6.8 SETTING THE SEASON CHANGE FROM THE CALENDAR (COOLING)

NOTICE

This mask is only visible if "BY CALENDAR" is selected on the page "Selecting the system operating mode".

This mask is used to set the start and end date for cooling mode:

Cooling/Heating

Select Cool/Heat with Outdoor temperature

Set ON cooling	**27.0°C**
Set ON heating	**13.0°C**

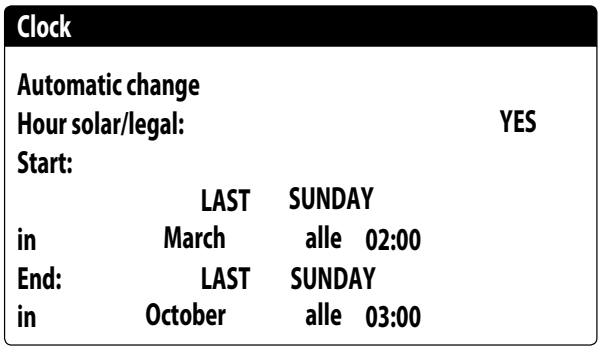
7 CLOCK MENU

7.1 SETTING SYSTEM DATE AND TIME

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

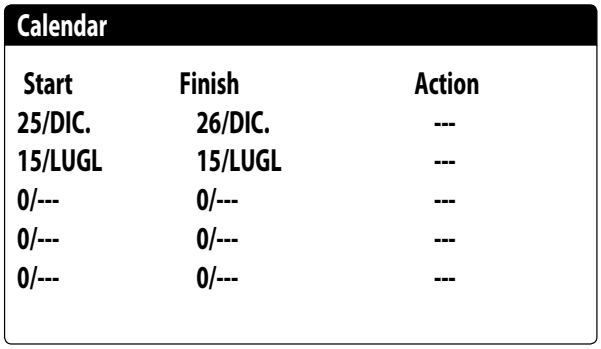
7.2 SETTING THE AUTOMATIC SUMMER/WINTER TIME CHANGE

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:



7.3 SETTING THE PUBLIC HOLIDAYS ON THE CALENDAR

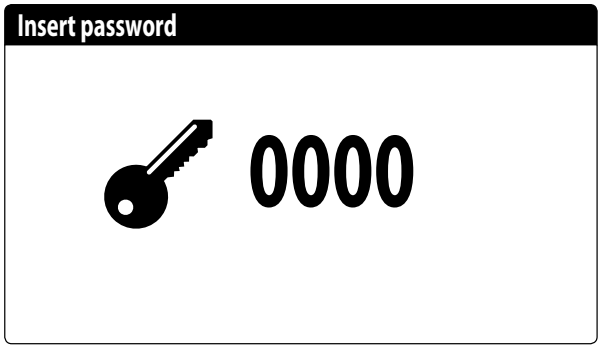
This mask is used to set the days (up to 5 intervals) to mark as "holidays" (therefore to activate the relative time programming previously specified for the holiday time band), or set the off mode for the system:



8 INSTALLER MENU

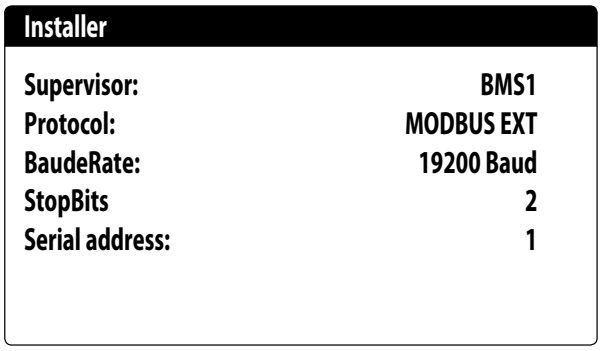
8.1 PASSWORD TO ACCESS THE INSTALLER MENU (0000)

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



8.2 SETTING THE BMS 1 PARAMETERS

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



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.

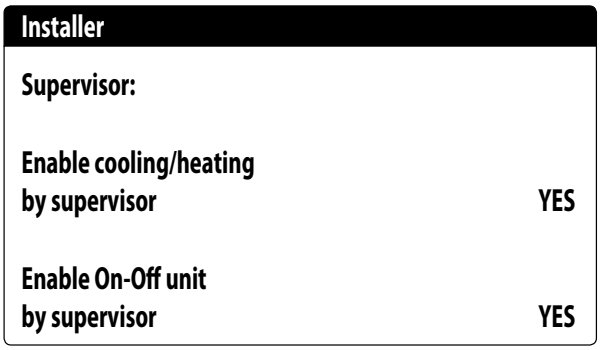
Speed: this value indicates which speed is set for serial communication; the possible selections are:
— 0: 1200 baud;
— 1: 2400 baud;
— 2: 4800 baud;
— 3: 9600 baud;
— 4: 19200 baud;
— 5: 38400 baud;

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;

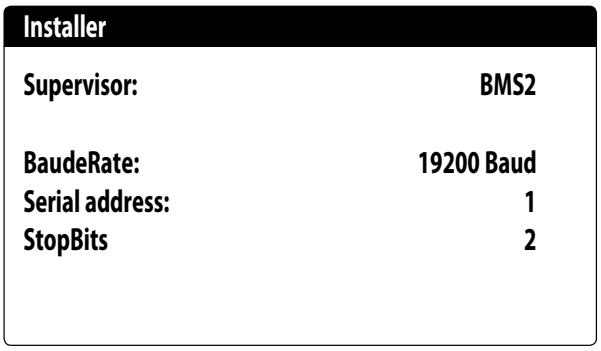
8.3 ENABLE CHANGE OVER AND ON/OFF BY SUPERVISOR

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



8.4 SETS THE BMS2 PARAMETERS

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



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;

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

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

Input enable

ID17: ON/OFF plant
NO

8.6 SETTING THERMOSTAT REGULATION

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

Installer

Regulation temperature sensor with:
OUTPUT

Type reg.: **PROP.+INT.**
Integ. Time(Ki) **600s**

Regulation with temperature probe: this value indicates on which probe the system bases its adjustment when producing water; The possible values are:
— OUTPUT (U2): the probe used for adjusting the production of water is the one at the output of the plate heat exchanger;
— INPUT (U1): the probe used for adjusting the production of water is the one at the input of the plate heat exchanger;
— COMMON OUTPUT PROBE: the probe used for adjusting the production of water is the one at the common output if there are two plate heat exchangers;

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+INT: applies proportional control + integral;
— PROP: applies only proportional control;

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

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

This mask is used to select the logic to apply to the working setpoint, and the value to assign to the differential for cooling operation:

Installer

Cooling regulation
COMPENS.TEMP.

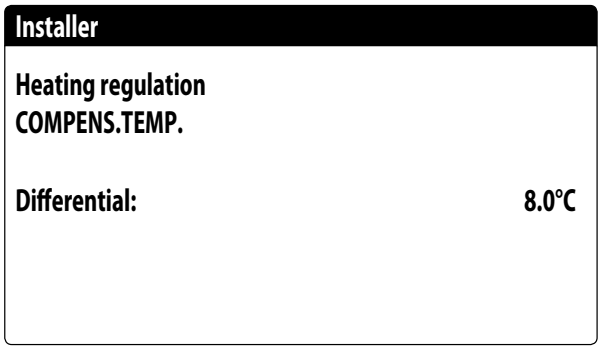
Differential: **8.0°C**

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 setpoint (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;

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

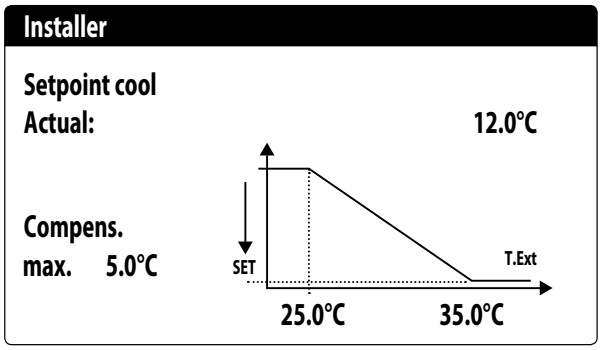
This mask is used to select the logic to apply to the working setpoint, and the value to assign to the differential for heating operation:



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 setpoint (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;

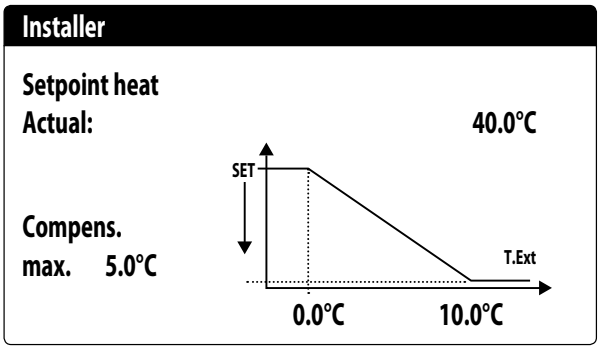
8.9 CLIMATIC CURVE CONFIGURATION IN COOLING MODE

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.



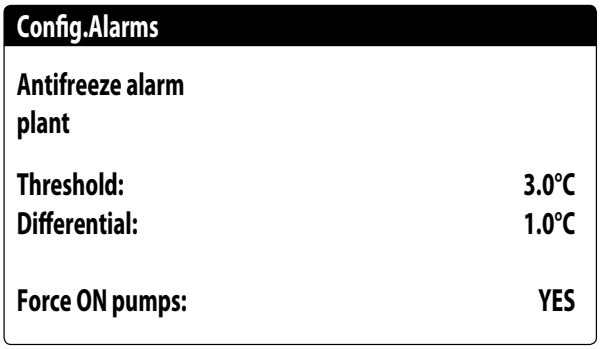
8.10 CLIMATIC CURVE CONFIGURATION IN HEATING MODE

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.



8.11 ANTI-FREEZE ALARM CONFIGURATION

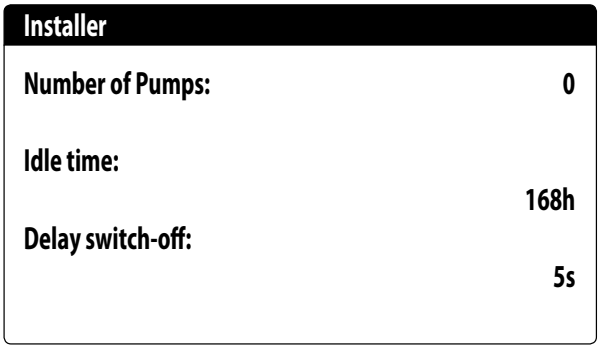
This window is used to configure the system anti-freeze alarm:



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;
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;

8.12 MANAGING THE PUMPS

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



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;

8.13 CONFIGURE ANTI-FREEZE MANAGEMENT VIA THE PUMP

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

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);

8.14 CONFIGURE FANS AT LOW TEMPERATURES

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

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

8.15 SETS PUMP START-UP FOR ANTI-FREEZE

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

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;

8.16 MULTI-FUNCTION INPUT CONFIGURATION (U10)

NOTICE

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

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

Installer

Multifunction Input

Config. Input (U10):
NOT PRESENT

Type:	**4-20mA**
Min: 4.0mA	**Max: 20.0mA**

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;
— NTC: input signal NTC;
— 4-20mA: input signal 4-20mA

NOTICE

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

8.17 CONFIGURATION OF POWER LIMITATION FOR INPUT (U10)

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

Installer	
Multifunction Input	
Power limit	
Minimun Limit :	**0%**
Maximum Limit :	**100%**

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;

8.18 CONFIGURATION OF THE NTC SIGNAL FOR INPUT (U10)

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

Installer	
Multifunction Input	
Config. NTC	
Minimum temp.:	**15.0°C**
Maximum temp.:	**25.0°C**

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);

8.19 CONFIGURATION OF VARIABLE SETPOINT FOR INPUT (U10)

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

Installer		
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;

8.20 CONFIGURE NIGHT MODE CONTROL

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

Fans	
Condensation mode overnight	**NO**
Controllo On:	**21:00**
Controllo Off:	**8:00**

In this mode, the Volts of the fans and the maximum speed of the inverter compressor are changed.

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;

8.21 CONFIGURATION OF THE SUPPLEMENTARY ELECTRIC HEATERS

This mask is used to set the operation of the supplementary heaters in case of low outside temperatures:

Installer

Suppl.electric heaters
Number: **0**

Power:
10%

Number of supplementary heaters: this value indicates the number of installed electric heaters (minimum zero, maximum three);
Heater power: this value specifies the percentage power of the individual heater with respect to the unit's total power;

8.22 SETS THE BOILER AS A REPLACEMENT

This mask is used to set the replacement boiler:

Installer

Boiler in replacement.
Ÿ
Enable: **NO**

Boiler enabled as replacement: this parameter indicates whether to activate the boiler if the outside temperature drops down below the "replacement" value specified in the following window, or if the heat pump has a “total alarm”;

8.23 CONFIGURATION OF HEATER INTEGRATION OR REPLACEMENT

This mask is used to set the outside air temperature limits for heater replacement and integration:

Installer

Integration air temp.:
5.0°C

Replacement air temp.:
-5.0°C

Integration air temp.: this value indicates the outside temperature above which the heat pump functions without the aid of the electric heaters, whereas if the outside temperature is lower than this value, but still higher than the replacement temperature, the heat pump functions TOGETHER with the heaters;
Replacement air temp. aria: this value indicates the outside temperature below which the heat pump stops and the electric heaters or, if enabled, the boiler, are used for heating;

8.24 COMPRESSOR HOUR COUNTER MONITOR

This window displays the data relative to the operating hours of the compressors on the unit:

Hour meter

Circuit 1

Compressor 1: **0000h**
Compressor 2: **0000h**

8.25 COMPRESSOR START-UP MONITOR

This window displays the data relative to the compressor start-ups on the unit:

Hour meter

Circuit 1
Number of starts

Compressor 1: **0000**
Compressor 2: **0000**

8.26 CONFIGURATION OF THE FAN SPEED

This window is used to configure the inverter fan signals:

Fans

Fans

Minimum V:	**1.0**
Max V cooling:	**6.0**
Max V heating:	**10.0**

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;

8.27 CONFIGURE MASTER SLAVE

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

Installer

Master/Slave

Unit:	**ALONE**
Step:	**1.0%**
Slave Pump off with Compressor off:	**NO**

(**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;

8.28 GLYCOL WATER MANAGEMENT

This window is used to enable or disable the use of glycol water:

Installer

Glycol water management.

Enable:	**YES**
Freezing temperature of mixed with antifreeze:	**0.0°C**

Enable: this value indicates if the unit uses glycol water; the possible states are:
— No: glycol water management is disabled;
— 1: Yes: glycol water management is enabled, in particular the following parameters are modified: minimum setpoint limit in cooling mode, low pressure threshold in cooling mode, anti-freeze heater threshold and force off thresholds in cooling mode;

Freezing temperature of the mixture with anti-freeze: if the unit is working with glycol water, this parameter indicates the base value for calculating and managing the following parameters:
— Minimum definable limit for in cooling = Value of this parameter +4°C;
— System anti-freeze alarm = Value of this parameter +3°C";
— Anti-freeze heater setpoint = Value of this parameter +3.5°C";
— Water outlet temperature with force off in cooling = Value of this parameter +3.5°C;

NOTICE

Note that, if glycol water is enabled, the values of the main parameters (apart from low pressure) can no longer be modified. Only the value of the freezing temperature of the mixture with anti-freeze can be altered.

8.29 VPF MANAGEMENT (GENERAL PARAMETERS)

This window is used to set the general parameters for the VPF (Variable Primary Flow):

Variable primary flow	
Enable:	**NO**
Differential pressure.	
Setpoint:	**150mbar**
Diff.:	**100mbar**
Integral:	**180s**

Enable: this value indicates whether to activate or deactivate this mode; the possible states are:
— No: VPF management disabled;
— Yes: VPF management enabled;

Setpoint: indicates the pressure value that the regulation tries to maintain at the ends of the evaporator, by opening and closing the bypass valve;
Diff.: differential used when regulating the bypass valve;
Integral: integral time used when regulating the bypass valve;

8.30 VPF MANAGEMENT (BYPASS 1 PARAMETERS)

This window is used to set the bypass parameters for the VPF (Variable Primary Flow):

Variable primary flow	
Bypass min:	**4.0V**
Bypass max:	**8.0V**
Transd. 4mA:	**0mbar**
Transd. 20mA:	**1000mbar**

Bypass min: this value indicates the minimum Volts corresponding to the minimum water bypass. All the water passes through the system;
Bypass max: this value indicates the maximum Volts corresponding to the maximum water bypass. All the water recirculates through the bypass;
Transd. 4mA; this value indicates the mbar at 4mA read by the differential transducer;
Transd. 20mA: this value indicates the mbar at 20mA read by the differential transducer;

8.31 VPF MANAGEMENT (BYPASS 2 PARAMETERS)

This window is used to set the bypass parameters for the VPF (Variable Primary Flow):

Variable primary flow	
Pressure:	**647mbar**
Valve by-pass.	
Proportional:	**100.0%**
Integral:	**0.0%**
Opening:	**0.0V**
By-pass test:	**0.0V**

Pressure: indicates the current value measured by the differential transducer;
Proportional: indicates the proportional component when calculating the bypass opening;
Integral: indicates the integral component when calculating the bypass opening;
Opening: indicates the current valve opening command;
Test bypass: indicates the forced valve command to use as a test. set to deactivate forcing;

8.32 ALARM RELAY LOGIC

Alarm relay logic digital output NO8.

Installer
Digital outputs.
Logic inversion
Alarm relay: Open

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

8.33 UNIT INFORMATION MONITOR

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

Information
Aermec S.p.A.
Code:
NRGI602XH°A°J°00
Ver.: 0.1.000 16/03/20
Testing date:
16:09 16/03/20

8.34 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

8.35 CONFIGURATION OF THE UNITS OF MEASURE

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

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]

8.36 CONFIGURES THE INSTALLER MENU PASSWORD

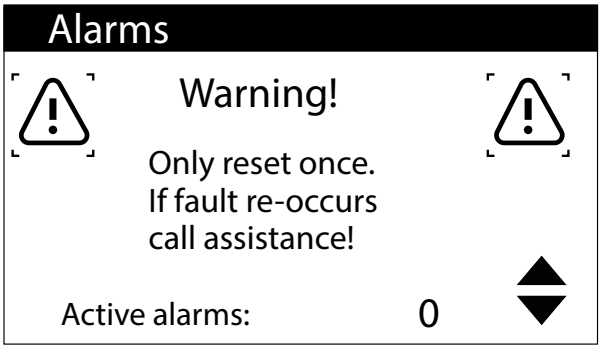
This window is used to change the "Installer" menu access parameter:

Password

New password
Installer: 0000

9 ALARM

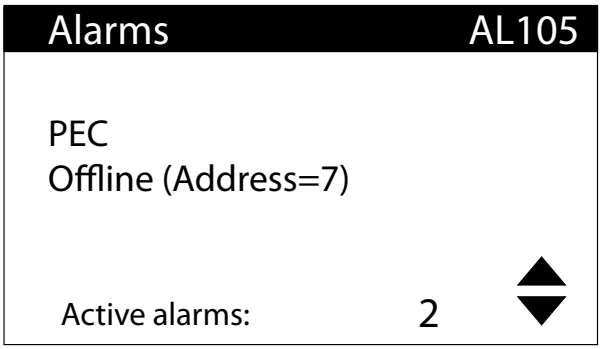
9.1 CONTROL OF ALARMS



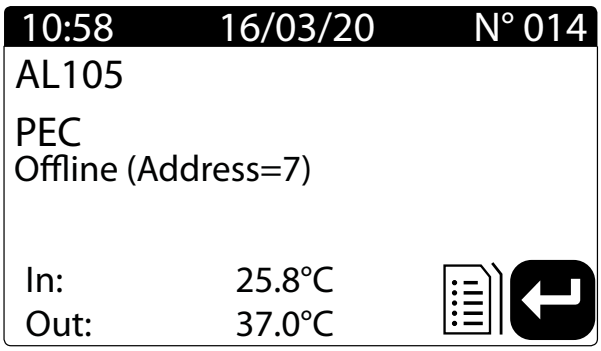
This mask displays the alarm management logic.

Alarms with password-protected reset are:
— Leak detector
— High pressure alarm
— Low pressure alarm
The alarm status and number of interventions remain in memory even after power failure.

9.2 ALARM HISTORY

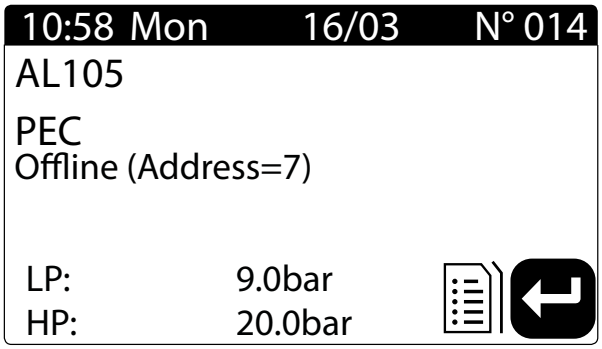


By pressing the list of active alarms is displayed.
Each alarm is uniquely identified by a 4-digit alarm code, this code can be found on the previous pages.
The last line shows how many alarms are active at that moment.



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 triggering
— Nature of alarm triggered
— High pressure
— Low pressure

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 normal user to reset the alarm history.

9.3 ALARM RESET

WARNING

The password-protected 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, with a password-protected reset, 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.

10 LIST OF ALARMS

WARNING

The password-protected 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, with a password-protected reset, 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.

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.

Code	Description	Reset	Interventions	Timeout(s)
AL01	Clock battery flat alarm	Auto		
AL02	pCO memory error alarm	Auto		
AL03	Phase monitor alarm	Semi-auto	3	300
AL04	Display alarm reset			
AL09	Evaporator 1 input faulty probe alarm	Manual	1	
AL10	Evaporator 1 output faulty probe alarm	Manual	1	
AL11	Common evap. output faulty probe alarm	Manual	1	
AL16	Outside temperature faulty probe alarm	Manual	1	
AL17	Coil 1 temperature faulty probe alarm	Semi-auto	5	60
AL19	Maintenance request compressor 1	Auto		
AL22	Evap pump 1 maintenance request	Auto		
AL23	Circ. 1 compressor 1 technical alarm	Manual	1	
AL24	Evaporator 1 pump thermal alarm	Manual	1	
AL25	Evaporator 2 pump thermal alarm	Manual	1	
AL28	Ventilation unit 1 thermal alarm	Manual	1	
AL29	Circuit 1 fan thermal series	Semi-auto	3	3600
AL30	Circ. 1 low pressure switch alarm	Manual	1	
AL31	Circ. 1 low pressure alarm	Manual	1	
AL32	Circ. 1 high pressure switch alarm	Manual	1	
AL33	Circ. 1 high pressure alarm	Manual	1	
AL34	Circ. 1 serious low pressure alarm	Manual	1	
AL38	Evaporator flow switch alarm	Manual	1	
AL40	Evaporator anti-freeze alarm	Manual	1	
AL41	Common evap. anti-freeze alarm	Manual	1	
AL42	Low water content force off alarm	Auto		
AL47	Differential pressure fault transducer alarm	Manual	1	
AL48	Air-water envelope alarm	Semi-auto	5	3600
AL49	Low overheating alarm	Semi-auto	3	300
AL51	Maintenance request compressor 2	Auto		
AL58	Evap pump 2 maintenance request	Auto		
AL59	Circ. 1 compressor 2 technical alarm	Manual	1	
AL60	Circ. 1 leak detector alarm	Manual	1	
AL61	Leak Detector Offline	Semi-auto	20	60
AL62	Leak detector sensor anomaly	Semi-auto	3	600
AL74	Circ. 1 comp. 1 discharge gas high temp. alarm	Manual	1	
AL75	Circ. 2 comp. 1 discharge gas high temp. alarm	Manual	1	
AL85	System high temperature	Manual	1	
AL86	SAC storage tank probe faulty	Auto		

Code	Description	Reset	Interventions	Timeout(s)
AL87	Master offline	Auto		
AL88	Slave offline	Auto		
AL89	Incorrect master/slave SW version	Auto		
AL91	Slave alarm summary	Auto		
AL102	Water inlet temp. out of operating limits	Manual	1	
AL103	Coil 2 temperature faulty probe alarm	Semi-auto	5	60
AL105	PEC Offline	Semi-auto	20	60
AL106	PEC Software - alarm set 1			
AL107	PEC Software - alarm set 2			
AL108	PEC Hardware - alarm set 1			
AL109	PEC Hardware - alarm set 2			
AL110	Inverter drive - Drive fault 1			
AL111	Inverter drive - Drive fault 2			
AL112	Inverter drive - Drive fault 3			
AL113	Inverter drive - Drive fault 4			

10.1 PEC ALARMS

The alarms concerning the PEC each represent a group of alarms.
The tables for each group of alarms are shown below:

Software - alarm set 1

Software - alarm set 1			
Bit	**Meaning**	**Reset**	**Note**
0	Circuit 1 low pressure	Manual	
1	Circuit 1 low superheat	Manual	
2	Circuit 1 high superheat	Automatic	
3	NOT USED		NOT USED
4	NOT USED		NOT USED
5	Circuit 1 refrigerant loss (warning): Valve opening1		NOT USED
6	Condensation pressure (high) circuit 1	Manual	
7	Circuit 1 Low envelope condensing temperature (warning)		NOT USED
8	Circuit 1 High envelope condensing temperature (warning)		NOT USED
9	Circuit 1 Low envelope evaporating temperature (warning)		NOT USED
10	Circuit 1 High envelope evaporating temperature (warning)		NOT USED
11	Circuit 1anti-freeze alarm		NOT USED
12	Circuit 1 envelope alarm	Manual	
13	End of defrosting for timeout		NOT USED
14	Circuit 1 high discharge gas temperature compressor 1	Manual	
15	Circuit 2 low superheat		NOT USED

Hardware - alarm set 1

Hardware - alarm set 1			
Bit	**Meaning**	**Reset**	**Note**
0	P1 sensor	Manual	
1	P2 sensor	Manual	
2	T1 sensor	---	NOT USED
3	T2 sensor	Manual	
4	T3 sensor	Manual	
5	T4 sensor	Manual	
6	T5 sensor	Manual	
7	T6 sensor	Manual	
8	T7 sensor	---	NOT USED
9	P3 sensor	---	NOT USED
10	P4 sensor	---	NOT USED
11	T8 sensor	---	NOT USED
12	T9 sensor	---	NOT USED
13	T10 sensor	---	NOT USED

Hardware - alarm set 1			
Bit	**Meaning**	**Reset**	**Note**
14	T11 sensor	---	NOT USED
15	T12 sensor	---	NOT USED

Software - alarm set 2

Software - alarm set 2			
Bit	**Meaning**	**Reset**	**Note**
0	Circuit 2 high superheat	Manual	NOT USED
1	Circuit 2 refrigerant loss (warning): Valve opening 2	---	NOT USED
2	Circuit 1 comp. 2 discharge gas high temp.	Manual	
3	Circuit 1 comp. 3 discharge gas high temp.	---	NOT USED
4	Circuit 2 low pressure	Manual	NOT USED
5	Circuit 2 high condensing pressure	Manual	NOT USED
6	Circuit 2 comp. 1 discharge gas high temp.	Manual	NOT USED
7	Circuit 2 comp. 2 discharge gas high temp.	Manual	NOT USED
8	Circuit 2 comp. 3 discharge gas high temp.	---	NOT USED
9	Circuit 2 Low envelope condensing temperature (warning)	---	NOT USED
10	Circuit 2 High envelope condensing temperature (warning)	---	NOT USED
11	Circuit 2 Low envelope evaporating temperature (warning)	---	NOT USED
12	Circuit 2 High envelope evaporating temperature (warning)	---	NOT USED
13	Circuit 2 envelope alarm	Manual	NOT USED
14	Circuit 2 anti-freeze alarm	---	NOT USED
15	Insufficient differential pressure in reverse cycle valve	Manual	

Hardware - alarm set 2

Hardware - alarm set 2			
Bit	**Meaning**	**Reset**	**Note**
0	T13 sensor		NOT USED
1	Drive VS communication	Manual	
2	EEPROM failure	Automatic	
3	System controller communication timeout (60s timeout, each new communication resets the timer and cancels the alarm)	Manual	
4	Drive VS Alarm	Automatic	
5	Drive VS configuration alarm	Automatic	
6	Safety feedback circuit 1	Automatic	
7	Safety feedback circuit 2	---	NOT USED
8	System Power Loss	Manual	
9	Drive VS locked out	Manual	
10	Valve configuration alarm	Automatic	
11	Valve 1 alarm	Manual	
12	Valve 2 alarm	Manual	
13	VS Drive startup alarm	Manual	
14	Pack configuration alarm	Automatic	
15	NOT USED	---	NOT USED

10.2 DRIVER ALARMS

The tables for each group of alarms are shown below:

Driver 1 alarms

Bit	Description	Reset	Note
0	Compressor phase over current	Manual	
1	AC input overcurrent (SW)	Manual	
2	DC bus over voltage (SW)	Manual	
3	DC BUS under-voltage	Manual	
4	AC input over voltage	Manual	
5	AC input under voltage	Manual	
6	AC input loss of phase / AC voltage imbalance	Manual	
7	Inverter desaturation	Manual	
8	High pressure switch fault	Manual	
9	Compressor loss of phase	Manual	
10	Loss of compressor motor control	Manual	
11	Compressor power module over temperature	Manual	
12	PDF-IGBT over temperature		NOT USED
13	Compressor startup fault	Manual	
14	Compressor motor thermistor fault		NOT USED
15	NOT USED		NOT USED

Driver 2 alarms

Bit	Description	Reset	Note
0	DC voltage low		NOT USED
1	Compressor phase over current (interm.)		NOT USED
2	Compressor phase current timeout	Manual	
3	Compressor power module temp. timeout	Manual	
4	AC input current timeout	Manual	
5	DLT temperature timeout	Manual	
6	Auto config communication timeout	Manual	
7	Modbus communication lost	Manual	
8	DLT high temperature	Manual	
9	Compressor motor temperature high		NOT USED
10	Board temperature high		NOT USED
11	Compressor power module temperature high	Manual	
12	PFC-IGBT temperature high		NOT USED
13	DSP to PFC communication lost		NOT USED
14	Comms to DSP communication lost		NOT USED
15	NOT USED		NOT USED

Driver 3 alarms

Bit	Description	Reset	Note
0	Compressor phase current imbalance	Manual	
1	3 phase PFC current imbalance		NOT USED
2	Micro electronic fault	Manual	
3	Motor overspeed		NOT USED
4	EEPROM failure	Manual	
5	High pressure transducer fault		NOT USED
6	Compressor model configuration error	Manual	
7	High pressure sensor type configuration error		NOT USED
8	Compressor U-phase over current / sensor fault	Manual	
9	Compressor V-phase over current / sensor fault	Manual	
10	Compressor W-phase over current / sensor fault	Manual	
11	Compressor HW over current	Manual	
12	PFC current sensor fault		NOT USED
13	AC input voltage sensor fault		NOT USED
14	DC bus voltage sensor fault		NOT USED
15	Compressor overload	Manual	

Driver 4 alarms

Bit	Description	Reset	Note
0	Inverter temperature imbalance		NOT USED
1	PFC temperature imbalance		NOT USED
2	DLT temp. sensor open or short fault	Manual	
3	Motor temperature low		NOT USED
4	Board temperature low		NOT USED
5	Power module temp. sensor open / short fault	Manual	
6	PFC-IGBT temp. sensor fault open / short fault		NOT USED
7	Comms ADC failure	Manual	
8	PFC HW over current		NOT USED
9	PFC SW over current		NOT USED
10	PFC over voltage		NOT USED
11	Cooling fan	Manual	
12	Board temperature sensor open/short	Manual	
13	Stator heater overcurrent	Manual	
14	Space expansion		NOT USED
15	Fault limit lockout	Manual	

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