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24/09 - 4472010_08
Translation of Original instructions

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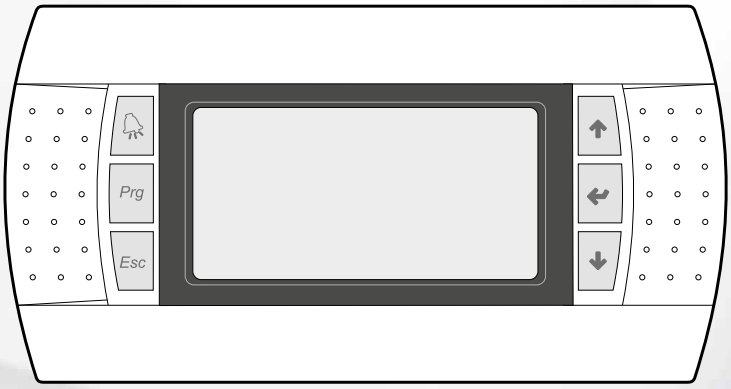


CARD PCO5 - PANEL PGD1

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

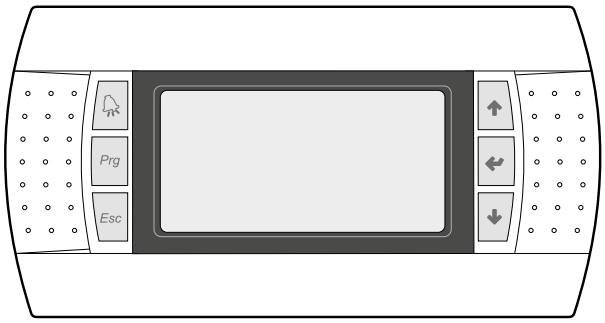
SAFETY CERTIFICATIONS

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**

TABLE OF CONTENTS

1 USER INTERFACE (PGD1)



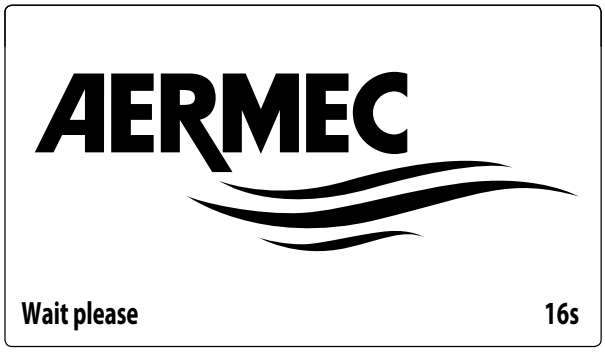
The command panel of the unit allows the rapid setting of the working parameters of the machine, and their visualisation. The card stores all the default settings and any modifications.
The installation of the remote panel PGD1 makes it possible to copy from remote all the functions and settings available 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

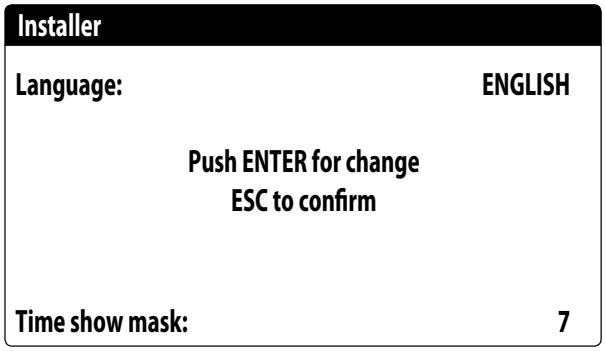
After powering the unit, the control card will perform preliminary operations before it is ready to be used; these initial procedures last about 60 seconds before they are complete; two windows are displayed during the initial loading procedures (a start window and one for selecting the system language);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

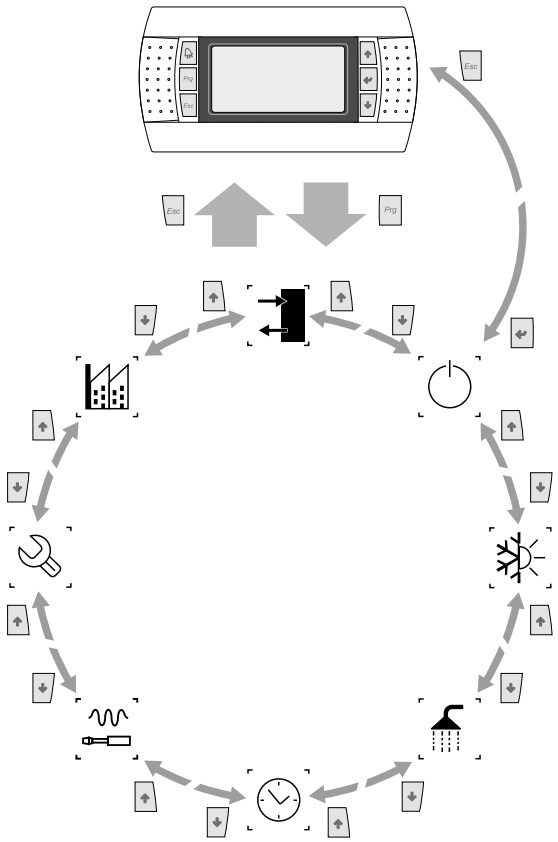
: Pressing this key can have different functions:
— Pressing this key when navigating menus/parameters passes to the previous menu/parameter;
— Pressing this key when changing a parameter decreases the value of the selected parameter;

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;

RECOVERY (if present in the unit):This menu allows to set the parameters related to the recovery management;

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

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;

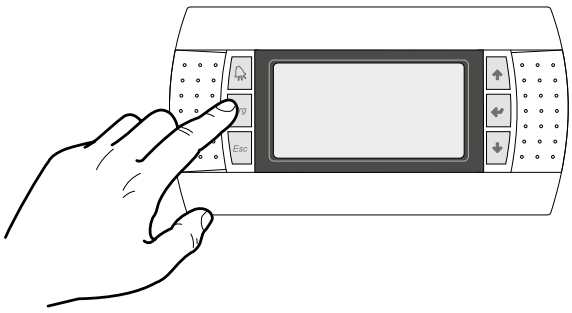
MANUFACTURER: This menu is not accessible except by authorized staff;

1.4 USER OPERATING PROCEDURES

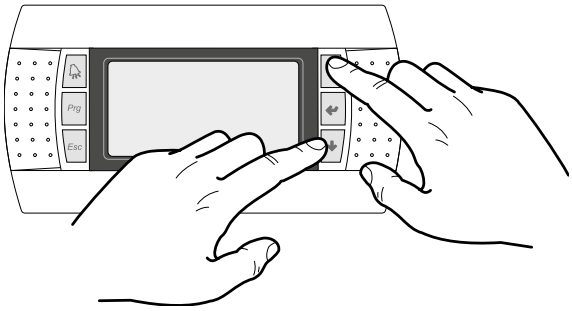
To check or modify the operating parameters of the unit it is necessary to use the interface of the control panel on the unit.
The basic operations that the user must be capable of, for the correct use of the unit, are:
— Moving between menus;
— Selecting and modifying a menu.

1.4.1 Moving between menus

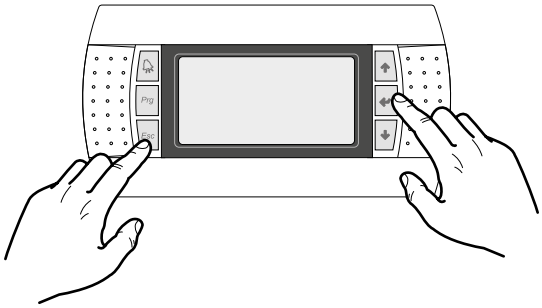
To move between the menus, the order in which they are displayed is shown in the previous page, enter the menu selection mode by pressing the key Prg;



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:

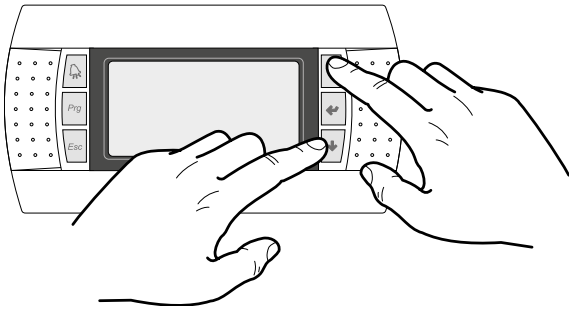


When the desired menu is seen press the key ↵ to enter the menu. Press the key Esc to return to the menu selection mode:



1.4.2 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:



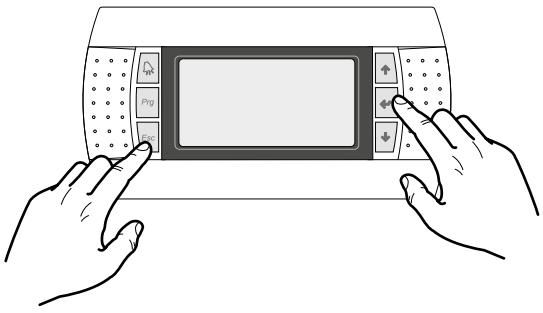
When the desired parameter is seen press the key ↵ to enter the parameter. To exit the parameter and return to the parameter selection mode press the key Esc.

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.



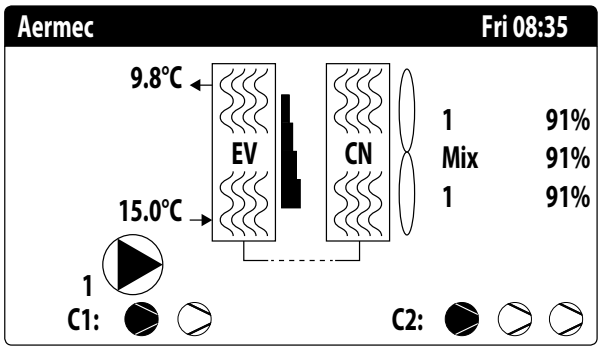
NOTICE

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

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;
— Circuit 1 (C1) or 2 (C2) compressor status;
— 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.

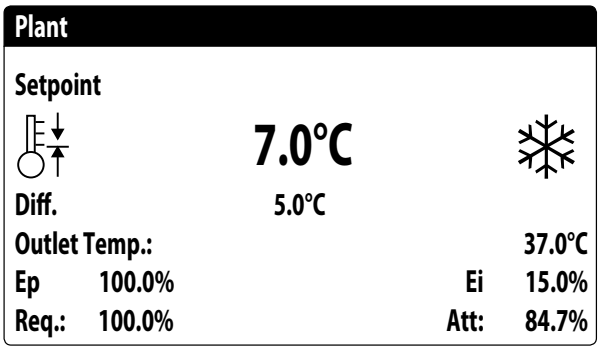
NOTICE

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)
— 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;
— AP: indicates a compressor alarm;
— : 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;

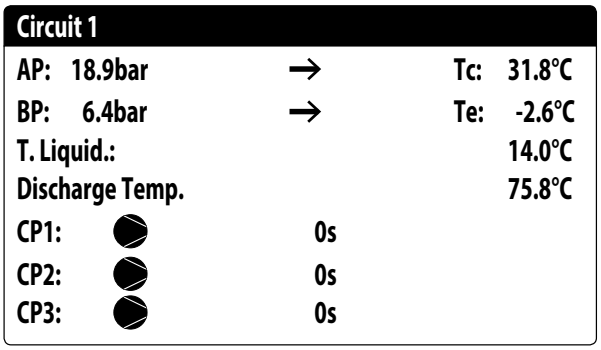
NOTICE

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

— : system chilled water production;
— : system hot water production;
— : time bands active;
— LC: indicates that the low charge function is active;
— M : multifunction input;

2.3 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:



— **AP**: high pressure
— **BP**: low pressure
— **Tc**: condensation temperature
— **Te**: evaporating temperature
— **T.Liquid**: liquid temperature

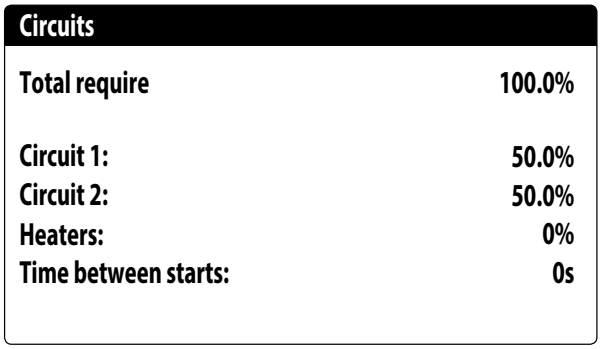
— **Pressing line Gas T.**: compressor pressing line gas temperature

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;

2.4 POWER DEMAND MONITOR

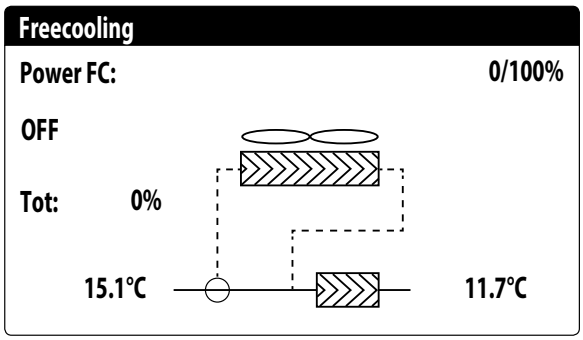
This mask is used to display the data related to the power demand on the indicated circuit; if the unit has multiple circuits, each will have a dedicated window:

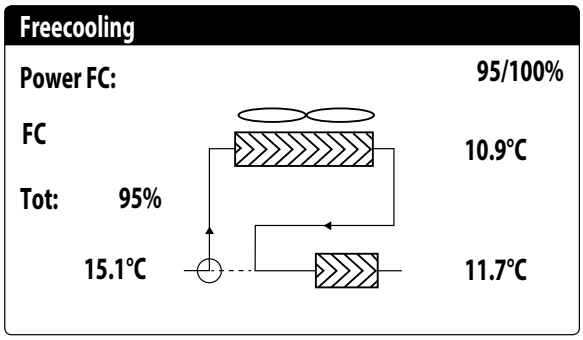


— Total thermostat request;
— Power delivered by circuit 1 and 2;
— Resistance: This is the percentage of integral resistance active at that moment (only visible with Integral resistance configuration);
— Seconds remaining until the next compressor is switched on.

2.5 FREE COOLING MONITOR

This mask is used to display the status of the free cooling circuit:





— Activation of the 3-way valve with the display of moving arrows for pump status and water circulation;
— Power delivered by the free cooling based on that available;
— Operating status;
— Tot: total power as a percentage delivered by the unit. If only free cooling, corresponds to the total power delivered by free cooling, if mixed operation the total power is the sum of the power delivered by free cooling and the compressors;
— Display of the values of the free cooling input (lower left), evaporator input (if FC on, upper right) and evaporator output (lower right) probes;

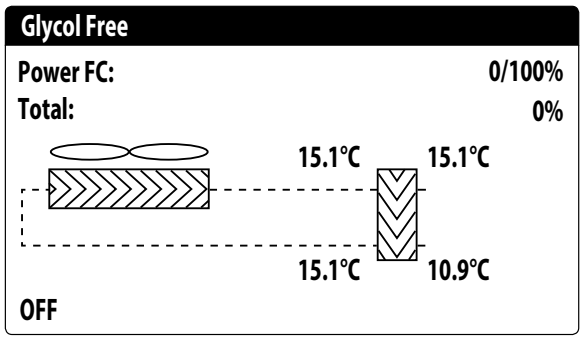
Possible operating status:
— OFF (unit off);
— FC (unit only operating in free cooling);
— FC+CP (unit in mixed operation);
— CP (unit operating with compressors only);

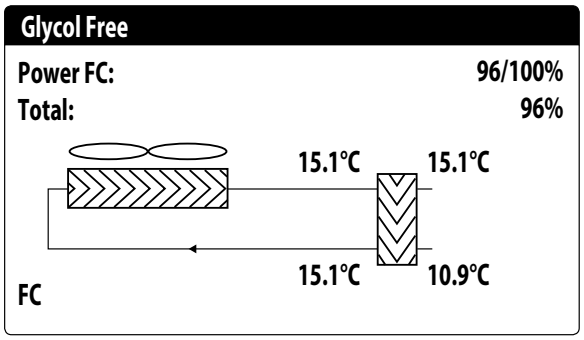
NOTICE

This mask is available on free cooling units.

2.6 GLYCOL FREE MONITOR

This mask is used to display the status of the glycolfree circuit:





— Activation of the branch containing glycol with the display of moving arrows for pump status and water circulation;
— Power delivered by the free cooling based on that available;
— Tot: total power as a percentage delivered by the unit. If only free cooling, corresponds to the total power delivered by free cooling, if mixed operation the total power is the sum of the power delivered by free cooling and the compressors;
— Display of the values of the free cooling output (upper left), free cooling input (lower left), intermediate evaporator (upper right) and evaporator input (lower right) probes;
— Operating status;

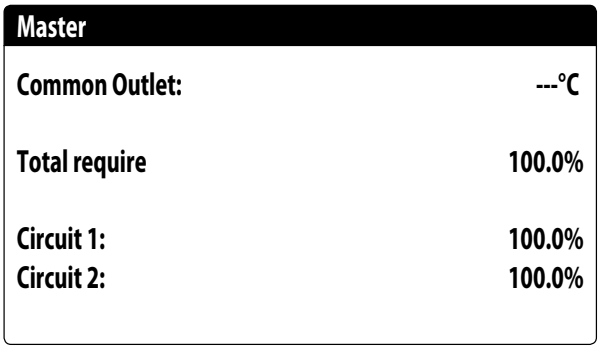
Possible operating status:
— OFF (unit off);
— FC (unit only operating in free cooling);
— FC+CP (unit in mixed operation);
— CP (unit operating with compressors only);

NOTICE

This mask is available on glycolfree units.

2.7 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:



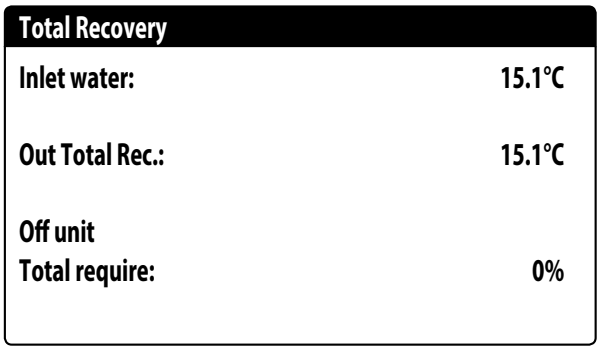
— **Common output (optional)**: probe water temperature on the common output of the two master and slave unit outputs;
— **Demand**: power calculated by the Master unit thermostat that will be distributed between the two units;
— **Unit 1**: percentage power requested of the Master unit;
— **Unit 2**: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

NOTICE

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

2.8 TOTAL RECOVERY MONITOR

This mask is used to display the status of the total recovery:



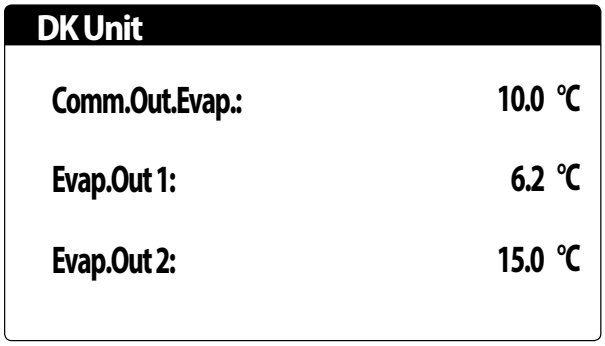
— Display of the water temperature value of the total recovery input probe;
— Display of the water temperature value of the total recovery output probe;
— Total recovery status:
flow switch open (water is not circulating in the hydraulic circuit of the recovery system and therefore it is disabled);
enabled (water is circulating in the hydraulic circuit of the recovery system and therefore it is enabled);
general off (the whole unit is in stand-by), off from the display (general disabling of the unit from the pGD1 button);

— Demand: this value indicates the actual power requested for total recovery

NOTICE

This mask is available on units with total recovery.

2.9 DK MONITOR (ONLY ON UNITS WITH 2 SEPARATE GAS-SIDE CIRCUITS)

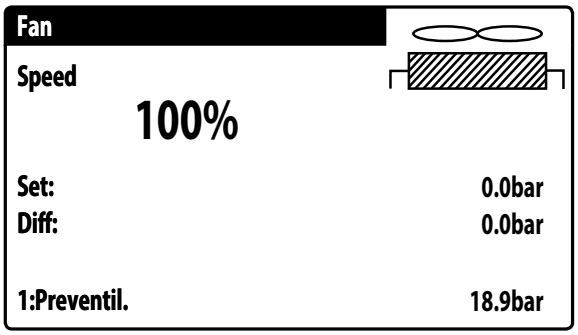


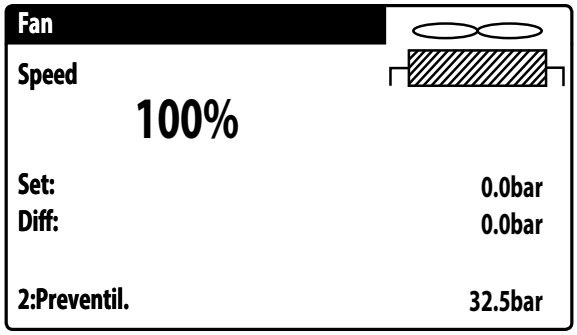
— **Evaporator common output**: indicates the current temperature value read by the probe placed on the common output connection from the two evaporators.
— **Evaporator water output 1**: indicates the current temperature value for water leaving the evaporator 1.
— **Evaporator water output 2**: indicates the current temperature value for water leaving the evaporator 2.

3 INPUT/OUTPUT MENU

3.1 FAN MONITOR

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



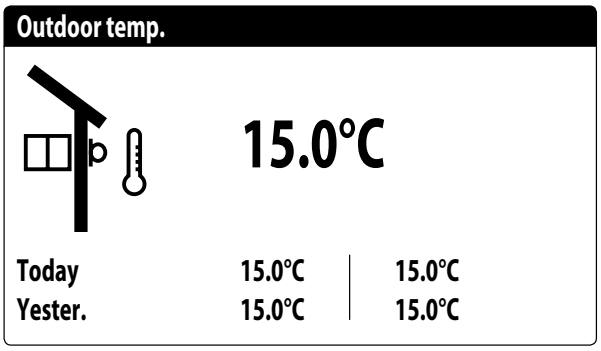


— **Speed**: this value indicates the current speed (as a percentage) at which the concerned fans are operating (common, circuit 1 or circuit 2);
— **Set**: Fan setpoint: this value indicates the current ventilation setpoint;
— **Diff**: Ventilation setpoint differential: this value indicates the current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

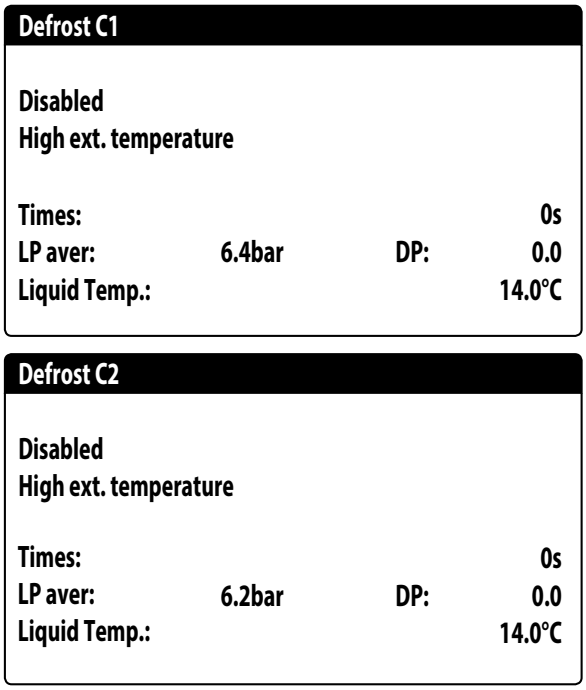
3.2 OUTSIDE TEMPERATURE MONITOR

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;
— **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;

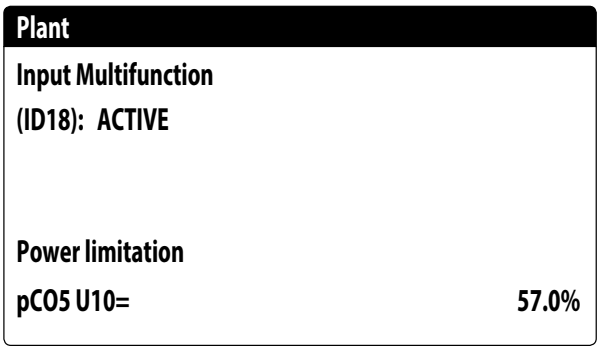
— **First defrost**: shows the first defrost phase after a power loss.

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.

3.4 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;

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 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;
— Inputs and outputs (uPC medium expansion for Chiller with Freecooling/GlycolFree or Recovery);
— Inputs and outputs (pCOE Expansion for NRL,NRB(Large 50Hz),NLC,NYB,NRV,BRB Heat Pumps and Two-circuit);
— Inputs and outputs (pCOE expansion for DK versions);
— Inputs and Outputs (pCOE expansion for Motor condensing);
— Inputs and outputs (pCOE expansion for NYB/NRV);
— Inputs and Outputs (pCOE Expansion for "NRB0282-0754", NRB Large 60Hz Two-circuit);
— Inputs and outputs (pCOE expansion for "Variable Primary Flow").

NOTICE

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

4 INPUT AND OUTPUT

4.1 ANALOGUE INPUTS

Analogue inputs	Code	Range	Description
	NRL 6 CP / NRLH 6CP		
U1	SIW		evaporator water inlet probe
	33%	Condensing units up to 6 CP	Step switch on contact
U2	SUW		evaporator water outlet probe
	16%	Condensing units up to 6 CP	Step switch on contact
U3	SAE		External air sensor
U4	SL1	**NRK**	Circuit 1 Liquid temperature probe
	SGP1	**NRL** NLC/H Single Circuit	Discharge temperature sensor circuit 1
U5 (4-20mA)	AP1		High pressure transducer circuit 1
U6 (4-20mA)	BP1		Low pressure transducer circuit 1
U7	SL2	**NRK**	Circuit 2 Liquid temperature probe
	SGP2	**NRL**	Discharge temperature sensor circuit 2
	SAC	NLC/H Single Circuit	
	SLB2	NRBH Single Circuit	Circuit 1 liquid temperature probe coil 2
U8 (4-20mA) o (NTC)	AP2		High pressure circuit 2 transducer
	SL1	NLC/H Single Circuit	
	SLB1	**NRB** Single Circuit	Circuit 1 liquid temperature probe coil 1
U9 (4-20mA) o (NTC)	BP2		Low pressure transducer circuit 2
	SGA	**NRB** Single Circuit	Intake temperature probe
U10	Multifunction		Multi-function input
	Common outlet probe	Slave Unit	Common output with Master/Slave

4.2 DIGITAL INPUTS

Digital inputs	Code	Range	Description
ID1	FL		Flow switch
ID2	AP1		Circuit 1 high pressure pressure switch / discharge gas thermostat
ID3	TV1		Fan circuit breaker circuit 1
ID4	RCS		Phase monitor
ID5	TC1		Overload compressor 1 circuit 1
ID6	TC1A		Overload compressor 2 circuit 1
ID7	TC1B		Overload compressor 3 circuit 1
ID8	AP2		Circuit 2 high pressure pressure switch /discharge gas thermostat
ID9	TV2		Fan circuit breaker circuit 2
ID10	SET2		Second setpoint
ID11	TC2		Overload compressor 1 circuit 2
ID12	TC2A		Overload compressor 2 circuit 2
ID13	TC2B		Overload compressor 3 circuit 2
ID14	TMP1		Overload pump 1
ID15	TMP2		Overload pump 2
ID16	C/H		Remote season contact (closed= summer mode)
	Anti-freeze	Cooling-only condensing unit	Anti-freeze contact
ID17	ON/OFF		Remote ON/OFF contact (closed=ON)
ID18	Enable Multifunction		Multifunction input enabling

Digital inputs	Code	Range	Description

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

4.3 DIGITAL OUTPUTS

Digital outputs	Code	Range	Description
N01	MPO1		Pump 1 evaporator
N02	CP1		Compressor 1 Circuit 1
N03	CP1A		Compressor 2 Circuit 1
N04	CP1B		Compressor 3 Circuit 1
N05	VSL1		Liquid solenoid valve circuit 1
N06	VIC1	With heat pump	Circuit 1 reverse cycle valve
N07	MV1		Fans group 1
N08	AE		Alarm summary
N09	CP2		Compressor 1 Circuit 2
	R1	NLCH single-circuit with integral resistance or replacement boiler	
N010	CP2A		Compressor 2 Circuit 2
	R2	NLCH single-circuit with integral resistance	
N011	CP2B		Compressor 3 Circuit 2
N012	VSL2		Solenoid valve circuit 2
N013	MV2		Fans group 2
	V2V	NYB Cooling only	Hydronic circuit closure valve
N014	VIC2	With heat pump	Circuit 2 reverse cycle valve
N015	VSB1	With heat pump	Thermostatic bypass solenoid valve circuit 1
N016	VSB2	With heat pump	Thermostatic bypass solenoid valve circuit 2
N017	RE		Heater exchanger
N018	MPO2		Pump 2 evaporator

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

4.4 ANALOGUE OUTPUTS

Analogue outputs	Code	Range	Description
Y1	DCP1		Modulating fans unit 1
Y2	DCP2		Modulating fans unit 2
Y3	DCP3		Modulating fan group 1+2 or 3 (with 3 ventilation groups)
Y4	DCP4	NRB	Circuit1 modulating fan unit that switches off at low outdoor temperatures
Y5	DCP5	NRB	Circuit2 modulating fan unit that switches off at low outdoor temperatures
Y6	Tray heater	Single Circuit	

4.5 INPUTS AND OUTPUTS (UPC MEDIUM EXPANSION FOR CHILLER WITH FREECOOLING/GLYCOL FREE OR RECOVERY)

Analogue inputs	Code	Range	Description
B1 (NTC)			
B2 (NTC)			
B3 (NTC)			

Analogue inputs	Code	Range	Description
B4 (NTC)			
B5 (NTC)			
B6 (NTC)	SIR	With total recovery	Total recovery inlet water temperature
	SFC	With Freecooling	Free cooling inlet probe
B7 (NTC)	SUR	With total recovery	Total recovery outlet water temperature
	SFC2	With Freecooling	Free cooling outlet probe (Glycol Free)
B8 (NTC)	SUR2	With total recovery	Total recovery outlet water temperature
	SRU	With Freecooling	Intermediate evaporator probe
B9 (NTC; NTC HT;)	SUW2	DK	Evaporator 2 water outlet probe
B10 (NTC,4-20mA)			
B11 (NTC, 0-5V)	SUC	DK	Common evaporator outlet probe
B12 (NTC, 0-5V)			
Digital inputs			
ID1	TPR	With total recovery	External heat recovery pump (new management proposed)
	FLC	With Freecooling Glycol Free	Flow switch side heater
ID2	FLR	With total recovery	Recovery flow switch
	MTP	With Freecooling Glycol Free	Glycol Side Pump thermomagnetic
ID3			
ID4			
ID5			
ID6			
ID7			
ID8			
ID9			
ID10			
Digital outputs			
NO1	VA1_40	With Freecooling	Coil disconnecting valve circuit 1
NO2	RS2	With total recovery	Heater recovery exchanger
	RS2	With Freecooling Glycol Free	Glycol Side Heater
NO3	VB1_40	With Freecooling	Coil spillage valve circuit 1
NO4	VR1	With total recovery	Circuit 1 spillage from Recovery
	VB1_60	With Freecooling	Coil spillage valve circuit 1
NO5	VB1	With total recovery	Circuit 1 spillage from Condenser
	VB2_40	With Freecooling	Coil spillage valve circuit 2
NO6	VR2	With total recovery	Circuit 2 spillage from Recovery
	VB2_60	With Freecooling	Coil spillage valve circuit 2
NO7	VB2	With total recovery	Circuit 2 spillage from Condenser
	VSFR3V	With Freecooling	Free cooling 3-way valve
	MPG	Glycol Free	Glycol Free pump
NO8	VRT1	With total recovery	Total recovery 3-way valve circuit 1
	VA1_60	With Freecooling	Coil disconnecting valve circuit 1
NO9	VRT2	With total recovery	Total recovery 3-way valve circuit 2
	VA2_40	With Freecooling	Coil disconnecting valve circuit 2
NO10	VA2_60	With Freecooling	Coil disconnecting valve circuit 2
NO11	VSL1A	With total recovery	Oil spillage valve from recovery circuit 1
NO12	VSL2A	With total recovery	Oil spillage valve from recovery circuit 2
Analogue outputs			
Y1			
Y2			
Y3			

Analogue inputs	Code	Range	Description
Y4			

Note: Modbus address=11

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

4.6 INPUTS AND OUTPUTS (PCOE EXPANSION FOR NRL, NRB(LARGE 50HZ),NLC,NYB,NRV,BRB HEAT PUMPS AND TWO-CIRCUIT)

Analogue inputs	Code	Range	Description
B1 (NTC)	SL1		Circuit 1 Liquid temperature probe
B2 (NTC)	SL2		Circuit 2 Liquid temperature probe
B3 (NTC)	SAC	With supplementary heater	Storage tank probe
B4 (NTC)			
Digital inputs			
ID1			
ID2			
ID3			
ID4			
Digital outputs			
NO1	RI1	With supplementary heater	Output1 Integral resistance
		With replacement boiler	Replacement boiler consent output
NO2	RI2/RI3	With supplementary heater	Output2 Integral resistance
NO3	Tray heater		Command also on output 0_10V Y6
NO4	V3V		Domestic hot water 3-way valve (required via Modbus)
Analogue outputs			
Y1			
Y2			
Y3			
Y4			

Note: Modbus address pCOE=2, DIP2=ON.

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

4.7 INPUTS AND OUTPUTS (PCOE EXPANSION FOR DK VERSIONS)

Analogue inputs	Code	Range	Description
B1 (NTC)	SUW2	DK	Second evaporator water outlet temperature probe
B2 (NTC)	SUC	DK	Evaporator common outlet temperature probe
B3 (NTC)			
B4 (NTC)			
Digital inputs			
ID1			
ID2			
ID3			
ID4			
Digital outputs			
NO1			
NO2			
NO3			
NO4			

Analogue inputs	Code	Range	Description
Analogue outputs			
Y1			
Y2			
Y3			
Y4			

Note: Modbus address pCOE=3, DIP1=ON, DIP2=ON.

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

4.8 INPUTS AND OUTPUTS (PCOE EXPANSION FOR MOTOR CONDENSING)

Analogue inputs	Percentage	Range	Description
B1 (NTC)			
B2 (NTC)			
B3 (NTC)			
B4 (NTC)			
Digital inputs			
ID1	100%	Condensing units up to 4 CP	Compressor or step switch on contact
	100%	Condensing units up to 6 CP	
ID2	75%	Condensing units up to 4 CP	Compressor or step switch on contact
	83%	Condensing units up to 6 CP	
ID3	50%	Condensing units up to 4 CP	Compressor or step switch on contact
	66%	Condensing units up to 6 CP	
ID4	25%	Condensing units up to 4 CP	Compressor or step switch on contact
	50%	Condensing units up to 6 CP	
Digital outputs			
NO1			
NO2			
NO3			
NO4			
Analogue outputs			
Y1			
Y2			
Y3			
Y4			

Note: Modbus address pCOE=4, DIP3=ON.

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

4.9 INPUTS AND OUTPUTS (PCOE EXPANSION FOR NYB/NRV)

Analogue inputs	Code	Range	Description
B1 (NTC)	SFC		Free cooling inlet probe
B2 (NTC)			
B3 (NTC)	Differential transmitter	For PN21 systems	Replaces the flow meter

Analogue inputs	Code	Range	Description
B4 (NTC)			
Digital inputs			
ID1			
ID2			
ID3			
ID4			
Digital outputs			
NO1	V2V		Evaporator Valve
NO2	V2VA		Free cooling valve Output ON= freecooling enabled Output Off= freecooling disabled
NO3			
NO4			
Analogue outputs			
Y1			
Y2			
Y3			
Y4			

Note: Modbus address pCOE=5, DIP1=ON, DIP3=ON.

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

4.10 INPUTS AND OUTPUTS (PCOE EXPANSION FOR "NRB0282-0754", NRB LARGE 60HZ TWO-CIRCUIT)

Analogue inputs	Code	Range	Description
B1 (NTC)	SL1		Circuit 1 Liquid temperature probe
B2 (NTC)	SL2		Circuit 2 Liquid temperature probe
B3 (NTC)	SGA1		Intake temperature probe circuit 1
B4 (NTC)	SGA2		Circuit 2 Intake temperature probe
Digital inputs			
ID1			
ID2			
ID3			
ID4			
Digital outputs			
NO1		NRB 0282-0754 Y	Thermostatic expansion valve exchange C1
NO2		NRB 0282-0754 Y	Thermostatic expansion valve exchange C2
NO3	Tray heater		Command also on output 0_10V Y6
NO4	V3V		Domestic hot water 3-way valve (required via Modbus)
Analogue outputs			
Y1			
Y2			
Y3			
Y4			

Note: Modbus address pCOE=6, DIP2=ON, DIP4=ON.

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

4.11 INPUTS AND OUTPUTS (PCOE EXPANSION FOR "VARIABLE PRIMARY FLOW")

Analogue inputs	Description	Note
B1 (NTC)	Differential pressure	Differential transducer
B2 (NTC)		
B3 (NTC)		
B4 (NTC)		
Digital inputs		
ID1		
ID2		
ID3		
ID4		
Digital outputs		
NO1		
NO2		
NO3		
NO4		
Analogue outputs		
Y1	Bypass VPF	valve control Bypass opening
Y2		
Y3		
Y4		

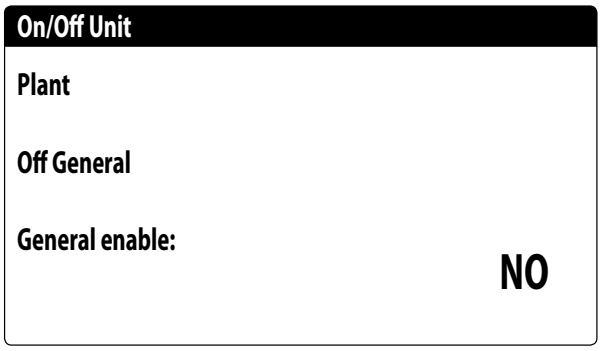
Note: Modbus address pCOE=7, DIP1=ON, DIP2=ON, DIP4=ON.

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

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:



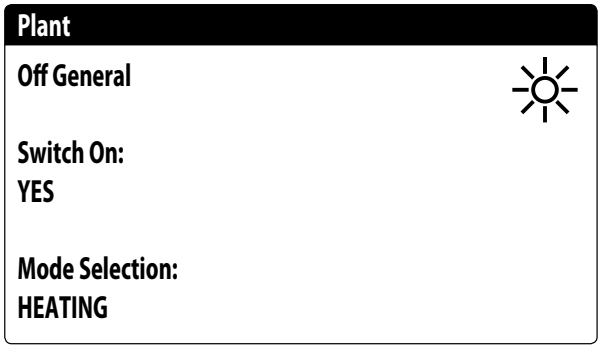
Display of the general system state:
- Flow switch open: the chiller's flow switch is open;
- Enabled: the system regulates via the main probe based on the system setpoint;
- Off due to alarm: system off due to serious alarm;
- General off: system turned off by general enabling (see the paragraph described 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;
- Antifreeze: unit forcibly switched on to prevent freezing;
- 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:

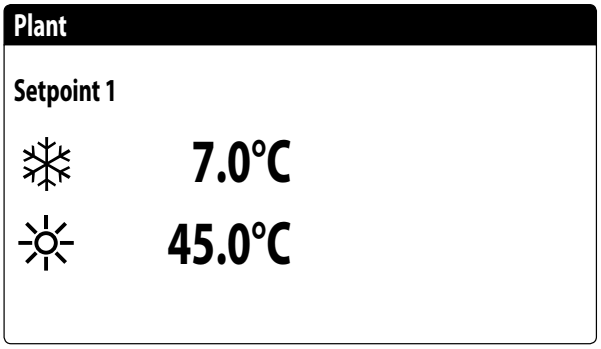


Enable: allows to select the mode with which to turn the unit on or off; the available options are:
— OFF: the system does not produce hot/chilled water;
— YES: the system regulates via the main probe based on the system setpoint;
— YES WITH SET2: the system regulates via the main probe based on setpoint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

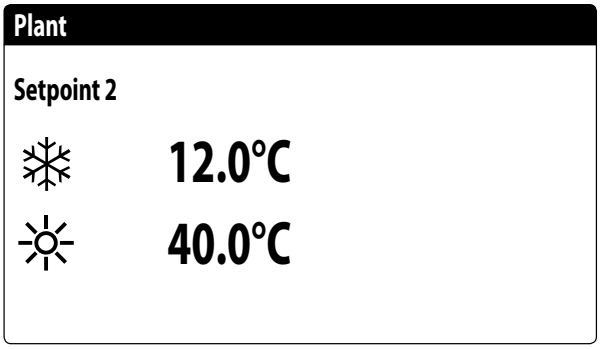
This mask is used to set the values to assign to the primary working setpoints:



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;

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.

6.4 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 = TIME-CLOCK);

6.5 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 = TIME-CLOCK);

6.6 COPY/PASTE TIME BANDS

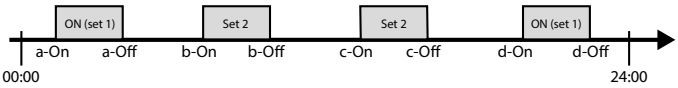
This mask is used to copy and paste the time bands set for a day of the week to another (or to all other days):

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:

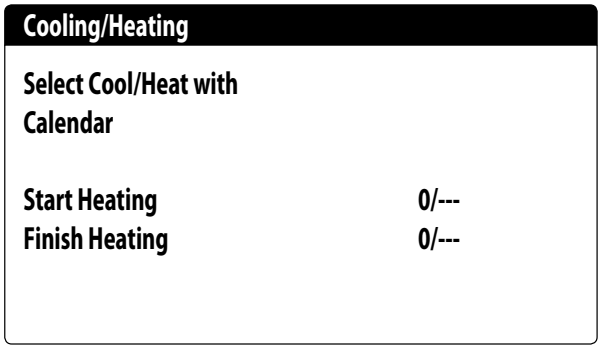


NOTICE

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

6.7 SETTING THE SEASON CHANGE FROM THE CALENDAR (HEATING)

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

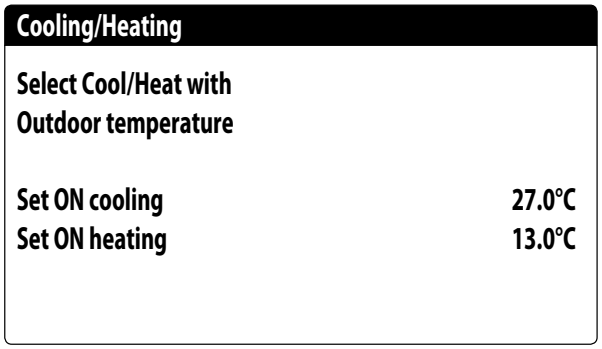


NOTICE

This mask is only visible if "BY CALENDAR" is selected on the page "6.1 Selecting the system operating mode p. 24";

6.8 SETTING THE SEASON CHANGE FROM THE CALENDAR (COOLING)

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



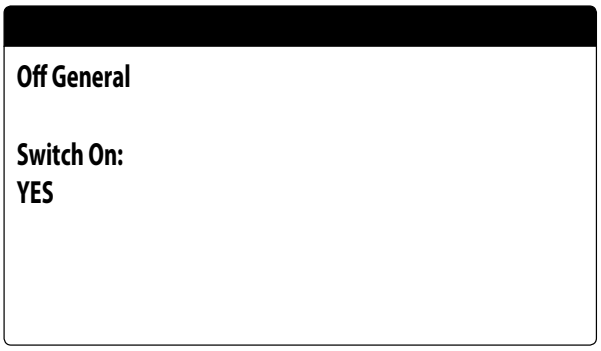
NOTICE

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.)

7 RECOVERY MENU

7.1 ENABLING RECOVERY

This mask is used to display the actual status of the total recovery, and to enable or disable the total recovery:



The mask displays the total recovery status;the available options are:

- flow switch open (water is not circulating in the hydraulic circuit of the recovery system and therefore it is disabled);
- enabled (water is circulating in the hydraulic circuit of the recovery system and therefore it is enabled);
- general off (whole unit in stand-by);
- off from display (general disabling of the unit from the pGD1 button);

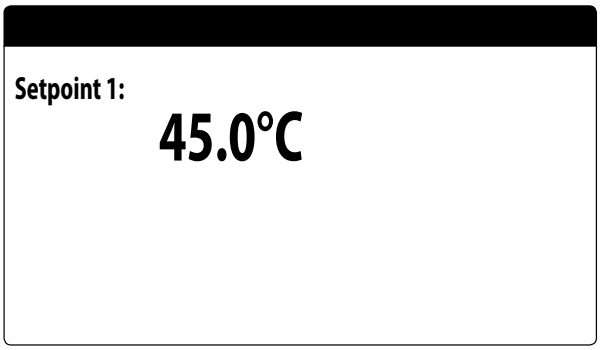
Enable: allows to enable or disable the total recovery;

NOTICE

This mask is available on units with total recovery.

7.2 SET THE RECOVERY SET VALUE

This mask allows to view and set the value to be assigned to the recovery work set (default value 45° C, setting range 30~50° C):



NOTICE

This mask is available on units with total recovery.

8 CLOCK MENU

8.1 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

8.2 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

8.3 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.

9 INSTALLER MENU

9.1 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):

Insert password

9.2 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

9.3 SETTING THE BMS 1 PARAMETERS

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

Installer

Supervisor:	**BMS1**
Protocol:	**MODBUS EXT**
BaudeRate:	**19200 Baud**
StopBits	**2**
Serial address:	**1**
Parity Type:	**NONE**

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:
— None
— Odd
— Even

9.4 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:

Installer

Supervisor:	
Enable cooling/heating by supervisor	**YES**
Enable On-Off unit by supervisor	**YES**

9.5 SETS THE BMS2 PARAMETERS

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

Installer	
Supervisor:	**BMS2**
BaudeRate:	**19200 Baud**
Serial address:	**1**
StopBits	**2**
Parity Type:	**NONE**

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:
— None
— Odd
— Even

9.6 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(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

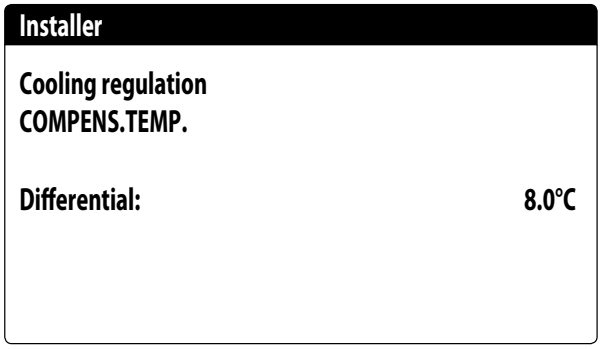
If selecting input based adjustment, in order to set a correct work setpoint, keep in mind the addition or the subtraction (based on if hot or cold operation) of the water production differential to or from the work setpoint.

Type of reg.: this value indicates which logic is used for managing the adjustment; The possible values are:
— PROP+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);

9.7 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:

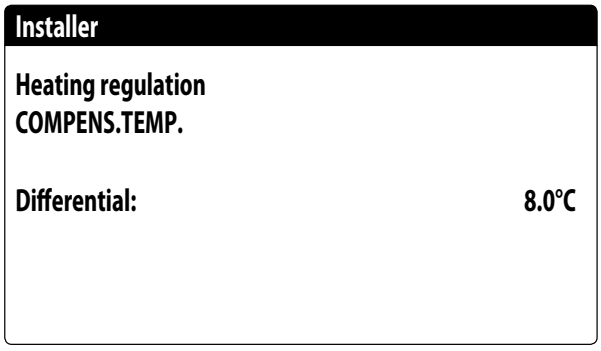


The type of setpoint indicates which logic is used for managing the working setpoint; the possible states are:

— **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;

9.8 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:

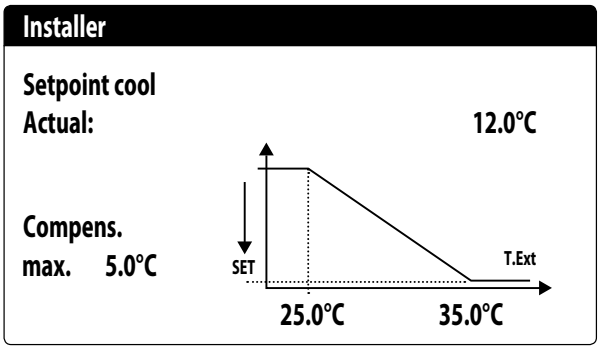


The type of setpoint indicates which logic is used for managing the working setpoint; the possible states are:

— **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;

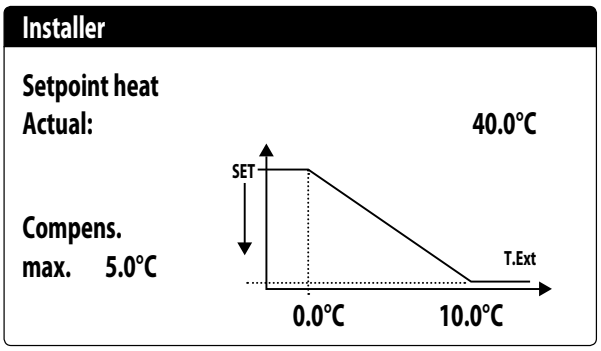
9.9 CLIMATIC CURVE CONFIGURATION IN COOLING MODE

This window is used to set the temperatures (minimum and maximum) and the maximum differential that will be applied to the working setpoint in cooling mode based on the minimum outside air temperature;



9.10 CLIMATIC CURVE CONFIGURATION IN HEATING MODE

This window is used to set the temperatures (minimum and maximum) and the maximum differential that will be applied to the working setpoint in heating mode based on the minimum outside air temperature;



9.11 TOTAL RECOVERY CONFIGURATION

This window allows to set the temperatures (minimum and maximum and differential) for the recovery management, in addition to the pump management logic:

Installer	
Total recovery	
Differential:	**5.0°C**
Max outlet temp.:	**53.0°C**
Pump:	**No**

Differential: indicates the differential used in the adjustment to calculate the power necessary for recovery;
Max output temp:indicates the recovery water output temperature above which it is forced out from the recovery system, it can re-enter when the water output temperature returns below this threshold minus 3° C;
Pump management:
— No: recovery activates when the flow switch contact closes for water passage. The pump is not managed by the unit;
— Yes: The pump is managed by the unit. It turns off when the recovery inlet temperature setpoint is reached.It turns back on when the temperature of the water at the recovery input drops 3°C below the recovery setpoint. In addition to the flow switch, a possible pump thermal switch is also managed that causes the shutdown;

NOTICE

This mask is available on units with total recovery.

9.12 ANTI-FREEZE ALARM CONFIGURATION

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

Config.Alarms	
Antifreeze alarm plant	
Threshold:	**3.0°C**
Differential:	**1.0°C**
Force ON pumps:	**YES**

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;

9.13 MANAGING THE PUMPS

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

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;

9.14 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);

9.15 CONFIGURATION OF THE ANTI-FREEZE ALARM ON THE TOTAL RECOVERY

This mask allows to set the parameters for managing the anti-freeze alarm control on the total recovery:

Installer	
Antifreeze alarm Recovery	
Threshold:	3.0°C
Differential:	1.0°C

Threshold: the anti-freeze alarm is generated below the temperature of the recovery input or recovery output probes;
Differential: once the anti-freeze alarm has been triggered, it can be reset when the temperature of the probe that caused the alarm rises beyond the Threshold value + the value of this parameter;

9.16 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

9.17 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;

9.18 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 multi-function 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;

9.19 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;

9.20 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;

9.21 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);

9.22 CONFIGURE NIGHT MODE CONTROL

NOTICE

The Night Mode function is not available for units NLC, NRL and NRK.

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

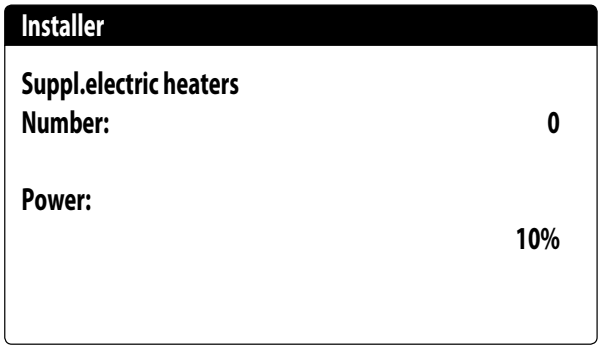
Fans	
Condensation mode overnight	NO
On:	21:00
Off:	8:00
Cooling VMax:	6.0V
FreeCool. VMax:	6.0V

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;

9.23 CONFIGURATION OF THE SUPPLEMENTARY ELECTRIC HEATERS

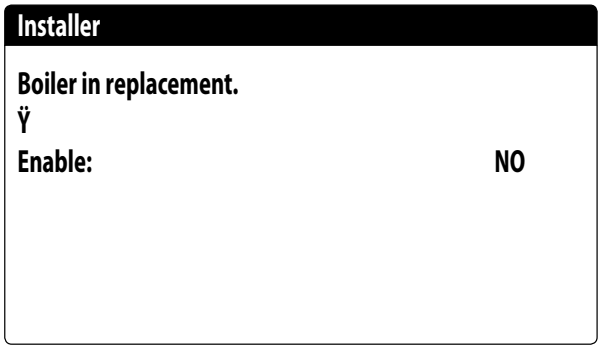
This mask is used to set the operation of the supplementary heaters in case of low outside temperatures:



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;

9.24 SETS THE BOILER AS A REPLACEMENT

This mask is used to set the replacement boiler:



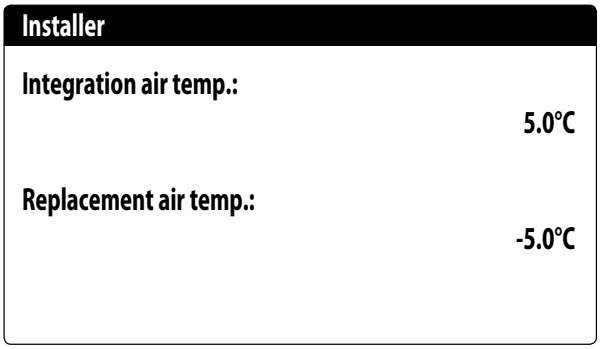
Boiler enabled as replacement: this parameter indicates whether to activate the boiler if the outside temperature drops down below the "replacement" value specified in the following window, or if the heat pump has a “total alarm”;

NOTICE

To manage the boiler on NRK models, it is necessary to provide the accessory VMF-CRP.

9.25 CONFIGURATION OF HEATER INTEGRATION OR REPLACEMENT

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



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;

9.26 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:	0002h
Compressor 2:	0002h
Compressor 3:	0002h

Hour meter	
Circuit 2	
Compressor 1:	0002h
Compressor 2:	0002h
Compressor 3:	0002h

9.27 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:	0003
Compressor 2:	0002
Compressor 3:	0002

Hour meter	
Circuit 2	
Number of starts	
Compressor 1:	0003
Compressor 2:	0002
Compressor 3:	0002

9.28 CONFIGURATION OF THE FAN SPEED

This window is used to configure the inverter fan signals:

Fans	
Fans	
Start time:	1s
Minimum V:	1.0
Max V cooling:	10.0
Max V heating:	10.0

Duration of the initial start: this value indicates the duration of the start at 4V when the fans are started;
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;

9.29 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;

9.30 CONFIGURATION OF THE FAN SPEED IN FREE COOLING

NOTICE

This mask is available on free cooling units.

This window is used to configure the inverter fan signals during the free cooling operation:

Fans	
Freecooling	
Delta T:	**15.0°C**
Max V Freecooilng:	**10.0V**

Delta T: value generated at the maximum fan speed at a design external air temperature;
Max volts Freecooling: maximum fan voltage during the free cooling operation.Used in silenced units to reduce noise;

9.31 FREE COOLING CONFIGURATION (YIELD CONTROL)

NOTICE

This mask is available on free cooling units.

This window allows to set the parameters related to the free cooling yield control management;this check constantly verifies that the free cooling coil generates a delta T; Used as a safety check on the operation of the 3-way valve. The control is active only with ventilation at maximum air flow:

Installer	
Freecooling **Control of gain**	
Delta T:	**1.5°C**
Time:	**180s**

Delta T: delta T generated at the maximum fan speed;

Control time: yield control bypass time given by the input in free cooling;

9.32 MANAGEMENT OF THE VALVES ON THE NYB/NRV UNIT

Installer	
NYB/NRV StandBy	
Valves closed:	**No**

Enables the boiler as replacement: this parameter indicates whether or not to close the valves for the passage of water in the evaporator when the units are in stand-by:
— NO: the water will pass in the evaporator when the machine is in stand-by;
— YES: the water will not pass in the evaporator when the machine is in stand-by;

9.33 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;

9.34 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;

9.35 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;
Bypass valve test: this value indicates the forced command to use as a test (set the value 0.0V to deactivate forcing).

9.36 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:	NRL3600°H°°°°°00
Ver.:	2.6.003 03/03/20
Testing date:	11:22 03/04/20

9.37 EVD VALVE INFORMATION MONITOR

Information	
EVD n°1	
Firmw. version.:	---

This mask displays information concerning the EVD valve connected in Modbus (if present).

9.38 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

9.39 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]

9.40 CONFIGURES THE INSTALLER MENU PASSWORD

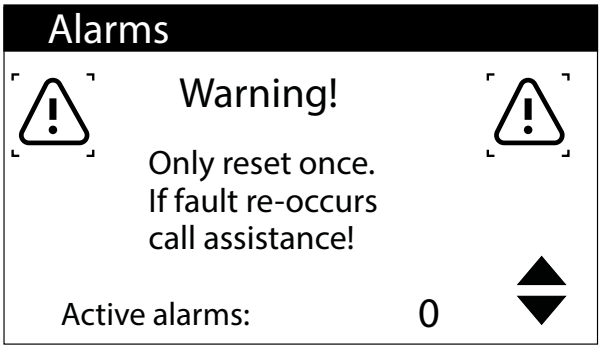
This window is used to change the "Installer" menu access parameter:

Password

New password
Installer: **0000**

10 ALARM

10.1 CONTROL OF ALARMS



This mask displays the alarm management logic.

Alarms with password-protected reset are:
— Anti-freeze alarm
— High pressure alarm
— Low pressure alarm
— Flow switch alarm
— High Discharge Temperature alarm

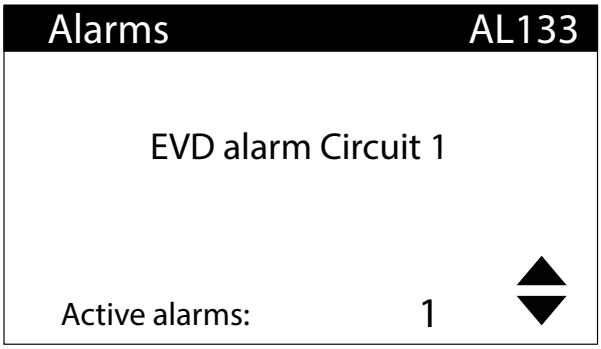
All other alarms are automatic reset.

Password reset can be disabled from the menu under password.
The alarm status and number of interventions remain in memory even after power failure.

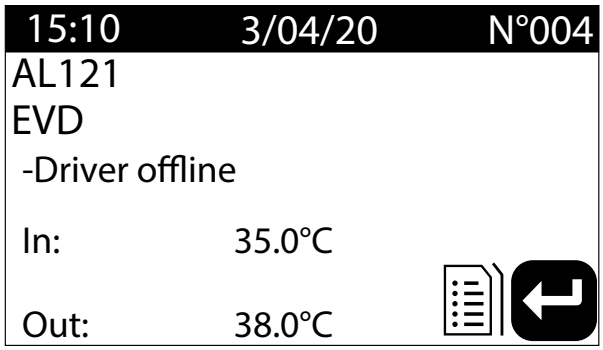
NOTICE

If the default parameters are loaded (via the manufacturer menu), the alarms and attempts stored up to that point are reset.

10.2 ALARM HISTORY

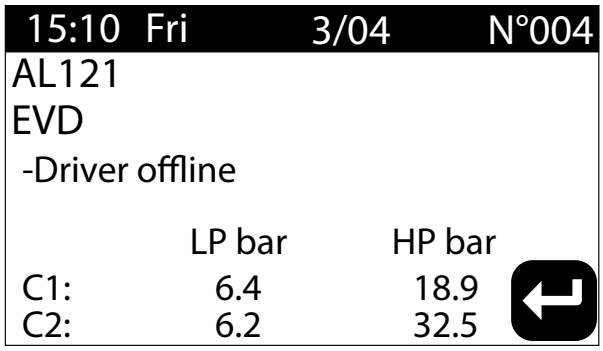


By pressing the list of active alarms is displayed.
Each alarm is uniquely identified by a 4-digit alarm code, this code can be found on the previous pages.
The last line shows how many alarms are active at that moment.



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
— Compressor status in the two circuits



This mask displays:
— Date and time of triggering
— Nature of alarm triggered
— 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 normal user to reset the alarm history.

11 LIST OF ALARMS

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	Note
AL01	Clock battery faulty or not connected	Automatic	---
AL02	Expansion memory damaged	Automatic	---
AL03	Phase monitor	Semi-Automatic	---
AL04	Display alarm reset	---	---
AL05	High pressure sensor circuit 1 faulty or not connected	Manual	Analog input U5
AL06	High pressure sensor circuit 2 faulty or not connected	Manual	Analogue input U8
AL07	Low pressure sensor circuit 1 faulty or not connected	Manual	Analogue input U6
AL08	Low pressure sensor circuit 2 faulty or not connected	Manual	Analog input U9
AL09	Inlet water temp sensor evap.1 faulty or not connected	Manual	Analog input U1
AL10	Outlet water temp sensor evap.1 faulty or not connected	Manual	Analog input U2
AL11	Outlet water temp sensor evap.com. faulty or not connected	Manual	---
AL12	Inlet water temp sensor recovery faulty or not connected	Manual	---
AL13	Outlet water temp sensor recovery1 faulty or not connected	Manual	---
AL14	Outlet water temp sensor recovery2 faulty or not connected	Manual	---
AL15	Outlet water temp sensor recovery common faulty or not connected	Manual	---
AL16	External temperature sensor faulty or not connected	Manual	---
AL17	Circuit 1 Liquid temperature probe broken or not connected	Manual	---
AL18	Liquid temperature sensor circuit 2 faulty or not connected	Manual	---
AL19	Circuit 1 compressor 1 maintenance request	Manual	---
AL23	Circuit breaker compressor 1 circuit 1	Manual	---
AL24	Thermal alarm system pump 1	Manual	---
AL25	Thermal alarm system pump 2	Manual	---
AL26	Thermal alarm heat recovery pump 1	Manual	---
AL28	Fans circuit breaker circuit 1	Manual	---
AL29	Fans circuit breaker circuit 2	Manual	---
AL31	Low pressure sensor circuit 1	Manual	---
AL32	High pressure from Circuit 1 pressure switch or EVD electronic valve alarm	Manual	---
AL33	High pressure sensor circuit 1	Manual	---
AL34	Circuit 1 low pressure sensor (serious)	Manual	---
AL35	Circuit 2 low pressure sensor (serious)	Manual	---
AL38	Loss of evaporator water flow	Manual	---
AL39	Loss of heat recovery water flow	Manual	---
AL40	Anti-freeze alarm system inlet/outlet temperature	Manual	---
AL41	Anti-freeze alarm system common outlet temperature	Manual	---
AL42	Anti-freeze alarm heat recovery 1 inlet/outlet temperature	Manual	---
AL43	Anti-freeze alarm heat recovery 2 outlet temperature	Manual	---
AL45	Expansion IO (uPC) Off-line	Semi-Automatic	---
AL46	Expansion IO (pCOe) Off-line	Semi-Automatic	---
AL48	Discharge gas temperature sensor circuit 1 faulty or not connected	Manual	---
AL49	Discharge gas temperature sensor circuit 2 faulty or not connected	Manual	---
AL50	Board re-start from lost power	Manual	It is not an alarm
AL51	Circuit 1 compressors 2 maintenance request	Manual	---
AL52	Circuit 1 compressors 3 maintenance request	Manual	---
AL53	Circuit 2 compressors 1 maintenance request	Manual	---
AL54	Circuit 2 compressors 2 maintenance request	Manual	---
AL55	Circuit 2 compressors 3 maintenance request	Manual	---
AL59	Circuit breaker compressor 2 circuit 1	Manual	---

Code	Description	Reset	Note
AL60	Circuit breaker compressor 3 circuit 1	Manual	---
AL61	Circuit breaker compressor 1 circuit 2	Manual	---
AL62	Circuit breaker compressor 2 circuit 2	Manual	---
AL63	Circuit breaker compressor 3 circuit 2	Manual	---
AL65	Low pressure sensor circuit 2	Manual	---
AL66	High pressure pressostat circuit 2	Manual	---
AL67	High pressure sensor circuit 2	Manual	---
AL75	High discharge gas temperature circuit 1	Manual	---
AL76	High discharge gas temperature circuit 2	Manual	---
AL85	High system inlet temperature alarm	Manual	---
AL86	SAC alarm storage tank probe broken or disconnected	Manual	---
AL87	Master Offline	Manual	---
AL88	Slave Offline	Manual	---
AL89	Incorrect Master/Slave software version (the two cards don't have the same software version)	Manual	---
AL90	Free cooling ouput alarm	Manual	---
AL91	Slave alarm summary	Manual	---
AL92	Glycol Free Flow switch	Manual	---
AL93	Glycol Free pump thermal	Manual	---
AL94	pCOE expansion offline (address=3) Unit DK	Manual	---
AL95	Common evaporator output probe broken or not connected (DK)	Manual	---
AL96	Evaporator 2 output probe broken or not connected	Manual	---
AL97	Free cooling input probe damaged or not connected	Manual	---
AL98	Free cooling output probe broken or not connected	Manual	---
AL99	Heat exchanger input probe damaged or not connected	Manual	---
AL100	Offline pCOE expansion (address=4) condenser unit	Manual	---
AL101	Offline pCOE expansion (address=5) NYB Freecooling	Manual	---
AL102	Water input outside operating limits	Manual	---
AL103	DeltaP alarm Circuit 1	Manual	---
AL104	DeltaP alarm Circuit 2	Manual	---
AL105	EVD Error Valve Motor A	Manual	---
AL106	Evap. low temperature EVD (LOP) A	Manual	---
AL107	EVD High evap. (MOP) A	Manual	---
AL108	Overheat. low EVD (LowSH) A	Manual	---
AL109	EVD Low intake temp. A	Manual	---
AL110	EVD High evap. condens. A	Manual	---
AL111	EVD Error Valve Motor B	Manual	---
AL112	Evap. low temperature EVD (LOP) B	Manual	---
AL113	EVD High evap. (MOP) B	Manual	---
AL114	Overheat. low EVD (LowSH) B	Manual	---
AL115	EVD Low intake temp. B	Manual	---
AL116	EVD alarm probe S1	Manual	---
AL117	EVD alarm probe S2	Manual	---
AL118	EVD alarm probe S3	Manual	---
AL119	EVD alarm probe S4	Manual	---
AL120	EVD EEPROM alarm	Manual	---
AL121	EVD Driver offline	Manual	---
AL122	EVD Battery discharged	Manual	---
AL123	EVD Parameter transmission error	Manual	---
AL124	EVD Firmware not compatible	Manual	---
AL125	Battery 2 battery liquid temperature probe broken or not connected	Manual	---
AL126	Expansion IO (pCOe) OffLine (address=6)	Manual	---
AL127	Circuit 1 intake temperature probe broken or not connected	Manual	---
AL128	Circuit 2 intake temperature probe broken or not connected	Manual	---
AL129	Expansion IO (pCOe) OffLine (address=7)	Manual	---
AL130	Differential transducer broken or not connected	Manual	---
AL131	High overheating of Circuit 1 (Circuit discharged)	Manual	---

Code	Description	Reset	Note
AL132	High overheating of Circuit 2 (Circuit discharged)	Manual	---
AL133	EVD alarms summary Circuit 1	Manual	---
AL134	EVD alarms summary Circuit 2	Manual	---
AL137	Mono drivers Circuit 1	Manual	Software 2.6.8
AL138	Mono drivers Circuit 2	Manual	Software 2.6.8

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