MANAGEMENT SOFTWARE
CLOSE CONTROL

Use Manual

IMPORTANT ADVICE

BEFORE TO CARRY OUT ANY INTERVENTION ON THE UNIT, READ CAREFULLY AND STRICTLY FOLLOW THE INSTRUCTION CONTAINED IN THIS MANUAL.

The unit of this software was built to operate without any risk for the purposes of it's construction even if: the software installation, programming, use and maintainance follow the instruction of the present manual and every intervention is carried out by expert personnel. Every intervention on the unit must strictly follow the instructions contained in the Unit's Use and Maintainance Manual.

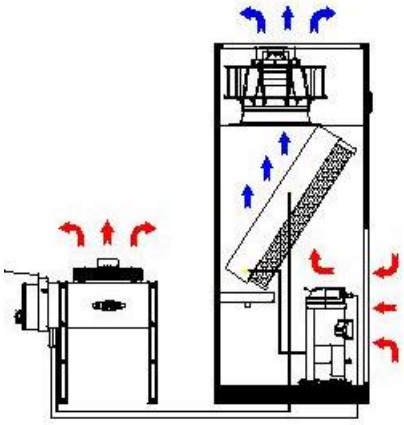
Every different use and every modify not expressed authorized by the Manufacturer has to be considered improper. The responsability for injury or damage caused by improper use will fall exclusively on the User/Owner of the unit.

Index

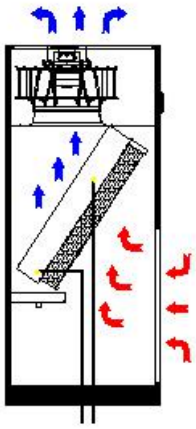
Introduction

.1 Program's main functions

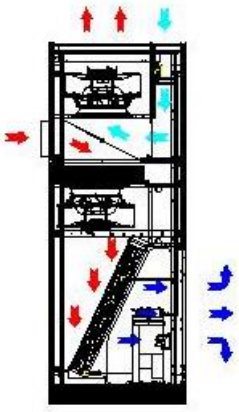
The described software runs on 1 or 2 refrigerant circuits direct expansion and remote condensation Close Control Unit, monoblock displached Close Control Unit with single refrigerant circuit and Close Control Unit provided of chilled water coils.



Single refrigerant circuit diretc expansion Close Control Unit



Close Contro Unit provided of water chilled coil



Monoblock displached Close Control Unit with single refrigerant circuit

Main features
-Direct expansion unit "DX" or chilled water coil "CW";
-Direct expansion unit "DX" with 1 or 2 refrigerant circuits;
-Tandem or on/off direct expansion circuit or with one compressor equipped with an inverter every circuit;
-Freecooling option;
-Separate/Shared circuit on the condenser;
-Possibility of condenser fan modulation on condensation pressure;
-Bipolar valve setting with EVD Evolution external driver;
-Works limits control (envelope) of the compressors through condensation and evaporation temperature (pressure);
-Alarms log;
- Lenguage chose (Italian, English, French, German)

Control devices:
-Up to 2 inverter compressors;
-Up to 2 driver for control of 2 electronic expansion valves;
-CPY Carel for the control of KUE CAREL humidifier kit.

Thermo-regulation:
-PI on air recovery temperature with floating flow set point;
-PI on air recovery temperature with control of the air delivery limit;
-PI on discharge air temperature;
-PI on suction humidity;
-PI on differential pressure of the supply fan.

Graphic Terminal pGD, by which is possible:
-read the settings of connected probes;
-Unit's start and stop;
-Alarm detection;
-Configuration parameters setting and operative parameters with password access;

-Control devices operating hours;
-Lenguage choose (Italian, English, French, German)

WARNING: To avoid manomissions during unit's functioning, only authorized personnel has to know the password.

Hardware installation

.2 Compatibles hardwares

The program is compatible with following devices:

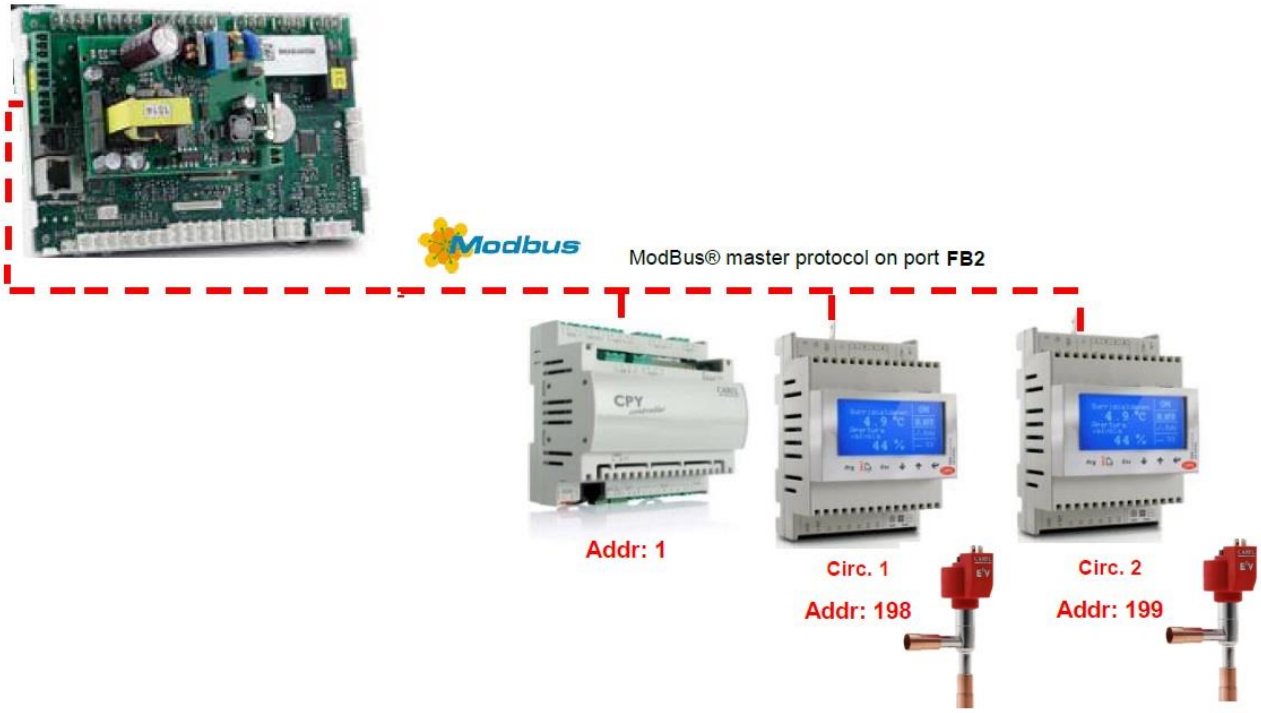
- microPC3 standard schede (extra small, small, medium);

- CPY schede with all input/output to control indipendently the schede CPY which features all the ecessaries input/ouput to independently control the KUE humidifer with immerse-elecrode. The connection with microPC3 is made by FieldBus 2 serial (address 2, Modbus protocol baud rate 19200, 8 data bit, no parity, 2 stop bit);

- EVD EVO driver to manage the electronic thermostatic valve (only for "DX" units);

- BMS schede to allow the supervision and/or the use of communication protocols.

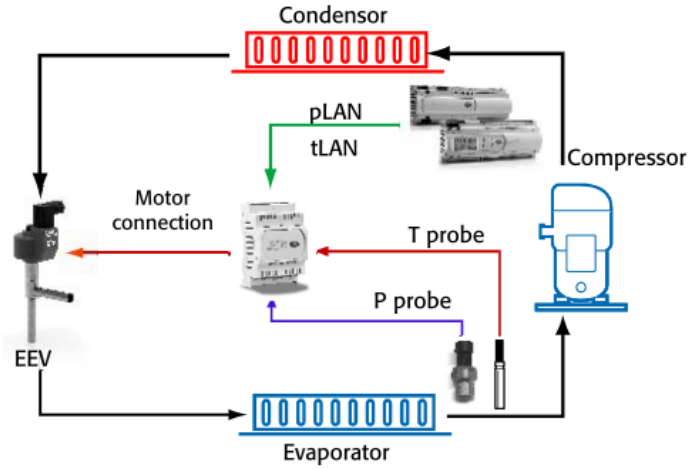
.3 H.W. connection



H.W. connection between microPC3 main schede and pheriperals (CPY humidifer schede, thermostatic valve driver) take place through the Field Bus/BMS 2 serial.
The serial address are abovementioned and the protocol charateristics are Modbus baud rate 19200, 8 data bit, No parity, 2 stop bit.
For CPY schede but also for EVD EVO driver the addressing procedure takes place using an external display (not provided with the unit); this configuration is carried on in the factory.

.4 *Electronic thermostatic valve driver*

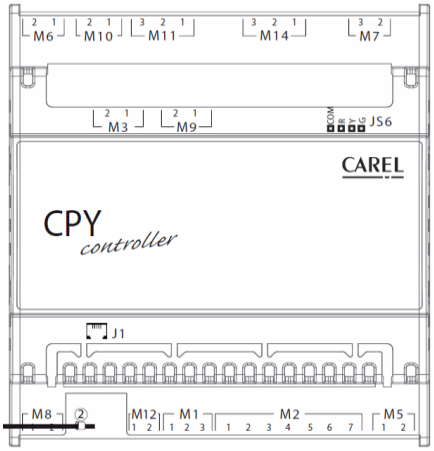
The valve is placed inside of refrigerant circuit as a expansion device for the refrigerant, using the overheating as regulation signal (the overheating is controlled by 2 probes, one in the inlet and one in the outlet of evaporator). This is efficient because the optimisation and the stabilisation of evaporator refrigerant flow increases the overall yeld of the unit while ensuring its safety (less intervention of low pressure gauge, less quantity of refrigerant returns to the compressor,…), moreover increases also the plant efficiency granting lower energy consumptions with an higher cooling capacity. Every refrigerant circuit has a thermostatic valve, in case of 2 circuits then there will be 2 driver.The heart of regolation excepted a PID control with adjustable coefficients for the overheating . Hereafter is shown the connection:



The connection of the controller is made by BMS2 serial in Modbus; the driver address is 198 (to circuit n.1) and 199 (to circuit n.2).

.5 *Humidifer control schede*

The schede controls also the humidifer. This device communicates with the control schede through RS485 (see M1 terminals shown in the picture below): in this case the serial to utilize is the second on the controller (BMS2/Fieldbus2). It has all the necessary entrances and exits to completely and independently control the humidifier, has 3 LED, one to show alarm presence (red LED), one the steam production (yellow LED) and one for the 24Vac alimentation presence (green LED) and it can be connected to the humidifier terminal. The control device communicates directly with the unit's main microprocessor utilizing the Modbus protocol by serial way to send all the informations (humidifier checks, alarms), it does not need any terminal as programming/configuration of the schede and all the informations are transmitted to the main microprocessor in serial way and shows on the unit's display.



detail:

J1 - tLAN connection, electronic terminal schede for the humidifer setting (terminal not required)

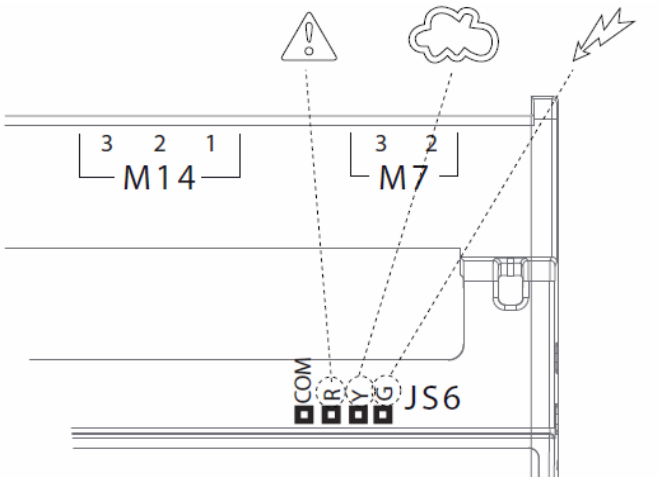
M1 - RS485 network connection: Modbus protocol, address 2, speed 19.200 bps; 8 bit data, 1 stop bit, no parity (M1.1: Rx/Tx-; M11.2: Rx/Tx+; M1.3: GND);

M2 – Enabling operation (M2.4, M2.5: External free contact inlet)

M2 – Manual discharge (M2.6. M2.5: Free contact inlet)

M2 - ‘dA’ Cylinder counter and alarms reset (M2.7. M2.5: Free contact inlet)

M8 - Electrical supply connection (M8.1: G; M8.2: G0)



Reset: Cylinder counter “dA”, active alarms and alarm log.

The reset can be done with a direct connection between M2.7 and M2.5 terminals for a few seconds or in serial way, through the unser terminal.
The “dA” cylinder hours counter has to be reset every cylinder change for the quick restart. The “db” hours counter can not be reset cause it measure the total unit life.

.6 The user terminal

The graphic terminal pGD1 allows to make all the configuration and programming unit operations.

The application software is only available on the microPC3 card, the terminal does not need any additional software during use. For the operation of the machine, the presence of the connected user terminal is not necessary.
For the connection between the board and the display you need a 6-wire telephone cable with an RJ12 connector on the back of the terminal.

KEY	DESCRIPTION
	Shows on the display all the alarms, is used to stop the alarm buzzer and to reset all the active alarms.
	If the cursor is in home position (top-left corner), slide upward the masks of the same group; if the cursor is on a settings field it allows to increase the value.
	If the cursor is in home position se (top-left corner), slide downward the masks of the same group; if the cursor is on a settings field it allows to decrease the value.
	Utilized for the cursor movement from home position (top-left corner) to the settings fields, where it confirms the settled value and moves to the next.
	Access to main menu, to group parameters selection for visualize/modify, the access to the paramters is confirms by [Enter] key press.
	Go back to the previous mask.

.7 Input/Output (I/O) configurations

The software allows many configurations I/O, according to the unit type. The configuration is loaded on the card during the factory tests and could be updated. We report the “CW” unit and “DX” unit configuration (1 and 2 circuits).
The multiple entries (xxx / xxx / …) indicates the different ways an input or output could be used for; the choice is made by “Unit Settings” mask, submenu “Configuration”.

.7.1 CW model (water chilled conditioner)

Analogic input

No.	Schede type	***Function***
B 1	Extra small	Ambient temperature
B 2		Discharge temperature
B 3		External setpoint (0-1V)
B 4		Ambient humidity (0-1V)
B 5		Differential pressure probe (4-20mA)
B 6		Recovered temperature
B 7	Small	External air (compensation)
B 8		
B 9		
B 10	Medium	
B 11		
B 12		

Digital input

No.	Schede type	***Function***
DI 1	Extra small	Remote ON/OFF
DI 2		Air flow switch / Main thermal fan
DI 3		Clogged filter alarm
DI 4		Thermal resistance alarm ½
DI 5		Smoke/fire alarm
ID 6		Flooding alarm
ID 7	Small	Analogi humidifer alarm
DI 8	Medium	
DI 9		
DI 10		

Digital outputs

No.	Schede type	***Function***
NO 1	Extra small	Discharge fan
NO 2		Hot valve opening / Heater 1
NO 3		Hot valve closing / Heater 2
NO 4		Unique cold valve opening
NO 5		Unique cold valve closing
NO 6		Serious alarms
NO 7	Small	Slight alarms
NO 8		Analogic humidifer control
NO 9		ON/OFF Freecoling control
NO 10	Medium	ON/OFF dehumidifer control
NO 11		
NO 12		

Analogic outputs

No.	Schede type	***Function***
Y 1	Extra small	Discharge fan
Y 2		Freecoling valve / Recovery damper
Y 3	Small	Hot valve / Cold valve / Analogic humidifer
Y 4	Medium	

.7.2 DX model (1 circuit direct expansion conditioner)

Analogic inputs

No.	Schede type	***Function***
B 1	Extra small	Ambient temperature
B 2		Discharge temperature
B 3		Low pressure alarm (Free contact)
B 4		Ambient humidity (0-1V)
B 5		Differential pressure probe (4-20mA)
B 6		Recovery temperature
B 7	Small	External air (compensation)
B 8		External setpoint (0-5V)
B 9		
B 10	Medium	
B 11		
B 12		

Digital inputs

No.	Schede type	***Function***
DI 1	Extra small	Remote ON/OFF
DI 2		Air flow switch / Main thermal fan
DI 3		Clogged filter alarm
DI 4		Compressor thermal alarm 1 e 2 / Hps alarm
DI 5		Heater thermal alarm ½
ID 6		Cumulative flooding/Smoke/Fire alarmAllarme / Flooding only
ID 7	Small	Smoke/Fire alarm
DI 8	Medium	Analogic humidifer alarm
DI 9		
DI 10		

Digital outputs

No.	Schede type	***Function***
NO 1	Extra small	Discharge fan
NO 2		Hot valve opening / Heater 1
NO 3		Hot valve closing / Heater 2
NO 4		Compressor 1
NO 5		Compressor 2
NO 6		Seriuos alarms
NO 7	Small	Slight alarms
NO 8		Analogic humidifer control
NO 9		Oil equalizer valve
NO 10	Medium	ON/OFF dehumidific control
NO 11		ON/OFF condenser control
NO 12		ON/OFF recovery control

Analogic Outputs

No.	Schede type	***Function***
Y 1	Extra small	Discharge fan
Y 2		Inverter on compressor
Y 3	Small	C1 condensation / Hot valve / Analogic humidifer
Y 4	Medium	C1 condensation / Hot valve (Freecooling valve / Recovery damper)

EVD EVO driver

S 1		Suction pressure
S 2		Suction temperature
S 3		Discharge pressure
S 4		Discharge temperature

.7.3 DX model (2 circuits direct expansion conditioner)

Analogic inputs

No.	Schede type	***Function***
B 1	Extra small	Ambient temperature
B 2		Discharge temperature
B 3		Low pressure alarm (Free contact)
B 4		Ambient humidity (0-1V)
B 5		Differential pressure probe (4-20mA)
B 6		Recovery temperature
B 7	Small	External air (compensation)
B 8		External setpoint (0-5V)
B 9		
B 10	Medium	
B 11		
B 12		

Digital inputs

No.	Schede type	***Function***
DI 1	Extra small	Remote ON/OFF
DI 2		Air flow switch / Main thermal fan
DI 3		Clogged filter alarm
DI 4		Heater 1-2 thermal alarm
DI 5		Smoke/Fire alarm
ID 6		Flooding alarm
ID 7	Small	Compressor 1-2 thermal alarm / Hps 1 alarm / Inverter 1alarm
DI 8	Medium	Compressor 3-4 thermal alarm / Hps 2 alarm / Inverter 2 alarm
DI 9		Low pressure 1 alarm
DI 10		Low pressure 2 alarm

Digital Outputs

No.	Schede type	***Function***
NO 1	Extra small	Discharge fan
NO 2		Heater.1 / Hot valve opening (OPT)
NO 3		Heater.2 / Hot valve closing (OPT)
NO 4		Compressor 1
NO 5		Compressor 2
NO 6		Cumulative or serious alar
NO 7	Small	Slight alarm
NO 8		Oil equalizer valve 1
NO 9		ON/OFF recovery control
NO 10	Medium	Oil equalizer valve 2
NO 11		Compressor 3
NO 12		Compressor 4

Analogic Outputs

No.	Schede type	***Function***
Y 1	Extra small	Discharge fan / Condenser 1
Y 2		Inverter C1
Y 3	Small	Analogic humidifer / Freecooling valve / Recovery damper / Hot valve / Condenser 2 / Common condenser
Y 4	Medium	Inverter C2

EVD EVO 1 driver

S 1		Suction pressure comp.1
S 2		Suction temperature comp.1
S 3		Discharge pressure comp.1
S 4		Discharge temperature comp.1

EVD EVO 2 driver

S 1		Suction pressure comp.3
S 2		Suction temperature comp.3
S 3		Pressione di mandata comp.3
S 4		Discharge temperature comp.3

Commissioning

.8 Start up

After verified the connections between schedes and terminals, give tension to schede/s. To the unit start, the software is factory settled with default values chosen by EMICON AC S.p.A. for all the unit parameters.
If necessary there is the possibilit to load the default parameters through a file saved on the schede. To do it is necessary to log in (with password) to Menu "Unit Settings" and submenu "Configuration":

1. Press the Prg key and select "Unit set" menù, with "UP" and "DOWN" keys to move and "Enter" to select;
2. Digit the Manufacturer password and confirm with "Enter" key";
3 Select "Configuration" and confirm with "Enter";
4 Using the arrows to move to the last mask (file import);
5 Select the file name to import and confirm with "Enter" key;
6 Wait a "Transfer complete" message for a few seconds;
7 Press "Esc" how many time is required to come back to Main Menù.

.9 Lenguage select

The language chosen is Italian, but it is possible to change it between those present in the s.w.
To modify the lenguage follow the hereafter operatios:

1. Press Prg key and select "Other setting" Menù, using "UP" and "DOWN" keys to move and "Enter" to select;
2. Using the arrows to select "Lenguage" Menù and confirm with "Enter";
3. Select using "UP" and "DOWN" keys the desire lenguage;
4. Press "Enter" key to confirm.

.10 User interface

Hereafter is shows the Main screen:

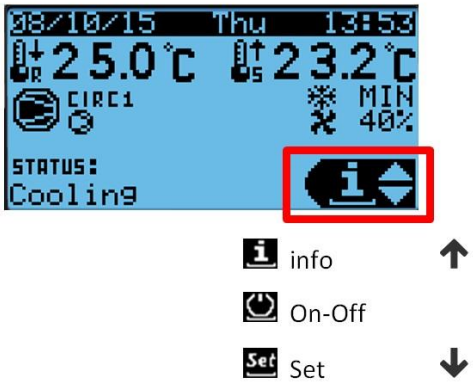
1. Date/Day time;
2. Regolation probes (Suction and discharge temperature, alternated with humidity value (if present))
3. Device status:

- CW unit, fan status with speed percentage, subcooling/overheating percentage required, humified percentage required, dehumidification percentage required;
- DX unit, is shown the compressors status, for one or two circuits, the percentage of cooling/heating required, humidifying percentage required, dehumifing percentage required, fans status with speed perccentage;

4. Unit status;
5. Quick Menù access.

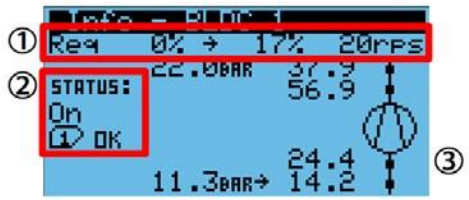
From Main mask it is possible to slide the different areas presents on the user menù with “UP” and “DOWN” keys and with “Enter” to confirm. The login and the parameter modify doesn’t requires any password; the different areas are:

- **INFO**, contains infos about the current unit functionig in the form of a synoptic, input and output states, serial device information, software license plate informations.
- **ON/OFF**, allows to Switch on/off the unit;
- **SETPOINT**, allows to change the temperature, humidity and ventilation setpoints.



It contains the most important data in the form of a synoptic. This allows, quickly, to describe the unit status grouping infos about different patterns. There are shown only info about actually enabled devices. Following the singles synoptic masks.

For the Inverter on compressor (BLDC)

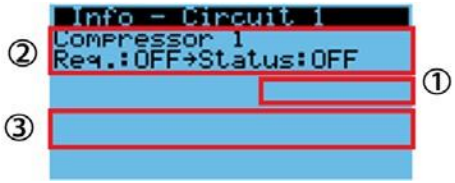


1. Thermoregulation request, power supplied, current compressor speed in rps.
2. Envelope zone and compressor status:

Zone	Icon	Description
1	Ok	Operative limits inside zone
2	HiDP	High compression ratio
3	HiDscgP	High condensation pressure
4	HiCurr	High motor current
5	HiSuctP	High suction pressure
6	LoPRat	Low compression ratio
7	LoDP	Low differential pressure
8	LoDscgP	Low condensation pressure
9	LoSuctP	Low evaporation pressure

3. Discharge and suction temperature and pressure

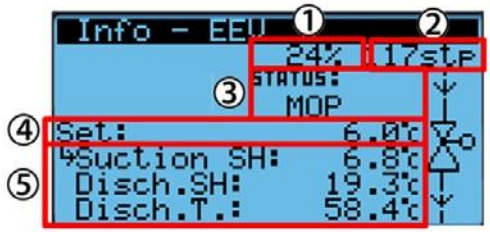
To the circuit



1. Current compressor speed (only BLDC)
2. Compressor 1 status:
   - Off (…s): Switched off with eventually residual time indication to restart;
   - On (…s): Switched on with eventually residual time indicatin to shut off ;
   - Man On: Manual switch on;
   - Man Off: Manual switch off;
   - Frcd Off: Forced switch off from driver EVD (not ready to regulate);
   - Defr: Switch on for defrosting cicle;
   - PmpD: Pump-down phase;
   - Alarm: Switched off for alarm.

3. Compressor 2 status: Same indications of 1

To driver EXV



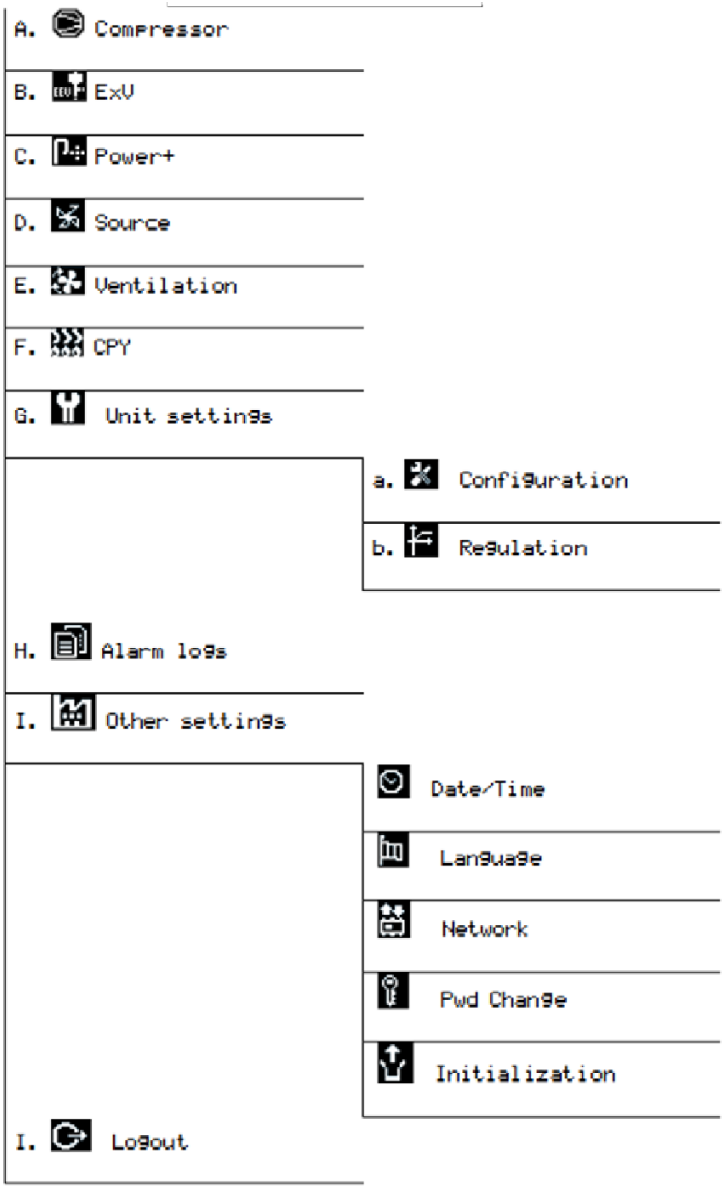
1. Percentage opening valve;
2. Valve opening steps;
3. Valve driver status:
   - Init: driver initialization
   - Close: valve closed
   - Off: valve in standby
   - Pos: valve in positioning
   - Wait: valve in activation
   - On: valve in regulation
   - LoSH: Low SH function active
   - LOP: LOP function active
   - MOP: MOP function active
   - HiTc: HiTcond function active
4. Current set-point
5. Regulation values
   - Suction overheating
   - Discharge overheating
   - Discharge temperature

To source fans (condensation)

1. Current discharge pressure
2. Condensation pressure Setpoint
3. Current condensation fan request

.11 User interface

Regardless on the mask in which you are located, by pressing PRG key you have access to the password input mask, and then to the main Menù.

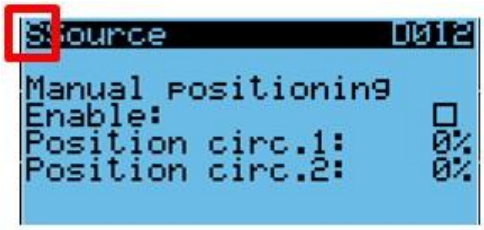


Inside of any Menù the masks sliding in cycle way using “UP” and “DOWN” keys. Every mask has a code, visible at the top of the right hand side, made of 4 characters:

1° character	2° character	3° character	4° character
Main Menù	Secondary Menù	Mask code	

.12 Password settings

The program foresee 3 password type levels:
1. Advanced user (Maintainer): all parameter only reade access. Default password: 0000.
2. Service: all parameters read access with the possibility to modify some of them. Default password: 1234
3. Manufacturer: all parameters read and write access. Default password: 5678.
On the parameters masks is shows which user can modify the parameters (M-Manufacturer, S-Service).
Hereafter an example of write access to Service level:



When the password is entered, will be active for 5 minutes from the last any key pressing, then you have to insert again. With Log-out control is possible to exit and re-enter using the password, without to wait the 5 minutes, to change the user level or before to leave unattended terminal.

Regulation

.13 Thermoregulation

.13.1 Temperature settings

The main regulation is about the temperature. As choice it is possible to regulate the suction temperature, discharge temperature or both. The control calculates the thermal capacity to be delivered that will be distributed, to priority order, on the water coil (cw) or direct expansion (dx) and then on the others auxiliary devices (Freecooling and ventilation). The temperature regulation has always the priority over humidity regulation.

Ref.	Description	Def.	U.M.	Min	Max
	Temp.Regulation				
Gb01	Return + Supply Return only	Return + supply	-	Return + Supply	Supply only

.13.2 Humidity regulation

Provide two functions:
- humidification;
- dehumidification,

can be activated only if the recovery humidity probe is enabled. Those work on different setpoint which can be close for a more precision control; anyway is suggested a minimum deviation in order to avoid pendulation between conflicting processes.

	Unit config.				
Ga04	Humidification	DISABLED	-	DISABLED	ENABLE
	Dehumidification	DISABLED	-	DISABLED	ENABLE

Humidification

The humidity regulator is of P+I type, which control the recovery relative humidity and send the request to
- CPY schede in serial way (KUE Carel kit);
- Using 0..10V output (a a generic humidifer).

Ref.	Description	Def.	U.M.	Min	Max
	Humidification				
ST07	Setpoint	30	Rh%	0	100

Dehumidification

Dehumidification is a compatible process with cooling as it acts on the cold (water / direct expansion) coil. The software provides, in addition to the temperature regulator (P + I), already mentioned, a dehumidification regulator (P + I). The unit is considered in the dehumification state, notified in the terminal main mask, when the dehumidification controller request exceeds the request of the temperature regulator by 20%.

Ref.	Description	Def.	U.M.	Min	Max
	Dehumidification				
ST06	Setpoint	70	RH%	0	100

Another enablig option is the absolute humidity control instead of relative humidity. It allows to limit the dehumidification function when the recovery air temperature is lower to the setpoint.

Heating

The software provides the heating set using a regulation that acts with max 3 steps. The heating is enabled only in dehumidification phase (post-heating), or is always enabled (post-heating snd integration). The heating setpoint is calculates start from temperature regulation setpoint with an negative offset proper settled

.13.3 Freecooling

The freecooling Il freecooling it is intended as a free energy source available in particular temperature conditions (external or recovery in general).

.13.4 Ventilation

The discharge fan is of modulating type and can be 0…10V configured or in serial way. The speed is regulated following:
- thermoregulation;
- differential pressure.

Fan modulation based on thermoregulation
There are two cases:
a) If is a discharge regulation, the fan speed is fixed and settled by the user with "Setpoint" menù;

Ref	Display description	Def	U.M	Min	Max
	Setpoint				
	Fan speed	AUTO	-	AUTO	MANUAL
ST05	Fixed speed	50%	-	0	100

b) Is is a recovery or recovery/discharge regulation, the fan speed follows, with a P + I type algorythm, to the request of recovery probe.

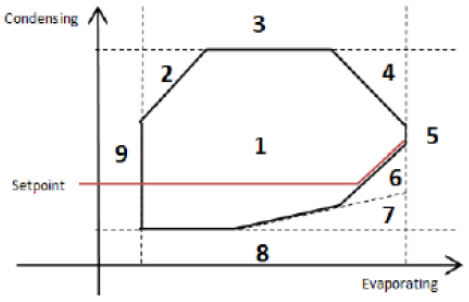
Fan moduation based on a differential pressure
It is possible to set a Setpoint dedicated and the related parameters of gain and integral time: is possible to regulate the ventilation to mantein a static pressure or a constant flow.
In both cases the fan modulation it takes place between a minimum and a maximum settable and a temporary minimum speed in the dehumidification phase.

.13.5 Cold valve (CW unit)

In case of CW units the thermal capacity is managed only by cold valve and optionally by freecooling (3 way modulating valve).

.13.6 Compressors

The software manages directly start-up of scroll type or BLDC modulating type compressors. Are planned at most 4 compressors on configuration 2 BLDC + 2 " On/Off on two circuits.
The compressors are managed with FIFO (First in First Out) logic, so the first compressor switched on is the first to switch off. If in the circuit a variable speed compressor (BLDC) is present, it is always the first to switched on and the last to shiched off; any compressors On/Off presents on the circuit follow the FIFO logic.
The compressor operative limit control is provided (envelope).



Zone	Description
1	Operative limits inside zone (Prevent is enabled in order to avoid to go out from the limits)
2	Max compression ratio
3	Max condensation pressure
3 Custom	Custom threshold max condensation pressure
4	Max motor current
5	Max evaporation pressure
6	Min compression ratio
7	Min differential pressure
8	Min cendensation pressure
9	Min evaporation pressure
9 Custom	Custom threshold min evaporator pressure

When the work point go out from envelope, the prevent is enabled, start the alarm delay counter.
The prevention actions act on the circuit capacity, on the source fans setpoint and on the electronic expansion valve opening.
After prevention actions the work point could:
- Stays outside from the envelope, when the delay time expires will enable the specific alarm which turn off the compressor;
- Come back in the envelope limits, the delay alarm count will reset.

.13.7 Thermostatic valve driver

It controls electronic expansion valve; allows to manage in safety the compressor and the circuit, to check suction overheating using the probes, to control the discharge temperature and manages the works field.

.14 Signals and alarms

The red LED of ALARM key could be:
- Turned off: no active alarms;
- Flashing: there is at least an active alarm acknoledged;
- Turned on: there is at least an active alarm recognized;

Pressing the ALARM key can take place in 2 cases: No alarms detected or at least an active alarm.
If there is no active alarm the following mask is shown:

If there is at least an active alarm, is shown the relative mask and the alarm is aknowledged. The masks are showed following a cresent alarm code.

1. Alarm number/alarm log;
2. Univocal alarm code;
3. Alarm date and day time;
4. Alarm extended description.

In every alarm visualisation mask, pressing Enter, it is possible to go to the alarm log. Those contain the activation (Start) and deactivation (Stop) alarm day time.

The infos of the alarm mask are also saved to the alarm log. The maximum number of event can be stored is 64, at which the older alar is overwritten. The alarm log could be cancelled on Setting Menù – specific control inizialisation.
The alarms could be manual reset, automatic or semiautomatic:

- manual: the cause of the alarm ceased, press Alarm one time to silenced the buzzer an a second time for the reset. The unit could be restarted;
- automatic: the cause of the alarm ceased, the buzzer is disabled and the unit restart automatically
- semiautomatic: if the number of intervention in 1 hour is less than the maximum number set, the alarm is to automatic reset, otherwise become to manual reset.

.15 Alarms tab

Cod.	Variable name	Type	Description	Action	Delay	Modbus
AL*001	mAl_retain	Manual	Retain variable to much overwritten alarm	Stop unit	30s	DI 1000
AL*002	mAl_Err_retain_write	Manual	Retain memory write error	Stop unit		DI 1001
AL*003	Al_DisStartDpState_Circ_1	Manual	High differential pressure alarm circuit 1	Stop BLDC 1		DI 1002
AL*004	Al_OutEnv_BLDC_1	Auto	Envelope alarm circuit 1	Stop BLDC 1	def. 60s	DI 1003
AL*005	Al_StartFail_BLDC_1	Auto	Starting failure circuit 1	Stop BLDC 1	def. 45s	DI 1004
AL*006	Al_StartFailLock_BLDC_1	Auto	Starting failure after retries circuit 1	Stop BLDC 1		DI 1005
AL*007	Al_LowDeltaP_BLDC_1	Auto	Low pressure difference circuit 1	Stop BLDC 1	def. 60s	DI 1006
AL*008	Al_HighDscgTemp_BLDC_1	Auto	High discharge temperature alarm circuit 1	Stop BLDC 1		DI 1007
AL*056	Al_BmsOffline	Auto	BMS offline		def. 60s	DI 1055
AL*059	Al_Low_SH_Circ_1	Auto	Low superheat circuit 1	Stop circuit 1	def. 300s	DI 1058
AL*060	Al_LOP_Circ_1	Auto	LOP circuit 1	Stop circuit 1	def. 300s	DI 1059
AL*061	Al_MOP_Circ_1	Auto	MOP circuit 1	Stop circuit 1	def. 600s	DI 1060
AL*062	Al_EEV_Circ_1	Auto	EEV motor error circuit 1	Stop circuit 1		DI 1061
AL*063	Al_LowSuct_Circ_1	Auto	Low suction temperature circuit 1	Stop circuit 1	def. 300s	DI 1062
AL*064	Al_HiT_Cond_EVD_1	Auto	High condesing temperature circuit 1	Stop circuit 1	def. 600s	DI 1063
AL*065	Al_S1_EVD_1	Auto	EVD EVO 1 -Probe S1 error	Stop circuit 1	15s	DI 1064
AL*066	Al_S2_EVD_1	Auto	EVD EVO 1 - Probe S2 error	Stop circuit 1	15s	DI 1065
AL*067	Al_S3_EVD_1	Auto	EVD EVO 1 - Probe S3 error	Stop circuit 1	15s	DI 1066
AL*068	Al_S4_EVD_1	Auto	EVD EVO 1 - Probe S4 error	Stop circuit 1	15s	DI 1067
AL*069	Al_Batt_EVD_1	Auto	EVD EVO 1 - Battery discharge	Stop circuit 1		DI 1068
AL*070	Al_EEPROM_EVD_1	Auto	EVD EVO 1 - EEPROM Alarm	Stop circuit 1		DI 1069
AL*071	Al_IncompleteClosing_EVD_1	Auto	EVD EVO 1 - Incomplete closing	Stop circuit 1		DI 1070
AL*072	Al_EmergencyClosing_EVD_1	Auto	EVD EVO 1 - Emergency closing	Stop circuit 1		DI 1071
AL*073	Al_FW_CompatibErr_EVD_1	Auto	EVD EVO 1 - Firmware not compatible	Stop circuit 1		DI 1072
AL*074	Al_ConfigErr_EVD_1	Auto	EVD EVO 1 - Configuration Error	Stop circuit 1		DI 1073
AL*075	Al_EVD_Offline_EVD_1	Auto	EVD EVO 1 offline	Stop circuit 1		DI 1074
AL*076	Al_Low_SH_Circ_2	Auto	Low superheat circuit 2	Stop circuit 2	def. 300s	DI 1075

Cod.	Variable name	Type	Description	Action	Delay	Modbus
AL*077	Al_LOP_Circ_2	Auto	LOP circuit 2	Stop circuit 2	def. 300s	DI 1076
AL*078	Al_MOP_Circ_2	Auto	MOP circuit 2	Stop circuit 2	def. 600s	DI 1077
AL*079	Al_EEV_Circ_2	Auto	EEV motor error circuit 2	Stop circuit 2		DI 1078
AL*080	Al_LowSuct_Circ_2	Auto	Low suction superheat circuit 2	Stop circuit 2	def. 300s	DI 1079
AL*081	Al_HiT_Cond_EVD_2	Auto	High condesing temperature circuit 2	Stop circuit 2	def. 600s	DI 1080
AL*082	Al_S1_EVD_2	Auto	EVD EVO 2 - Probe S1 error	Stop circuit 2	15s	DI 1081
AL*083	Al_S2_EVD_2	Auto	EVD EVO 2 - Probe S2 error	Stop circuit 2	15s	DI 1082
AL*084	Al_S3_EVD_2	Auto	EVD EVO 2 - Probe S3 error	Stop circuit 2	15s	DI 1083
AL*085	Al_S4_EVD_2	Auto	EVD EVO 2 - Probe S4 error	Stop circuit 2	15s	DI 1084
AL*086	Al_Batt_EVD_2	Auto	EVD EVO 2 - Battery discharge	Stop circuit 2		DI 1085
AL*087	Al_EEPROM_EVD_2	Auto	EVD EVO 2 - EEPROM Alarm	Stop circuit 2		DI 1086
AL*088	Al_IncompleteClosing_EVD_2	Auto	EVD EVO 2 - Incomplete closing	Stop circuit 2		DI 1087
AL*089	Al_EmergencyClosing_EVD_2	Auto	EVD EVO 2 - Emergency closing	Stop circuit 2		DI 1088
AL*090	Al_FW_CompatibErr_EVD_2	Auto	EVD EVO 2 - Firmware not compatible	Stop circuit 2		DI 1089
AL*091	Al_ConfigErr_EVD_2	Auto	EVD EVO 2 - Configuration Error	Stop circuit 2		DI 1090
AL*092	Al_EVD_Offline_EVD_2	Auto	EVD EVO 2 offline	Stop circuit 2		DI 1091
AL*093	Al_SmokeFire	Auto	Smoke/fire alarm	Stop unit		DI 1092
AL*094	Al_W_Leakage	Auto	Water leakage	Stop unit		DI 1093
AL*095	Al_AirFlw	Manual	Air flow alarm	Stop unit	def. 20s	DI 1094
AL*096	Al_AirFiltClogged	Auto	Air filter clogged		def. 60s	DI 1095
AL*098	Al_HiRetAirTemp	Auto	High return air temperature		def. 600s	DI 1097
AL*099	Al_LowRetAirTemp	Auto	Low return air temperature		def. 600s	DI 1098
AL*104	Al_HiCondPstat_Circ_1	Auto	Circuit 1 high condensing pressure alarm from digital input	Stop circuit 1		DI 1103
AL*105	Al_LoEvapP_TransdCirc1	3 retries /hour	Circuit 1 low evaporating pressure alarm from transducer	Stop circuit 1	def. 3s /10s	DI 1104
AL*106	Al_Comp1Circ1_OnOff_ThProt	Auto	Compressor 1 circuit 1 (On/Off) thermal protection	Stop comp.1 circ.1 (on/off)		DI 1105
AL*107	Al_Comp2Circ1_OnOff_ThProt	Auto	Compressor 2 circuit 1 (On/Off) thermal protection	Stop comp.2 circ.1 (on/off)		DI 1106
AL*108	Al_PrbTempBrk	Auto	Temperature serial probe broken	Stop unit		DI 1107
AL*109	Al_PrbHumBrk	Auto	Humidity serial probe broken	Stop humidity regulation		DI 1108
AL*114	Al_Offline_CPY	Auto	CPY offline	Stop humidity regulation		DI 1113
AL*115	Al_ExpCylLife_CPY	Auto	Mn alarm	Stop humidity regulation		DI 1114
AL*116	Al_HiConduct_CPY	Auto	EC alarm	Stop humidity regulation		DI 1115
AL*117	Al_ParamsNotDwnld_CPY	Auto	E1 alarm	Stop humidity regulation		DI 1116
AL*118	Al_CalibrationParams_CPY	Auto	E0 alarm	Stop humidity regulation		DI 1117
AL*119	Al_HiCurr_CPY	Auto	EH alarm	Stop humidity regulation		DI 1118
AL*120	Al_LowProduction_CPY	Auto	Ep alarm	Stop humidity regulation		DI 1119
AL*121	Al_CylFull_CPY	Auto	EU alarm	Stop humidity regulation		DI 1120
AL*122	Al_PrbNotConnected_CPY	Auto	E3 alarm	Stop humidity regulation		DI 1121
AL*123	Al_MissingW_CPY	Auto	EF alarm	Stop humidity regulation		DI 1122
AL*124	Al_AlrmDrn_CPY	Auto	Ed alarm	Stop humidity regulation		DI 1123
AL*125	Al_HiHum_CPY	Auto	Eh1 alarm	Stop humidity regulation		DI 1124

Cod.	Variable name	Type	Description	Action	Delay	Modbus
AL*126	Al_LowHum_CPY	Auto	Eh2 alarm	Stop humidity regulation		DI 1125
AL*127	Al_SerialDisconnected_CPY	Auto	SU alarm	Stop humidity regulation		DI 1126
AL*128	Al_CylLifeWarn_CPY	Auto	CY warn	Stop humidity regulation		DI 1127
AL*129	Al_FoamWarn_CPY	Auto	EAwarn	Stop humidity regulation		DI 1128
AL*130	Al_PreExhaustWarn_CPY	Auto	CP warn	Stop humidity regulation		DI 1129
AL*131	Al_CylExhaustWarn_CPY	Auto	CL warn	Stop humidity regulation		DI 1130
AL*132	Al_BkpMemExhaustWarn_CPY	Auto	E2 warn	Stop humidity regulation		DI 1131
AL*160	Al_LowDeltaP_BLDC_2	Auto	Low pressure difference circuit 2	Stop BLDC 2		DI 1159
AL*161	Al_LowDlvryAirTemp	Auto	Low supply air temperature			DI 1160
AL*162	Al_HiDlvryAirTemp	Auto	High supply air temperature			DI 1161
AL*163	Al_HiWaterInTemp	Auto	High water inlet temperature		def. 60min	DI 1162
AL*164	Al_DisStartDpState_Circ_2	Manual	DeltaP > allowable at startup	Stop BLDC 2		DI 1163
AL*165	Al_OutEnv_BLDC_2	Auto	Envelop alarm circuit 2	Stop BLDC 2		DI 1164
AL*166	Al_StartFail_BLDC_2	Auto	Starting failure circuit 2	Stop BLDC 2		DI 1165
AL*167	Al_StartFailLock_BLDC_2	Auto	Starting failure after retries circuit 2	Stop BLDC 2		DI 1166
AL*168	Al_HighDscgTemp_BLDC_2	Auto	high discharge temperature alarm circuit 2	Stop BLDC 2		DI 1167

Cod.	Variable name	Type	Description	Action	Delay	Modbus
AL*216	Al_Comp1Circ2_OnOff_ThProt	Auto	Compressor 1 circuit 2 (On/Off) thermal protection	Stop comp.1 circ.2 (on/off)		DI 1215
AL*217	Al_Comp2Circ2_OnOff_ThProt	Auto	Compressor 2 circuit 2 (On/Off) thermal protection	Stop comp.2 circ.2 (on/off)		DI 1216
AL*218	Al_HiCondPstat_Circ_2	Auto	Circuit 2 high condensing pressure alarm from digital input	Stop circuit 2		DI 1217
AL*219	Al_Hrs_Comp1Circ1_OnOff	Auto	Hours counter alarm for compressor 1 circuit 1 (On/Off)		def. 30000h	DI 1218
AL*220	Al_Hrs_Comp2Circ1_OnOff	Auto	Hours counter alarm for compressor 2 circuit 1 (On/Off)		def. 30000h	DI 1219
AL*221	Al_Hrs_Comp1Circ2_OnOff	Auto	Hours counter alarm for compressor 1 circuit 2 (On/Off)		def. 30000h	DI 1220
AL*222	Al_Hrs_Comp2Circ2_OnOff	Auto	Hours counter alarm for compressor 2 circuit 2 (On/Off)		def. 30000h	DI 1221
AL*223	Al_Hrs_Heater_1	Auto	Hours counter alarm for heater 1		def. 99000h	DI 1222
AL*224	Al_Hrs_Heater_2	Auto	Hours counter alarm for heater 2		def. 99000h	DI 1223
AL*225	Al_Hrs_Heater_3	Auto	Hours counter alarm for heater 3		def. 99000h	DI 1224
AL*226	Al_Hrs_SrcFan_1	Auto	Hours counter alarm for source fan 1		def. 99000h	DI 1225
AL*227	Al_Hrs_SrcFan_2	Auto	Hours counter alarm for source fan 2		def. 99000h	DI 1226
AL*228	Al_Hrs_Unit	Auto	Hours counter alarm for unit		def. 99000h	DI 1227
AL*229	Al_Hrs_WaterValve	Auto	Hours counter alarm for water valve		def. 60000h	DI 1228
AL*230	Al_ InvUnexpectedRestart_ Circ_1	Auto	Inverter unexpected restart (98)	Stop BLDC 1		DI 1229
AL*231	Al_ InvUnexpectedRestart_ Circ_2	Auto	Inverter unexpected restart (98)	Stop BLDC 2		DI 1230
AL*245	Al_RetTempPrb	Auto	Unit - Return temperature probe alarm	Stop unit (if regulation probe)	def. 20s	DI 1244
AL*246	Al_RetHumPrb	Auto	Unit - Return humidity probe alarm	Stop humidity regulation	def. 20s	DI 1245
AL*247	Al_SupplyTempPrb	Auto	Unit - Supply temperature probe alarm		def. 20s	DI 1246
AL*248	Al_SupplyHumPrb	Auto	Unit - Supply humidity probe alarm		def. 20s	DI 1247
AL*249	Al_ExtTempPrb	Auto	Unit - External temperature probe alarm		def. 20s	DI 1248
AL*250	Al_DiffPressOnFanPrb	Auto	Unit - Differencial fan pressure probe alarm	Stop unit	def. 20s	DI 1249
AL*251	Al_SuctPCirc_1_Prb	Auto	Circuit 1 - Suction pressure probe alarm	Stop circuit 1	def. 20s	DI 1250
AL*252	Al_SuctTempCirc_1_Prb	Auto	Circuit 1 - Suction temperature probe alarm	Stop circuit 1	def. 20s	DI 1251
AL*253	Al_DscgPCirc_1_Prb	Auto	Circuit 1 - Discharge pressure probe alarm	Stop circuit 1	def. 20s	DI 1252
AL*254	Al_DscgTempCirc_1_Prb	Auto	Circuit 1 - Discharge temperature probe alarm	Stop circuit 1	def. 20s	DI 1253
AL*255	Al_SuctPCirc_2_Prb	Auto	Circuit 2 - Suction pressure probe alarm	Stop circuit 2	def. 20s	DI 1254
AL*256	Al_SuctTempCirc_2_Prb	Auto	Circuit 2 - Suction temperature probe alarm	Stop circuit 2	def. 20s	DI 1255
AL*257	Al_DscgPCirc_2_Prb	Auto	Circuit 2 - Discharge pressure probe alarm	Stop circuit 2	def. 20s	DI 1256
AL*258	Al_DscgTempCirc_2_Prb	Auto	Circuit 2 - Discharge temperature probe alarm	Stop circuit 2	def. 20s	DI 1257
AL*259	Al_LiqTempPrb	Auto	Unit - Liquid temperature probe alarm		def. 20s	DI 1258
AL*262	Al_ OilRetTempComp1Circ1_ BLDC_Prb	Auto	Circuit 1 - Oil return temperature compressor 1 (BLDC)		def. 20s	DI 1261
AL*263	Al_ OilRetTempComp1Circ1_ OnOff_Prb	Auto	Circuit 1 - Oil return temperature compressor 1 (On/Off) probe alarm		def. 20s	DI 1262
AL*264	Al_ OilRetTempComp1Circ2_ BLDC_Prb	Auto	Circuit 2 - Oil return temperature compressor 1 (BLDC)probe alarm		def. 20s	DI 1263
AL*265	Al_ OilRetTempComp1Circ2_ OnOff_Prb	Auto	Circuit 2 - Oil return temperature compressor 1 (On/Off) probe alarm		def. 20s	DI 1264

Cod.	Variable name	Type	Description	Action	Delay	Modbus
AL*266	Al_FCP_Offline	Auto	Unit - Alarm FCP Offline	Stop unit		DI 1265
AL*267	Al_Unit1_Offline	Auto	Unit 1 offline	Unit rotation		DI 1266
AL*268	Al_Unit2_Offline	Auto	Unit 2 offline	Unit rotation		DI 1267
AL*269	Al_Unit3_Offline	Auto	Unit 3 offline	Unit rotation		DI 1268
AL*270	Al_Unit4_Offline	Auto	Unit 4 offline	Unit rotation		DI 1269
AL*271	Al_Unit5_Offline	Auto	Unit 5 offline	Unit rotation		DI 1270
AL*272	Al_Unit6_Offline	Auto	Unit 6 offline	Unit rotation		DI 1271
AL*273	Al_Unit7_Offline	Auto	Unit 7 offline	Unit rotation		DI 1272
AL*274	Al_Unit8_Offline	Auto	Unit 8 offline	Unit rotation		DI 1273
AL*275	Al_Unit9_Offline	Auto	Unit 9 offline	Unit rotation		DI 1274
AL*276	Al_Unit10_Offline	Auto	Unit 10 offline	Unit rotation		DI 1275
AL*277	Al_Unit11_Offline	Auto	Unit 11 offline	Unit rotation		DI 1276
AL*278	Al_Unit12_Offline	Auto	Unit 12 offline	Unit rotation		DI 1277
AL*279	Al_Unit13_Offline	Auto	Unit 13 offline	Unit rotation		DI 1278
AL*280	Al_Unit14_Offline	Auto	Unit 14 offline	Unit rotation		DI 1279
AL*281	Al_Unit15_Offline	Auto	Unit 15 offline	Unit rotation		DI 1280
AL*282	Al_Unit16_Offline	Auto	Unit 16 offline	Unit rotation		DI 1281
AL*283	Al_RemAlrm	Auto	Remote alarm	Stop unit		DI 1282
AL*284	Al_OvldHeaters	Auto	Overload heaters alarm	Stop re-heating		DI 1283
AL*285	Al_WaterFlw	Auto	Water flow alarm		def. 60s	DI 1284
AL*286	l_LoEvapPstat_Circ_1	3 retries	Circuit 1 low evaporating pressure alarm from digital input	Stop circuit 1	def. 3s /10s	DI 1288
AL*287	Al_LoEvapPstat_Circ_2	3 retries	Circuit 2 low evaporating pressure alarm from digital input	Stop circuit 2	def. 3s /10s	DI 1289
AL*288	Al_LoEvapP_TransdCirc2	3 retries	Circuit 2 low evaporating pressure alarm from transducer	Stop circuit 2	def. 3s /10s	DI 1290
AL*289	Al_HiCondP_TransdCirc1	Auto	Circuit 1 high condensing pressure alarm from transducer	Stop circuit 1		DI 1291
AL*290	Al_HiCondP_TransdCirc2	Auto	Circuit 2 high condensing pressure alarm from transducer	Stop circuit 2		DI 1292
AL*291	Al_OvldSupplyFan	Auto	Supply fan fault			DI 1297
AL*292	Al_OvldSrcFanCirc1	Auto	Source fan circuit 1 fault			DI 1352
AL*293	Al_OvldSrcFanCirc2	Auto	Source fan circuit 2 fault			DI 1353
AL*294	Al_Comp1Circ1_BLDC_ThProt	Auto	Compressor 1 circuit 1 (BLDC) thermal protection			DI 1354
AL*295	Al_Comp1Circ2_BLDC_ThProt	Auto	Compressor 1 circuit 2 (BLDC) thermal protection			DI 1355
AL*296	Al_HiRetAirHum	Auto	High return humidity			DI 1306
AL*297	Al_LowRetAirHum	Auto	Low return humidity			DI 1307