iCHiLL

Ichill 206CX EVO
Ichill 208CX EVO

(Firmware version 4.0)

INDEX

General advice

PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding
- The technical data and information in the user manual could change without obligation to notice.

SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to “Dixell company with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- Fit the probe where it is not accessible by the end user.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

1. GENERAL FEATURES

IC206CX_IC208CX EVO is an electronic controller for chiller and heat pump applications having one or two circuits; the Ichill has specific regulation for:

- Air/air
- Air/water
- Water/water
- Condensing unit

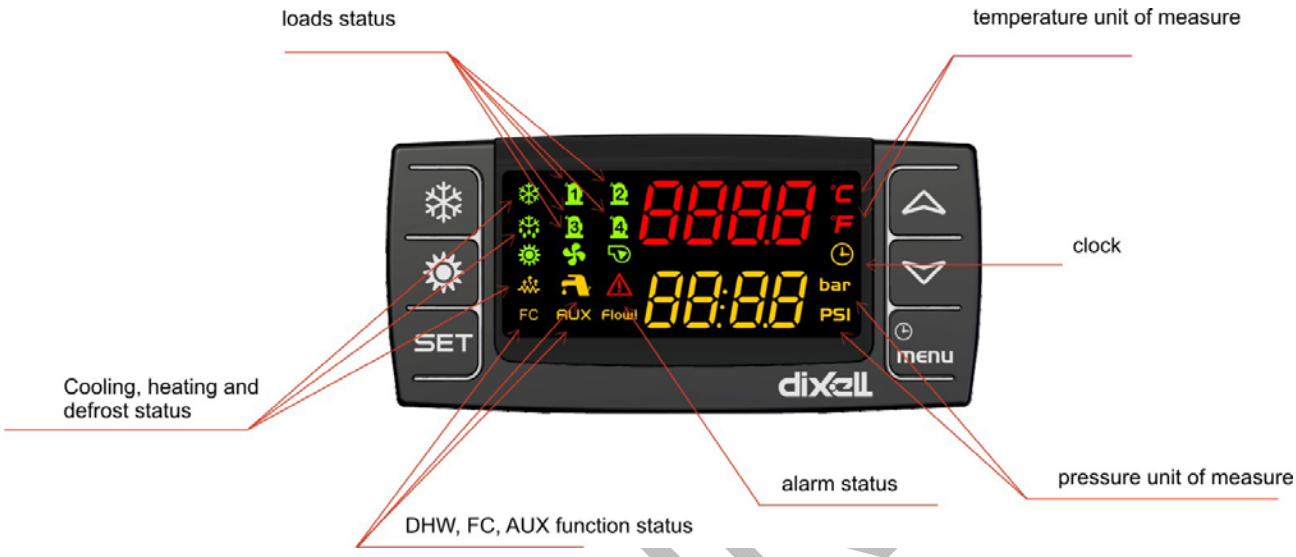
2. ICHILL 206CX/IC208CX FEATURES

FEATURES	IC206CX	IC208CX
OUTPUT RELAYS		
6	●	
8		●
DIGITAL INPUTS		
11 (free voltage)	configurable	configurable
PROBE INPUTS		
4 (NTC/PTC)	configurable	configurable
2 (NTC/PTC/0..5V/4..20mA)	configurable	configurable
PROPORTIONAL OUTPUTS		
2 0÷10V or PWM outputs	configurable	configurable
2 0÷10V	configurable	configurable
OTHER OUTPUTS		
TTL	●	●
Output for remote keyboard	●	●
LAN	●	●
POWER SUPPLY		
12 Vac/dc (+15%;-10%)	●	●
24 Vac/dc (± 10%)	opt	opt
OTHERS		
Internal real time clock	opt	opt
Buzzer	opt	opt

- configurable = the function is configurable by parameter
- opt = optional
- ● = default

3. USER INTERFACE

Meaning of the LEDs



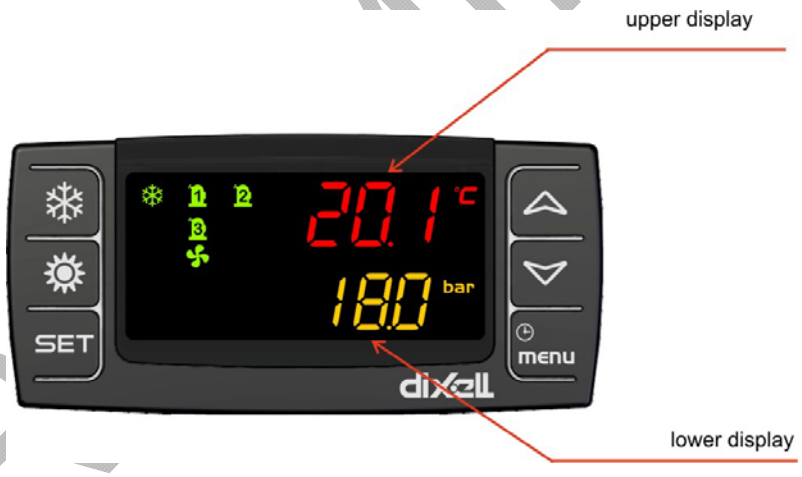
Display and Icons

ICON	MEANING / FUNCTIONNING
°C -°F BAR-PSI	ON when a temperature or pressure is visualized
1 2 3 4	ON when the compressor is active Blinking = when a compressor activation is delayed (minimum OFF time, delay after water pump activation, etc.)
⚠	General alarm: blinking in case of alarm
	Anti freeze heaters/ integration heating / boiler: ON if the heaters are switched ON
Flow!	Water flow alarm / supply fan overload (air / air unit): blinking in case of water flow alarm or supply fan overload alarm
	Real time clock: ON when the bottom display show the RTC ON during the programming with time based parameter value In function menu indicates the defrost delay counting
	Water pump: ON if at least one water pump is actives or if supply fan is active
	Condenser fan: ON if at least one condenser fan is active

	Domestic hot water: ON when domestic hot water production is active
menu	ON when menù button is pressed
AUX	ON when an auxiliary output is active
	ON if the Ichill is swithed ON in cooling or heating
FC	ON when the free cooling is active
	ON in defrost Blinking during defrost activation delay

3.1 UPPER & LOWER DISPLAY CUSTOMIZATION

It is possible to select wich probe has to be visualized on the upper & lower display.



Main display (upper display)

Parameter dP01

PARAMETER VALUE	DESCRIPTION	CORRESPONDING LABEL
0	no visualization	**No label**
1	evaporator water inlet temperature	**Ein**
2	evaporator water outlet 1 and 2 temperature	**Out1** circuit 1 **Out2** circuit 2
3	common evaporator water outlet temperature	**Eout**
4	common condenser water inlet temperature	**Cin**

5	condenser 1 or condenser 2 water inlet temperature	**CIn1** circuit 1 **CIn2** circuit 2
6	condenser 1 or condenser 2 water outlet	**Cou1** circuit 1 **Cou2** circuit 2
7	common condenser water outlet	**Cout**
8	outlet temperature	**Et**
9	free cooling temperature	**FCIN**
10	remote terminal 1 temperature	**trE1**
11	remote terminal 2 temperature	**trE2**
12	combined defrost tempereature	**dEF1** circuit 1 **dEF2** circuit 2
13	domestic hot water temperature 1	**SAn1**
14	domestic hot water temperature 2	**SAn2**
15	solar panel temperature	**SoLE**
16	condenser temperature	**Cdt1** circuit 1 **Cdt2** circuit 2

Secondary display (lower display)

Parameter dP02

PARAMETER VALUE	DESCRIPTION	CORRESPONDING LABEL
0	no visualization	**No label**
1	evaporator water inlet temperature	**Ein**
2	evaporator water outlet 1 and 2 temperature	**Out1** circuit 1 **Out2** circuit 2
3	common evaporator water outlet temperature	**Eout**
4	common condenser water inlet temperature	**Cin**
5	condenser 1 or condenser 2 water inlet temperature	**CIn1** circuit 1 **CIn2** circuit 2
6	condenser 1 or condenser 2 water outlet	**Cou1** circuit 1 **Cou2** circuit 2
7	common condenser water outlet	**Cout**
8	outlet temperature	**Et**
9	free cooling temperature	**FCIN**
10	remote terminal 1 temperature	**trE1**
11	remote terminal 2 temperature	**trE2**
12	combined defrost tempereature	**dEF1** circuit 1 **dEF2** circuit 2
13	domestic hot water temperature 1	**SAn1**

14	domestic hot water temperature 2	**SAn2**
15	solar panel temperature	**SoLE**
16	condenser temperature	**Cdt1** circuit 1 **Cdt2** circuit 2
17	condenser pressure	**CdP1** circuit 1 **CdP2** circuit 2
18	evaporator pressure	**LP1** circuit 1 **LP2** circuit 2
19	compressor oil pressure	
20	real time clock	

3.2 FORCED READ - OUT OF THE TOP AND BOTTOM DISPLAY

The dP03 parameter allows to have a pre-defined visualization.
dP03=0
The visualization is defined by parameters dP01 and dP02
dP03 = 1
Top display:
- Evaporator water inlet temperature, **Ein** label.

Bottom display:
- Evaporator 1 water outlet temperature, label **Out1 or** evaporator 2 water outlet temperature, label **Out2**

dP03 = 2
Top display:
- Condenser 1 water inlet temperature, label **CIn1 or** Condenser 2 water inlet temperature, label **CIn2**

Bottom display
- Condenser 1 water outlet temperature, label **COu1 or** condenser 2 water outlet temperature, label **COu2**

dP03 = 3
Top display of the circuit 1:
- Condenser temperature **Cdt1** / pressure **CdP1 or** Condenser temperature **Cdt2** / pressure **CdP2**

Bottom display of the circuit 1
Evaporator pressure probe **LP1 or** Evaporator pressure probe **LP2**

3.3 VICX620: REMOTE TERMINAL 1 VISUALIZATION

If dP04=0 the display has the same visualization of the Ichill.
If dP04=1 upper display visualizes the temperature measured by the probe mounted in the remote terminal 1 (remote terminal must have internal temperature sensor)

3.4 VICX620: REMOTE TERMINAL 2 VISUALIZATION

If dP05=0 the display has the same visualization of the Ichill.
If dP05=1 upper display visualizes the temperature measured by the probe mounted in the remote terminal 2 (remote terminal must have internal temperature sensor)

3.5 DISPLAY VISUALIZATION IN CONDENSIG UNIT

If the Ichill is used to control a condensing unit (CF03=1):
- and a digital input has to be configured as “cooling request”; in case of cooling request the display shows “OnC”
- and a digital input has to be configured as “heating request”; in case of heating request the display shows “OnH”

If the Ichill is used to control a condensing unit (CF03=1):

- and a digital input has to be configured as “regulation request”; in case of cooling request by key the display shows “OnC”; in STD-BY the display swows “On”, when the digital input is not active the display shows “OFF”
- and a digital input has to be configured as “regulation request”; in case of heating request by key the display shows “OnH”; in STD-BY the display swows “On”, when the digital input is not active the display shows “OFF”

3.1 DISPLAY VISUALIZATION IN REMOTE OFF

Digital input configured as remote ON/OFF: the active input sets the unit in OFF (even when the unit is a condensing unit).
The upper display shows **“OF.F** ”, the led of the decimal point is blinking.

3.2 DISPLAY VISUALIZATION IN STD-BY

It is possible to customise the visualization of the display when the unit is in STD-BY:
Parameter dP10:
0= the display shows "STD-BY"
1= the display shows what defined by parameters dP1 and dP2
2= the display shows “OFF”

dP10=0

dP10=1
The display shows what defined by parameters dP1 and dP2

dP10=2

3.3 HOW TO READ COMPRESSOR STATUS

if a compressor is disable for maintenance the display shows:
compressor 1 disabled: label **c1ds**
compressor 2 disabled: label **c2ds**
compressor 3 disabled: label **c3ds**
compressor 4 disabled: label **c4ds**

3.1 KEY FUNCTION

KEY	ACTION	FUNCTION
SET	Push and release	Show chiller set point **SetC** and heat pump **SetH**
	Push once again	In chiller or heat pump if the Energy saving or the Dynamic setpoint are enabled it shows the real setpoint **Setr,** the led is blinking.
	Push for 3 seconds	Set point modification
	During the programming: push once	To enter parameter modification or confirm a value
	Push when an alarm is showed in menù ALrM	To reset the alarm
	Push once with probe label showed on the bottom display (press up or down starting from default visualization)	To read probes values of circuit 1 or circuit 2
	Push once	To read probes value
	Pushing once during the programming	To change the group of parameters, to change the parameter, to change the value of the parameter
	Push for 1 second during the programming when the display visualize Pr1 or Pr2 or Pr3	1 time shows the Pr2 programming level 2 times shows the Pr3 programming level
	Push once	To read probes value
	Pushing once during the programming	To change the group of parameters, to change the parameter, to change the value of the parameter
	Push once	To turn ON or turn OFF the controller (in chiller or heat pump depending from CF58 parameter)
	Push once	To turn ON or turn OFF the controller (in chiller or heat pump depending from CF58 parameter)
menu	Push once	To enter the function Menu
	Push for 3 seconds	To set the clock (controller with clock on board)
	Pushing once during the programming	To exit from a group of parameter

3.2 KEY COMBINANTION

KEY	ACTION	FUNCTION
SET + DOWN	Push for 3 seconds together	Enter the programming parameters
	Only in Pr3 level: push SET and DOWN key	Select the parameter level visibility Pr1 / Pr2 / Pr3
SET + UP	Push once together	Exit the programming parameters
	Push 5 seconds in heat pump mode	Manual defrost
SET + menu	Only in Pr3 programming level: push SET and then the MENU key	In Pr3 defines if the parameter can be modified or not in the other levels.

4. REMOTE TERMINAL

It is possible to connect max. two remote terminals (with or without internal temperature sensor).
The maximum length of the cable is 150 mt. (shielded cable is recommended, e.g Belden 8762).
In case of communication problems (hardware problem, wrong connection, cable too long, wrong serial address) the upper display shows "**noL"** (no link).
The serial address has to be set using the dip switch placed on the back side of the remote terminal.

5. FIRST INSTALLING

On Board Clock (Optional)

If giving power supply the bottom display shows "**rtC**" alternated with a temperature or pressure value, It is necessary to set the internal clock.
After a power failure, clock back-up battery lasts maximum 3 or 4 days. After this period it is necessary to set the clock again.

The internal clock is an option and it is not possible to update the instrument; it is necessary to order the instrument already complete of this features.

Real Time Clock Setup

1. Push **MENU** key for some seconds until the bottom display shows **"Hour**" and the top display shows its value.

2. Push **SET** one time: the value is blinking
3. Use the Up and Down keys to adjust it. Push **SET** one time to confirm; automatically the display shows next parameter
4. Repeat the operations 2. 3. and 4. for all the RTC parameters:

- **Min:** minutes (0÷60)
- **UdAy:** day of the week **(Sun** = Sunday, **Mon** =Monday, **tuE** =Tuesday, **UEd** = Wednesday, **tHu** = Thursday, **Fri** =Friday, **SAt** =Saturday)
- **dAy:** day of the month (0÷31)
- **MntH:** month (1÷12)
- **yEAr:** year (00÷99)

6. PROGRAMMING WITH THE "HOT KEY 64"

Download: how to program an instrument with a programmed "Hot Key"

1. Power off the instrument
2. Insert the hot key already programmed (by software Wizmate or other instrument)
3. Power on the instrument
4. Automatically the parameters are downloaded

During the download the regulation is locked and the top display shows the "**doL**" blinking label. At the end of the download will appear:
"End" if the programming procedure is completely OK, after 30seconds the regulation starts automatically.
"Err" if the programming procedure has found an error and the parameter have not been transferred. In this case turn off and then on the instrument supply to repeat the operation or remove the hot key, with power supply off, to restart the regulation.

Upload: How to program a "Hot Key" with the parameters of the instrument

1. Power on the instrument
2. Insert the hot key
3. Enter the function Menu
4. Select the **UPL** function (on the bottom display)
5. Push **SET** key and immediately the instrument starts transfer the parameters into the Hot key.

During the upload the regulation is locked and the top display shows the "**UPL**" blinking label. At the end of the UPLOAD will appear:
"End" if the programming procedure is completely OK, after 30seconds the regulation starts automatically.
"Err" if the programming procedure has found an error and the parameter have not been transferred. Repeat the procedure.
To exit the UPL function push the MENU key or wait the time-out (15 sec).

7. PROGRAMMING USING THE KEYBOARD

Through the instrument keyboard it is possible to enter the programming. In all the three accessible levels the user can show and modify both value and visibility of the parameters. To ensure an easy navigation through the different levels the common parameters have been named and grouped under a family name. The three levels of programming:

- Pr1 User level
- Pr2 Maintenance level
- Pr3 OEM level

Password default values

- Password level Pr1 = **1**
- Password level Pr2 = **2**
- Password level Pr3 = **3**

Each password can be changed; the range is 0 ... 999.
Each parameter has two level: visibility and changeability. Therefore it can be configured as follow:

- The parameter can be showed and changed.
- The parameter can be showed but not changed.

Enter the Pr1 - Pr2 - Pr3 programming levels

Pr1 LEVEL:
Push **SET** + **DOWN** together for 3 seconds, the top display shows the PAS label and the bottom display shows the Pr1 label. The leds cir1/cir2 are blinking (up and down leds) to inform that you now are in PR1 programming level.
Pr2 LEVEL:
From the Pr1 level push the UP key for 2 seconds and the bottom display will show Pr2. The top display still shows PAS.
Pr3 LEVEL:
From the Pr2 level push the UP key for 2 seconds and the bottom display will show Pr3. The top display still shows PAS.
After selecting the level push the SET key and the top display will show the 0 blinking value where to insert the password .
Set the password level using the UP and DOWN keys then confirm with SET key.
Dependening on the password value there will be the different level access, if the password is wrong the instrument shows the password value again.

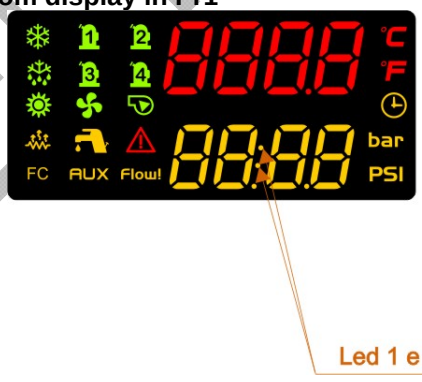
ATTENTION:
For all the programming levels Pr1, Pr2, Pr3 CF parametrs (configuration parameters) cannot be changed if the instrument is switched on.
During the defrost the dF parameters can't be programmed.

Enter the programming level Pr1

Enter Pr1 "User level ":
1. Push **SET** + **DOWN** keys together for 3 seconds. The top display shows PAS while the bottom display shows **Pr1** labels.
2. Push **SET** key and the top display shows a blinking **0**; pressing **UP** or **DOWN keys** insert the Pr1 password. Push **SET** and, if the value is correct, top display will show the first family of parameters **"ALL"**. Otherwise set the password again.
3. Select a parameter group pressing **DOWN** or **UP** keys.
4. Push **SET** to enter; the bottom display shows the first available parameter label while the top display shows its value.

The user can shows and modify all the parameters belonging to this family.

Parameter status, leds and bottom display in Pr1



- If the selected parameter can not be changed the leds 1 and 2 are blinking.
- In Pr1 level the user can not see and change any parameter of Pr2 and Pr3.
- The MENU key allows to exit from a family to reselect another without exit the Pr1 level.
- To exit completely the programming push SET + UP.

Enter the programming level Pr2

Enter the Pr2 "maintenance level ":
1. Push the **SET** + **DOWN** keys together for 3 seconds. The top display shows PAS while the bottom display shows Pr1 labels.
2. Push UP key for 2 seconds and the top display will show Pr2.

3. Push **SET** key and the top display shows a blinking 0, with **UP** or **DOWN** insert the Pr2 password. Push **SET** and, if the value is correct, top display will show the first family of parameters **"ALL"**. Otherwise set the password again.
4. Select a parameter family with **DOWN** or **UP** keys.
5. Push **SET** to enter, the bottom display shows the first available parameter label while the top display shows its value.

The user can shows and modify all the paramters belonging to this family.

Parameter status, leds and bottom display in Pr2

- Leds 1 / 2 are blinking: the parameter can not be changed.
- All the leds are off: the parameter ca not be seen in Pr1 level.
- Led 3 is on: the parameter can be seen in Pr1 level.
- Leds 1 / 2 are blinking and led 3 is on: the parameter can be showed and changed in Pr2, showed but not changed in Pr1.
- Leds 1 / 2 / 3 are blinking: the parameter can be showed and changed in Pr2 and in Pr21.
- In Pr2 level the user can not see and change any parameter of Pr3 level.
- The MENU key allows to exit from a family to reselect another without exit the Pr2 level.
- The MENU key allows to pass to Pr1 starting from a family label.
- To exit completely the programming push SET + UP.

Enter the programming level Pr3

Enter the Pr3 "OEM level ":

1. Push the **SET** + **DOWN** keys together for 3 seconds. The top display shows PAS while the bottom display shows Pr1 labels.
2. Push UP key for 2 seconds and the top display will show Pr2.
1. Push UP key again for 2 seconds and the top display will show Pr3
3. Push **SET** key and the top display shows a blinking 0, with **UP** or **DOWN** insert the Pr3 password. Push **SET** and, if the value is correct, top display will show the first family of parameters **"ALL"**. Otherwise set the password again.
4. Select a parameter family with **DOWN** or **UP** keys.
5. Push **SET** to enter, the bottom display shows the first available parameter label while the top display shows its value.

The user can shows and modify all the paramters belonging to this family.

Parameter status, leds and bottom display in Pr3

- Leds 1 / 2 are blinking: the parameter can not be changed.
- All the leds are off: the parameter is available only in Pr3.
- Led 4 on: the parameter can be changed also in Pr2.
- Led 4 blinking: the parameter is visible also in Pr2 .
- Leds 3 / 4 on: the parameter is available in Pr2 and in Pr1.
- Leds 3 / 4 blinking: the parameter is visible in Pr1 and in Pr2.
- The MENU key allows to exit from a family to reselect another without exit the Pr2 level.
- The MENU key allows to pass to Pr1 starting from a family label.
- To exit completely the programming push SET + UP.

How to change a parameter value

Enter the programming

1. Push the **SET** + **DOWN** keys together for 3 seconds;
2. Select the parameter label with up and down keys;
3. Push **SET** to enter the parameter value;
4. Change the value with **UP** or **DOWN** keys;
5. Push "**SET**" to confirm, after some seconds the display shows the next parameter;
6. Exit: Push **SET + UP** together when a parameter label is displayed or wait 15seconds without pushing a key.

NOTE: a new parameter value is confirmed also after the 15 seconds of timeout is expired (without pushing SET key to confirm).

Change the Password value

Pr1 LEVEL

1) Enter Pr1 visibility level
2) Select a whatever parameter family.
3) Search "**Pr1**" label; push SET key to change the value that now is blinking.
4) Use the UP or DOWN key to insert the NEW PASSWORD value, then push SET to confirm the new value.
5) Top display blinks for some seconds and then shows the next parameter.
6) Exit the programming pushing SET + UP together or wait the timeout.

Pr2 LEVEL

1. Enter Pr2 visibility level
2. Select a whatever parameter family
3. Search "**Pr2"** label; push SET key to change the value that now is blinking.
4. Use the UP or DOWN key to insert the NEW PASSWORD value, then push SET to confirm the new value.
5. Top display blinks for some seconds and then shows the next parameter
6. Exit the programming pushing SET + UP together or wait the timeout.

Inside the Pr2 level it is possible to change also the Pr1 password.

Pr3 LEVEL

1. Enter Pr3 level
2. Select a whatever parameter family
3. Search "**Pr3"** label; push SET key to change the value that now is blinking.
4. Use UP or DOWN key to insert the NEW PASSWORD value, then push SET to confirm the new value.
5. The top display blinks for some seconds and then shows the next parameter
6. Exit the programming pushing SET + UP together or wait the timeout.

Inside the Pr3 level it is possible to change also the Pr1 and Pr2 passwords.

Move a parameter level from Pr2 to Pr1

Enter Pr2 programming level

Select the parameter and if the led # 3 is off: the parameter is available only in Pr2.

To show the parameter also in Pr1:

1. Keep pushed SET key;
2. Push 1 time the DOWN key and the led 3 should be on, the parameter is now available in Pr1.

To hide the parameter in Pr1:

1. Keep pushed SET key;
2. Push 1 time the DOWN key and the led 3 should be off, the parameter is now removed from Pr1.

Move a parameter from Pr3 to Pr2 to Pr1

Enter Pr3 programming level, here the parameter are all visible:

Select the parameter, if all the leds are off the parameter is available only in Pr3.

To show the parameter also in Pr2 and Pr1:

1. Keep pushed SET key;
2. Push 1 time the DOWN key and the leds 3 and 4 should be on, the parameter is now available also in Pr2 / Pr1.

To show the parameter only in Pr2:

1. Keep pushed SET key;
2. Push 1 time the DOWN key and the leds 3 is off, the parameter is now available also in Pr2.

To show the parameter only in Pr3:

1. Keep pushed SET key
2. Push 1 time the DOWN key and the leds 3 and 4 are off, the parameter is now available only in Pr3.

Visibility and Parameter value locked

To set the only visibility and lock the parameter value it is necessary enter Pr3 programming level.

Pr1 PARAMETER VISIBILITY

Enter the Pr3 level

1. Select the parameter;
2. Keep pushed the SET key;
3. Push 1 time the MENU key and the led 3 change from on to blinking: the parameter is visible in Pr1 but can't be changed.

Pr2 PARAMETER VISIBILITY

Enter the Pr3 level

1. Select the parameter;
2. Keep pushed the SET key;
3. Push 1 time the MENU key and the led 4 change from on to blinking the parameter is visible in Pr2 but can't be changed.

Leds 3 / 4 blinking: the parameter is visible in Pr1 and in Pr2 but in those levels now they can't be changed.

TO SET THE ORIGINAL TAG FOR THE PARAMETER Pr1 / Pr2

1. Keep pushed the **SET** key;
2. Push one time the **MENU** key, the leds 3 / 4 turn on, the parameter can be seen and modified in Pr1 and Pr2.

Programming: digital input and output polarity

The configuration parameters of :

- Digital inputs
- Digital outputs (relay)
- Proportional output configured as ON/OFF
- Analogue input configured as digital input

are composed by a letter and a number.

Letter can be:
o (open) = function associated to the input or output is active when the contact is open
c (close) = function associated to the input or output is active when the contact is closed
The number defines the function associated to the input or output.

Example 1:

The bottom display shows the parameter label CF36 = digital input 7 configuration:

- **7** means that the digital input is configured as “high pressure switch of circuit 1” (see digital input configuration)
- **o** means that the digital input is active for **open** contact, then the high pressure alarm is detected when the digital input is open.

Example 2:

The bottom display shows the parameter label CF36 = digital input 7 configuration:

- **7** means that the digital input is configured as “high pressure switch of circuit 1” (see digital input configuration)
- **c** means that the digital input is active for **closed** contact, then the high pressure alarm is detected when the digital input is closed.

8. DISPLAY LAYOUT

Pushing  or  key it is possible to read the valure of the probes connected to the instrument.
Every probe is identified by a label (see display visualization table).

Example:
Fig.1: upper display shows outlet 1 evaporator temperature, the lower display shows Out1.
Pressing SET key is possible to read the same probe of the second circuit (if configured).

Fig.1

Fig.2: upper display shows outlet 2 evaporator temperature, the lower display shows Out2.
Pressing SET key is possible to read the same probe of the first circuit.

Fig.2

9. DISPLAY INFORMATION

Read Set Point value

Push and release the **SET** key, the leds of the circuits are off and the set value is displayed.
In stand-by the bottom display shows **SetC** (set chiller), by pushing SET again the next label is **SetH** (set heat pump).
If the unit is running the only set displayed is related to the running mode.

Modify the Set Point

1) Push **SET** key for at least **3** seconds: the leds of the circuits are off and the set value is blinking.
2) Use the **UP** or **DOWN** key to modify the setpoint.
3) Push **SET** to confirm or wait the timeout (15seconds).

Read real SetPoint during Energy Saving or Dynamic Setpoint

Chiller mode: push **SET** one time, the bottom display shows the **SEtC** (set chiller) while the top display shows the set value. Only if the Energy saving or the Dynamic Setpoint are active, pushing another time the **SET** key, the bottom display shows **"SEtr"** (real setpoint), and the top display shows the setpoint that the unit is really using for the thermoregulation.
Chiller mode: push **SET** one time, the bottom display shows the **SEtH** (set Heat pump) while the top display shows the set value. Only if the Energy saving or the Dynamic Setpoint are active, pushing another time the **SET** key, the bottom display shows **"SEtr"** (real setpoint), and the top diplay shows the setpoint that the unit is really using for the thermoregulation.
ATTENTION
The **SEtr** label appears only if the Energy saving or the Dynamic Setpoint are active.

10. FUNCTION MENU " M" KEY

The function Menu is composed of the following items:

- Read and reset the alarms **ALrM**
- Compressor overload alarm reset **COtr**
- Read and reset the alarm log **ALOG**
- Upload the parameter into the Hot Key **UPL**
- Enable – disable one or the two circuits **CrEn**
- Enable – disable one of the compressors **COEn**
- Read and reset the number of compressor running hour **Hour**
- Read and reset the number of compressor starts-up **COSn**
- Read the compressor discharge temperature **COdt**
- Read the condensing fan speed percentage of the proportional output **Cond**
- Read the percentage of the proportional output 0 ÷ 10 Vdc **Pout**
- Enable – disable evaporator or condenser water pumps **PoEn**
- Time counting to next defrost cycle, under heat pump mode, **dF**
- Read the probe temperatures that enabled to control the auxiliary output **uS**
- Read temperature, Set point and output status of solar panel **SoL**
- Read temperature, Set point and output status of Free cooling **FC**
- Read probe temperature of the remote panels **trEM**
- Read temperature, pressure, set point of the electronic expansion valve 1 **Et1**
- Read temperature, pressure, set point of the electronic expansion valve 2 **Et2**

Alarm list: show and reset

ALrM FUNCTION

Enter the function MENU pushing M key one time

1) Use the **UP** or **DOWN** to select the AlrM label
2) Push **SET** key (Nothing happens if there are no active alarm events)
3) Bottom display: alarm label code; Top display: label **rSt** to reset or **NO** if it is not possible.
4) Use the **UP** or **DOWN** to scroll the alarm list.
5) Pushing SET when the rSt label is displayed the corresponding alarm is reset
6) Then the display shows next alarm in the list; pushing SET again the alarm is reset and the display shows next alarm etc.
7) Nothing happens by pushing SET when the label NO is displayed, in this case push UP or DOWN to move to another alarm label.
8) To exit the ALrM reset function push MENU one time or wait the timeout.

Compressor overload alarm reset

CO1r = compressor 1 overload

…

CO4r = compressor 4 overload

MANUAL ALARM RESET PROCEDURE

Enter Menu function

1. Use **UP** or **DOWN** key and select "Alrm" label on the bottom display.
2. Push **SET** once, if there are active alarms the bottom display shows the alarm label C1tr (for compressor 1) while the top display shows the label rSt to reset the alarm or NO if the alarm can not be reset. Use

the UP or DOWN keys to scroll all the alrm list (nothing happens by pushing SET when the label NO is displayed).
3. Pushing SET when the rSt label is displayed; the corresponding alarm will be reset
4. To exit the Alrm function push MENU or wait the timeout.
5. Repeat operation 1 – 4 to reset the other alarms.

Compressor overload alarm; manual reset with password
If the number of compressor overload alarm is bigger than the parameter AL20, the alarm is showed and has to be reset in the **COtr** menu.

Labels involved in Cotr function:
CO1r = compressor 1 overload reset
…
CO4r = compressor 4 overload reset

MANUAL ALARM RESET PROCEDURE
Enter Menu function
1. Use UP or DOWN key and select the **COtr** on the bottom display.
2. Push **SET** one time, if there are active alarms the bottom display shows the alarm label **CO1r** (for compressor 1) while the top display shows the label **rSt** to reset the alarm or **NO** if the alarm can not be reset. Use the UP or DOWN keys to scroll all the alrm list.
3. Nothing happens by pushing SET when the label NO is displayed.
4. Pushing SET when the rSt label is displayed the corresponding alarm will be reset after the password: bottom display ArSt while the top display PAS.
5. Push SET and the top display blinks 0 while the bottom shows **PAS**. Insert the password using UP or DOWN key. If the password is OK the **ArSt** blinks for per 3 seconds, if the password value is not correct the top display blinks 0 while the bottom shows PAS. If within 5 seconds no value is inserted the display label come back to CO1r function.
6. To exit the COtr function push MENU or wait the timeout.
7. Repeat operation 1 – 5 to reset the other alarms.

Compressor overload password

The parameter that define the password is AL46; default value is **0.**

Alarm log list

ALOG FUNCTION TO SEE THE ALARM LOG
The function and the alarm codes are visible only if there are alarm events. If many events are active at the same time the list displayed by increasing order.
Enter the function Menu
1. Select **ALOG**
2. Push **SET** one time; nothing happens if there are no active alarm.
3. The bottom display shows the alarm label, the top display shows the a number in the range 00 to 99.
4. Use the UP or DOWN keys to scroll the list.
5. To exit the ALOG function push MENU or wait the timeout.

Erase the Alarm log list

ALOG FUNCTION TO ERASE THE LOG LIST

1. Enter the function Menu.
2. Push **UP** or **DOWN** keys to select ALOG on the bottom display.
3. Push **SET** key.
4. Push **UP** or **DOWN** keys to search **ArSt** label on the bottom display.
5. Push **SET**: the bottom display shows **PAS** and the top display a blinking 0.
6. Insert the password (see parameter AL46)
7. If the password is OK the label **ArST** blinks for 5 seconds then the display returns to normal condition read-out (probes).
8. If the password is not correct the display shows **PAS** again. in any case is possible to scroll the list with **UP** or **DOWN**
9. To exit push the M key one time or wait the timeout.

THE ALARM LIST CONTAINS 100 EVENTS IN A FIFO STRUCTURE. WHEN THE MEMORY IS FULL ANY NEW ALARM WILL ERASE THE OLDEST.

Disable – enable a circuit

CrEn FUNCTION.
Label involved with CrEn function: **Cr1E = circuit 1, Cr2E = circuit 2**
DISABLE A CIRCUIT
Enter the function Menu
1. Use **UP** or **DOWN** keys to select **CrEn** on the bottom display
2. Push **SET** key: the bottom display **Cr1E**, top display **En**.
3. Select the circuit 1 or 2 with UP or DOWN (Cr1E or Cr2E).
4. Push **SET** key for 3 seconds when one of the two Cr1E, Cr2E label are displayed. The top display shows the **En** blinking label, use the UP or DOWN to change in **diS** (Disabled) or **En** (Enabled). Then push SET key to confirm the new selection. The display shows next circuit status.
5. To exit the CrEn function push MENU key or wait the timeout.

Read-out of a Circuit Not enabled

If one circuit is disabled the bottom display shows diS alternated with the label name of the measurement selected.
Circuit 1 = diS the bottom display shows **b1dS** = circuit 1 disabled.
Circuit 2 = diS the bottom display shows **b2dS** = circuit 2 disabled.

Enable or disable a single compressor

COEn FUNCTION
Label involved in COEn function: **CO1E = Compressor 1 status… CO4E = Compressor 4 status**
The **COEn** function uses only the compressors configured by the corresponding output parameters.
Enter the function Menu
1. Use the **UP** or **DOWN** keys to select COEn.
2. Push SET key: bottom display = CO1E, top display = En
3. Select the compressor with UP or DOWN: CO2E - CO3E - CO4E if available.
4. Push SET for 3 seconds when the label corresponds to the compressor to disable: CO1E - CO2E - CO3E - CO4E. Top display shows the blinking En label, use the UP or DOWN key and change to **diS** (Compressor disabled) or **En** (compressor enabled) then push SET to confirm, the display shows next item.
5. To exit the COEn function push MENU key or wait the timeout.

Read-out of the compressor discharge temperature probe

The menu function allows to read-out the compressor temperature probes.
COdt FUNCTION.
Label involved in **Codt** function: **CO1t** Compressor 1 discharge temperature… **CO4t** Compressor 4 discharge temperature
1. Use the **UP** or **DOWN** keys to select **COdt**
2. Push SET key: bottom display = **CO1t**, top display = temperature value of that probe.
3. Use the UP or DOWN kys to scroll the list: **CO1t** or **CO2t** or **CO3t** or **CO4t**
4. To exit the COEn function push MENU key or wait the timeout

Read-out of the running hours

This menu allows to shows all the time running hours of the compressors, supply fan and pumps.
Hour FUNCTION to show the controlled load consumption
Label involved in the Hour function:
CO1H Compressor 1 running hours .. **CO4H** Compressor 6 running hours.
EP1H Evaporator water pump or Supply fan running hours
EP2H Support evaporator water pump running hours
CP1H Condenser water pump running hours
CP2H Support condenser water pump running hours
SAPH Domestic hot water pump running hours
PAPH Solar panel water pump running hours
FCPH Free cooling water pump running hours

The labels are displayed only if the corresponding output is present and configured.

The running hours is displayed on the top display, the resolution is x 10 hours (eg 2 means 20 hours, 20 means 200hours)

Enter the function Menu

1. Use the UP or DOWN keys to select Hour
2. Push SET key: bottom display = above labels, top display = hours x10. The time is on.
3. Use the UP or DOWN keys to scroll the list.
4. To exit the Hour function push MENU key or wait the timeout

Reset the running hour

Enter the function Menu

1. Within the Hour function select, with UP or DOWN, the interested label: CO1H, CO2H, CO3H, CO4H, EP1H, EP2H, CP1H, CP2H, SAPH, PAPH or FCPH.
2. Push the **SET** keys for 3 seconds: the top display shows the running hours blinking value, then it shows 0 to confirm the reset. The next load label is automatically loaded.

To exit the Hour function push MENU key or wait the timeout

Read-out of the compressor starts-up

For each compressor is possible to show the number of starts-up.

COSn FUNCTION.

Label involved in COSn function: **C1S** number of compressor 1 starts-up .. **C4S** number of compressor 4 starts-up

The labels are displayed only if the corresponding output is present and configured

The number of starts-up is displayed on the top display, the resolution is x 10 (eg 2 means 20 starts, 20 means 200 starts)

Enter the function Menu

1. Use the UP or DOWN keys to select **COSn**.
2. Push **SET** one time: the label of the first load C1S is showed on the top display, the bottom display shows the number x10.
3. With UP or DOWN scroll the compressor list.
4. To exit the Hour function push MENU key or wait the timeout

Reset the starts-up number

Enter the function Menu

1. Within the Hour function select, with UP or DOWN, the interested label: CS1, CS2, CS3, CS4.
2. Push the **SET** keys for 3 seconds: the top display shows the running hours blinking value, then it shows 0 to confirm the reset. The next load label is automatically loaded.
3. To exit the Hour function push MENU key or wait the timeout.

Read-out of the Proportional Output percentage of the condenser fan control

The proportional outputs of the two circuits, that control the fan speed, can be showed in the menu function.

Cond FUNCTION.

Label involved in Cond function.

Cnd1 output value of the condenser fan of the circuit 1.

Cnd2 output value of the condenser fan of the circuit 2.

TO SEE THE OUTPUT PERCENTAGE:

Enter the function menu

1. Use the UP or DOWN keys to select **Cond**.
2. Push **SET** key: the bottom display shows Cnd1, the top display shows the output percentage.
3. Use the UP or DOWN keys to select Cnd1 or Cnd2, the top display always shows the value, between 0% and 100%, of the proportional output of the selected circuit.
4. To exit the Hour function push MENU key or wait the timeout.

Read-out of the proportional output value (outputs OUT1...OUT4)

The four proportional outputs, 4..20ma or 0-10V, can be showed in the menu function.

Pout FUNCTION selects the proportional outputs.

Label involved in Pout function:

IC200CX outputs:

Pou1 Proportional output for dumper control or to drive the external relay 1

Pou2 Proportional output for dumper control or to drive the external relay 2

Pou3 Proportional output for dumper control or to drive the external relay 3

Pou4 Proportional output for dumper control or to drive the external relay 4

ICX207D outputs (I/O expansion):
PoE1 Proportional output for dumper control or to drive the external relay 1
PoE2 Proportional output for dumper control or to drive the external relay 2
PoE3 Proportional output for dumper control or to drive the external relay 3

The labels are displayed only if the corresponding output is present and configured.
TO SEE THE FOUR OUTPUT PERCENTAGE:
Enter the function menu
1. Use the UP or DOWN keys to select **Pout**.
2. Push **SET** key: the bottom display shows Pou1, the top display shows the output percentage.
3. Use the UP or DOWN keys to select Pou1, Pou2, Pou3, etc. the top display always shows the value, between 0% and 100%, of the proportional output of the selected circuit.
4. To exit the Hour function push MENU key or wait the timeout.

ATTENTION:
If the proportional output Pou1 - Pou2 - Pou3 - Pou4 are configured to drive an external relay the display will show 0=relay off and 100=relay on.

Read-out of the time counting to the next defrost

dF FUNCTION
Label involved in dF function:
dF1 delay time to next defrost of the circuit 1
dF2 delay time to next defrost of the circuit 2

Enter the function menu :
1. Use the UP or DOWN keys to select **dF**
2. Push **SET** key: the dF1 label is showed on the top display, the bottom display shows the time delay to next defrost in minutes / seconds. The icon is on.
3. Use the UP or DOWN keys to select dF1 or dF2.
4. To exit the Hour function push MENU key or wait the timeout

Read-out of the probes configured to control Solar panel

Sol FUNCTION
Label involved in **Sol** function**:**
FCP1 Free cooling probe 1 temperature
FCP2 Free cooling probe 2 temperature
FCdF Free cooling differential
FCrL Free cooling water pump status
FCAn Free cooling analog output status

Read-out of the probes configured to control Free cooling

Sol FUNCTION
Label involved in **Sol** function**:**
SLPb Solar panel probe 1 temperature
SSP2 Solar panel probe 2 temperature
SSdi Solar panel differential
SPMP Solar panel water pump status
SLrL Solar panel valve status

Read-out of the probes configured to control an auxiliary output relay

uS FUNCTION.
Label involved in **uS** function**:**
uSt1 auxiliary probe value of the circuit 1
uSt2 auxiliary probe value of the circuit 2
Enter the function menu
1. Use the UP or DOWN keys to select uS.

2. Push **SET** key: the label **uSt1** (temperature probe) or **uSP1** (Pressure probe) is showed on bottom display, the top display shows the the temperature or pressure value.
3. Use the UP or DOWN keys to select **uSt1** auxiliary probe for circuit 1or **uSt2** auxiliary probe for circuit 2.
4. To exit the Hour function push MENU key or wait the timeout.

How to display the tempaerature of the internal temperaure sensor of the remote terminal 1 or 2

Inside the funcion menu it is possible to see the ambient temperature detected by the NTC sensor
FUNCTION trEM to show the temperature of the remote panels
Identification label **trEM.**
trE1 value of the NTC probe of the remote #1
trE2 value of the NTC probe of the remote #2
Select with **UP** or **DOWN** the **trEM** function
Push **SET** the trE1 or trE2 label is shown on the bottom display, the top display shows the probe value.
Use the UP or DOWN arrow to change beteween **trE1** or **trE2** read-out.
To exit to the normal display read-out push MENU or wait the time – out time.
ATTENTION:
THE trEm function and the labels trE1 or trE2 appear only if the CF56 = =2 or 3 (remote panel 1 configuration) or if the parameter CF56 = 2 or 3 (remote panel 2 configuration).

11. ANALOG AND DIGITAL OUTPUT CONFIGURATION

11.1 ICHILL INPUT / OUTPUT CONFIGURATION

Analog input Pb1 - Pb2 – Pb5 – Pb6

0. Not enabled
1. Temperature probe **PTC** for compressor 1 discharge
2. Temperature probe **PTC** for compressor 2 discharge
3. Temperature probe **PTC** for compressor 3 discharge
4. Temperature probe **PTC** for compressor 4 discharge
5. Not used
6. Not used
7. Temperature probe **PTC** for solar panel
8. Temperature probe **NTC** for evaporator inlet
9. Temperature probe **NTC** for evaporator 1 outlet
10. Temperature probe **NTC** for evaporator 2 outlet
11. Temperature probe **NTC** for common evaporator outlet
12. Temperature probe **NTC** for common hot water condenser / recovery inlet
13. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 inlet
14. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 inlet
15. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 outlet
16. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 outlet
17. Temperature probe **NTC** for hot water of the condenser / recovery common outlet
18. Temperature probe **NTC** for free cooling water inlet circuit
19. Temperature probe **NTC** for dynamic setpoint external air / boiler / change over
20. Temperature probe **NTC** for combined defrost circuit 1
21. Temperature probe **NTC** for combined defrost circuit 2
22. Temperature probe **NTC** for auxiliary output 1
23. Temperature probe **NTC** for auxiliary output 2
24. Temperature probe **NTC** sanitary water 1
25. Temperature probe **NTC** sanitary water 1
26. Temperature probe **NTC** solar panel
27. Temperature probe **NTC** for condensing circuit 1
28. Temperature probe **NTC** for condensing circuit 2

After the number 28 the configuration can be selected from **o 1** to **c75** that allows to set an analogue input as digital input (see polarity of the digital input/outputs).

Analog input Configuration Pb3 - Pb4

0 Not enabled
1 Temperature probe **PTC** for compressor 1 discharge
2 Temperature probe **PTC** for compressor 2 discharge
3 Temperature probe **PTC** for compressor 3 discharge
4 Temperature probe **PTC** for compressor 4 discharge
5 Not used
6 Not used
7 Temperature probe **PTC** for solar panel
8 Temperature probe **NTC** for evaporator inlet
9 Temperature probe **NTC** for evaporator outlet 1
10 Temperature probe **NTC** for evaporator outlet 2
11 Temperature probe **NTC** for common evaporator outlet
12 Temperature probe **NTC** for common hot water condenser / recovery inlet
13 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 1
14 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 2
15 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 1
16 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 2
17 Temperature probe **NTC** for hot water condenser / recovery common outlet circuit
18 Temperature probe **NTC** for free cooling water inlet
19 Temperature probe **NTC** for external air dynamic setpoint/ boiler / change over
20 Temperature probe **NTC** for combined defrost circuit 1
21 Temperature probe **NTC** for free cooling water inlet 2
22 Temperature probe **NTC** for auxiliary output 1
23 Temperature probe **NTC** for auxiliary output 2
24 Temperature probe **NTC** sanitary water 1
25 Temperature probe **NTC** sanitary water 2
26 Temperature probe **NTC** solar panel
27 Condenser probe circuit 1 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
28 Condenser probe circuit 2 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
29 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
30 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
31 Aux 1 output probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
32 Aux 2 output probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
33 Dynamic setpoint probe (**4÷20 mA)**
34 Compressor 1 or circuit 1 pressure probe
35 Compressor 2 or circuit 2 pressure probe

After the number 35 the display read-out goes from "**o 1"** to "**c75** that allows to set an analogue input as digital input (see polarity input of digital inputs).

Digital Input Configuration Id1 – Id11

0. Not enabled
1. Remote ON / OFF
2. Remote chiller / heat pump
3. Flow switch/ Supply fan overload
4. Flow switch of heated side
5. Antifreeze heater circuit 1
6. Antifreeze heater circuit 2
7. High pressure switch circuit 1
8. High pressure switch circuit 2
9. Low pressure switch circuit 1
10. Low pressure switch circuit 2
11. Compressor 1 high pressure
12. Compressor 2 high pressure
13. Compressor 3 high pressure
14. Compressor 4 high pressure
15. Not used
16. Not used

17. Compressor 1 overload
18. Compressor 2 overload
19. Compressor 3 overload
20. Compressor 4 overload
21. Not used
22. Not used
23. Condenser fan overload of circuit 1
24. Condenser fan overload of circuit 2
25. Condenser fan overload of circuit 1 and 2 (comun)
26. Water pump overload of evaporator 1
27. Water support pump overload of evaporator
28. Water pump overload of condenser 1
29. Water support pump overload of condenser
30. Recovery request circuit 1
31. Recovery request circuit 2
32. Start/End defrost circuit 1
33. Start/End defrost circuit 2
34. Energy Saving
35. Pressure switch / compressor 1 oil
36. Pressure switch / compressor 2 oil
37. Pressure switch / compressor 3 oil
38. Pressure switch / compressor 4 oil
39. Not used
40. Not used
41. Pump down pressure switch of circuit 1
42. Pump down pressure switch of circuit 2
43. Generic alarm from digital input with stop regulation n° 1
44. Generic alarm from digital input with stop or signal regulation n° 2
45. Operation working mode: by RTC or keyboard
46. Operation mode with supplay fan only
47. Digital input of thermoregulation request (condensing unit)
48. Digital input of cooling request (condensing unit)
49. Digital input of heating request (condensing unit)
50. Request step 2 (condensing unit)
51. Request step 3 (condensing unit)
52. Request step 4 (condensing unit)
53. Request step 5 (condensing unit)
54. Request step 6 (condensing unit)
55. Request step 7 (condensing unit)
56. Request step 8 (condensing unit)
57. Request step 9 (condensing unit)
58. Request step 10 (condensing unit)
59. Request step 11 (condensing unit)
60. Request step 12 (condensing unit)
61. Request step 13 (condensing unit)
62. Request step 14 (condensing unit)
63. Request step 15 (condensing unit)
64. Request step 16 (condensing unit)
65. Sanitary water flow switch
66. Solar panel flow switch
67. Only sanitary water
68. Sanitary water heaters overload
69. Sanitary water pump overload
70. Sanitary water second set point
71. Phase sequence alarm
72. Sanitary water priority
73. Free cooling water pump flow switch
74. Expansion valve 1 alarm
75. Expansion valve 2 alarm

Digital Output (relay) Configuration RL1- RL8

0. Not enabled
1. Alarm
2. Evaporator water pump / Supply fan
3. Support water pump of the evaporator
4. Anti-freeze heater / integration heating / boiler circuit 1
5. Anti-freeze heater / integration heating / boiler circuit 2
6. Water pump of the condenser recovery circuit
7. Support water pump of the condenser recovery circuit
8. 4-way valve for chiller / heat pump inversion of the circuit 1
9. 4-way valve for chiller / heat pump inversion of the circuit 2
10. 1° condenser fan step ON/OFF control of the circuit 1
11. 2° condenser fan step ON/OFF control of the circuit 1
12. 3° condenser fan step ON/OFF control of the circuit 1
13. 4° condenser fan step ON/OFF control of the circuit 1
14. 1° condenser fan step ON/OFF control of the circuit 2
15. 2° condenser fan step ON/OFF control of the circuit 2
16. 3° condenser fan step ON/OFF control of the circuit 2
17. 4° condenser fan step ON/OFF control of the circuit 2
18. Solenoid valve of the pump-down circuit 1
19. Solenoid valve of the pump-down circuit 2
20. Recovery valve circuit 1
21. Recovery valve circuit 2
22. Free cooling ON/OFF valve
23. Auxiliary output circuit 1
24. Auxiliary output circuit 2
25. Solenoid valve Intermittent for screw compressor 1
26. Solenoid valve Intermittent for screw compressor 2
27. Solenoid valve of the liquid injection for compressor 1
28. Solenoid valve of the liquid injection for compressor 2
29. Sanitary valve 1
30. Sanitary valve 2
31. Sanitary heater 1
32. Sanitary heater 2
33. Sanitary heater 3
34. Solar panel water pump
35. Solar panel valve
36. Sanitary water pump
37. Hybrid exchanger 1 circuit 1
38. Hybrid exchanger 2 circuit 1
39. Hybrid exchanger 1 circuit 2
40. Hybrid exchanger 2 circuit 2
41. Cooling/Heating status circuit 1
42. Cooling/Heating status circuit 2
43. Defrost status circuit 1
44. Defrost status circuit 2
45. Status of the regulation circuit 1
46. Status of the regulation circuit 2
47. Domestic hot water status
48. STD-BY/Remote OFF status
49. Solenoid water valve circuit 1
50. Solenoid water valve circuit 2
51. Direct start-up : compressor 1 relay
    PW start: relay PW 1 of the compressor 1
52. PW start: relay PW 2 of the compressor 1
53. Capacity step valve 1 compressor 1
54. Capacity step valve 2 compressor 1
55. Capacity step valve 3 compressor 1
56. By-pass gas valve compressor 1
57. Direct start: compressor 2 start
    PW start: relay 1 of the compressor 2
58. PW start: relay PW 2 of the compressor 2
59. Capacity step valve 1 compressor 2

60. Capacity step valve 2 compressor 2
61. Capacity step valve 3 compressor 2
62. By-pass gas valve compressor 2
63. Direct start: compressor 3 relay
    PW start: relay PW 1 of the compressor3
64. PW start: relay PW 2 of the compressor 3
65. Capacity step valve 1 compressor 3
66. Capacity step valve 2 compressor 3
67. Capacity step valve 3 compressor 3
68. By-pass gas valve compressor 3
69. Direct start: compressor 4 relay
    PW start: PW 1 of the compressor 4
70. PW start: relay PW 2 of the compressor 4
71. Capacity step valve 1 of the compressor 4
72. Capacity step valve 2 of the compressor 4
73. Capacity step valve 3 of the compressor 4
74. By-pass gas valve compressor 4

Proportional output configuration OUT 1 and OUT 2 (0 ÷ 10 Vdc)

0 Not enabled
1 Modulated evaporator water pump
2 Modulated Free cooling valve
3 not used
4 Auxiliary output 0÷10V n° 1
5 Auxiliary output 0÷10V n° 2
6 Proportional output for modulating compressor 1
7 Proportional output for modulating compressor 2
8 Condenser fan circuit 1
9 Condenser fan circuit 2

After selection number 9 it is possible to configure the analog output as digital output with the same meaning of the relays configuration; every analog output can be configured from "**o 1"** to "**c50"** (see relay configuration table).

Proportional output configuration OUT 3 and OUT 4 (0 ÷ 10 Vdc/PWM)

0 Not enabled
1 Modulated evaporator water pump (0..10 Vdc)
2 Modulated Free cooling valve (0..10 Vdc)
3 not used
4 Auxiliary output 0÷10V n° 1 (0..10 Vdc)
5 Auxiliary output 0÷10V n° 2 (0..10 Vdc)
6 Proportional output for modulating compressor 1 (0..10 Vdc)
7 Proportional output for modulating compressor 2 (0..10 Vdc)
8 Condenser fan circuit 1 (0..10 Vdc)
9 Condenser fan circuit 2 (0..10 Vdc)
10 Condenser fan circuit 1 (PWM)
11 Condenser fan circuit 2 (PWM)

After selection number 11 it is possible to configure the analog output as digital output with the same meaning of the relays configuration; every analog output can be configured from "**o 1"** to "**c50"** (see relay configuration table).

OTHER OUTPUTS

- LAN to connect I/O Expansion
- Serial output TTL to connect the HotKey, or Personal computer (through hardware interface) for parameters programming with Wizmate software, or XJ485RS device for connection to XWEB supervisor system.

- Remote keyboard (LED or LCD depending from the Ichill model).

11.2 I/O EXPANSION INPUT/OUTPUT CONFIGURATION

Analog input Pb1 - Pb2 – Pb6 – Pb7– Pb8

0. Not enabled
1. Temperature probe **PTC** for compressor 1 discharge
2. Temperature probe **PTC** for compressor 2 discharge
3. Temperature probe **PTC** for compressor 3 discharge
4. Temperature probe **PTC** for compressor 4 discharge
5. Not used
6. Not used
7. Temperature probe **PTC** for solar panel
8. Temperature probe **NTC** for evaporator inlet
9. Temperature probe **NTC** for evaporator 1 outlet
10. Temperature probe **NTC** for evaporator 2 outlet
11. Temperature probe **NTC** for common evaporator outlet
12. Temperature probe **NTC** for common hot water condenser / recovery inlet
13. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 inlet
14. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 inlet
15. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 outlet
16. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 outlet
17. Temperature probe **NTC** for hot water of the condenser / recovery common outlet
18. Temperature probe **NTC** for free cooling water inlet circuit
19. Temperature probe **NTC** for dynamic setpoint external air / boiler / change over
20. Temperature probe **NTC** for combined defrost circuit 1
21. Temperature probe **NTC** for combined defrost circuit 2
22. Temperature probe **NTC** for auxiliary output 1
23. Temperature probe **NTC** for auxiliary output 2
24. Temperature probe **NTC** sanitary water 1
25. Temperature probe **NTC** sanitary water 1
26. Temperature probe **NTC** solar panel
27. Temperature probe **NTC** for condensing circuit 1
28. Temperature probe **NTC** for condensing circuit 2

After the number 28 the configuration can be selected from **o 1** to **c75** that allows to set an analogue input as digital input (see polarity of the digital input/outputs).

Analog input Configuration Pb3 - Pb4 - Pb5

0 Not enabled
1 Temperature probe **PTC** for compressor 1 discharge
2 Temperature probe **PTC** for compressor 2 discharge
3 Temperature probe **PTC** for compressor 3 discharge
4 Temperature probe **PTC** for compressor 4 discharge
5 Not used
6 Not used
7 Temperature probe **PTC** for solar panel
8 Temperature probe **NTC** for evaporator inlet
9 Temperature probe **NTC** for evaporator outlet 1
10 Temperature probe **NTC** for evaporator outlet 2
11 Temperature probe **NTC** for common evaporator outlet
12 Temperature probe **NTC** for common hot water condenser / recovery inlet
13 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 1
14 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 2
15 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 1
16 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 2
17 Temperature probe **NTC** for hot water condenser / recovery common outlet circuit
18 Temperature probe **NTC** for free cooling water inlet
19 Temperature probe **NTC** for external air dynamic setpoint/ boiler / change over

20 Temperature probe **NTC** for combined defrost circuit 1
21 Temperature probe **NTC** for free cooling water inlet 2
22 Temperature probe **NTC** for auxiliary output 1
23 Temperature probe **NTC** for auxiliary output 2
24 Temperature probe **NTC** sanitary water 1
25 Temperature probe **NTC** sanitary water 2
26 Temperature probe **NTC** solar panel
27 Condenser probe circuit 1 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
28 Condenser probe circuit 2 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
29 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
30 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
31 Aux 1 output probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
32 Aux 2 output probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
33 Dynamic setpoint probe (**4÷20 mA)**
34 Compressor 1 or circuit 1 pressure probe
35 Compressor 2 or circuit 2 pressure probe

After the number 35 the display read-out goes from "**o 1"** to "**c75** that allows to set an analogue input as digital input (see polarity input of digital inputs).

Digital Input Configuration Id1 – Id11

0. Not enabled
1. Remote ON / OFF
2. Remote chiller / heat pump
3. Flow switch/ Supply fan overload
4. Flow switch of heated side
5. Antifreeze heater circuit 1
6. Antifreeze heater circuit 2
7. High pressure switch circuit 1
8. High pressure switch circuit 2
9. Low pressure switch circuit 1
10. Low pressure switch circuit 2
11. Compressor 1 high pressure
12. Compressor 2 high pressure
13. Compressor 3 high pressure
14. Compressor 4 high pressure
15. Not used
16. Not used
17. Compressor 1 overload
18. Compressor 2 overload
19. Compressor 3 overload
20. Compressor 4 overload
21. Not used
22. Condenser fan overload of circuit 1
23. Condenser fan overload of circuit 2
24. Condenser fan overload of circuit 1 and 2 (comun)
25. Water pump overload of evaporator 1
26. Water support pump overload of evaporator
27. Water pump overload of condenser 1
28. Water support pump overload of condenser
29. Recovery request circuit 1
30. Recovery request circuit 2
31. Start/End defrost circuit 1
32. Start/End defrost circuit 2
33. Energy Saving
34. Pressure switch / compressor 1 oil
35. Pressure switch / compressor 2 oil
36. Pressure switch / compressor 3 oil
37. Pressure switch / compressor 4 oil
38. Not used
39. Not used
40. Pump down pressure switch of circuit 1
41. Pump down pressure switch of circuit 2

42. Generic alarm from digital input with stop regulation n° 1
43. Generic alarm from digital input with stop or signal regulation n° 2
44. Operation working mode: by RTC or keyboard
45. Operation mode with supplay fan only
46. Digital input of thermoregulation request (condensing unit)
47. Digital input of cooling request (condensing unit)
48. Digital input of heating request (condensing unit)
49. Request step 2 (condensing unit)
50. Request step 3 (condensing unit)
51. Request step 4 (condensing unit)
52. Request step 5 (condensing unit)
53. Request step 6 (condensing unit)
54. Request step 7 (condensing unit)
55. Request step 8 (condensing unit)
56. Request step 9 (condensing unit)
57. Request step 10 (condensing unit)
58. Request step 11 (condensing unit)
59. Request step 12 (condensing unit)
60. Request step 13 (condensing unit)
61. Request step 14 (condensing unit)
62. Request step 15 (condensing unit)
63. Request step 16 (condensing unit)
64. Sanitary water flow switch
65. Solar panel flow switch
66. Only sanitary water
67. Sanitary water heaters overload
68. Sanitary water pump overload
69. Sanitary water second set point
70. Phase sequence alarm
71. Sanitary water priority
72. Free cooling water pump flow switch
73. Expansion valve 1 alarm
74. Expansion valve 2 alarm

Digital Output (relay) Configuration RL1- RL8

0. Not enabled
1. Alarm
2. Evaporator water pump / Supply fan
3. Support water pump of the evaporator
4. Anti-freeze heater / integration heating / boiler circuit 1
5. Anti-freeze heater / integration heating / boiler circuit 2
6. Water pump of the condenser recovery circuit
7. Support water pump of the condenser recovery circuit
8. 4-way valve for chiller / heat pump inversion of the circuit 1
9. 4-way valve for chiller / heat pump inversion of the circuit 2
10. 1° condenser fan step ON/OFF control of the circuit 1
11. 2° condenser fan step ON/OFF control of the circuit 1
12. 3° condenser fan step ON/OFF control of the circuit 1
13. 4° condenser fan step ON/OFF control of the circuit 1
14. 1° condenser fan step ON/OFF control of the circuit 2
15. 2° condenser fan step ON/OFF control of the circuit 2
16. 3° condenser fan step ON/OFF control of the circuit 2
17. 4° condenser fan step ON/OFF control of the circuit 2
18. Solenoid valve of the pump-down circuit 1
19. Solenoid valve of the pump-down circuit 2
20. Recovery valve circuit 1
21. Recovery valve circuit 2
22. Free cooling ON/OFF valve
23. Auxiliary output circuit 1
24. Auxiliary output circuit 2
25. Solenoid valve Intermittent for screw compressor 1
26. Solenoid valve Intermittent for screw compressor 2

27. Solenoid valve of the liquid injection for compressor 1
28. Solenoid valve of the liquid injection for compressor 2
29. Sanitary valve 1
30. Sanitary valve 2
31. Sanitary heater 1
32. Sanitary heater 2
33. Sanitary heater 3
34. Solar panel water pump
35. Solar panel valve
36. Sanitary water pump
37. Hybrid exchanger 1 circuit 1
38. Hybrid exchanger 2 circuit 1
39. Hybrid exchanger 1 circuit 2
40. Hybrid exchanger 2 circuit 2
41. Cooling/Heating status circuit 1
42. Cooling/Heating status circuit 2
43. Defrost status circuit 1
44. Defrost status circuit 2
45. Status of the regulation circuit 1
46. Status of the regulation circuit 2
47. Domestic hot water status
48. STD-BY/Remote OFF status
49. Solenoid water valve circuit 1
50. Solenoid water valve circuit 2
51. Direct start-up : compressor 1 relay
    PW start: relay PW 1 of the compressor 1
52. PW start: relay PW 2 of the compressor 1
53. Capacity step valve 1 compressor 1
54. Capacity step valve 2 compressor 1
55. Capacity step valve 3 compressor 1
56. By-pass gas valve compressor 1start
57. Direct start: compressor 2 start
    PW start: relay 1 of the compressor 2
58. PW start: relay PW 2 of the compressor 2
59. Capacity step valve 1 compressor 2
60. Capacity step valve 2 compressor 2
61. Capacity step valve 3 compressor 2
62. By-pass gas valve compressor 2 start
63. Direct start: compressor 3 relay
    PW start: relay PW 1 of the compressor3
64. PW start: relay PW 2 of the compressor 3
65. Capacity step valve 1 compressor 3
66. Capacity step valve 2 compressor 3
67. Capacity step valve 3 compressor 3
68. By-pass gas valve compressor 3 start
69. Direct start: compressor 4 relay
    PW start: PW 1 of the compressor 4
70. PW start: relay PW 2 of the compressor 4
71. Capacity step valve 1 of the compressor 4
72. Capacity step valve 2 of the compressor 4
73. Capacity step valve 3 of the compressor 4
74. By-pass gas valve compressor 4 start

Proportional output configuration OUT 1 (0 ÷ 10 Vdc)

0 Not enabled
1 Modulated evaporator water pump
2 Modulated Free cooling valve
3 not used
4 Auxiliary output n° 1
5 Auxiliary output n° 2
6 Proportional output for modulating compressor 1

7 Proportional output for modulating compressor 2
8 Condenser fan circuit 1
9 Condenser fan circuit 2

After selection number 9 it is possible to configure the analog output as digital output with the same meaning of the relays configuration; every analog output can be configured from "**o 1"** to "**c50"** (see relay configuration table).

Proportional output configuration OUT 3 and OUT 4 (0 ÷ 10 Vdc / 4..20Ma / PWM)

0 Not enabled
1 Modulated evaporator water pump
2 Modulated Free cooling valve
3 not used
4 Auxiliary output 0÷10V n° 1
5 Auxiliary output 0÷10V n° 2
6 Proportional output for modulating compressor 1
7 Proportional output for modulating compressor 2
8 Condenser fan circuit 1
9 Condenser fan circuit 2
10 Condenser fan circuit 1
11 Condenser fan circuit 2

After selection number 11 it is possible to configure the analog output as digital output with the same meaning of the relays configuration; every analog output can be configured from "**o 1"** to "**c50"** (see relay configuration table).

12. PROBE SELECTION FOR REGULATION WITH SELECTABLE PROBE

For some regulators it is possible to select the reference probe; in this case select the probe as showed below:

1= Pb1 of Ichill
2= Pb2 of Ichill
3= Pb3 of Ichill
4= Pb4 of Ichill
5= Pb5 of Ichill
6= Pb6 of Ichill
7= probe mounted in remote keyboard 1 (VICX620)
8= probe mounted in remote keyboard 2 (VICX620)
9= Pb1 of I/O expansion module (ICX207D)
10= Pb2 of I/O expansion module (ICX207D)
11= Pb3 of I/O expansion module I/O (ICX207D)
12= Pb4 of I/O expansion module (ICX207D)
13= Pb5 of I/O expansion module (ICX207D)
14= Pb6 of I/O expansion module (ICX207D)
15= Pb7 of I/O expansion module (ICX207D)
16= Pb8 of I/O expansion module (ICX207D)
17= Pb1 of electronic expansion valve 1 (IEV)
18= Pb2 of electronic expansion valve 1 (IEV)
19= Pb3 of electronic expansion valve 1 (IEV)
20= Pb4 of electronic expansion valve 1 (IEV)

13. HOW TO SWITCH ON / SWITCH OFF THE UNIT

SWITCH ON / SWITCH OFF THE ICHILL BY KEYBOARD

Push and release the ❄ key allows to start in chiller mode if CF58 =0, in heat pump if CF58 =1. When the unit is running the corresponding led is on.
INPORTANT: To change from chiller to heat pump and viceversa the unit must be set in stand-by before continuing.
Push and release the ☼ key allows to start in heat pump mode if CF58 =0, in chiller if CF58 =1er. When the unit is running the corresponding led is on.
INPORTANT: To change from chiller to heat pump and viceversa the unit must be set in stand-by before continuing.

STAND- BY (OR UNIT OFF, NOT RUNNING)
The unit is considered in stand by when the leds ❄ and ☼ are both off. The stand-by is reached each time the Chiller or the Heat Pump are turned off. During the stand by the user can:

- Show all the probe measurements
- Detect and reset the alarm events.

SWITCH ON / SWITCH OFF THE ICHILL DIGITAL INPUT

Turn on or off the unit from digital input
If a digital input is configured as remote ON/OFF:

- The digital input overrides the keyboard command.
- The keyboard can run only if the digital input is not active.
- When the digital input is not active the instrument restore its status (had before the digital input activation).

14. SWITCH ON / SWITCH OFF THE CONDENSING UNIT BY DIGITAL INPUT

DIGITAL INPUT CONFIGURED AS REGULATION REQUEST

The machine has to be configured as condensing unit CF03 = 1.

- If the digital input is not active the unit is on stand-by and the display shows **OFF**
- If the digital input is active the unit is on and the display shows **On**

Cooling or heating selection is done by keyboard; the display shows **OnC in cooling and OnH in heating.**
If the machine has more compressors

- by “regulation request” digital input activation, first compressor will start
- other compressors will start when the digital input congigured as” Request step 2 (condensing unit), or Request step 3 (condensing unit), etc. are activated.

With active contact if the unit is being switched off by keyboard it can be switched on by keyboard. If the unit is being switched off by keyboard, in order to switch on the unit from digital input it must be deactivated and activated.

DIGITAL INPUT CONFIGURED AS CHILLER REQUEST

The machine has to be configured as condensing unit CF03 = 1.

- If the digital input is not active the unit is on stand-by and the display shows **OFF**
- If the digital input is active the unit is on in cooling and the display shows **OnC**

With active contact if the unit is being switched off by keyboard it can be switched on by keyboard. If the unit is being switched off by keyboard, in order to switch on the unit from digital input it must be deactivated and activated.

DIGITAL INPUT CONFIGURATED AS HEAT PUMP REQUEST

The machine has to be configured as condensing unit CF03 = 1.

- If the digital input is not active the unit is on stand-by and the display shows **OFF**
- If the digital input is active the unit is on in heating and the display shows **OnH**

With active contact if the unit is being switched off by keyboard it can be switched on by keyboard. If the unit is being switched off by keyboard, in order to switch on the unit from digital input it must be deactivated and activated.

15. CHILLER / HEAT PUMP SELECTION

Select the Chiller or the Heat pump mode

The CF59 parameter allows to select and enable the running mode:
Par. CF59 = 0: Through keyboard
The user can start and stop the unit using the keys of the front panel.

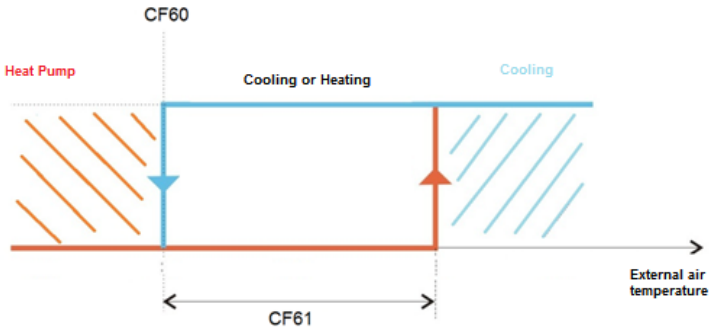
Par. CF59 = 1: Through digital input programmed to start/stop the unit from remote control.

- This selection is enabled if there is one digital input configured as start/stop from remote (remote chiller / heat pump). I non of the digital input are configure the unit remains in **stand–by**.
- The “open” status of the input forces the chiller running mode.
- The “closed” status of the input forces the heat pump running mode.
- The keyboard selection is disabled.
- The key on the front panel can start/stop the unit only with the digital input selection

Par. CF59 =2: Automatic selection of the Chiller - Heat Pump through analogue input
The analogue input selection or change over function overrides the digital input C-HP function. If the external air temperature are within the CF81 differential, the user can change the running mode from the keyboard. If the unit is running with CF79 = 1 or CF79=2, and it is requested a running mode change, the controller turns off all the outputs, starts a fixed delay time signalled by the chiller or heat pump blinking led. This blinking led indicates which running mode will be activated after the compressor delay time protection.

Change Over

CF60 Change over Setpoint. If the analogue input control (from probe) function is enabled, it represents the limit temperature of the probe value under which the unit runs the Heat Pump mode.
CF61 Change over Differential. If the analogue input control (from probe) function is enabled, it represents the limit differential temperature of the probe value to restart in the Chiller mode.
For external air temperature within CF81 the user can manually change the status from keyboard.
GRAPH: AUTOMATIC CHANGE OVER



Keyboard selection

CF58 = 0: pushing ❄ key the unit starts in chiller, pushing ✹ key the unit starts in heat pump

CF58 = 1: pushing ❄ key the unit starts in heat pump, pushing ✹ key the unit starts in chiller

Analog input selection

CF58 = 0 NTC, External air temperature probe > CF60+ CF61 ❄ the unit starts in chiller, NTC, External air temperature probe < CF60 ✹ the unit starts in heat pump.

CF58 = 1 NTC, External air temperature probe > CF60+ CF61 ✹ the unit starts in chiller, NTC, External air temperature probe < CF60 ❄ the unit starts in heat pump.

16. COMPRESSOR REGULATION

CF74	Working mode of the compressor 0 = chiller and heat pump 1 = only chiller 2 = only heat pump	0	2		

It is possible to decide how many compressors are used in chiller, heat pump and sanitary water production.

- parameter CO76: number of compressors to use in chiller
- parameter CO77: number of compressors to use in heat pump
- parameter CO78: number of compressors to use in sanitary water

In case of contemporary production of sanitary water and chiller the number of compressors is defined by sanitary water request.

16.1 Compressor Security Time

- CO01 Minimum ON time of the compressor after switching on
- CO02 Minimum OFF time of the compressor after switching off
- CO91 Minimum time between two switch on of the same compressor

17. CHILLER / HEAT PUMP REGULATION

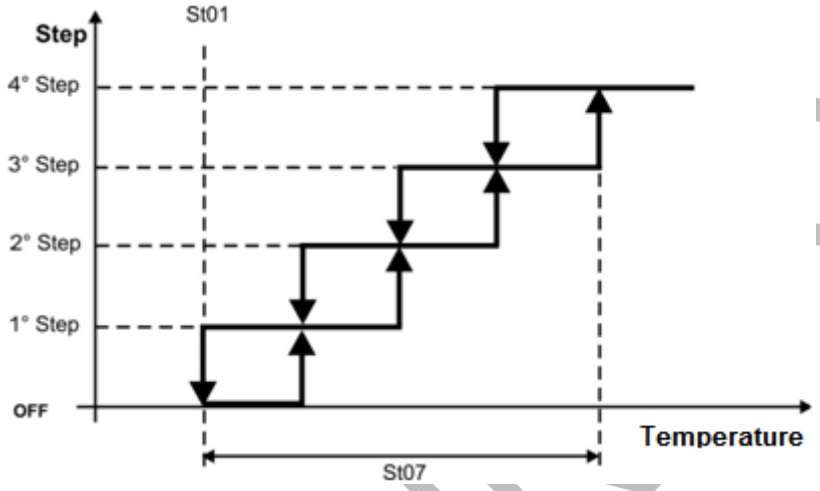
17.1 Parameter Description

Par. **ST01** Chiller Setpoint
It allows to set the chiller working temperature within the range ST02..ST03.
Par. **ST02** Minimum setpoint limit in chiller.
The user cannot program a setpoint value lower than ST02, the range is –30 °C..ST01.
Par. **ST03** Maximum setpoint limit in chiller.
The user cannot program a setpoint value higher than ST02, the range is ST01..70°C.
Par. **ST04** Heat pump setpoint
It allows to set the Heat pump working temperature within the range ST05..ST06.
Par. **ST05** Minimum setpoint limit in heat pump.
The user cannot program a setpoint value lower than ST05, the range is –30 °C..ST04.
Par. **ST06** Maximum setpoint limit in heat pump
The user cannot program a setpoint value higher than ST06, the range is ST01..70°C.
Par. **ST07** Regulation band width in chiller mode.

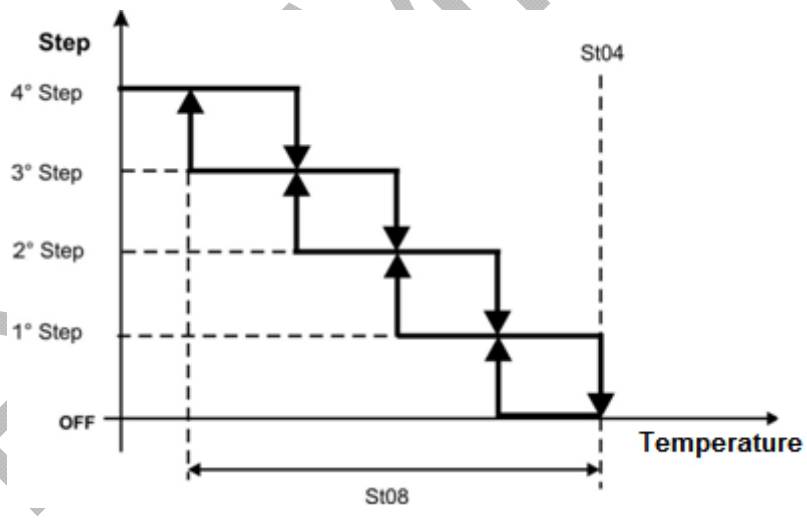
Par. **ST08** Regulation band in heat pump mode
Par. **ST09** Defines the thermoregulation probe in chiller.
Par. **ST10** parameter defines the thermoregulation probe of the unit with heat pump control
Par. **ST11** defines the type of regulation
St11 = 0 Proportional regulation
St11 = 1 Neutral zone regulation

17.2 Proportional Regulation

Cooling regulation

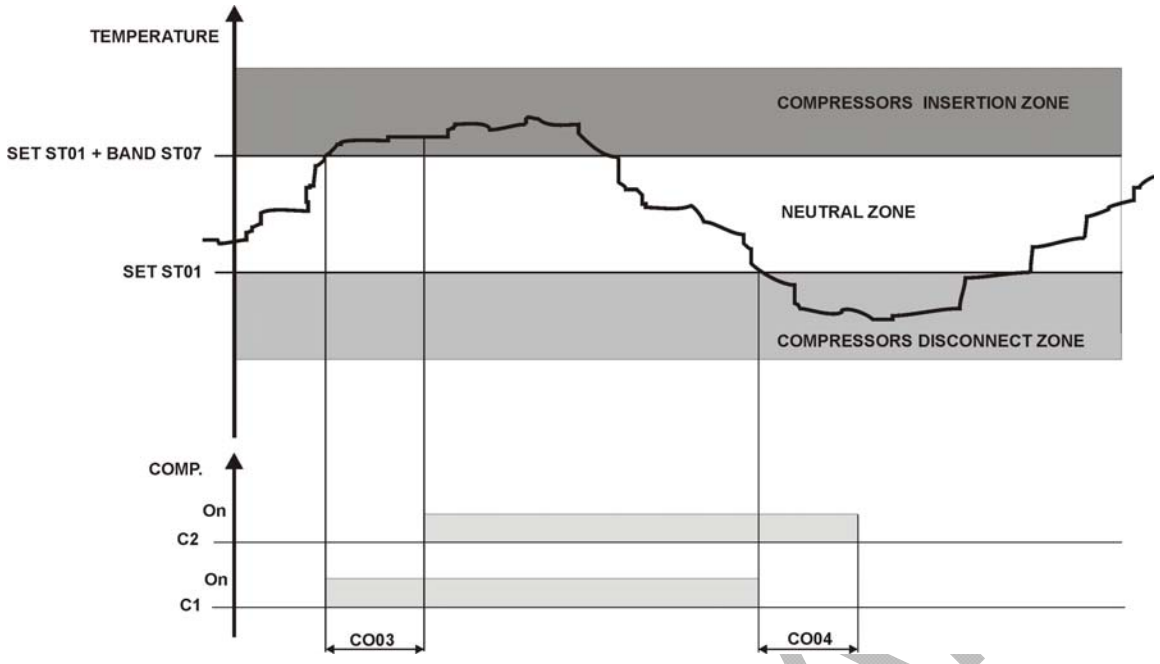


Heating regulation

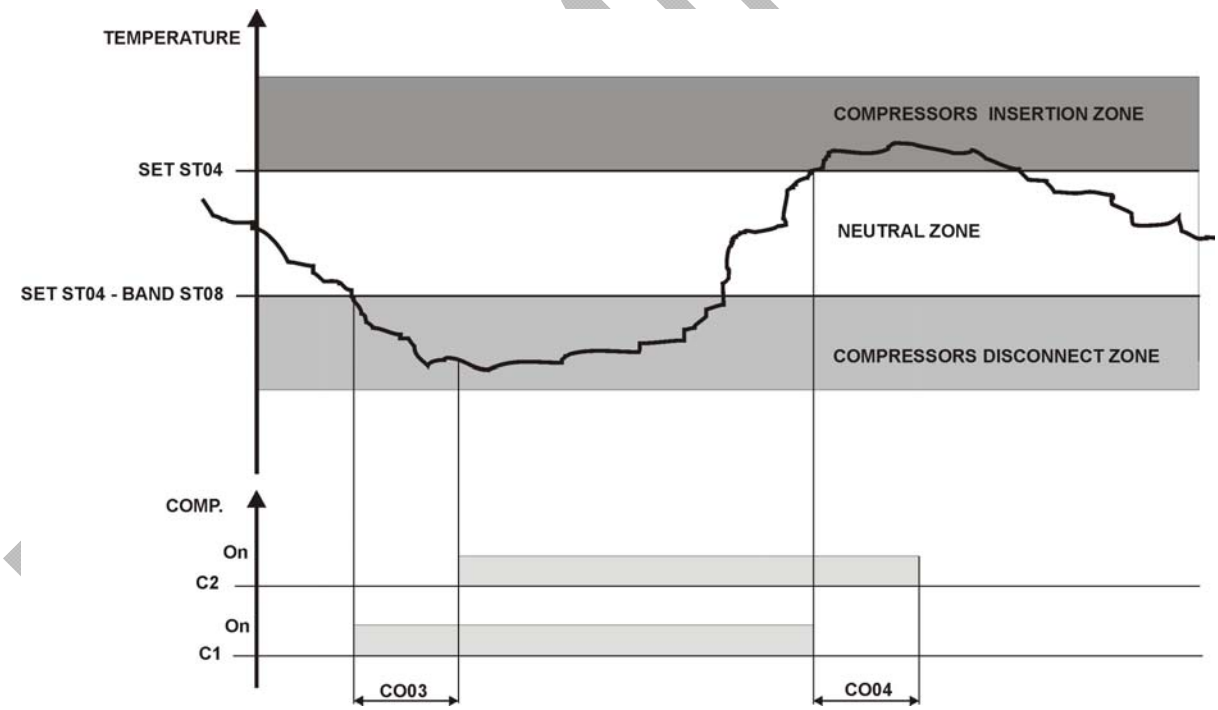


17.3 Neutral Zone Regulation

Compressor regulation in chiller



Compressor regulation in heat pump



Compressor in neutral zone

Par. CO53 Maximum time of work in neutral zone without resource insertion

When the temperature is inside the neutral zone, a timer is activated (parameter CO53); when this time is elapsed, the Ichill switch on all the compressor to avoid an stationary situation.
If the parameter value is 0 the function is non activated.

Par. CO54 Maximum time of work in neutral zone without rotation resource
When the temperature is inside the neutral zone and only one compressor is ON, a timer is activated (parameter CO54); when this time is elapsed, the Ichill switch off the compressor and swith on an available compresso.
If the parameter value is 0 the function is non activated.

18. COMPRESSORS MANAGEMENT

18.1 Compressors Start- Up

The parameter CO10 defines the compressor start-up:
CO10=0 direct
CO10=1 part winding

Direct Start-Up

It is necessary to configure one relay to drive the contactor of the compressor.
EXAMPLE
Direct start up configuration for one compressor

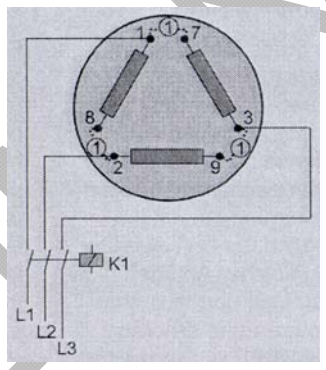


Fig. 1

Part Winding Start-Up

Each compressor needs two relay outputs:

- Part Winding coil 1 of the compressor;
- Part Winding coil 2 of the compressor.

The time delay between coil 1 and coil 2 activation is CO11 (decimal of second, in a range 0..5 seconds).

EXAMPLE
Part Winding configuration of the compressor relay outputs
RL1: set Par CF41 = c39 Part Winding coil 1 the compressor 1;
RL2: set Par CF42 = c40 Part Winding coil 2 of the compressor 1.

Compressor Start- up With Part Winding

First step: the Part winding coil 1 of the compressor 1 (relay K1 of fig2) is switched on
Second step: after the CO11 delay is turned on the Part winding coil 2 of the compressor 1 (relay K2 of fig2).
To turn off the compressor the two relay outputs are both turned off at the same time.

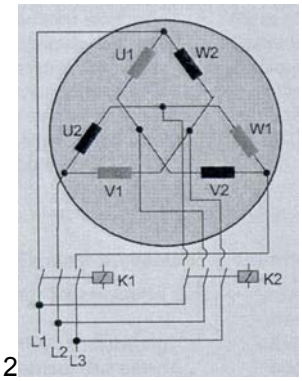


Fig 2

Part Winding start- up of Compressors or capacity compressors
If one or more capacity compressors are configured and the thermoregulation requires the full load start-up: the controller turns the solenoid valve on, after 1 second the first motor part of the 1st compressor (relay K1 of Fig. 2) and then the complete control with the contactor K2. Durning the CO13 time delay the step valve is forced on: minimum power. When the C013 is expired if the thermoregulation requires more power the valve will be switched off (maximum power).

19. COMPRESSORS ROTATION

The **CO14** parameter determines the sequence of compressor activation / deactivation.
CO14= 0 Fixed sequence.
E.g.: 3 compressors configured
Switching on: 1st compressor → 2nd compressor → 3rd compressor → etc.
Switching off: 3rd compressor → 2nd compressor -→ 1st compressor
CO14= 1
Working hour rotation
First compressor to be activated is the compressor with less working hours; next compressor to be activated follows the same rule.
CO14= 2
Sart-up rotation
First compressor to be activated is the compressor with less start-up; next compressor to be activated follows the same rule.

20. CAPACITY STEP CONTROL

CO06 capacity step operation mode.
To select the right operation mode, please read the compressor technical documentation.

- **CO06 = 0 ON/OFF step**

Eg: compressor with 3 capacity step.

Capacity	**25%**	**50%**	**75%**	**100%**
Compr.	Compressor **ON**	Compressor **ON**	Compressor **ON**	Compressor **ON**
Out relay	Cap. step 1 **ON**	Cap. step 1 **OFF**	Cap. step 1 **OFF**	Cap. step 1 **OFF**
Out relay	Cap. step 2 **OFF**	Cap. step 2 **ON**	Cap. step 2 **OFF**	Cap. step 2 **OFF**
Out relay	Cap. step 3 **OFF**	Cap. step 3 **OFF**	Cap. step 3 **ON**	Cap. step 3 **OFF**

Step control process

Compressor	**Cap. step 1**	**Cap. step 2**	**Cap. step 3**

Power

0 %
25 %
50 %
75 %
100 %

- **CO06 = 1 direct action**

Eg: compressor with 3 capacity step.

Capacity	**25%**	**50%**	**75%**	**100%**
Compr.	Compressor **ON**	Compressor **ON**	Compressor **ON**	Compressor **ON**
Out relay	Cap. step 1 **ON**	Cap. step 1 **ON**	Cap. step 1 **ON**	Cap. step 1 **OFF**
Out relay	Cap. step 2 **OFF**	Cap. step 2 **ON**	Cap. step 2 **ON**	Cap. step 2 **OFF**
Out relay	Cap. step 3 **OFF**	Cap. step 3 **OFF**	Cap. step 3 **ON**	Cap. step 3 **OFF**

Direct action with sequential step

Compressor	**Cap. step 1**	**Cap. step 2**	**Cap. step 3**

Power
0 %
25 %
50 %
75 %
100 %

- **CO06 = 2 inverse action**

Eg: compressor with 3 capacity step.

Capacity	**25%**	**50%**	**75%**	**100%**
Compr.	Compressor **ON**	Compressor **ON**	Compressor **ON**	Compressor **ON**
Out relay	Cap. step 1 **ON**	Cap. step 1 **ON**	Cap. step 1 **ON**	Cap. step 1 **OFF**
Out relay	Cap. step 2 **ON**	Cap. step 2 **ON**	Cap. step 2 **OFF**	Cap. step 2 **OFF**
Out relay	Cap. step 3 **ON**	Cap. step 3 **OFF**	Cap. step 3 **OFF**	Cap. step 3 **OFF**

Inverse action with sequential step

Compressor	**Cap. step 1**	**Cap. step 2**	**Cap. step 3**

Power
0 %
25 %
50 %
75 %
100 %

- **CO06 = 3 Continuous steps and direct action**

Eg: compressor with 3 capacity step.

Capacity	**25%**	**50%**	**75%**	**100%**
Compr.	compressor **ON**	compressor **ON**	compressor **ON**	compressor **ON**
Out relay	Cap. step 3 **OFF**	Cap. step 3 **ON**	Cap. step 3 **ON**	Cap. step 3 **ON**
Out relay	Cap. step 2 **OFF**	Cap. step 2 **OFF**	Cap. step 2 **ON**	Cap. step 2 **ON**
Out relay	Cap. step **OFF**	Cap. step **OFF**	Cap. step 1 **OFF**	Cap. step 1 **ON**

Direct action with sequential step

Compressor	Cap. step 1	Cap. step 2	Cap. step 3

Power
0 %
25 %
50 %
75 %
100 %

ATTENTION
When working with capacity control in sequential step in direct or reverse modes: if the power requested is 50% and 75% the unit turn on also the step 25% that must be enabled to make run the other two.

20.1 Minimum Load Start- Up

Par. CO07: configuration of the start-up with minimum load.
This parameter allows to configure the first capacity step operation mode for alternative compressors and screw compressors.
CO07=0
First capacity step is used only to start the compressor at the minimum load; the valve is switched on for CO13 seconds, then it is switche off.

CO07=1
First capacity step is used as lower step of the regulation.

CO07=2 SCREW COMPRESSOR
First capacity step is used only to start the screw compressor at the minimum load; the valve is ON when the compressor is OFF and it remains ON for CO13 seconds after the switching ON of the compressor.

CO07=3 SCREW COMPRESSOR
First capacity step is used as lower step of the regulation; when the compresor is OFF the valve is ON.

20.2 INTERMITTENT SOLENOID VALVE FOR SCREW COMPRESSOR

Some screw compressors have an intermittent solenoid valve; when the compressor is ON, this valve stays CO08 ON and CO09 OFF.

21. COMPRESSOR INVERTER CONTROLLED

The signal 0÷10V is given by one of 4 configurable outputs of the Ichill (OUT1÷OUT4).
The compressor inverter controlled can be used only with proportional regulation (parameter St11=0).
Possible unit configuration:

- 1 circuit: 1 compressor inverter controlled
- 1 circuit: 1 compressor inverter controlled and maximum 2 ON/OFF compressor (managed by relay)
- 2 circuits: 1 compressor inverter controlled per circuit
- 2 circuits: 1 compressor inverter controlled and maximum 2 ON/OFF compressor (managed by relay) per circuit

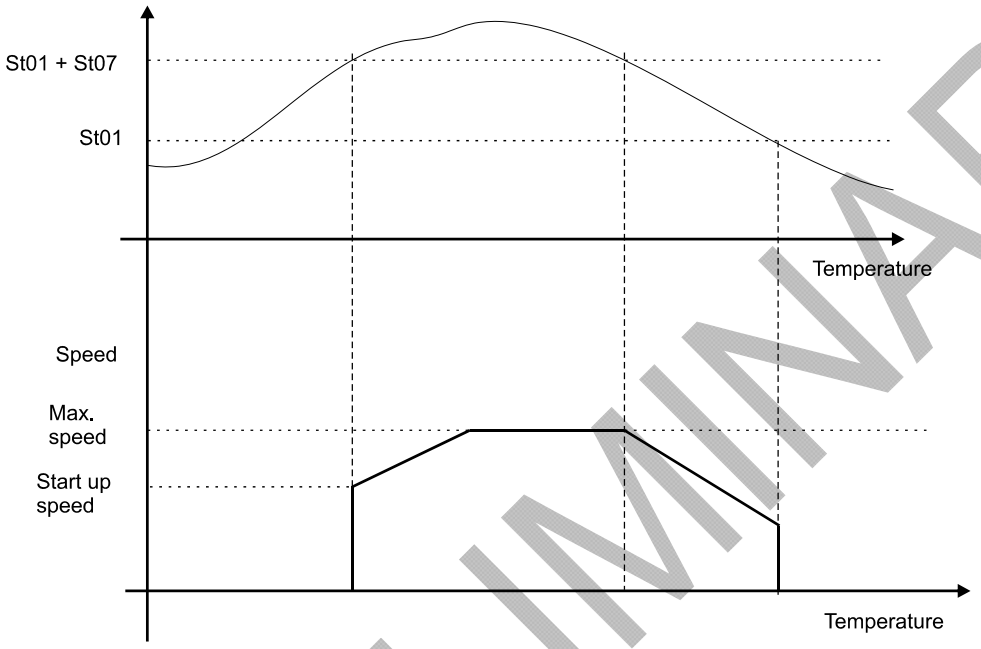
First step to be activated is always the compressor inverter controlled; it will be swiched on when the regulation requests 100% of the compressor power.
To increase / decrease the power the compressor works by step of 1% of the power; every step is delayed by CO62 at the start-up of the compressor and CO71 when the compressor works normally.
When the compressor inverter controlled is activated, it works at power configured by CO61 parameter for CO60 seconds; after that:

- if the parameter CO62=0 the compressor modulates the power according to the regulation request

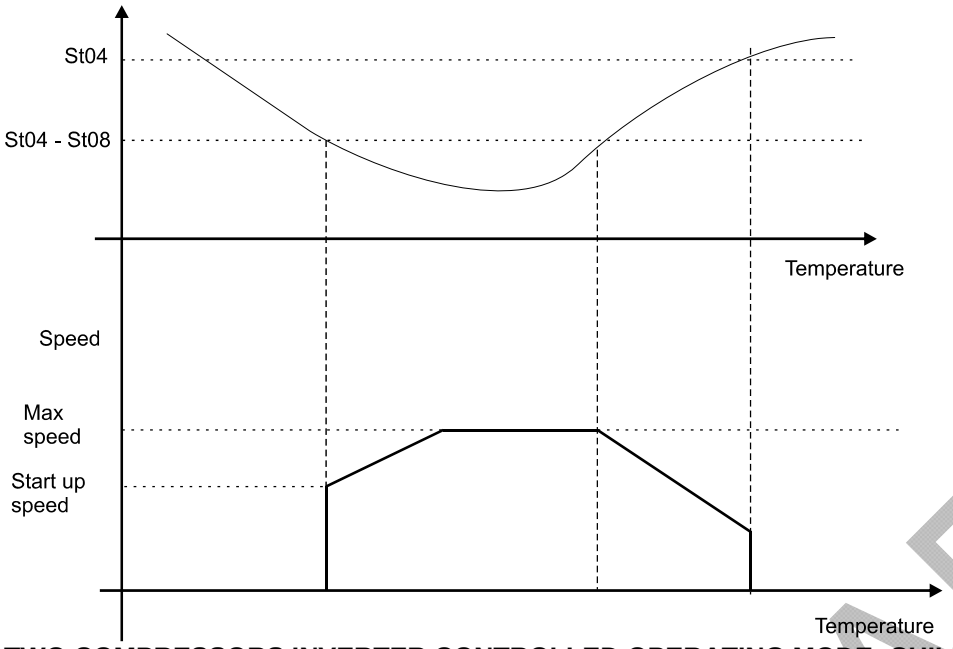
- the parameter CO62≠0 the compressor is forced to works at maximum power and then it modulates the power according to the regulation request

It is possible to limit the output % of the inverter compressor in Chiller, Heat pump and Sanitary hot water:
- o maximum % output inverter in Chiller (parameter CO79)
- o maximum % output inverter in Heat pump (parameter CO80)
- o maximum % output inverter in Sanitary hot water (parameter CO81)

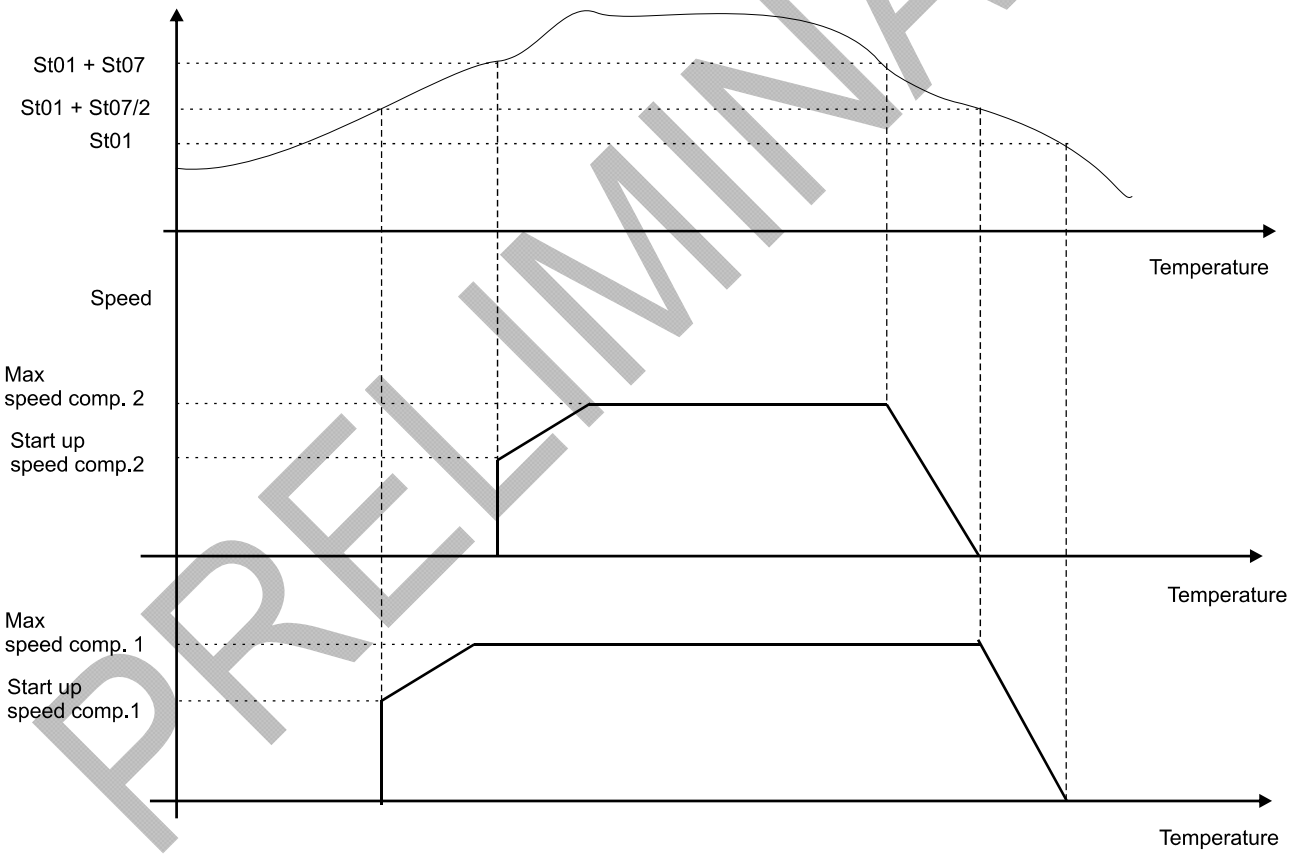
COMPRESSOR INVERTER CONTROLLED OPERATING MODE: CHILLER
At the start up the compressor is forced to work at CO61 speed for CO60 seconds.



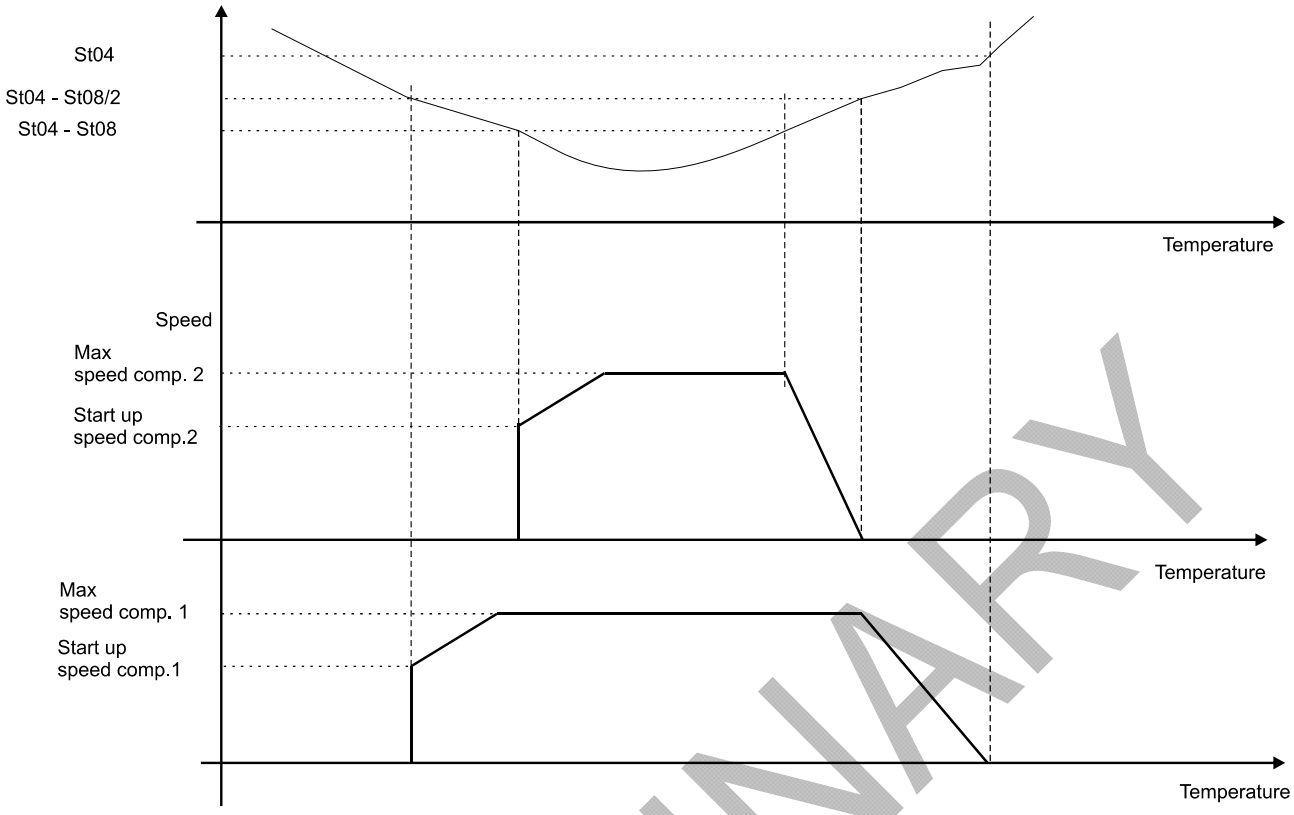
COMPRESSOR INVERTER CONTROLLED OPERATING MODE: HEAT PUMP
At the start up the compressor is forced to work at CO61 speed for CO60 seconds.



TWO COMPRESSORS INVERTER CONTROLLED OPERATING MODE: CHILLER



TWO COMPRESSORS INVERTER CONTROLLED OPERATING MODE: HEAT PUMP



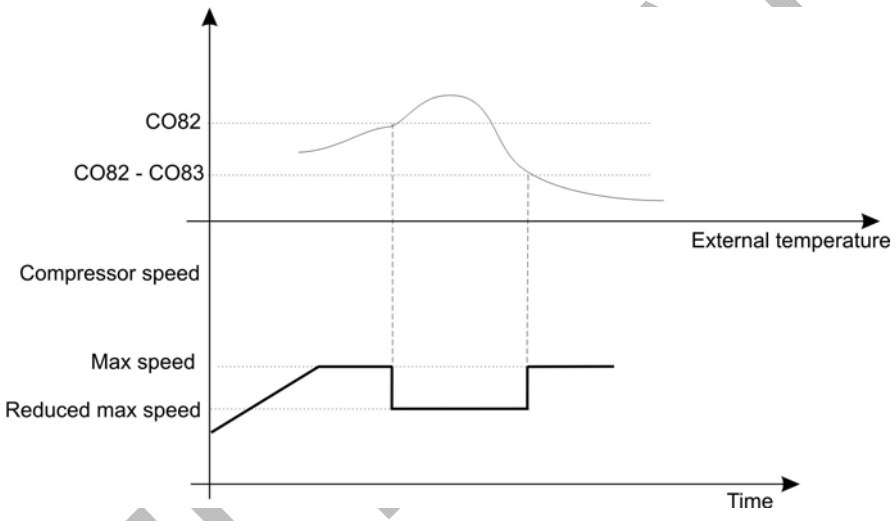
Parameters involved:

CO60	Operation time at CO61 power when the compressor inverter controlled is switched on	0	250	sec	
CO61	Forced power when the compressor inverter controlled is switched on	0	100	%	
CO62	Delay to increase the power during the start up phase of the compressori inverter controlled	1	250	sec	
CO63	Compressor inverter controlled operation power under whitch start counting CO64 time	0	100	%	
CO64	Maximun operation time of the compressor inverter controlled with power less than CO63	0	250	Min	10 Min
CO65	Operating time of the compressor inverter controlled at maximum power	0	250	sec	10sec
CO66	Maximum operating time of the compressor inverter controlled	0	999	Hr	1Hr
CO67	Minimum value of the compressor 1 inverter controlled	0	CO68	%	
CO68	Maximum value of the compressor 1 inverter controlled	CO67	100	%	
CO69	Minimum value of the compressor 2 inverter controlled	0	CO70	%	
CO70	Maximum value of the compressor 2 inverter controlled	CO69	100	%	
CO71	Delay to increase/decrease the power of the compressori inverter controlled	1	250	sec	
...					
CO79	Maximum speed of the inverter compressors in chiller	1	100	%	
CO80	Maximum speed of the inverter compressors in heat pump	1	100	%	

CO81	Maximum speed of the inverter compressors in sanitary water	1	100	%	
CO82	Outside temperature to reduce inverter compressor speed in Heat pump	-50.0 -58 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
CO83	Hysteresis temperature to reduce inverter compressor speed in Heat pump	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO84	Compressor speed if outside temperature > CO82	0	100	%	

21.1 Inverter Compressor In Heat Pump And External Temperature

It is possible to reduce the compressor speed (both compressor in parallel if configured) in heat pump when external temperature increases over a determined temperature.



22. COMPRESSOR RACK

The Ichill can manage a compressor rack:

- the machine must have only one gas circuit
- the machine must work only in cooling mode (machine only chiller)
- the machine has to regulate in proportional mode
- the machine must have max. ON/OFF compressors

The parameter Cr01 allows to enable the compressor rack regulation:
Cr01 = 0 Compressor rack regulation disabled
Cr01 = 1 Compressor rack enabled and regulation on the probe defined by parameter ST09
Cr01 = 2 Compressor rack enabled and regulation on the evaporator trasducer (that has to be configured)

It is possible to choose the number of compressors the controller can use in case of regulation faulty probe; the parameter involved is Cr08.
It is possible to choose the number of condenser fan steps the controller can use in case of faulty probe; the parameter involved is Cr09.

The Energy Saving function, in case of compressor rack unit, has dedicated set point and differential (parameter Cr06 = “Energy saving offset for compressor rack unit”, Cr07 = “Energy saving differential for compressor rack unit”)

23. COMPRESSORS WITH DIFFERENT CAPACITY POWER

The function is enabled if:
- one circuit unit
- at least 2 compressor are configured
- the capacity of the compressors is not 0 and different for each one

Parameters involved:

CF67	Compressor 1 capacity	0	100%
CF68	Compressor 2 capacity	0	100%
CF69	Compressor 3 capacity	0	100%
CF70	Compressor 4 capacity	0	100%
CF73	Maximum number of start up of the compressor in 15 minutes 0= Not enabled	0	15

Example: circuit with 2 compressors:
- step 1: first compressor to be activated is the compressor with lower capacity
- step 2: the compressor is switched off and is activated the compressor with higher capacity
- step 3: both compressors are activated

The regulation is a steps; if two compressors with different weight are configured, 3 steps are available.

24. CIRCUIT MANAGEMENT: SATURATION OR BALANCING

In case of 2 circuits machine it is possible to decide how to balance the circuits:
- **it is possible to switch on all compressors of the circuit before switch on a compressor of the other circuit (saturation)**
- **it is possible to switch on first compressor of a circuit and then the first compressor of the other circuit (balancing)**

CIRCUIT SATURATION
CO15 = 0
If the machine has 2 compressors in the circuit 1 and 2 compressors in the circuit 2, the sequence of activation is:
1st compressor circuit 1→ 2nd compressor circuit 1 → 1st compressor circuit 2→ 2nd compressor circuit 2

CIRCUIT BALANCING
CO15 = 1
If the machine has 2 compressors in the circuit 1 and 2 compressors in the circuit 2, the sequence of activation is:
1st compressor circuit 1→ 1st compressor circuit 2 → 2nd compressor circuit 2→ 2nd compressor circuit 2

25. PUMP DOWN

PUMP DOWN with low pressure switch or pump down pressure switch

CO36 = 1 Pump down enabled during the switching off (low pressure switch or pump down switch)
Before turning off the last compressor, the solenoid valve is closed; the compressor works until the pressure switch is activated or after a maximum time CO39; in this case an alarm is displayed (b1PH or b2PH) but the machine continuous to work as normal condition.
If the alarm occurs more than AL21 times per hour, the Ichill generate a manual alarm.

Low pressure alarm (when the low pressure switch is used) is disabled for AL02 time after valve activation (AL02=0 the alarm is disabled when the compressor is OFF).
When first compressor of the circuit is switched on, the solenoid valve is switched on 1 seconds before it.

CO36 = 2 Pump down enabled during the switching off and switching on (low pressure switch or pump down switch)
Compressor switching off:
before turning off the last compressor, the solenoid valve is closed; the compressor works until the pressure switch is activated or after a maximum time CO39; in this case an alarm is displayed (b1PH or b2PH) but the machine continuous to work as normal.
If the alarm occurs more than AL21 times per hour, the Ichill generate a manual alarm.
Low pressure alarm (when the low pressure switch is used) is disabled for AL02 time after valve activation (AL02=0 the alarm is disabled when the compressor is OFF).
Compressor switching on:
when first compressor of the circuit is switched on, the solenoid valve is switched on 1 seconds before it.
If the pump down pressure switch remains active, the compressors does not restart and after CO39 time a pump-down alarm is displayed.
The parameter AL23 allows to choose if the pump down alarm (during the switching on) is automatic or manual reset:

- AL23 =0 automatic reset; the compressor will rester when the pump down pressure switch is active
- AL23=1 manual reset; if the number of pump down alarm per hour is lower than AL22 the reset is automatic, manual reset; if the number of pump down alarm per hour is higher than AL22 the reset is manual

PAR. CO36 = 3 Pump down enabled during the switching off only in chiller mode (low pressure switch or pump down switch)
The pump douwn procedure works as CO36=1 but only in chiller mode; in heat pump mode the solenoid valve is activated when the first compressor is ON and de-activated when the last compressor is OFF.

PAR. CO36 = 4 Pump down enabled during the switching off and switching on inly in chiller mode (low pressure switch or pump down switch)
The pump douwn procedure works as CO36=2 but only in chiller mode; in heat pump mode the solenoid valve is activated when the first compressor is ON and de-activated when the last compressor is OFF.

PUMP DOWN with low pressure probe

CO36 = 1 Pump down enabled during the switching off (low pressure probe)
Before turning off the last compressor, the solenoid valve is closed; the compressor works until the pressure falls below CO37 or after a maximum time CO39; in this case an alarm is displayed (b1PH or b2PH) but the machine continuous to work as normal.
If the alarm occurs more than AL21 times per hour, the Ichill generate a manual alarm.
Low pressure alarm (when the low pressure switch is used) is disabled for AL02 time after valve activation (AL02=0 the alarm is disabled when the compressor is OFF).
When the first compressor of the circuit is switched on, the solenoid valve is switched on 1 seconds before it.

CO35 = 2 Pump down enabled during the switching off and switching on (low pressure probe)
Before turning off the last compressor, the solenoid valve is closed; the compressor works until the pressure falls below CO37 or after a maximum time CO39; in this case an alarm is displayed (b1PH or b2PH) but the machine continuous to work as normal.
If the alarm occurs more than AL21 times per hour, the Ichill generate a manual alarm.
Low pressure alarm (when the low pressure switch is used) is disabled for AL02 time after valve activation (AL02=0 the alarm is disabled when the compressor is OFF).
When the first compressor of the circuit is switched on, the solenoid valve is switched on 1 seconds before it and the compressor is switched on if the pressure is higher than CO37 + CO38.
If the pressure remains lower than CO37 + CO38 the compressors does not restart and after CO39 time a pump-down alarm is displayed.
The parameter AL23 allows to choose if the pump down alarm (during the switching on) is automatic or manual reset:

- AL23 =0 automatic reset; the compressor will rester when the pump down pressure switch is active

- AL23=1 manual reset; if the number of pump down alarm per hour is lower than AL22 the reset is automatic, manual reset; if the number of pump down alarm per hour is higher than AL22 the reset is manual

CO36 = 3 Pump down enabled during the switching off only in chiller mode(low pressure probe)
The pump douwn procedure works as CO36=1 but only in chiller mode; in heat pump mode the solenoid valve is activated when the first compressor is ON and de-.activated when the last compressor is OFF.

CO36 = 4 Pump down enabled during the switching off and switching on only in chiller mode (low pressure probe)
The pump douwn procedure works as CO36=1 but only in chiller mode; in heat pump mode the solenoid valve is activated when the first compressor is ON and de-.activated when the last compressor is OFF.

ATTENTION
If the pump down function is enabled, during the unit start-up from digital input as pump down pressure switch and also from analogue input as low pressure transducer, the compressor will restart only if both the inputs are satisfied.

Pump Down by TIME

The pump down can be enabled also by time; in this case the compressor is activated after CO58 from solenoid valve switching on and de-activated after CO59 from solenoid valve switching off.

CO 58	Maximum time for the activation of the pump-down during the switching off CO58 = 0 Not enabled	0	250	Sec	
CO 59	Maximum time for the activation of the pump-down during the switching on CO59 = 0 Not enabled	0	250	Sec	

26. UNLOADING

26.1 High Temperature Of The Evaporator Water Inlet

It is possible to use this function if there are at least 2 steps of power (two compressor or 1 compressor with partialization) for every circuit or with inverter compressor.

UNLOADING ACTIVATION
When the evaporator water inlet temperature is higher than CO40 for CO42 time, the unit works with the number of compressors selected in CO49 parameter or CO96 speed in case of inverter compressor.

EXAMPLE
2 circuits and 3 compressors per circuit
6 compressors are running; if CO49 = 2 in case of unloading 2 compressors are switched off and 4 continuous to work.

UNLOAD DE-ACTIVATION
When the evaporator water inlet temperature falls below CO40-CO41 the unloading function is disabled and all compressor are available to work.

Unloading Information
If the evaporator water inlet temperature remains between CO40 and CO40-CO41, after CO43 time the unloading function is deactivated.

26.2 Condenser High Pressure, Condenser High Temperature Or Evaporator Low Pressure

UNLOADING ACTIVATION IN CHILLER MODE
When the condenser pressure or temperature is higher than CO44 the unit works with the number of compressors selected in CO49 parameter or CO96 speed in case of inverter compressor.
If the compressor is a screw compressor the unloading function works at least CO50 time; if CO50 = 0 this function is disabled.

EXAMPLE
2 circuits and 3 compressors per circuit
6 compressors are running; if CO49 = 2 in case of unloading 2 compressors are switched off and 4 continuous to work.

UNLOADING DE-ACTIVATION IN CHILLER MODE
When the condenser pressure or condenser temperature falls below CO44-CO45 the unloading function is disabled and all compressor are available to work.

Other information about the Unloading in chiller
If the condenser pressure or condenser temperature remains between CO44 and CO44-CO45, after CO48 time the unloading function is deactivated.

UNLOADING IN HEAT PUMP MODE
The reference probe for this function is the evaporator probe; if any evaporator probe is configured, the function uses the condenser probe.
When the evaporator/condenser pressure is lower than CO46 the unit works with the number of compressors selected in CO49 parameter or CO96 speed in case of inverter compressor.
If the compressor is a screw compressor the unloading function works at least CO50 time; if CO50 = 0 this function is disabled.

EXAMPLE
2 circuits and 3 compressors per circuit
6 compressors are running; if CO49 = 2 in case of unloading 2 compressors are switched off and 4 continuous to work.

UNLOADING DE-ACTIVATION in HEAT PUMP MODE
When the evaporator probe (orcondenser pressure or condenser temperature) increase over CO46+CO47 the unloading function is disabled and all compressor are available to work.

Other information about the Unloading in Heat Pump
If the evaporator probe (or condenser pressure or condenser temperature) remains between CO46 and CO46+CO47, after CO48 time the unloading function is deactivated.

26.3 Low Temperature Of The Evaporator Water Outlet

ACTIVATION
The lower value between the inlet evaporator probe, common outlet evaporator probe or outlet probe for the circuit, enables the unloading function.
When the value of one of the probes above decrease under the set point CO55 the unloading function is activated; the number of active compressors/step is determined by the CO49 parameter or CO96 speed in case of inverter compressor.
The display shows the label **b1EU – b2EU** alternated to a default visualization.

DE-ACTIVATION

Unloading function is disabled when the temperature of all the probes configured rise over CO55 + CO56 or when the CO57 time is elapsed.

27. SOLENOID VALVE FOR LIQUID INJECTION

It is possible to configure 2 valves for the liquid injection of the screw compressor (compressor 1 and compressor 2).
When the **compressor is off** the solenoid valve **is always OFF**. When the compressor is on:

- if the temperature detected by the probe mounted in the compressor increases over CO51 setpoint, the valve is switched on
- if the temperature detected by the probe mounted in the compressor decreases under C51-CO52 the valve is switched off.

28. EVAPORATOR WATER PUMP / SUPPLY FAN (AIR/AIR UNIT)

Water pump / supply fan operation mode:

CO16=0: Not enabled: water pump/supply fan is not managed.
Attention: The air / air unit configured with CO16= 0 does not manage the output for integration heaters.

CO16 = 1: Continuous control
The water pump / supply fan is ON only if the unit is running (chiller or heat pump).
When the Ichill is switched on in chiller or heat pump, the water pump is immediately activated and the first compressor is switched on after CO17 delay.
When the Ichill is in STD-BY or remote OFF the water pump is OFF (with a delay if CO18>0).
The parameter Ar09 allows to set the status of the water pump in case of antifreeze if the Ichill is in stand-by.

CO16 = 2: on compressor demand
The water pump / supply fan is ON only if at least a compressor is ON; in case of compressor activation, the water pump is switched on CO17 before the compressor.
When the last compressor is switched off, the water pump / supply fan is switched off after CO18 delay from compressor.
When the unit is in stand-by or remote off and the Ar09 =1, if the regulation requires the antifreeze heaters also the water pump is turned on.

The pump is always off when:

- Remote OFF from digital input.
- Water pump overload.
- Evaporator flow switch alarm if MANUAL reset.

During the defrost and when the compressor is off in dripping time the water pump/supply fan is on.

28.1 Evaporator Pump Group

It is possible to configure two evaporator water pumps; the water pump to be activated is the pump with less working hours.
When a water pump works continuosly for CO19 time, the other one is switched on and after CO20 second the first one is switched off.
If a water pump overload occurs, the water pump is switched off and the other one is switched on.

Note: During the defrost and when the compressor is off in dripping time, the pump is on.

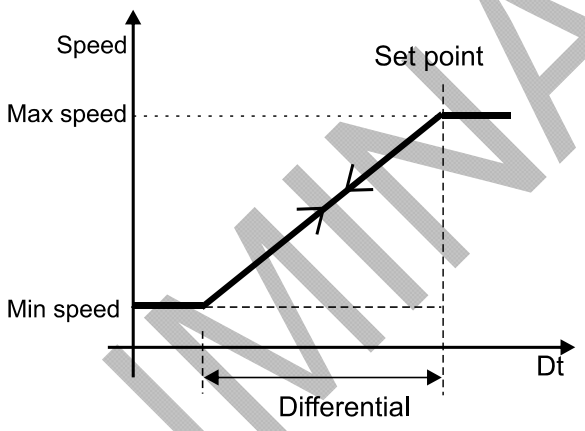
28.2 Modulating Evaporator Water Pump

To enable the modulating evaporator water pump is necessary to configure an analog output as “Modulated evaporator water pump” (see analog and digital output configuration) .
The modulating evaporator water pump is enabled in cooling, heating and sanitary hot water production; if the machine is in STD-BY or OFF the water pump is OFF.

The water pump works according the Dt between two probes, which can be choosen both in summer an winter mode, among those configured in the instrument (Pb1, Pb2,…).
If the state of the water pump is tied to the state of the compressor, when last compressor is switched off the water pump is forced to run at US60 speed for CO18 minutes, then it is switched off.
If the state of the water pump is not tied to the state of the compressor, when last compressor is switched off the water pump is forced to run at US60 speed.

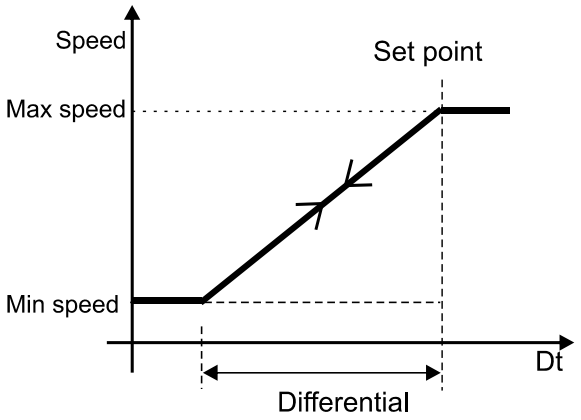
The regulation is done as showed below.

Chiller and chiller + sanitary hot water (machine with valves OUt1 and OUT2 in the gas circuit)



Parameter	Description	min	max	udm	
US 47	Probe 1 selection for evaporator water pump modulation in chiller	0	10		
US 48	Probe 2 selection for evaporator water pump modulation in chiller	0	10		
US 49	Set point for maximum speed of modulationg evaporator water pump in chiller	30.0 -58 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 50	Proportional band for maximum speed of modulationg evaporator water pump in chiller	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 51	Minimum speed of the evaporator water pump in chiller	0	100	%	
US 52	Maximum speed of the evaporator water pump in chiller	0	100	%	

Heat pump and domestic hot water



Parameter	Description	min	max	udm	
US 53	Probe 1 selection for evaporator water pump modulation in Heat Pump	0	10		
US 54	Probe 2 selection for evaporator water pump modulation in Heat Pump	0	10		
US 55	Set point for maximum speed of modulationg evaporator water pump in Heat Pump	30.0 -58 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 56	Proportional band for maximum speed of modulationg evaporator water pump in Heat Pump	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 57	Minimum speed of the evaporator water pump in Heat Pump	0	100	%	
US 58	Maximum speed of the evaporator water pump in Heat Pump	0	100	%	

29. WATER PUMP OF CONDENSER SIDE

Condenser Water pump control

Water pump operation mode:

CO21=0: Not enabled: water pump is not managed.

CO21 = 1: Continuous control
The water pump is ON only if the unit is running (chiller or heat pump).
When the Ichill is switched on in chiller or heat pump, the water pump is immediately activated and the first compressor is switched on after CO17 delay.
When the Ichill is in STD-BY or remote OFF the water pump is OFF (with a delay if CO23>0).
The parameter Ar09 allows to set the status of the water pump in case of antifreeze if the Ichill is in stand-by.

CO21 = 2: on compressor demand
The water pump is ON only if at least a compressor is ON; in case of compressor activation, the water pump is switched on CO17 before the compressor.
When the last compressor is switched off, the water pump is switched off after CO23 delay from compressor.
When the unit is in stand-by or remote off and the Ar09 =1, if the regulation requires the antifreeze heaters also the water pump is turned on.

The pump is always off when:
- Remote OFF from digital input.
- Water pump overload.
- Condenser flow switch alarm if MANUAL reset.

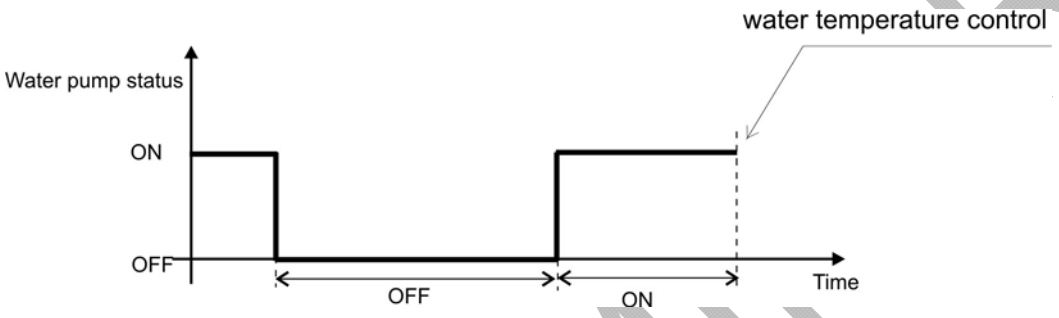
During the defrost and when the compressor is off in dripping time the water pump/supply fan is on.

29.1 Condenser Pump Group

It is possible to configure two condenser water pumps; the water pump to be activated is the pump with less working hours.
When a water pump works continuosly for CO24 time, the other one is switched on and after CO25 second the first one is switched off.
If a water pump overload occurs, the water pump is switched off and the other one is switched on.

30. CYCLIC OPERATION OF THE WATER PUMPS

If the water pump is OFF (reached set point), is possible to enable it to run to detect the right water temperature.
At the end of the ON time, the controller verify if is necessary to switch on the compressor/s or not; if is not necessary, the water pump is switched OFF for CO85 time and then switched on for another CO87 ON cycle.

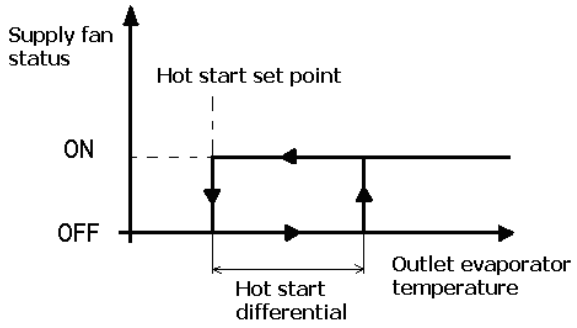


Parameters	Description	min	max	unit of measure
CO 85	Evaporator water pump OFF time if the set point is reached	0	250	10 min
CO 86	Evaporator water pump OFF time if the machine is STD-BY or OFF	0	250	10 hour
CO 87	Evaporator water pump ON time	0	250	10 Sec
CO 88	Condenser water pump OFF time if the set point is reached	0	250	10 min
CO 89	Condenser water pump OFF time if the machine is STD-BY or OFF	0	250	10 hour
CO 90	Condenser water pump ON time	0	250	10 Sec

31. HOT START

In the air air unit and in heating mode it is possible to stop the supply fan when the outlet evaporator temperature falls below FA24 degrees.

FA24 Hot start Setpoint
FA25 Hot start differential



32. LOAD MAINTENANCE

It is possible to define for each load (compressors and water pumps) the number of working hours after witch the display will show a maintenance warning.

Parameters **CO26..CO29:** number of working hour of the compressors
Parameters **CO32..CO33:** number of working hour of the evaporator water pump
Parameters **CO34..CO35:** number of working hour of the condenser water pump
Parameters **CO73:** number of working hour of the sanitary water pump
Parameters **CO74:** number of working hour of the solar panel water pump
Parameters **CO95:** number of working hour of the free cooling water pump

If the parameter is set to 0, the maintenance signalling is disabled but the running hours counter remains active.

33. CONDENSER FAN REGULATION

The signal to drive the modulating condenser fan is available in the Out 1...Out 4analog outputs:

- OUT 1 and OUT 2 are 0..10V
- OUT 3 and OUT 4 are 0..10V or PWM selectable by parameter CF49

FA01 and **FA02** parameters define the operative mode of the condenser fans.
Par. **FA01** Fan regulation
0 = Output not enabled
1 = Always on
2 = ON/OFF step regulation
3 = ON/OFF continuous step regulation
4 = proportional fan speed
Par. **FA02** Condenser fan operation mode
0 = Fan on only if compressor on
1 = Independent from the compressor and off during the stand–by / or from remote OFF

Example:
Par. **FA01 = 1** / Par. **FA02 = 0**
Fans on when the compressor on (the fans work following the same output algorithm)

Par. **FA01 = 1** / Par. **FA02 = 1**
Independent from the compressor status but off in stand–by.

Par. **FA01 = 2** / Par. **FA02 = 0**
Fans on, with ON/OFF regulation and with temperature/pressure transducer control, only when the compressor is on (at least one relay is configured as fan control). When the compressor turns off also the fans are forced off.

Par. **FA01 = 2** / Par. **FA02 = 1**

Fans on, with ON/OFF regulation and with temperature/pressure transducer control, only when the compressor is on (at least one relay is configured as fan control). When the compressor turns off the fans are thermoregulated depending on the condensing temperature/pressure.

Par. **FA01 = 3** / Par. **FA02 = 0**
Fans on, with ON/OFF continuos regulation and with temperature/pressure transducer control, only when the compressor is on (at least one relay is configured as fan control). When the compressor turns off also the fans are forced off.

Par. **FA01 = 3** / Par. **FA02 = 1**
Fans on, with ON/OFF continuos regulation and with temperature/pressure transducer control, only when the compressor is on (at least one relay is configured as fan control). When the compressor turns off the fans are thermoregulated depending on the condensing temperature/pressure.

Par. **FA01 = 4** / Par. **FA02 = 0**
Fans on, with proportional regulation (PWM, 4..20mA, 0.10V) and with temperature/pressure transducer control, only when the compressor is on. When the compressor turns off also the fans are forced off.

Par. **FA01 = 4** / Par. **FA02 = 2**
Fans on in proportional regulation (PWM, 4..20mA or 0..10V) according to condenser temperature/pressure (only when the compressor is on).
When the compressor turns off the fans are thermoregulated depending on the condensing temperature/pressure.

33.1 Output Step Rele' Condenser Fan

Par FA01 = 2 ON/OFF step regulation

E.G.: 1 circuit and 4 step of ventilation

OUT relè	step n° 1	step n° 2	step n° 3	step n° 4
Out relè step n° 1	ON	OFF	OFF	OFF
Out relè step n° 2	OFF	ON	OFF	OFF
Out relè step n° 3	OFF	OFF	ON	OFF
Out relè step n° 4	OFF	OFF	OFF	ON

Par FA01 = 3 ON/OFF continuous step regulation

E.G.: 1 circuit and 4 step of ventilation

Continuous step regulation

OUT relè	Gradino n° 1	Gradino n° 2	Gradino n° 3	Gradino n° 4
Out relè step n° 1	ON	ON	ON	ON
Out relè step n° 2	OFF	ON	ON	ON
Out relè step n° 3	OFF	OFF	ON	ON
Out relè step n° 4	OFF	OFF	OFF	ON

33.2 PWM Output For Fan Control

When the condenser fan is switched on it works at maximum speed for FA03 time, then it modulate according to condenser pressure/temperature or evaporator pressure (heat pump mode).
FA04 parameter allows to adapt the signal to the motor (current-voltage phase displacement of a line-powered ac load).
If FA01=3, when the compressor starts-up and the proportional regulation requires to turn off the fan (cut-off), if FA14>0 the fan is forced at the minimum speed for the time set in FA14 itself (if FA14=0 the function is disabled).

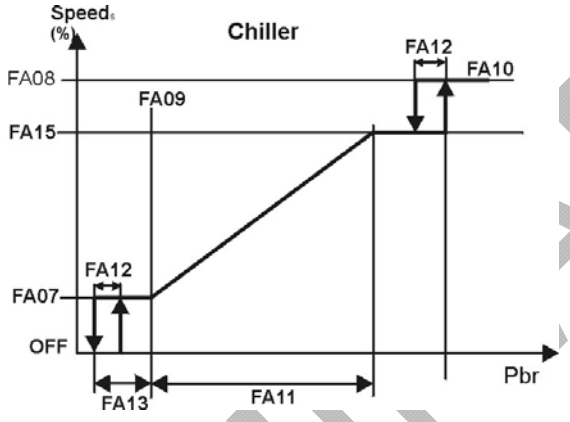
33.3 Condensing Unit: Common Or Separate Condenser

FA05 defines the condenser unit
Par. **FA05** type of condenser
FA05=0 Common condenser unit (only one common fan but a probe for each condenser is needed)
FA05=1 Separate condenser units (one fan and one probe for circuit are needed)
If FA05= 0 the condenser fan of the circuit 1 and circuit 2 works in parallel:

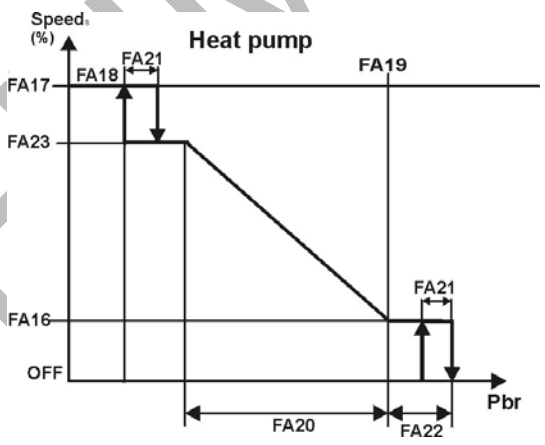
- **CHILLER mode:** the regulation probe is the probe that has the higher value
- **HEAT PUMP mode:** the regulation probe is the probe that has the lower value

33.4 Proportional Regulation Of Condenser Fans

Condenser fan in Chiller mode.

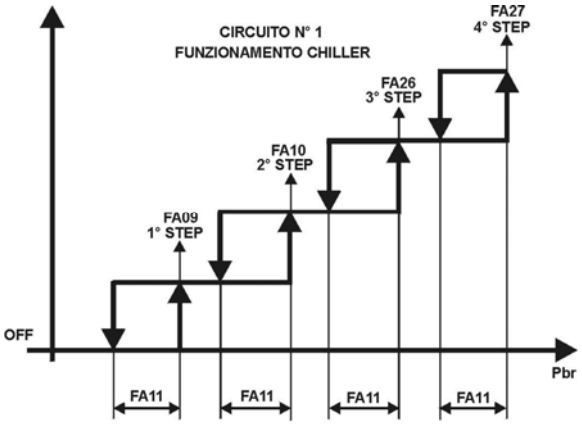


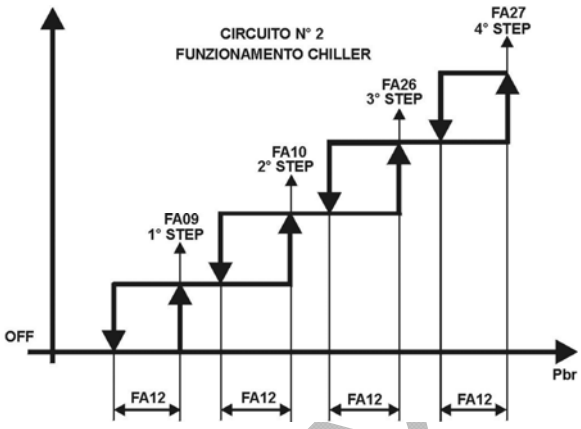
Condenser fan in Heat pump mode.



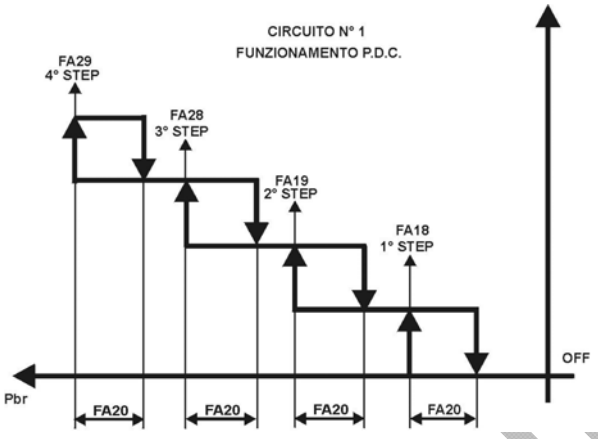
33.5 On/Off Regulation Of Condenser Fans

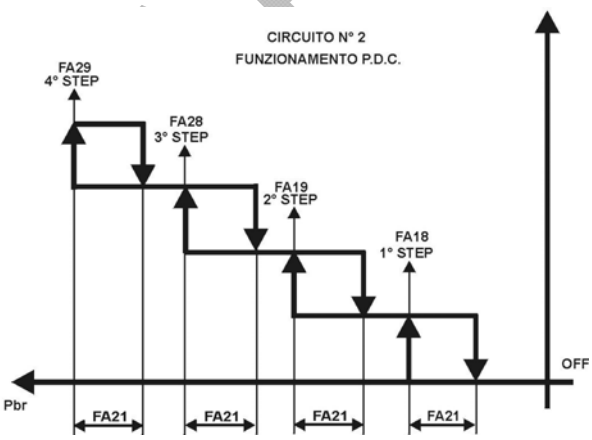
Condenser fan in Chiller mode.





Condenser fan in Heat pump mode.





33.6 Pre-Ventilation And Post-Ventilation

Pre-ventilation:
in chiller and heat pump mode when first compressor is swtiched on if FA06>0 and/or FA30>0 the fan runs at maximum speed for FA06 and/or FA30.
Post-ventilation:
in heat pump mode if FA31>0 and outside temperature > FA32, when last compressor is switched off the condenser fan (if on at that moment) is forced at FA33 speed for FA31 seconds (outside temperature probe is required).

34. ANTI FREEZE HEATERS, INTEGRATION HEATING OR BOILER

Regulation of the heaters in chiller

Par. Ar06 selects the probe/s control for the anti-freeze relay outputs configured as anti-freeze / support / boiler heaters for the circuits 1 and 2 in chiller mode.
Par. **Ar06 = 0**: the function is disabled
Par. **Ar06 = 1**: function enabled; the regulation probe is evaporator water inlet.
Par. **Ar06 = 2**: function enabled; the regulation probe are evaporator water outlet circuit 1 and evaporator water outlet circuit 2.
ATTENTION: It is not possible to control the heaters of the circuit #1 with the probe of the circuit #2 and viceversa.
Par. **Ar06 = 3**: function enabled; the regulation probe are evaporator water outlet circuit 1, evaporator water outlet circuit 2 or evaporator common probe.
Par. **Ar06 = 4**: function enabled; the regulation probe is outside temperature.

Regulation of the heaters in heat pump

The **Par. Ar07** selects the probe/s control for the anti-freeze alarm and the relay outputs configured as anti-freeze / support / boiler heaters for the circuits 1 and 2 in heat pump mode.
Par. **Ar07 = 0:** the function is disabled
Par. **Ar07 = 1:** function enabled; the regulation probe is evaporator water inlet.
Par. **Ar07 = 2**: function enabled; the regulation probe are evaporator water outlet circuit 1 and evaporator water outlet circuit 2.
ATTENTION: It is not possible to control the heaters of the circuit #1 with the probe of the circuit #2 and viceversa.

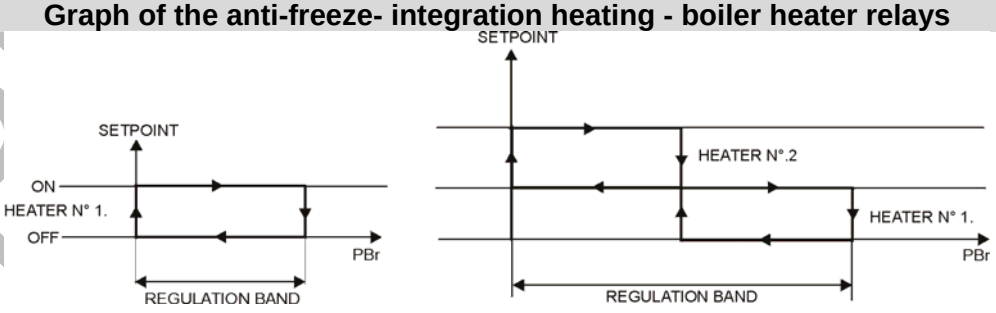
Par. **Ar07 = 3:** function enabled; the regulation probe are evaporator water outlet circuit 1, evaporator water outlet circuit 2 or evaporator common probe.
Par. **Ar07 = 4**: function enabled; the regulation probe is outside temperature.

ANTI-FREEZE HEATERS, INTEGRATION HEATING, BOILER HEATERS DURING THE DEFROST CYCLE
The **Ar05** parameter allows to choose the operation mode of the heaters during the defrost:
Par. **Ar05 = 0:** The heaters are activated according the regulation request.
Par. **Ar05 = 1:** The heaters are activated only by the regulation request and are always on during the defrost. The heaters are switched on when the 4-way valve change from heat-pump to chiller and switched off only after the dripping time and the compressors restart.

Condenser Anti-freeze heaters regulation

The parameter Ar08 allows to select the heaters probe control in chiller and heat pump mode.
Par. **Ar08 = 0:** the function is disabled.
Par. **Ar08 = 1:** function enabled; the regulation probe is condenser water inlet.
Par. **Ar08 = 2:** function enabled; the regulation probe are condenser water inlet circuit 1, condenser water inlet circuit 2 and condenser water common inlet.
ATTENTION: It is not possible to control the heaters of the circuit #1 with the probe of the circuit #2 and viceversa.
Par. **Ar08 = 3**: function enabled; the regulation probe are evaporator water outlet circuit 1, evaporator water outlet circuit 2
Par. **Ar08 = 4**: function enabled; the regulation probe are evaporator water outlet circuit 1, evaporator water outlet circuit 2 and condenser common outlet.
ATTENTION
When the outputs are configured as heaters circuit #1 and 2 they are both controlled by the NTC probe of the common condenser outlet.

Graph of the anti-freeze- integration heating - boiler heater relays



Boiler function

The function is enabled when:
- One probe is configured as outside temperature.
- Parameter Ar11 > 0.

Ar11=1 Boiler in integration mode

When outside temperature decreases under the Ar12 setpoint, the Ar14 delay starts counting. If during the Ar14 counting the external air increases above the Ar12 + Ar13 (differential) the function is aborted and the Ar14 time is reloaded.
When the time Ar14 is elapsed and the external air temperature is still under the Ar12 setpoint, if the water temperature detected by the evaporator probe is lower than Ar15 in chiller mode or Ar17 in heat pump mode, the heaters are turned on.
When the temperature rises over Ar15 + Ar16 in chiller mode or Ar17+Ar18 in heat pump the heaters are turned off.
If the heaters are on, when the outside temperature increases over Ar12 + Ar13, they are turned off and the Ar14 delay is reloaded.
Attention
If outside temperature falls blow Ar19 setpoint, the compressors are switched off; they can restart if the outside temperature increase over Ar19+Ar20.

Heating control Ar11=2
When outside temperature decreases under the Ar12 setpoint, the Ar14 delay starts counting.
If during this delay the outside temperature increase over the Ar12+Ar13 the process is aborted and the time Ar14 reloaded.
When the time Ar14 is elapsed and the external air temperature is still under the Ar12 setpoint, if the water temperature detected by the evaporator probe is lower than Ar15 in chiller mode or Ar17 in heat pump mode, the heaters are turned on and the compressor(s) and the condensing fan(s) are turned off. The heating is made only by the heaters.
When outside temperature increase over Ar15+Ar16 or Ar15 + Ar17 the heaters are turned off.
If the outside temperature increase over Ar12 +Ar13, the heaters are turned off, the compressor regulation restarts, the Ar14 delay is reloaded.

BOILER HEATERS DURING the DEFROST CYCLE
The Ar05 parameters defines the tatus of the heaters during the defrost:
Ar05=0 Heaters activated accordingb the regulation
Ar05=1 The heaters are switched on when the 4-way valve changes the status from heat pump to chiller and switched off after the dripping time at the end of the defrost.

ATTENTION
The heaters of the boiler are always off in case of:
- flow switch alarm
- water pump overload alarm

35. ENERGY SAVING

35.1 Energy Saving Activation By Digital Input

The energy saving is activated when one digital input is configured as energy saving is active.
If the energy saving is active, the Vset icon is on.
The real value of the set point is showed pressing the SET key.
When the Energy Saving function is activated the chiller set point and heat pump are modified as follow:
- Set point chiller = St1 ± ES14
- Chiller differential = ES15
- Set point heat pump = St4 ± ES16
- Heat pump differential = ES17

35.2 Energy Saving Time Table With Rtc

This function can be used only if the Ichill has the real time clock on board (optional) and allows to set three events per day.

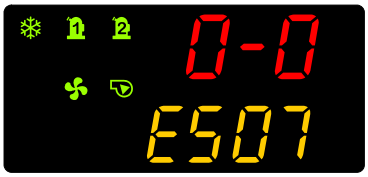
If the energy saving is active, the € icon is on.

The real value of the set point is showed pressing the SET key.
When the Energy Saving function is activated the chiller set point and heat pump are modified as follow:

- Set point chiller = St1 ± ES14
- Chiller differential = ES15
- Set point heat pump = St4 ± ES16
- Heat pump differential = ES17

How to program the Energy saving and how to Switch on / Switch off the Ichill by RTC

Enter the parameter programming:
1. Select the ES parameter family.
2. Select the parameters ES07 (Monday)…ES13 (Sunday).

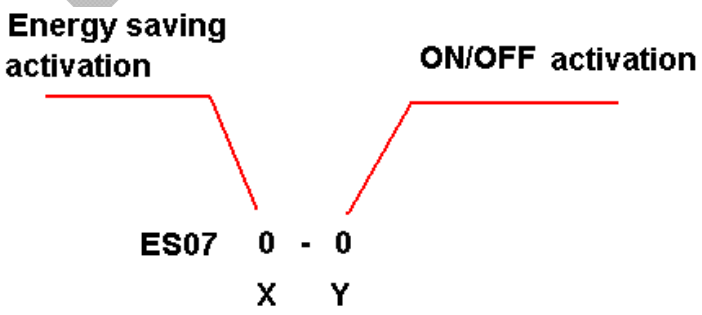


Configuration table Energy saving or unit ON/OFF activation with rtc programming

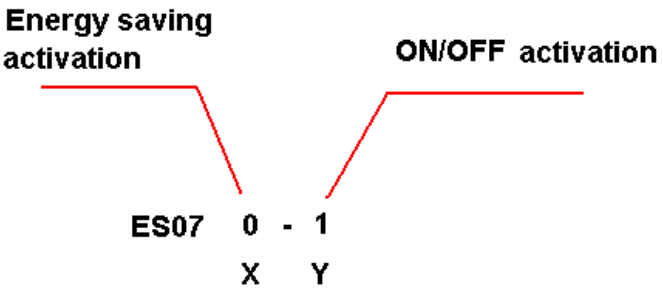
Par. ES07 – ES13	0= Function disabled 1= 1st period enabled 2= 2nd period enabled 3= 1st and 2nd periods enabled 4= 3rd period enabled 5= 1st and 3rd periods enabled 6= 2nd and 3rd periods enabled 7= 1st, 2nd and 3rd periods enabled
Energy saving or unit ON/OFF with RTC and **X Y**	where: **X** with range 0..7 represents the energy saving where: **Y** with range 0..7 represents the unit on/off

Example of a daily programming:
Monday
Enter parameter programming:
1. In the ES parameter family, select the parameter ES07, the top display shows 0 - 0
2. Push SET key and using UP or DOWN keys set the right value:
3. Push SET to confirm.

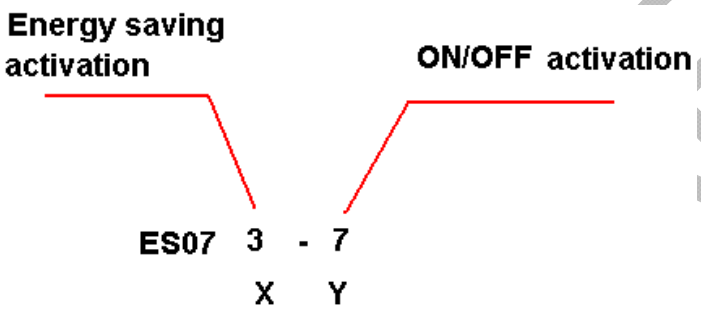
MONDAY
X = 0 - Y= 0: energy saving and automatic on/off are both disabled



MONDAY
X = 0 - Y= 1: the energy saving is disabled, the automatic on is enabled in time band 1



MONDAY
X = 3 - Y= 7: the energy saving is enabled in time band 1 and time band 2, the automatic on is enabled in time band 1, time band 2 and time band 3.



WEEKLY PROGRAMMING

Repeat the daily programming for the other days of the week using parameters ES08..ES13.

How to switch on the controller when it is off by real time clock

When the unit is in OFF by RTC and the parameter ES18 > 0, if the user switch on the controller by keyboard the unit stay on for ES18 time; when this time is elapsed the unit return to OFF.

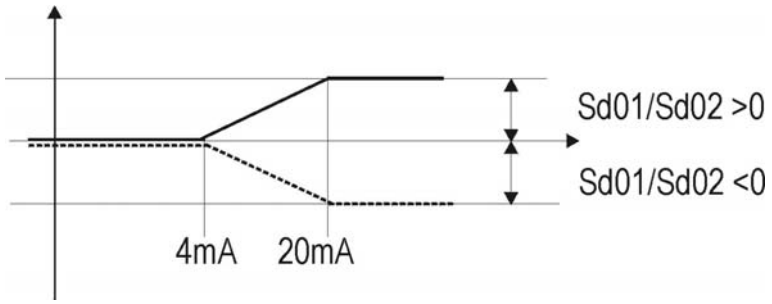
36. DYNAMIC SETPOINT

This function allows to modify the set point according to outside temperature or a 4..20mA analog input.
This function is enabled if:

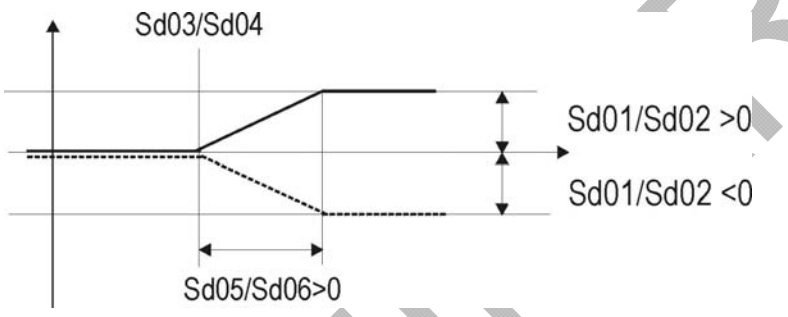
- In chiller mode the parameter Sd01 is not equal to 0.
- In heat pump mode the parameter Sd02 is not equal to 0.
- A analog input is configured as 4÷20mA for dynamic setpoint control or outside temperature

Dynamic setpoint diagram

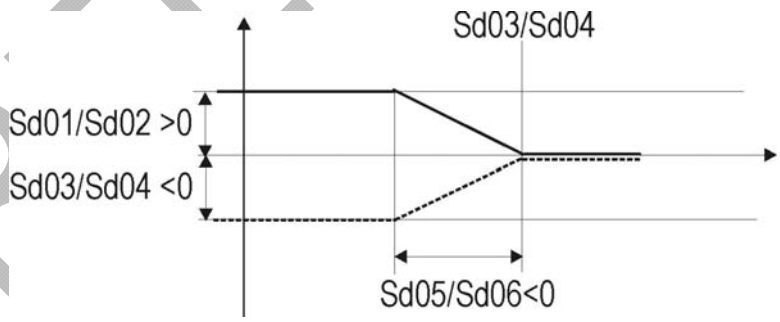
Analog input configured as 4..20mA for dynamic setpoint:



Analog input configured as outside temperature and positive differential:



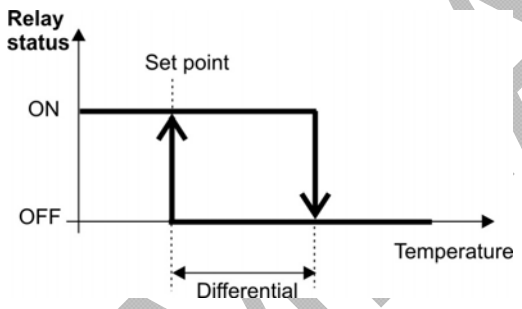
Analog input configured as outside temperature and negative differential:



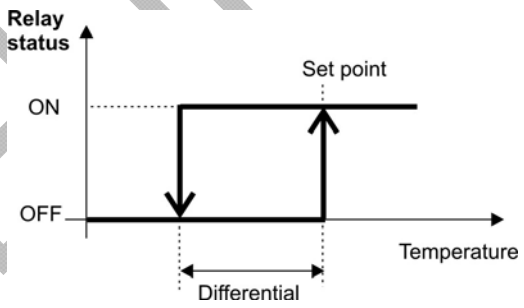
37. AUXILIARY RELAYS

Par. **uS01** configuration auxiliary relay 1
Par. **uS05** configuration auxiliary relay 2
0 = Not enabled
1 = Function enabled, direct action, also if the Ichill is in stand-by or remote off.
2 = Function enabled, direct action, only if the Ichill is on in chiller or heat pump (not in stand-by or remote off)
3 = Function enabled, inverse action, also if the Ichill is in stand-by or remote off
4 = Function enabled, inverse action, only if the Ichill is on in chiller or heat pump (not in stand-by or remote off).
To configure the regulation of the auxiliary relay, please refer to uS parameters.

Auxiliary relay with direct action



Auxiliary relay with inverse action



US 1	Auxiliary relay 1 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 2	Analog input configuration for auxiliary relay 1 control. Allows to select which probe value Pb1..Pb10 controls the relay	1	10		
US 3	Auxiliary relay 1 summer minimum set point	-30.0 -22 0.0 0	US5	°C °F Bar Psi	Dec int Dec int
US 4	Auxiliary relay 1 summer maximum set point	US5	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 5	Auxiliary relay 1 summer set point	US3	US4	°C °F Bar Psi	Dec int Dec int

US 6	Auxiliary relay 1 winter minimum set point	-30.0 -22 0.0 0	US8	°C °F Bar Psi	Dec int Dec int
US 7	Auxiliary relay 1 winter maximum set point	US8	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 8	Auxiliary relay 1 winter set point	US6	US7	°C °F Bar Psi	Dec int Dec int
US 9	Auxiliary relay 1 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 10	Auxiliary relay 1 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 11	Auxiliary relay 2 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 12	Analogue input configuration for auxiliary relay 2 control . Allows to select which probe value Pb1..Pb10 controls the relay	1	10		
US 13	Auxiliary relay 2 summer minimum set point	-30.0 -22 0.0 0	US15	°C °F Bar Psi	Dec int Dec int
US 14	Auxiliary relay 2 summer maximum set point	US15	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 15	Auxiliary relay 2 summer set point	US13	US14	°C °F Bar Psi	Dec int Dec int
US 16	Auxiliary relay 2 winter minimum set point	-30.0 -22 0.0 0	US18	°C °F Bar Psi	Dec int Dec int
US 17	Auxiliary relay 2 winter maximum set point	US18	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 18	Auxiliary relay 2 winter set point	US16	US17	°C °F Bar Psi	Dec int Dec int
US 19	Auxiliary relay 2 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 20	Auxiliary relay 2 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 21	Maximum operating time of auxiliary realys	0	250	min	
...					
US 61	AUX 1 relay operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
US 62	AUX 2 relay operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		

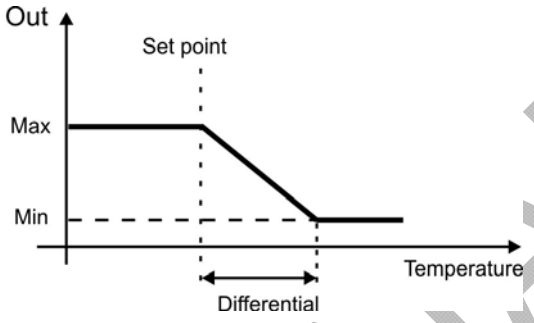
38. AUXILIARY PROPORTIONAL OUTPUTS

The outputs OUT 3 .. OUT 6 can be configured as proportional output.
Each output is managed with a dedicated temperature or pressure probe; the parameters involved in the probe selection are uS23 for the output 1 and uS35 for the output 2.
The function is enabled when the parameter uS22>0 for the output 1 and the parameter uS34>0 for the output 2 and at least one output is configured as auxiliary output.
Par. **uS22** configuration auxiliary output 1

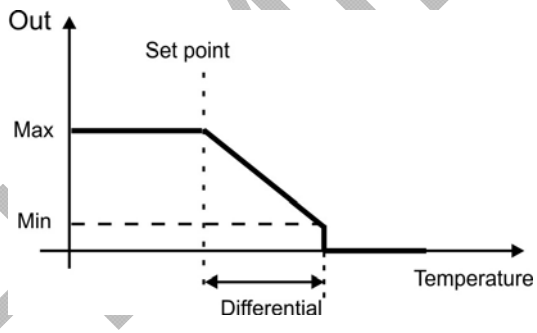
Par. **uS34** configuration auxiliary output 2
Value and function
0 = Not enabled
1 = Function enabled, direct action, enabled also in stand-by and remote off
2 = Function enabled, direct action, enabled only if the Ichill is working in chiller or heat pump
3 = Function enabled, inverse action, enabled also in stand-by and remote off
4 = Function enabled, inverse action, enabled only if the Ichill is working in chiller or heat pump

Auxiliary Proportional output: Direct action

US46=0

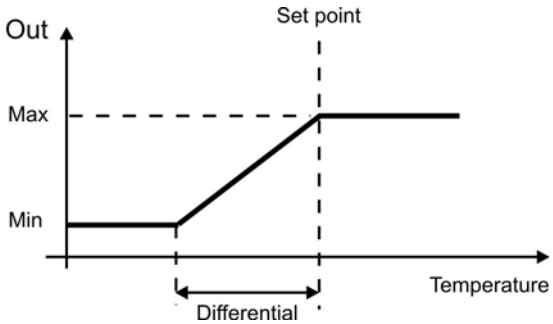


US46=1

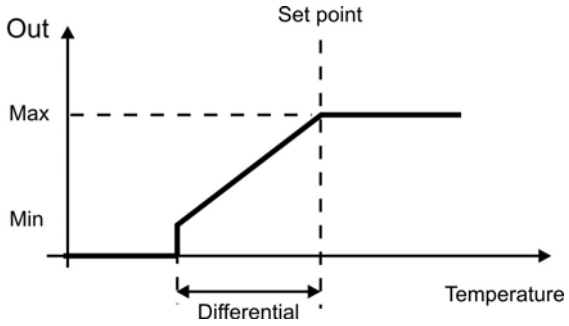


Auxiliary Proportional output: Inverse action

US46=0



US46=1



US 22	Auxiliary proportional output n° 1 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 23	Analogue input configuration for auxiliary control 1 Allows to select which probe value Pb1..Pb10 controls output	1	10		
US 24	Analog output 1 summer minimum set point	-30.0 -22 0.0 0	US26	°C °F Bar Psi	Dec int Dec int
US 25	Analog output 1 summer maximum set point	US26	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 26	Analog output 1 summer set point	US24	US25	°C °F Bar Psi	Dec int Dec int
US 27	Analog output 1 winter minimum set point	-30.0 -22 0.0 0	US29	°C °F Bar Psi	Dec int Dec int
US 28	Analog output 1 winter maximum set point	US29	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 29	Analog output 1 winter set point	US27	US28	°C °F Bar Psi	Dec int Dec int
US 30	Analog output 1 summer differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 31	Analog output 1 winter differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 32	Analog output 1 minimum value	0	US33	%	
US 33	Analog output 1 maximum value	US32	100	%	
US 34	Auxiliary proportional output n° 2 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 35	Analogue input configuration for auxiliary 2 control Allows to select which probe value Pb1..Pb10 controls output	1	10		

US 36	Analog output 2 summer minimum set point	-30.0 -22 0.0 0	US38	°C °F Bar Psi	Dec int Dec int
US 37	Analog output 2 summer maximum set point	US38	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 38	Analog output 2 summer set point	US36	US37	°C °F Bar Psi	Dec int Dec int
US 39	Analog output 2 winter minimum set point	-30.0 -22 0.0 0	US41	°C °F Bar Psi	Dec int Dec int
US 40	Analog output 2 winter maximum set point	US41	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 41	Analog output 2 winter set point	US39	US40	°C °F Bar Psi	Dec int Dec int
US 42	Analog output 2 summer differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 43	Analog output 2 winter differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 44	Analog output 2 minimum value	0	US45	%	
US 45	Analog output 2 maximum value	US44	100	%	
US 46	Operation mode under minimum value	0	1		
...					
US 63	AUX 1 analog output operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
US 64	AUX 2 analog output operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		

39. DEFROST CYCLE

The following condition are mandatory to enable the defrost:
- The Ichill has to be configured as Heat pump unit
- DF01>0 (defrost enabled)

dF01 Defrost configuration:
0= Not enabled
1= Start and stop for temperature / pressure
2= Start depends on probe selected by par. dF24 and stop for time duration (dF05)
3= Start depends on probe selected by par. dF24 and stop for external contact
4= Defrost only with condenser fan
5= Start from digital input and stop on probe selected by par. dF24

39.1 Automatic Defrost Procedure

Phase 1

When the condenser temperature/pressure or evaporating pressure falls below dF02 and at least one compressor is ON, the delay between two defrost dF09 starts counting.

The display of the keyboard shows the symbol ❄ blinkking.

dF09 counter is reloaded in case of power down, after a defrost cycle, when the Ichill change the operation mode (from heat pump to chiller) or when the Ichill is in STD-BY or remote OFF.

dF09 counter is stopped if the last compressor of the circuit is turned off or if the pressure-temperature of the condensing-evaporating probe increase over dF02.

Phase 2

When dF09 counter is elapsed the defrost procedure starts.

If one digital input is configured as “end defrost” is active, the unit waits until the contact is de-activated.

If one probe is configured as combined defrost:

- If the combined defrost probe of the 1st circuit is lower than dF10 and/or the combined defrost probe of the circuit 2 is lower than dF12, the process proceeds to phase 3.
- If the combined defrost probe of the 1st circuit is higher than dF10 and/or the combined defrost probe of the circuit 2 is higher than dF12, the process doesn’t proceed to phase 3

Phase 3

If dF07=0 the reversiong valve is activated without stopping any conmpressor and the defrost cycle is immediately activated.

If df07>0:

1. Compressors are turned off
2. After dF07 / 2 the reversing valve is activated;
3. After dF07 / 2 the compressor is activated; if dF14=1 and / or dF15=1 all the compressor are activated (with a delay of dF16).

Phase 4

Defrost ON

Condenser fan management:

- If dF17=0: condenser fan are always off;
- If dF17=1: condenser fans start if the condensing temperature-pressure value is higher than dF18 and the regulation is the standard chiller regulation.

ATTENTION

The condenser fan is controlled by the condensing probe even if the evaporator probe is present and configured.

The phase 4 lasts at least dF04 time; phase 4 ends:

1. If dF01=1:
   - the combined probe is higher than dF11 of the 1st circuit;
   - the combined probe is higher than dF13 of the 2nd circuit;
   - when the condensing temperature/pressure is higher than dF03
2. If dF401=2: when dF05 counter is elapsed
3. If dF01=3: when the digital input configured as end defrost is deactivated

PHASE 5

If dF08 = 0 the reversing valve is switched without stopping the compressors and the defrost ends.

If dF08 > 0:

1. All the compressors are switched off
2. After dF08 / 2 reversing valve is de-activated
3. After dF08 / 2 the heat pump regulation can restart

39.2 Other Information About The Defrost

If the unit is configured with one condenser FA05=0, the defrost of the two circuits starts at the same time.

ATTENTION

Before starting the 3rd phase, the dF06 counting, time delay between two circuits defrost, must be expired.

If the defrost ends because of the dF05 counting (Maximum defrost time) and the dF02 configuration or with the end defrost contact, the bottom display will show, alternated with the normal measurement value, the label **b1dF** (circuit #1) or **b2dF** (circuit #2) labels to indicate the defrost end alarms.

39.3 Forced Defrost

The function is enabled if the parameter dF19>0. It allows to make a forced defrost cycle even if the dF09 timeout counting is not expired, when the condensing/evaporating temperature/pressure is lower than dF20 setpoint for the dF19 time counting.
If during the dF19 time counting the condensing/evaporating temperature/pressure rises above the value dF20+dF21 (set+differential) the function is disabled and the tF19 time is reloaded.

ATTENTION: the forced defrost is not related to the dF09 /dF06 delay times, therefore the forced defrost cycle, if condition are OK, is immediately executed.

39.4 Combined Defrost

The function is enabled if one of the digital input is configured as NTC temperature for combined defrost of the 1st or 2nd circuit. This probe detects the external air temperature of the condenser (evaporator in heat pump) and its temperature value determines the start and the stop of the defrost cycle.
Description:
The defrost count-down starts when the temperature/pressure of the probe, configured as condensing/evaporating circuit 1 or 2 probe, is lower than dF02 parameter.
After the dF09 counting the instruments checks the temperature probe value (configured as combined defrost circuit 1 or 2) and if it is lower than dF10 (temperature setpoint to start the defrost of the circuit 1) or dF12 (temperature setpoint to start the defrost of the circuit 2) the defrost cycle starts, otherwise the unit still runs in heat pump mode.
When the temperature decreases under the dF10 or dF12 values the defrost immediately start.
The defrost ends when the NTC combined defrost probe 1 or 2 increases over dF11 (circuit1) or dF13 (circuit2).

39.5 Manual Defrost

The manual defrost key function is enabled if the unit is on with at least one compressor running.
The defrost start temperature/pressure of the controlled probe must be lower than dF02 setpoint value while if the combined defrost is active the detected temperature must be lower than dF10 or dF12.
At this point by pushing ❄ key in the “Defrost status of the circuit” visualization, the defrost starts.

ATTENTION: the manual defrost is not related to the dF09 /dF06 delay times, therefore the forced defrost cycle, if condition are OK, is immediately executed for both circuits.

39.6 Defrost In Unit With Two Circuits

39.6.1 Start defrost in unit with common condenser

Parameter involved: dF22
0= Independent
1= Only if both circuit conditions are satisfied
2= At least one circuit condition is satisfied

39.6.2 End defrost in unit with two condenser

Parameter involved: dF23
0= Independent
1= Both circuits have reached the conditions to stop the defrost
2= At least one circuit has reached the end defrost condition

Common condensation: possibile configuration

Parametri	dF23=0	dF23=1	dF23=2
dF22=0	not possible (ACF1)	not possible (ACF1)	not possible (ACF1)
dF22=1	not possible (ACF1)	YES	YES
dF22=2	not possible (ACF1)	YES	not possible (ACF1)

Separate condensation: possibile configuration

Parameter	dF23=0	dF23=1	dF23=2
dF22=0	YES	not possible (ACF1)	not possible (ACF1)
dF22=1	YES	YES	YES
dF22=2	not possible (ACF1)	YES	not possible (ACF1)

ATTENTION:
The configuration error ACF1 is displayed if the parameter value of dF22 and dF23 is not permitted.
For only one condensing unit the dF22 and dF23 values must be not equal to 0.

39.7 Defrost With Condenser Fan Procedure

DEFROST WITH CONDENSER FANS
If dF01 = 4 defrost is activated only through the condenser fans.
If the temperature detected by the probe configured as external air temperature > dF26, instead of reverse the cycle, the compressor is stopped and is activated the condenser fan.
The defrost ends:

- If the combined defrost is ON, for temperature or max time
- If only NTC probes are configured, for temperature or max time
- If only pressure probes are configured, for max time

ATTENTION:
also if the defrost through condenser fan is activated, if the external temperature < dF26, the defrost is through hot gas (compressor ON).

If dF17 = 2 during dripping time (dF08 if different from 0) the ventilation is forced for the time set on dF08 only if the temperature detected by the probe configured as external temperature is > of the Par. dF26 value.
ATTENTION:
With defrost with only ventilation enabled the forced defrost is always with hot gas.

39.8 Defrost Parameter Description

ATTENTION IT IS NOT POSSIBLE TO DO MODIFY THE dF PARAMETERS WHEN THE DEROST CYCLE IS RUNNING.
dF01 Defrost mode
0 = Defrost not enabled;
1 = Temperature/pressure defrost. The dF09 “Time delay to defrost” starts to decrease when the temperature/pressure decreases under the dF02 setpoint.
The defrost ends when pressure/temperature reaches the end defrost temperature/pressure.
2 = Time duration defrost. The dF09, time delay to the defrost, starts when the temperature decreases under the dF02 setpoint (see start probe par. dF24). The defrost cycle ends after dF05 minutes.
3 = Defrost starts when the temperature/pressure decreases under the dF02 setpoint (see start probe par. dF24) and stops when the digital input configured as “digital input to start defrost” is active. The delay dF09 “Time delay to defrost” starts when the temperature decreases under the dF02 set point. The Defrost cycle ends when the digital input is active.
4 = Defrost with condenser fan
5= Defrost starts if the digital input configured as “digital input to start defrost” is active and ends when pressure/temperature reaches the end defrost temperature/pressure.
dF02 Temperature / pressure to begin the time counting to next defrost.
It allows to program a setpoint under which the dF09 starts counting.
dF03 Temperature / pressure to end the defrost.
It allows to program a temperature/pressure setpoint value to determines the end of the defrost when the probe value is rising.
dF04 Minimum duration of the defrost
It determines the minimum defrost time duration after starting the defrost itself even if the conditions are not more satisfied.
dF05 Maximum duration of the defrost

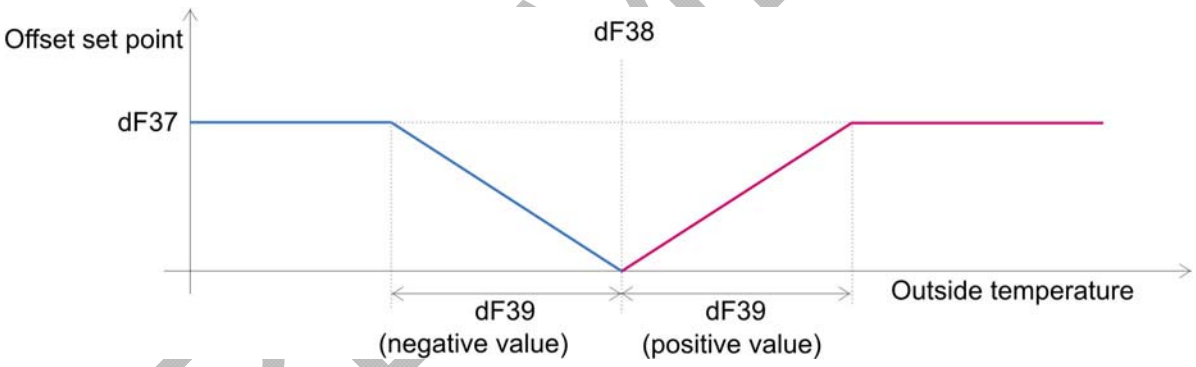
If dF01=2, it determines the maximum duration of the defrost and even if, for the other cases, the end defrost condition are still to be satisfied.
dF06 defrost delay time between the 1st and the 2nd circuit.
After the interval dF09 determined by the defrost request of one of the circuits the other 2nd circuits must wait also the time dF06 before defrosting.
dF07 Compressor off time before the defrost (the led of the compressor is blinking)
After the dF09 delay and before activating the defrost, the compressors are stopped for the dF07 time.
Exactly in the middle of the dF07 time the 4-way valve is activated to equalise the pressure of the unit and when dF07 is completely expired the compressors and the defrost can start.
This procedure does not respect the compressor on delay protection therefore the compressor is immediately turned off and then on. If dF07 = 0 the compressor is not stopped and the 4-way valve is immediately turned.
dF08 Compressor off time after the defrost (the led of the compressor is blinking)
After the defrost cycle the compressors are stopped for the dF08 time.
Exactly in the middle of the dF07 time the 4-way valve is activated to equalise the pressure of the unit and to drain the external exchange unit, when dF08 is completely expired the unit restart in heat pump mode.
This procedure does not respect the compressor on delay protection therefore the compressor is immediately turned off and then on. If dF08 = 0 the compressor is not stopped and the 4-way valve is immediately turned.
DF09 Delay time to next defrost
It starts when the condensing/evaporating temperature/pressure probe value is lower than dF02 setpoint.
This time is reloaded if the power supply fails, after a defrost cycle or from a digital input request of defrost.
The time counting is interrupted if the compressor is turned off or if the temperature/pressure is higher then dF02.
dF10 Temperature setpoint to start a combined defrost of the circuit #1.
It allows to set a temperature value to determines the beginning of a combined defrost.
After the dF09 counting the NTC probe of the combined defrost of the circuit #1 is compared to the dF10 setpoint, if the value is lower the defrost starts otherwise the unit runs in heat pump mode and when the temperature decreases under dF10 the defrost immediately starts.
dF11 Temperature setpoint to end a combined defrost of the circuit #1.
It allows to set a temperature value to determine the end of a combined defrost.
When the NTC probe of the combined defrost of the circuit #1 becomes higher than dF10 setpoint the defrost cycle stops.
dF12 Temperature setpoint to start a combined defrost of the circuit #2.
It allows to set a temperature value to determine the beginning of a combined defrost.
After the dF09 counting the NTC probe of the combined defrost of the circuit #2 is compared to the dF12 setpoint, if the value is lower the defrost starts otherwise the unit runs in heat pump mode and when the temperature decreases under dF12 the defrost immediately starts.
dF13 Temperature setpoint to end a combined defrost of the circuit #2.
It allows to set a temperature value to determine the end of a combined defrost.
When the NTC probe of the combined defrost of the circuit #2 becomes higher than dF13 setpoint the defrost cycle stops.
dF14 All the resources on during the defrost of the circuit #1
0= Not enabled
1= Enabled
dF15 All the resources on during the defrost of the circuit #2
0= Not enabled
1= Enabled
dF16 Compressor step delay time in defrost.
dF17 Condensing fan control during defrost and dripping cycle
0= Not enabled
1 = Enabled in defrost
2= Enabled in defrost and in dripping time
If dF17 = 0: During the defrost the fan control is not active.
If dF17 = 1: when the condensing temperature/pressure value increases over dF18 the fans are turned on. the fan control is determined by the same algorithm used in chiller mode.
If dF17 = 2: during the dripping time (dF08 <>0) the fan are turned on for the time duration set in dF08 .
dF18 Pressure / temperature setpoint to force the fans on during the defrost
When the temperature/pressure rises over this value the fan are turned on at the maximum speed.
dF19 Time delay before starting a forced defrost
It determines a delay time before starting the defrost cycle
dF20 Temperature / pressure setpoint to force a defrost

It determines a temperature/pressure setpoint under which the dF19 starts counting, when dF19 is expired if the temperature/pressure is still lower than dF20 the defrost is immediately executed.
ATTENTION If during the dF19 counting the temperature rises over df20+dF21(differential) the process is aborted and the dF19 time reloaded.
dF21 Forced defrost differential
dF22 defrost mode for unit with two circuits
Operative mode:
0= Independent
1= The condition are satisfied in both circuits
2= At least one circuit has reached the start condition
dF23 It determines the end of the defrost for unit having two circuit and common condensing ventilation
Operative mode:
0= Independent
1= The end defrost condition are satisfied In both circuits
2= At least one circuit has reached the end defrost condition
dF24 Start / stop defrost probe
Start / stop defrost from analog input
0= start and stop with condenser temperatur / pressure probe
1= start with evaporator pressure probe / stop with condenser temperatur / pressure probe
2= start with condenser temperatur / pressure probe / stop with evaporator pressure probe
3= start and stop with evaporator pressure probe

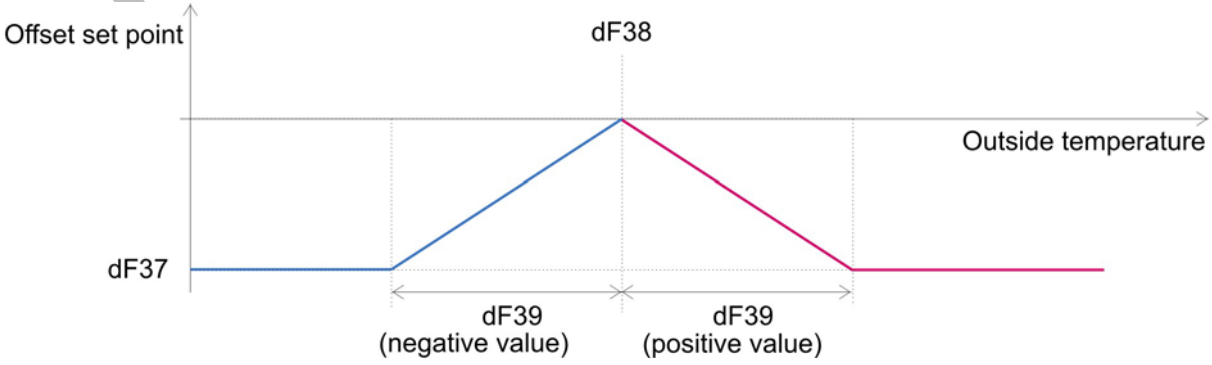
39.9 Defrost Dynamic Set Point

It is possible to modify the start defrost set point according to outside temperature.

Offset set point if dF37>0



Offset set point if dF37<0



40. PRODUCTION OF DOMESTIC HOT WATER

The domestic hot water production is enabled when the machine is switched on and disabled if the machine is OFF or in STAND-BY.
The Ichill has to be configured for the proportional regulation (St11=0) and not in neutral zone.
In case of machine with valve 1 and valve 2 in gas circuit and cooling and domestic hot water active at the same time, the number of compressors to use is determined by CO78 parameter.
Two temperature probes need to be configured when the function is enabled:

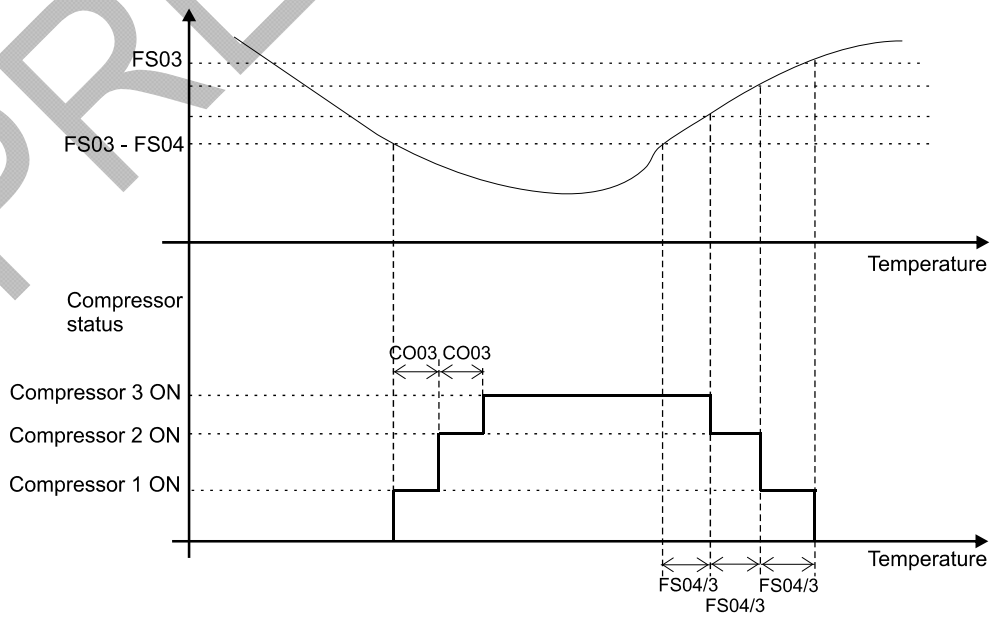
- Probe 1: it is used to determine the temperature of the domestic hot water
- Probe 2: it can be used to stop the domestic hot water production for high temperature. As an alternative to Probe 2 it is possible ti choose another probe setting FS48 parameter.

Configurable proportional band and set-point are used to regulate the production of domestic hot water; when the domestic hot water function is enabled, you will see symbol lighted on the display.
The production of domestic hot water can only be requested when the temperature detected by Probe n°1 is below the FS03 set-point – band FS04; all the compressors are called into action when the function is enabled.
The domestic hot water set-point can be viewed and modified on the display by pressing the SET button.
It is possible to set a minimum temperature under which the domestic hot water heaters are switched on (low temperature protection).
It is possible to use a second domestic hot water set point by time schedule (parameters ES19..ES33, internal clock is necessary) or by digital input (opportunely configured).
Inside the time band or when the digital input is active, to the set point is applied an offset determined by ES32 parameter and the new differential is ES33.

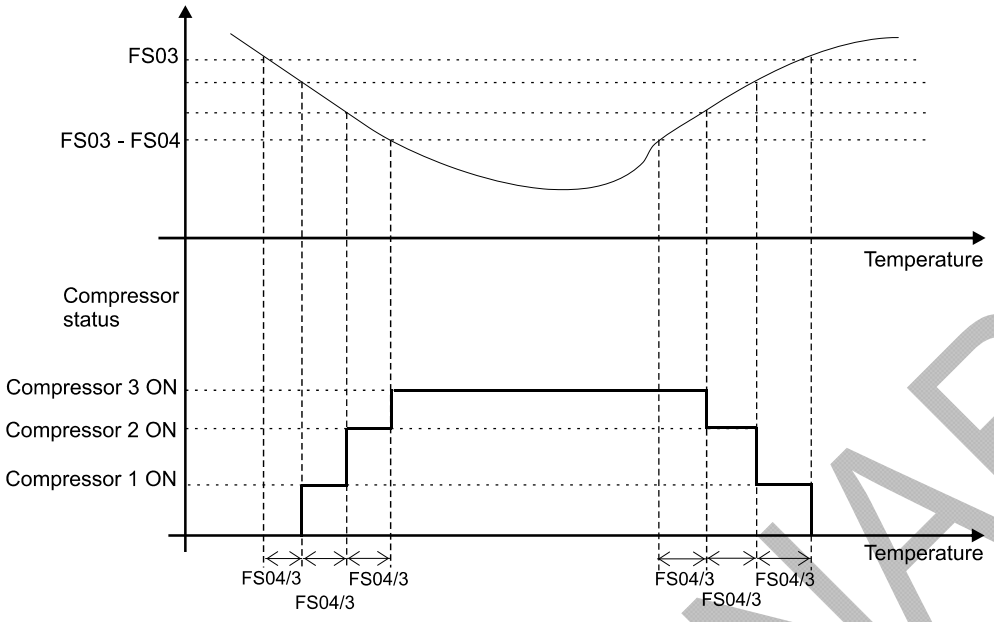
Compressors regulation:

- FS49=0 the compressors are switched on when sanitary temperature < FS03 (domestic hot water set point) – FS04 (proportional band); all the compressors are switched on with a delay of CO03 seconds each other
- FS49=1 the proportional band is divided by the number of compressors; at every step (proportional band/number of compressors) a compressor will be switched on

- FS49=0 Example for machine with 3 compressors



- FS49=1 Example for machine with 3 compressors



Domestic hot water heaters:
Domestic hot water is produced using mainly the compressors; the domestic hot water heaters are only used to produce domestic hot water if one or more compressors are not available for regulation (due to an alarm of a compressor, activation of the unloading function,..) or if the domestic hot water set-point is not reached within a configured timeframe (described in greater detail below).
The FS08 parameter allows you to determine if the domestic hot water heaters can be used when a compressor is not available.
When the sanitary heaters are activated, the regulation band is divided according to the number of compressors and sanitary heaters available (see figure below).

Max time for reaching the domestic hot water set-point
A counter determines the maximum time for reaching the domestic hot water set-point as from the moment the production of domestic hot water is requested; once this time has elapsed (parameter FS09) there are 2 options:
- If FS07=0, enable all the compressors (if not already enabled)
- If FS07=1, enable all the compressors and all the heating elements

After all the available steps (compressors and heaters) have been enabled, they remain activated until the domestic hot water set-point has been reached. At which point the heating elements are switched off immediately, while the compressors are switched off in order, with a CO03 delay between each one.

In the event of domestic hot water probe 1 faulty (the domestic hot water regulation probe), the domestic hot water function is stopped and disabled; the controller will regulate normally in chiller or heat pump mode.
In the event of domestic hot water probe 2 faulty (not involved in the regulation), the alarm is signalled without affecting heat regulation in any way; domestic hot water will continue to be produced normally even if the display probe is not working properly.
If there is an error with the heat regulation probe (for the chiller or heat pump) during production of domestic hot water, the machine will continue to operate but the regulation of the chiller or heat pump is disabled and domestic hot water continues to be produced.

40.1 Anti-Legionella Function

The FS12 parameter allows you to enable the anti-legionella function.

- **FS12=0** intervals between two anti-legionella cycles; the process will have to be repeated after the FS13 time since the last anti-legionella production procedure was carried out. The counter continues to operate, regardless of whether the machine is on or off or in standby; if the power is OFF, the value of the counter is recorded and then continued when the machine is next started up.

- **FS12=1** time-bands; Ichill with internal real time clock is required (you need to configure the day of activation FS18 and the start time FS17).

- **FS12=2** daily time band (start time FS17 is needed)

To disable the function is necessary to configure FS12=0 and FS13=0 or FS12=1 and FS18=0 or FS12=2 and FS17=0:00.

The function is enabled when the machine is ON. If the request for an anti-legionella cycle is made when the machine is switched off, the cycle will start immediately when the machine is next switched on and the priority is given to anti-legionella cycle.
If instead heat regulation is prioritized, the anti-legionella cycle will run when the chiller/heat pump set-point is reached.
The function must remain active for the minimum time configured with parameter FS19 (activated when the temperature of the domestic hot water reaches the anti-legionella set-point) and can last a maximum of FS29 minutes.
If FS02=0 the Anti-legionella cycle starts when cooling/heating set point is reached.

Compressors and sanitary heaters in Anti-legionella cycle

FS46=0 Compressors and heaters used at the same time in Anti-legionella cycle
When the anti-legionella cycle is active, all the compressors and heating elements configured for the domestic hot water are switched on; once the set-point (FS14) is reached, the compressors are switched off (delayed of CO04 time) while the heating elements are switched off when the the set-point (FS14) + band (FS20) is reached.
The anti-legionella cycle is enabled for FS19 time; during this time the machine works to maintain the anti-legionella set point.
The Anti-legionella cycle lasts maximum FS29 minutes.
It is possible to switch off the compressors if the domestic hot water temperature reaches FS50 temperature.
At the end of this procedure, the controller returns to the production of domestic hot water or normal heating/cooling regulation.
If the FS02 parameter (operating priority) gives priority to heating/cooling regulation and the production of anti-legionella needs to be enabled, then the heat regulation set-point has to be reached beforehand.
The anti-legionella cycle has to end before heating/cooling regulation can start, even if the FS02 parameter gives the priority to heating/cooling regulation.

FS46=1 First compressors then heaters are used in Anti-legionella cycle
At first the compressors are switched on; when FS50 set point is reached, all the compressors are switched off and sanitary heaters are switched on to reach the Anti-legionella set point (FS14) + band (FS20).
Once reached, the instrument works to maintain the set point for FS19 time; if water temperature falls down below FS14 the heaters are switched on and if falls down below FS 50 compressors are switched on.
The Anti-legionella cycle lasts maximum FS29 minutes.

FS46=2 Only heaters are used in Anti-legionella cycle
Only sanitary heaters are used in the Anti-legionella cycle (compressors off); when FS14 + FS20 temperature is reached the heaters are switched off.
Once reached the set point, the instrument works to maintain the set point for FS19 time; the Anti-legionella cycle lasts maximum FS29 minutes.

FS46=3 Only compressors are used in Anti-legionella cycle
Only compressors are used in the Anti-legionella cycle (heaters off); when FS14 + FS20 temperature is reached the compressors are switched off.
Once reached the set point, the instrument works to maintain the set point for FS19 time; the Anti-legionella cycle lasts maximum FS29 minutes.

Priority management (domestic hot water or heating/cooling)

If FS02 =0, priority is given to the production of chilled/hot water; sanitary hot water is produced once the chiller/heat pump requests has been satisfied.
The production of anti-legionella is stopped in case of chiller/heat pump requests.

If FS02=1, priority is given to the production of domestic hot water (or anti-legionella). Chilled water or hot water can be produced once the need for sanitary hot water has been satisfied (if required).

If FS02=2, if the digital input configured as "Domestic hot water priority" is active, the priority is given to the production of domestic hot water.

If defrosting is required, this takes priority over the production of domestic hot water or anti-legionella even if FS02=1.

40.2 Water Pumps Management

The domestic hot water pump is managed in sanitary hot water regulation or during the anti-legionella cycle.

Evaporator water pump:

- if CO16=1 (evaporator water pump always on), also in domestic hot water regulation the water pump is ON. If the machine is forced to work only in domestic hot water (digital input "only domestic hot water" is active), the evaporator water pump is:
  - OFF if FS47=1
  - ON if FS47=0

- if CO16=2 (evaporator water pump on if at least a compressor is on), the parameter FS47 allows to choose if the water pup is on or off in case of sanitary hot water production. If the machine has the sanitary valves placed in the gas circuit, in case of contemporary cooling and sanitary hot water production, the evaporator water pump is on.

If only one water pump is needed for cooling, heating and domestic hot water, the evaporator water pump has to be configured.

The times for managing the domestic hot water pump are as follows:
- The valve 1 and valve 2 are switched with the delay of FS27 seconds from start-up of the domestic hot water pump
- The domestic hot water pump is switched off with the delay of FS28 seconds from switching valve 1 and valve 2

The domestic hot water flow switch is operated according to the times of the evaporator flow switch (parameter AL15, AL16, AL17 and AL18).

Domestic hot water flow switch, solar panel flow switch and overload domestic hot water pump.

It is possible to enable the domestic hot water flow switch by setting appropriately parameters AL65..AL68.
It is possible to enable the solar panel flow switch by setting appropriately parameters AL69..AL72.

If domestic hot water flow switch or domestic hot water pump overload is active, domestic hot water regulation is disabled; heating and cooling regulation proceed normally.

If solar panel flow switch is active, solar panel regulation is disabled; heating and cooling regulation proceed normally.

40.3 Domestic hot water Second Set Point

The domestic hot water second set point can enabled by time bands (ES19..ES33 parameters) or digital input properly configured.
In case of domestic hot water second set point enabled by time bands, the Ichill must have internal clock.

Par. ES25 – ES31	0= Function disabled 1= 1st period enabled 2= 2nd period enabled 3= 1st and 2nd periods enabled 4= 3rd period enabled 5= 1st and 3rd periods enabled 6= 2nd and 3rd periods enabled 7= 1st, 2nd and 3rd periods enabled

Inside the time band or when the digital input is active to the domestic hot water set point is applied an offset (parameter ES32) and the new differential for the regulation is ES33.

40.4 Sanitary Hot Water Production: Valves In Water Circuit ___ Fs01=1 (Air/Water, Water/Water Unit)

40.4.1 - Sanitary hot water operation when the unit is producing hot water

When sanitary hot water production is required (and it has priority), the sequence of operation is the following:

- the domestic hot water pump is switched on
- after a delay of FS27 seconds, sanitary valve 1 is swithed on
- after a delay of FS10 seconds the sanitary valve 2 is switched off

Sanitary hot water is produced until the FS03 set-point is reached.
Once the domestic hot water set-point is reached, the sequence of operation is the following:

- sanitary valve 2 is switched on
- after a delay of FS10 seconds the domestic hot water valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water circulation pump is switched off

Condenser fans are managed normally.

The defrost takes priority over the production of domestic hot water.
If the controller determines the need for a defrosting cycle during the production of domestic hot water, the Ichill stops the sanitary hot water operation to activate the defrost procedure:

- all compressors and heaters are stopped
- the sanitary valve 2 is switched on
- after the FS10 delay domestic hot water valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water pump is switched off

The defrost can now start as per the normal procedure.
At the end of the defrosting cycle:

- If there is a need to produce domestic hot water, the compressors and any heating elements will be switched on. After the FS11 delay from the end of the dripping phase, domestic hot water valve 1 is switched on and, after the FS10 delay, domestic hot water valve 2 is switched off.
- If there is no need to produce domestic hot water, the controller continues with normal heat regulation.

40.4.2 - Sanitary hot water operation when the unit is producing cold water

When the production of domestic hot water is required (and it has priority), it is necessary to reverse the cycle as follows:

- the compressors are switched off
- after the dF07/2 delay the 4-way valve status is reversed
- after dF07/2 the compressors are switched on
- after a delay of FS27 seconds valve 1 is switched on
- after the FS10 delay the domestic hot water valve 2 is switched off

The production of domestic hot water stops once the set-point is reached and it will be possible to return to produce cold water (if needed):

- the compressors are switched off
- the valve 2 is switched on
- after the FS10 delay the domestic hot water valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water circulation pump is switched off
- after a delay of dF08/2 the 4-way valve status is reversed
- after a delay of dF08/2 the compressors are switched on as per normal if required by the chiller regulator

40.5 Sanitary Hot Water Production: Valves In Gas Circuit ___ Fs01=2 (Air/Water, Water/Water Unit)

40.5.1 Sanitary hot water operation when the unit is producing hot water

When sanitary hot water production is required (and it has priority), the sequence of operation is the following:

- the domestic hot water pump is switched on
- after a delay of FS27 seconds the valve 1 is activated
- after a delay of FS10 seconds the domestic hot water valve 2 is switched off

Sanitary hot water is produced until the FS03 set-point is reached.

Once the domestic hot water set-point is reached:

- domestic hot water valve 2 is switched on
- after a delay of FS10 seconds the domestic hot water valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water circulation pump is switched off

Condenser fans are managed normally.

The defrost takes priority over the production of domestic hot water.

If the controller determines the need for a defrosting cycle during the production of domestic hot water, the Ichill stops the sanitary hot water operation to activate the defrost procedure:

- all compressors and heaters are stopped
- the valve 2 is activated
- after the FS10 delay the sanitary valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water pump is switched off

The defrost can now start as per the normal procedure.
At the end of the defrosting cycle:

- If there is a need to produce domestic hot water, the compressors and any heating elements will be switched on. After the FS11 delay from the end of the dripping phase, domestic hot water valve 1 is enabled and, after the FS10 delay, domestic hot water valve 2 is switched off.
- If there is no need to produce domestic hot water, the controller continues with normal heat regulation.

40.5.2 - Sanitary hot water operation when the unit is producing cold water

When the production of hot domestic hot water is required, the sequence of operation is different and depend on the status of the compressors:

a) One or more compressors are switched on for production of chilled water

If the production of sanitary hot water is required during operation in chiller mode:

- the domestic hot water circulation pump is switched on
- after a delay of FS27 seconds the domestic hot water valve 1 is switched on
- after the FS10 delay the domestic hot water valve 2 is switched off

The following two cases could occur during the production of sanitary hot water:

- The domestic hot water set-point is reached when the chiller is working (the chiller set-point is not reached):
  - the domestic hot water valve 2 is switched on
  - after the FS10 delay the domestic hot water valve 1 is switched off
  - after a delay of FS28 seconds the domestic hot water circulation pump is switched off

  At the end of this phase, if necessary, the machine continues to regulate in chiller mode.
- The regulation temperature reaches the chiller set-point (parameter ST01) and the sanitary hot water production is working:
  - the domestic hot water circulation pump stays on
  - the domestic hot water valve 2 is switched on
  - after the FS10 delay the domestic hot water valve 1 and the compressors are switched off
  - after the DF07/2 delay the 4-way valve status is reversed
  - after dF07/2 the compressors are switched on again to produce hot domestic hot water
  - after the FS11 delay from the 4-way valve switching, the domestic hot water valve 1 is switched on
  - after the FS10 delay the domestic hot water valve 2 is switched off

  Once the domestic hot water set-point is reached:
  - the domestic hot water valve 2 is switched on
  - after the FS10 delay domestic hot water valve 1 is switched off
  - after FS28 seconds the domestic hot water circulation pump and the compressors are switched off
  - after the dF08/2 delay the status of the 4-way valve is reversed

If the domestic hot water production is working and the temperature detected by the chiller regulation probe is greater than ST01+ST07 (cold water required), the sequence of operatiuon is the following:

- the domestic hot water pump will remain on
- the sanitary valve 2 is switched on
- after the FS10 delay the domestic hot water valve 1 is switched off
- the compressors are switched off
- after the DF08/2 delay the 4-way valve status is reversed
- after a delay of dF08/2 the compressors are switched on to produce chilled water and domestic hot water

When the domestic hot water set-point is reached:

- domestic hot water valve 2 is switched on
- after the FS10 delay the domestic hot water valve 1 is switched off
- after a delay of FS28 seconds the domestic hot water circulation pump is switched off

b) None of the compressors are switched on for the production of chilled water

In this case, the cycle is reversed as follows:

- the 4-way valve status is reversed
- after dF07/2 the compressors are switched on
- the domestic hot water pump switches on after the FS11 delay from start-up of the compressors
- after a delay of FS27 seconds the domestic hot water valve 1 is switched on
- after the FS10 delay the domestic hot water valve 2 is switched off.

Once the domestic hot water set-point is reached, the sequence of operation is the following:

- the sanitary valve 2 is switched on
- after the FS10 delay the domestic hot water valve 1 and the compressors are switched off
- after a delay of FS28 seconds the domestic hot water circulation pump is switched off

- after the DF07/2 delay the 4-way valve status is reversed and normal regulation is restored.

If chilled water is required during the production of domestic hot water, operation is the same as in the previous case.

41. SOLAR PANEL MANAGEMENT

Though appropriate configuration of FS55 and FS56 parameters is possible to use the solar panel in heating or for sanitary hot water production.
The solar panel is managed through the valve and water pump control; their status depend from:

- solar panel temperature
- regulation probe (typically heating regulation probe or domestic hot water regulation probe); this probe is defined in FS57 and FS58 parameters

41.1 Solar Panel In Sanitary Hot Water

- **Compressors and solar panel in integration to domestic hot water (FS55=1):**

If:

solar panel temperature – sanitary temperature > FS59 (Dt to enable solar panel in domestic hot water)

the solar panel are enabled to work; sanitary probe is defined by FS57 parameter (it is possible to set another probe, if needed).
Compressors are normally managed by sanitary hot water temperature and domestic hot water set point.

- if domestic hot water temperature < FS23-FS24, the valve of the solar panel is open and the water pump is on
- if domestic hot water temperature > FS23, , the valve of the solar panel is close and the water pump is off

- **Solar panel in heating mode (FS55=2)**

If:

solar panel temperature – sanitary temperature > FS59 (Dt to enable solar panel in domestic hot water)

the solar panel are enabled to work; sanitary probe is defined by FS57 parameter (it is possible to set another probe, if needed).
At first compressors are not used for sanitary hot water.
It is possible to set a maximum time to use solar panel (FS61); when this time is elapsed and sanitary set point is not reached, the solar panel are disabled and compressors are switched on.
The domestic hot water pump runs when solar panel are enabled.
In regulation, if

solar panel temperature – sanitary temperature < FS59

the solar panel are disabled and the hot domestic hot water is done by compressors.

Dt control is done only at the time of the request of sanitary hot water; at this moment, if Dt< FS59 the solar panel are not used and compressors are used for heating.

41.2 Solar Panel In Heating Mode

- **Solar panel in integration mode (FS56=1)**

If:

solar panel temperature – heating temperature > FS60 (Dt to enable solar panel in heating)

the solar panel are enabled to work (valve is open and water pump on); heating probe is defined by FS58 parameter (it is possible to set another probe, if needed).
Compressors are normally managed by heating regulation.

- **Solar panel in Heating (FS56=2)**

If:

solar panel temperature – heating temperature > FS60 (Dt to enable solar panel in heating)

the solar panel are enabled to work; heating probe is defined by FS58 parameter (it is possible to set another probe, if needed).
At first compressors are not used for heating.
It is possible to set a maximum time to use solar panel (FS61); when this time is elapsed and sanitary set point is not reached, the solar panel are disabled and compressors are switched on.

In regulation, if

solar panel temperature – heating temperature < FS60

the solar panel are disabled and the heating is done by compressors.

Dt control is done only at the time of the request of heating; if Dt< FS60 the solar panel are not used and compressors are used for heating.

42. UNIT WITH HYBRID EXCHANGERS (AIR / WATER UNIT)

The parameter CF75=1 enables this function.
This unit manages two exchangers by relay:

- Hybrid exchanger 1
- Hybrid exchanger 2

Setting the parameter CF75=1 hybrid exchangers are enabled; through the parameter dF35 is possible to select witch probe is used for the regulation (external temperature or condenser temperature/pressure).
If external temperature is selected, hybrid exchangers regulation of both circuits works in parallel.
If condenser temperature/pressure is selected:

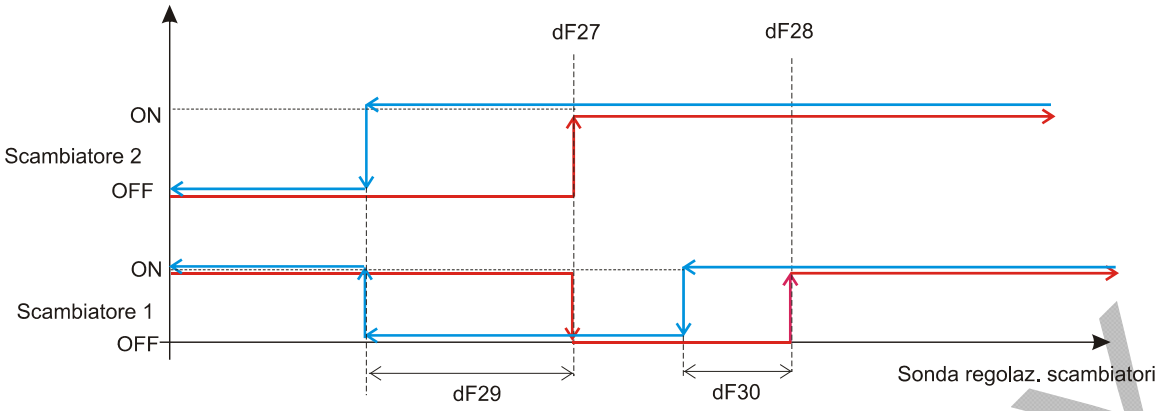
- common condenser: the regulation is done according the higher value of pressure/temperature of the circuits in summer and the lower value in winter
- separated condenser: every exchanger is managed accordind the temperature/pressure of the specific circuit

Parametres involved:

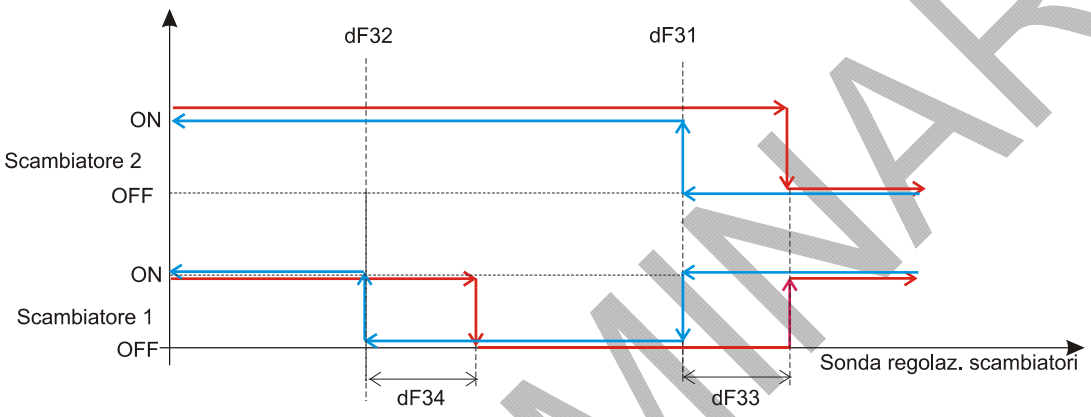
-
- Hybrid exchangers set point 1 in chiller (parameter dF27)
- Hybrid exchangers set point 1 in chiller (parameter dF29)
- Hybrid exchangers set point 2 in chiller (parameter dF28)
- Hybrid exchangers set point 2 in chiller (parameter dF30)

- Hybrid exchangers set point 1 in heat pump (parameter dF31)
- Hybrid exchangers set point 1 in heat pump (parameter dF33)
- Hybrid exchangers set point 2 in heat pump (parameter dF32)
- Hybrid exchangers set point 2 in heat pump (parameter dF34)

Summer operation mode:



Winter operation mode:



If the machine is switched on and external temperature or condenser temperature/pressure is inside the differential:

- machine in chiller and temperature/pressure inside the differential dF29: exchanger 2 ON
- machine in chiller and temperature/pressure inside the differential dF30: exchanger 1 and exchanger 2 ON
- machine in heat pump and temperature/pressure inside the differential dF33: exchanger 2 ON
- machine in heat pump and temperature/pressure inside the differential dF34: exchanger 1 and exchanger 2 ON

In chiller when first compressor starts both exchangers are ON for dF36 time; after this time the regulation follows diagrams above.
If dF36=0 the regulation follows diagrams above also at the start up.
In defrost this regulation is disabled.
In STD-BY or remote OFF the status of the exchangers is hybrid exchanger 1=ON, hybrid exchanger 2=OFF.
The set point is related to the status of the machine:

- if the machine is producing cooled water and domestic hot water, reference set point is chiller set point
- if the machine is producing only domestic hot water, reference set point is heat pump set point

43. GEOTHERMAL FREE COOLING

Outputs managed:

- relay for valve/pump management
- 0..10V analog output to control a modulating valve

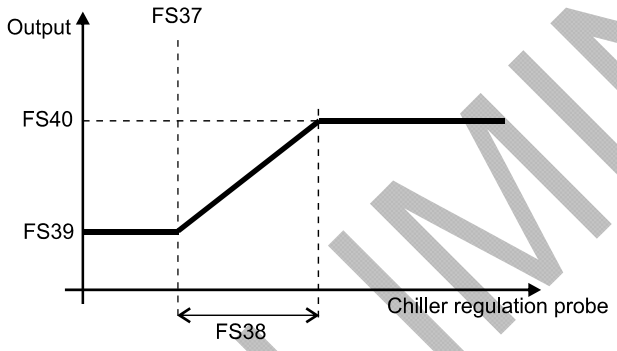
In heating the relay is OFF and the analog output is 0V.
Free cooling operation mode:

- **CF77=2**: Free cooling is the only cooling source
- **CF77=3**: Free cooling and compressors work together to produce cooling. The compressors work according their standard regulation.

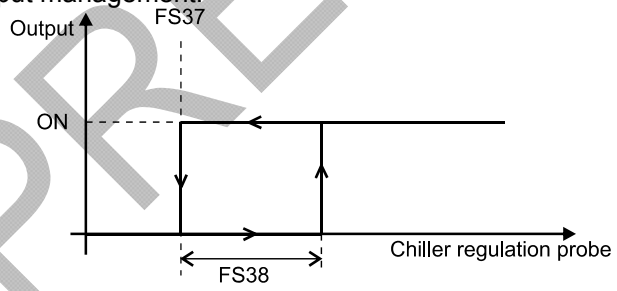
Free cooling management:
2 probes are needed, selected from those configured in the instrument (1 Pb1, 2=Pb2, etc.); parameters to select the probes are FS41 and FS42.

- if T1 temperature – T2 temperature ≥ FS21, the Free cooling is enabled and the relay and analog output are manages as figures below
- if T1 temperature – T2 temperature < FS21 – FS22, the Free cooling is disabled

Analog output management:



Digital output management:



Parameter	Description	min	max	udm
FS21	Temperature differential to enable the freecooling function	0	25.0 45	°C °F
FS22	Temperature differential for the free cooling regulation	0.1 0	25.0 45	°C °F
….				
FS34	Free cooling water pump OFF time if chiller only Free cooling	0	250	min
FS35	Free cooling water pump ON time if chiller only Free cooling	0	250	sec

FS36	Free cooling maximum time	0	250	min
FS37	Set point Free cooling	-50.0 -58 0.0 0	70.0 158 50.0 725	°C °F bar psi
FS38	Proportional band Free coling	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi
FS39	Minimum value Free cooling analog output	0	100	%
FS40	Maximum value Free cooling analog output	0	100	%
FS41	T1 probe selection for Free cooling 0=disabled, 1=Pb1, 2=Pb2, etc.	0	10	
FS42	T2 probe selection for Free cooling 0=disabled, 1=Pb1, 2=Pb2, etc.	0	10	
FS43	Outside temperature set point to force the maximum speed of condenser fan	0	1	

- Only free cooling for cooling (CF77=2)

  Compressors are not used for cooling.
  Evaporator and condenser water pumps are managed according to chiller probe and St01 set point; free cooling valve/pump is managed according chiller probe and FS37 set point (or St01 if St01<FS37).
  If the free cooling set point is not reached in FS36 minutes (0 = function disabled) or when the free cooling set point is reached, the free cooling will be disabled for FS34 minutes.
  After this time the valve/pump is switched on for FS35 seconds and, when this time is elapsed the controller verify if T1 temperature – T2 temperature ≥ FS21 and if free cooling temperature > FS37.
  If both condition are true, the free cooling valve/pump is activated.
  If FS34=0 and FS35=0 this function is disabled.

- Compressors and free cooling used for cooling (CF77=2)
  Compressors are managed as standard chiller regulation.
  Free cooling valve/pump is managed according chiller probe and FS37 set point (FS37 has to be set >St01); the regulation is done like figure above.

Low temperature protection

If the temperature detected by probe selected with FS62 parameter is lower than FS63 set point, the free cooling is disabled.
The free cooling will be enabled when temperature detected by probe selected with FS62 parameter is higher than FS63 + FS64.

43.1 FAN SPEED CONTROL IF COMPRESSORS AND FREE COOLING ARE USED FOR COOLING (CF77=3)

When the free cooling is not active the condenser fan speed is managed like standard regulation.
If free cooling is active:

- outside temperature > FS43 + FS44: condenser fan speed is forced at maximum speed
- outside temperature < FS43: when outside temperature decreases below FS43 temperature, after FS45 minutes the condenser fan speed is managed as standard regulation

44. RECOVERY FUNCTION

The recovery function is Enabled if:

1 Par. **rC01** not equal to 0.
2 Chiller running mode.
3 The condensing temperature / pressure is lower than set rC06 –rC07 (differential).
4 The input/output resources are configured
5 The remote recovery digital input is activated.

The recovery function is NOT Enabled if:

1 Par. **rC01** = 0.
2 Heat pump running mode, remote OFF or stand by.
3 The condensing temperature / pressure is higher than set rC06.
4 The input/output resources are not properly configured (alarm ACF9).
5 The remote recovery digital input is not activated.

NECESSARY RESOURCE FOR THE RECOVERY OF THE CIRCUIT #1

Output relay configured as valve for recovery circuit #1.
Remote recovery digital input for circuit #1.
Condenser probe of the circuit #1.

NECESSARY RESOURCE FOR THE RECOVERY OF THE CIRCUIT #2

Output relay configured as valve for recovery circuit #2.
Remote recovery digital input for circuit #2
Condenser probe of the circuit #2.

44.1 UNIT WITH TWO SEPARATE IDRAULIC CIRCUITS

FUNCTIONING

Par. **rC01** = 1 unit with two separate circuits:

CIRCUIT # 1
With the recovery function enabled, the unit running in chiller and with the temperature/pressure proper condition, the unit can start the recovery of the first circuit if the corresponding digital input is active. When the digital input is active the relay of the valve for the recovery of the first circuit is activated.

CIRCUIT # 2
With the recovery function enabled, the unit running in chiller and with the temperature/pressure proper condition, the unit can start the recovery of the second circuit if the corresponding digital input is active. When the digital input is active the relay of the valve for the recovery of the second circuit is activated.

After starting the function, if the digital input becomes not active the recovery function runs for the time set in rC04 before stopping.

Between the end and the next recovery function the instrument waits the time set in the parameter rC05 even if the digital input is activated again.

RECOVERY START AND STOP OF THE TWO CIRCUITS CONFIGURED WITH CAPACITY STEPS
During the start and the stop of the function the time delay rC02 and rC03 are not counted and the valve is immediately turned on or off.

RECOVERY START OF THE TWO CIRCUITS CONFIGURED WITH MORE THAN ONE CAPACITY STEP
Circuits 1 and 2 configured with more than one step of power (eg each circuit with three compressors), if the thermoregulation requires to turn on one or more resources and the recovery is activated from the digital input the unit turns on only one step and then waits the rC02 delay (this delay keep off all the other steps after the recovery is started). After the delay the recovery valve is turned on and, after the rC03 time (this

delay keeps off all the other steps after the recovery is started), the other resources if necessary are turned on.

RECOVERY STOP OF THE TWO CIRCUITS CONFIGURED WITH MORE THAN ONE CAPACITY STEP
Circuits 1 and 2 configured with more than one step of power (Eg. each circuit with three compressors). After the rC04 time delay (minimum on time of the recovery function when activated) if the digital input of the recovery is not active the units stops the new resources for the time set in rC02. After this delay the recovery valve is turned off and the regulation restarts with its normal running condition.

RECOVERY START OF THE TWO CIRCUITS WITH ALL THE CAPACITY STEPS ACTIVATED
When the system is running with 100% (eg all the three compressor of a circuit are on) of power and the digital input start the recovery function: before turning on the recovery valve one of the step (depending on the time running hours), is turned off for the time set in rC02. After rC02 the recovery valve is turned on. Then, after the rC03 time (this delay keeps off all the other steps after the recovery is started) the resource forced off if necessary is turned on again.

RECOVERY STOP OF THE TWO CIRCUITS WITH ALL THE CAPACITY STEPS ACTIVATED
When the system is running with 100% (eg all the three compressor of a circuit are on) of power and the digital input stop the recovery function: after the rC04 time delay (minimum on time of the recovery function when activated) and before turning off the recovery valve, one of the step is turned off for the time set in rC02. When the delay is expired the unit turns off the recovery valve and and the regulation restarts with its normal running condition.

ATTENTION:
For both the circuits: when the compressor are off because of the thermoregulation and the digital input of the recovery function is active, the recovery valve is disabled.

44.2 UNIT WITH TWO IDRAULIC CIRCUIT WORKING IN PARALLEL

FUNCTIONING
Par. **rC01** = 2 unit with two circuits working in parallel:
The recovery function from the digital inputs is divided in two steps:

UNIT WITH ONE CIRCUIT RUNNING
If the recovery function is enabled and if the condenser temperature/pressure condition are within the limits that circuit starts the recovery when one of the digital inputs is activated. With active digital input the recovery valve of the circuit is on.

UNIT WITH BOTH THE CIRCUITS RUNNING
If recovery function is enabled, if the condenser temperature/pressure condition are within the limits the circuit #1 starts the recovery (recovery valve #1 on) when the digital input #1 is activated and the circuit #2 starts the recovery (recovery valve #2 on) when the digital input #2 is activated.

After starting, the recovery function will run at least for the time set in parameter rC04 (minimum time with recovery on).
Between the end of a recovery cycle and the next start the unit waits the time set in Par. rC05 before starting it again.

RECOVERY START–STOP OF THE CIRCUITS 1 AND 2 CONFIGURED WITH ONE STEP EACH
Both for recovery start or stop, the delay time rC02 and rC03 are not counted and the recovery valve is immediately turned on or off.

RECOVERY START OF THE TWO CIRCUITS CONFIGURED WITH MORE THAN ONE CAPACITY STEP
Circuits 1 and 2 configured with more than one step of power (eg each circuit with three compressors), if the thermoregulation requires to turn on one or more resources and the recovery is activated from the digital input the unit turns on only one step and then waits the rC02 delay (this delay keep off all the other steps after the recovery is started). After the delay the recovery valve is turned on and, after the rC03 time (this delay keeps off all the other steps after the recovery is started), the other resources if necessary are turned on.

RECOVERY STOP OF THE TWO CIRCUITS CONFIGURED WITH MORE THAN ONE CAPACITY STEP

Circuits 1 and 2 configured with more than one step of power (Eg. each circuit with three compressors). After the rC04 time delay (minimum on time of the recovery function when activated) if the digital input of the recovery is not active the units stops the new resources for the time set in rC02. After this delay the recovery valve is turned off and the regulation restarts with its normal running condition.

RECOVERY START OF THE TWO CIRCUITS WITH ALL THE CAPACITY STEPS ACTIVATED
When the system is running with 100% (Eg. all the three compressor of a circuit are on) of power and the digital input start the recovery function: before turning on the recovery valve one of the step (depending on the time running hours), is turned off for the time set in rC02. After rC02 the recovery valve is turned on. Then, after the rC03 time (this delay keeps off all the other steps after the recovery is started) the resource forced off if necessary is turned on again.

RECOVERY STOP OF THE TWO CIRCUITS WITH ALL THE CAPACITY STEPS ACTIVATED
When the system is running with 100% (Eg. all the three compressor of a circuit are on) of power and the digital input stop the recovery function: after the rC04 time delay (minimum on time of the recovery function when activated) and before turning off the recovery valve, one of the step is turned off for the time set in rC02. When the delay is expired the unit turns off the recovery valve and and the regulation restarts with its normal running condition.

ATTENTION:
For both the circuits: when the compressor are off because of the thermoregulation and the digital input of the recovery function is active, the recovery valve is disabled.

45. CONDENSER TEMPERAURE / PRESURE CONDITION TO ENABLE/DISABLE THE RECOVERY CYCLE

The recovery can be disabled depending on the condenser condition to avoid a possible high pressure alarm. The function can be executed by programming the analogue input as condenser transducer 1 or 2 (Par **CF07=0** temperature control or **CF07= 1** pressure control).
FUNCTIONING

45.1 RECOVERY DISABLED

With the recovery function is activated: if the temperature/pressure is equal or higher than the set rC06 (limit of the recovery cycle) the recovery cycle, of the circuit detected by transducer, is disabled. When the recovery is disabled the bottom display shows the following blinking icons: **b1rC** = for circuit 1, **b2rC** = for circuit 2.

45.2 RECOVERY ENABLED

If the temperature/pressure decreases under the set rC06-rC07 (differential) the recovery cycle, of the circuit detected by that transducer , is enabled again.

45.3 NOTE ABOUT RECOVERY ENABLED/DISABLED

To avoid long period of time with recovery function disabled and the temperature/pressure within the range rC06-rC07, the units starts counting the delay set in rC08. After this delay if the decreasing temperature is still within the rC06-rC07 range, the recovery cycle is forced on again.

46. OPERATION RELATED TO THE REAL TIME CLOCK

46.1 Real Time Clock Disabled By Digital Input

When the digital input configured as “Operation working mode: by RTC or keyboard” is active, the real time clock is disabled and all the function involved with the real time clock are disabled.

46.2 “Only supply fan” working mode”

This function can be enabled only if the Ichill is provided with internal clock.
If one of the digital input is configured as “Operation mode with supplay fan only” and it is activated, the Ichill enables only the supply fan (other loads are disabled); the supplay fan works according to the time table programming (parameters ES01..ES13).

ATTENTION:
When the supply fan is on and the Ichill is forced in STD-BY or remote OFF (by digital input), the supply fan will be switched off with a CO18 delay.

47. MESSAGES - ALARM CODES

The alarm codes are defined by an alphanumeric code.
Alarm typology:

- **A** = alarm of the unit
- **b** = alarm of the circuit
- **C** = alarm of the compressor

47.1 Automatic / Manual Alarm Description

The menù ALrM allows to read/reset the alarms.
An alarm can be:

- **automatic reset**: the alarm reset automatically when the cause of the alarm is not present
- **manual reset**: manual reset is requested

Some alarms are managed by number of events per hour; it is possible to set a number of alarms per hour after witch the alarm become a manual reset.
Following an example of low pressure alarm:

- AL05=0 the alarm is always manual reset
- 0<AL05<16:
  - the alarm is automatic if the number of the event is < AL05
  - the alarm is manual if the number of the event is = AL05
- AL05=16 the alarm is always automatic reset

Compressor overload alarm is managed in a special way:

- when the number of the alarms per hour is < AL20, the alarm is a manual reset
- when the number of the event is = AL20, the alarm is manual reset and a password is requested. In this case the alarm is stored and visible in COtr menu.

If the cause of alarm is already present, the display shows “no” and it is not possible to reset the alarm.
If the cause of alarm is not present, the display shows “Rst” and it is possible to reset the alarm.

AP1 ... AP6, APt1.. Apt2, APE1 .. APE8, APU1 .. APU4 PROBE FAILURE

Label on alarm visualization menu	**AP1** = PB1 probe alarm…**AP6** = PB6 regulator probe alarm **APt1** = remote keyboard 1 alarm probe …**APt2** = remote keyboard 2 alarm probe **APE1** I/O expansion probe 1 alarm…**APE8** I/O expansion probe 8 alarm **APU1** expansion valve probe 1 alarm... **APU4** expansion valve probe 2 alarm
Reason	Probe configured but the read-out is not in the range
Reset	Probe not configured or probe in the right range
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Loads	The behaviour of the load depend on witch probe is on error (regulation probe = all loads OFF; external temperature probe = only loads involved on this probe)

AEFL: evaporator flow alarm (differential pressure switch)

Label on alarm visualization menu	**AEFL** evaporator flow alarm
Origin	Digital input active for the time set in AL15 after the water pump is on and, after the digital input itself is activated, for the time set in AL17.
Reset	Digital input not active for the time AL18.
Restart	Automatic – Manual if the digital input is active for AL16 seconds (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on only during normal running conditions.

ATTENTION

The alarm relay and the buzzer are activated only if the alarm appears during normal running conditions.
When the temperature setpoint has been reached and CO16/CO21= 2, the icon **Flow!** blinks without alarm.

NOTE ABOUT THE FLOW ALARM

CO16 / CO21=0 Water pump not enabled.
The alarm is managed only if one digital input is configured as flow switch, **the restart is always automatic.**
CO16 / CO21=1 Water pump with continuous control.
The alarm is managed only if one digital input is configured as flow switch, **the restart is always automatic, in stand–by or remote OFF (pump off),** it becomes **manual** after AL16 time.
In chiller or heat pump only. During the functioning of the unit any flow alarm stop the loads described in the table, the water pump follow its regulation algorithm and is turned off, after AL16 time.
CO16 / CO21=2 Compressor on – pump on
The alarm is managed only if one digital input is configured as flow switch, **the restart is always automatic, in stand–by or remote OFF (pump off),** it becomes **manual** after AL16 time.
During the functioning of the unit any flow alarm stop the loads described in the table, the water pump follow its regulation algorithm and is turned off, after AL16 time it is completely locked.

MANUAL RESTART OF THE FLOW ALARM

After AL16 time it is necessary to enter the function Menu to reset the alarm itself. The alarm message **DOES NOT DISAPPEAR** if the alarm condition is still on. The water pump, if configured, can start and the alarm is by-passed for AL18 seconds.
AL15 Alarm flow delay after on pump.
When the water pump starts the AL15 delay stops any flow alarm to reach the normal flow condition.
AL16 Maximum time flow switch alarm active befor to block the water pump
It determines maximum time of flow alarm active before to block the water pump.

ATTENTION

With air/water or water/water units and CF01=1,2 the minimum number of events per hour is 1.
AL17 Active flow input duration
Within this time the flow alarm must be active and after AL17 is expired the alarm is signalled. The counter starts after AL15 and allows to filter the improvise flow reduction or the possible bubbles of air.
AL18 Not active flow input duration
Within this time the flow alarm must be not active and, after this time, the previous alarm is automatically reset (if automatic) or, if manual, the unit can be restarted.

ACFL: condenser flow alarm (differential Pressure switch)

Label on alarm visualization menu	**ACFL** condenser flow alarm
Origin	Digital input active for the time set in AL55 after the water pump is on and, after the digital input itself is activated, for the time set in AL57. Alarm not enable if AL14=0 Alarm enabled in chiller only if AL14=1 Alarm enabled in heat pump only if AL14=2 Alarm enabled in chiller and heat pump if AL14=3
Reset	Digital input not active for the time AL58.
Restart	Automatic – Manual after AL56 (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking

Action	Alarm Relay + and buzzer on only during normal running conditions.
Loads	OFF

APFL: solar panel flow alarm

Label on alarm visualization menu	**APFL solar panel flow alarm**
Origin	The flow switch alarm is not detecded for AL69 seconds starting from water pump activation. Flow switch alarm is signalled if the digital input is active for AL71 seconds.
Reset	Automatic reset: digital input not active for AL72 seconds. Manual reset: Reset procedure in Menu function
Type of alarm	Automatic if flow switch digital input activation < AL70 + AL71 Manual if Automatic if flow switch digital input activation > AL70 + AL71
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on only during normal running conditions.
Loads	Solar panel water pump OFF

AHFL: domestic hot water flow alarm

Label on alarm visualization menu	**AHFL domestic hot water flow alarm**
Origin	The flow switch alarm is not detecded for AL65 seconds starting from water pump activation. Flow switch alarm is signalled if the digital input is active for AL67 seconds.
Reset	Automatic reset: digital input not active for AL68 seconds. Manual reset: Reset procedure in Menu function
Type of alarm	Automatic if flow switch digital input activation < AL66 + AL67 Manual if Automatic if flow switch digital input activation > AL66 + AL67
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on only during normal running conditions.
Loads	Domestic hot water pump OFF

AtSF: supply fan overload alarm

Label on alarm visualization menu	**AtSF:** Overload alarm of the supply fan
Origin	CF01=0: After on fan when the ID is activated for AL15 time. After on pump when the ID is activated for AL17.
Reset	Digital input not active for AL18 time
Restart	Automatic – Manual if the digital input is active for AL16 seconds (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

MANUAL RESET OF THE OVERLOAD ALARM OF THE SUPPLY FAN
If the digital input is active for AL16 seconds it is necessary to restart manually the unit (reset procedure in larm Menu with blinking label **Reset** if the alarm is not active from Al18 otherwise label **Active** (can not be reset)). Push SET key to reset the alarm, the label disappears, the fan restarts and the alarm is by-passed for AL15 time delay to allow the start-up if within this interval the alarm does not appear again.

AtE1 - AtE2 Evaporator pump overload alarm

Label on alarm visualization menu	**AtE1** (overload pump alarm of evaporator 1) **AtE2** (overload pump alarm of support evaporator 2)

Origin	Active ID when it is configured as overload pump of evaporator 1 Active ID when it is configured as overload pump of support evaporator 2.
Reset	With active digital input
Restart	Manual (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	Evaporator water pump and compressors OFF

AtC1 - AtC2 Condenser pump overload alarm

Label on alarm visualization menu	**AtC1** (overload pump alarm of condenser 1) **AtC2** (overload pump alarm of support condenser 2)
Origin	Active ID when it is configured as overload pump of condenser 1 Active ID when it is configured as overload pump of condenser 2.
Reset	With active digital input
Restart	Manual (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	Condenser water pump and compressors OFF

AtAS Domestic hot water pump overload alarm

Label on alarm visualization menu	**AtAS** (domestic hot water pump overload)
Origin	Digital input active
Reset	Digital input not active
Restart	Automatic reset if number of alarms per hour < AL75. Manual reset if number of alarms per hour = AL75 (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	Domestic hot water pump OFF

AtHS Sanitary heaters overload alarm

Label on alarm visualization menu	**AtHS** (sanitary heaters overload)
Origin	Digital input active
Reset	Digital input not active
Restart	Manual (reset procedure in function menu)
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	Sanitay heaters OFF

Phase sequence alarm

Label on alarm visualization menu	**ALSF**
Origin	Digital input active
Reset	Digital input not active
Restart	Automatic

Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

AEE Eeprom alarm	
Label on alarm visualization menu	**AEE**
Origin	Wrong eeprom data
Reset	-------
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

AFr: Power supply frequency alarm	
Label on alarm visualization menu	**AFr** (Line frequency alarm)
Origin	Power supply frequency is not equal to the Par. CF63
Reset	Ferquency control parameter adjusted, disabled CF63 = 2, frequency within the tolerance
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

ALC1: Generic alarm with stop regulation	
Label on alarm visualization menu	**ALC1: generic alarm from digital input with stop regulation**
Origin	Digital input configured as generic alarm with stop regulation active after the delay in Par. AL43
Reset	Digital input configured as generic alarm with stop regulation not active after the delay in Par. AL44
Restart	Automatic – It becomes manual after AL42 events/hour Logged only if manuale
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
REGULATION	
Alarm	Alarm relay + buzzer ON
Other loads	OFF

ATTENTION
If during AL44 the alarm stop and start again the AL44 time delay is reloaded.

ALC2: Generic Signal alarm	
Label on alarm visualization menu	**ALC1:** generic signal alarm from digital input if AL50 = 0
Origin	Digital input configured as generic alarm with stop regulation active after the delay in Par. AL52
Reset	Digital input configured as generic alarm with stop regulation not active after the delay in Par. AL53
Restart	Automatic

Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
REGULATION	
Alarm	Alarm relay + buzzer ON

ATTENTION
If during AL53 the alarm stop and start again the AL44 time delay is reloaded.

ALC2: Generic alarm with stop regulation

Label on alarm visualization menu	**ALC1:** generic signal alarm from digital input with stop regulation if AL50 = 1
Origin	Digital input configured as generic alarm with stop regulation active after the delay in Par. AL52
Reset	Digital input configured as generic alarm with stop regulation not active after the delay in Par. AL53
Restart	Automatic – It becomes manual after AL51 events/hour Logged only if manuale
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
REGULATION	
Alarm	Alarm relay + buzzer ON
Other loads	OFF

ATTENTION
If during AL53 the alarm stop and start again the AL44 time delay is reloaded.

ACF1 - ACF2 - ACF3 - ACF4 - ACF5 - ACF6 - ACF7 - ACF8 - ACF9

Label on alarm visualization menu	**ACF1** • Heat pump unit selected but 4-way valve not configured • Wrong configuration of defrost parameters dF22 and dF23 **ACF2** • Condensing control enabled but condenser probes not configured (one probe per circuit with 2 separate circuits, at least 1 probe for common cond.) • Fan proportional control algorithm not respected: FA09 + FA11 + FA12 < FA10 FA12 < FA13 FA07 < FA15 < FA08 • Fan proportional control algorithm not respected and pump enabled: FA18 + FA21 + FA20 < FA19 FA21 < FA22 FA16 < FA23 < FA17 • Fan ON - OFF regulation algorithm not respected: FA09 < FA10 • Fan ON - OFF regulation algorithm not respected and pump enabled: FA18 < FA19 • If the defrost is enabled and no evaporating/condensing probes configured. • With triac regulation (CF68, CF69 = 2) the power supply configuration is continuous control (CF63 = 2) **ACF3** • Two relays, or two digital inputs, or two analog inputs are configured with the same function or without the necessary resources (es. compressor 3 overload but compressor 3 relay not configured) **ACF4** • CF59 = 1 and none digital input configured as Chiller request or Heat Pump request • CF59 = 2 and none probe configured as external temperature probe • Unit configured as Heat pump and rack compressorr unit enabled (Cr01≠0) • CF03 = 1 and wrong configuration of the digital input or digital output for condensing unit unit **ACF5** Circuit # 2 not configured but at least one of its resources are present (e.g.: solenoid pump-down valve, heaters, inversion valve, fan, recovery, etc)

ACF6

- The number of compressor of the 2 circuits (CF04 + CF05) is:

√ > 4

√ > 4 with no direct compressor start-up (CO10 ≠ 0) or the number of steps is > 0 (CF06),

√ > 2 and the intermittent valve is configurated

- Pump-down function but at least in one circuit:
  - √ The pump-down solenoid relay is not present
  - √ No pump-down pressure switch or evaporating probe when
    - ❑ the pump-down is enabled with unit in start

    Or
    - ❑ No low pressure switch configurated.
- The compressor configuration with CF04 and CF05 but not the relay outputs:
  - √ Main relay of the compressor
  - √ Intermittent valve when enabled with the ON / OFF time (CO08 / CO09 > 0)
  - √ When the by-pass time >0 and there is no partialization or by-pass valve configured
  - √ Coil 2 of part-winding start up
  - √ Requested step valve for screw compressor are configurated
- One relay is configured as:
  - √ Compressor not selected in CF04 or CF05
  - √ Intermittent valve configured but CO08 =0 and CO09 =0
  - √ By-pass gas valve configured but by-pass time = 0
  - √ Coil 2 of part winding start up configured but direct start up selected
- Wrong configuration of the capacity step valve

ACF7

Evaporator pump

√ Enabled (CO16 >0) but the relay is not configured

√ Not enabled (CO16>0) but the relay is configured

Condenser pump

√ Enabled (CO21 >0) but the relay is not configured

√ Not enabled (CO21 = 0) but the relay is configured

Allarm configuration water pump in antifizee alarm

- if Ar24=1 and Ar25=0

or

- ifAr25=1 and not probe configurated like NTC
- if Ar29=1 and Ar30=0

or

- Ar29=1 and wrong configuration of the probes

ACF8

- Regulation probe
  - ✓ The regulation probe selected by ST09 or ST10 is not properly configured
  - ✓ Compressor rack is configurated with termoregulation like pressure probe and the pressure probe is not configured

Label on alarm visualization menu	**ACF9** Recovery function enabled but whitout resources needed (condenser probe, digital input for recovery, valve for recovery) **AC10** Compressor inverter controlled • 2 anologue output configurated for the same compressor • One analog output is configured as output for compressor inverter controlled but none relays is configured as compressor • Parameter CF03=1 and one analog output configured as compressor inverter controlled **AC11** Compressor with different power capacity enabled and: • One analog output is configured as output for compressor inverter controlled • one of the compressor has capacity power = 0 • the regulation is not a neutral zone **AC12** Free cooling function enabled and: • None relay is configured as free cooling valve • None probe is configured as evaporator inlet probe and free cooling probe • wrong configuration of the following parameters: FS21 < FS22 **AC13** Sanitary hot water function enabled and: • None relay is configured as valve 1, valve 2 or domestic hot water pump • None probe is configured as probe 1 and probe 2 for sanitary hot water production
Origin	Wrong programming
Reset	Correctly programming
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON

ArtF Clock failure

Label on alarm visualization menu	**ArtF** (clock failure)
Origin	Clock failure
Reset	Replace the instrument
Restart	Manual in function menu
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Loads	Not changed
Energy saving	Disabled if controlled by RTC
Unit ON/OFF	Disabled if controlled by RTC

ArtC Clock alarm

Label on alarm visualization menu	**ArtC** (clock alarm)
Origin	Wrong setting

Reset	After clock adjustement
Restart	Manual in function menu
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Loads	Not changed
Energy saving	Disabled if controlled by RTC
Unit ON/OFF	Disabled if controlled by RTC

AEun: Unloading from high temperature of the evaporator water inlet

Label on alarm visualization menu	**AEUn** Unload signalling from evaporator
Origin	During normal running condition when the temperature/pressure of evaporator water inlet is higher than CO40 setpoint for the CO42 time delay.
Reset	▪ If the water temperature is lower than CO39 –CO41 (differential) ▪ With unloading ON after the CO43 time delay.
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

AEht: alarm from high temperature of the evaporator water inlet

Label on alarm visualization menu	**AEht** High water temperature evaporator inlet
Origin	During normal running condition when the temperature/pressure of evaporator water inlet is higher than AL61 setpoint for the AL60 time delay.
Reset	▪ If the water temperature is lower than AL61 – AL62 (differential) ▪ With unit in stand by or remote OFF if alarm reset is automatic
Restart	Reset procedure in Menu function Always manual AL59 = 0 Always automatic AL59 =16 From manual to utomatic if AL59 value is between 1 and 15
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
REGULATIONS	
Compressor	OFF
Other Loads	Not modified

ALti: low air ambient temperature (Air / Air unit only)	
Label on alarm visualization menu	**ALti** (low temperature value of the evaporator air inlet)
Origin	Chiller mode: evaporator inlet NTC probe lower than AL26 for AL28 seconds. Heat pump: evaporator inlet NTC probe lower than lower than AL33 forAL36 seconds In stand-by or remote OFF: evaporator inlet NTC probe lower than the lowest value compared between AL28 and AL36.
Reset	Chiller: evaporator inlet NTC probe higher than AL26 + AL27(differential). Heat pump: evaporator inlet NTC probe higher than AL33 + AL34 (differential). n stand-by or remote OFF: the evaporator inlet NTC probe higher than AL26+AL27 or AL33+AL34.
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

AEP1 - AEP2 Evaporator pump / Supply fan maintenance request	
Label on alarm visualization menu	**AEP1** (Main water pump) **AEP2** (Support water pump)
Activation	Load running hours > counter setpoint for that load
Reset	Running hour reset (Hour label in Menu function)
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Actions	Alarm relay and buzzer activated
REGULATIONS	
Actions	Only signalling
Loads	Not modified

The parameters CO34 / CO35 define the hour set counters for the condenser water pump / Support water pump.
They establish the load running hours limit of the pump/s or the supply fan to give a maintenance signalling.
If one of these parameters is equal to 0 the maintenance signalling of that load is disabled but the running hours counter remains active.

ACP1 - ACP12 Condenser pumps maintenance request	
Label on alarm visualization menu	**ACP1** (main water pump) **ACP2** (support water pump)
Activation	Load running hours > counter setpoint for that load
Reset	Running hour reset (Hour label in Menu function)
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Actions	Alarm relay and buzzer activated
REGULATION	
Actions	Only signalling
Loads	Not modified

b1HP - b2HP High Pressure switch circuit 1 and 2	
Label on alarm visualization menu	**b1HP** (high pressure switch circuit #1) **b2HP** (high pressure switch circuit #2)
Reason	The unit is running and the digital input of the high pressure switch is active
Reset	Digital input not active

Restart	Reset procedure in Menu function Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Regulation	
Condensing fan	If FA02=0 the fan is forced at maximum speed for 60 seconds then switched off If FA02=1 the fan is forced at maximum speed for 60 seconds then regulate according to normal fan regulation

b1lp - b2lp Low temperature / Low Condensing pressure of the Circuit

Label on alarm visualization menu	**b1lP** (low pressure digital input of the circuit 1) **b2lP** (low pressure digital input of the circuit 2)
Origin	When the condensing probe value is lower than AL03 setpoint if: • In chiller or heat pump • Stand-by o remote OFF when AL08 = 1 • In defrost when AL06=1 The alarm is not signalled if: • In defrost ,for the time AL07, when the 4-way valve is turned on. • For the time set in AL01 after turning on the compressor.
Reset	When the condensing probe temperature is higher than AL03 + AL04 (differential)
Restart	Automatic– Manual after AL05 events per hour (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

b1AC - b2AC - b1Ac - b2Ac Antifreeze alarm / Low outlet temperature (Air / Air unit in Chiller mode)

Label on alarm visualization menu	**b1AC** (anti-freeze alarm of the circuit #1 in chiller) **b2AC** (anti-freeze alarm of the circuit #2 in chiller) **b1Ac** (anti-freeze alarm signalling of the circuit #1 in chiller) **b2Ac** (anti-freeze alarm signalling of the circuit #2 in chiller) Both the labels are displayed when the alarm is coming from the evaporator inlet probe or evaporator common outlet probe or when there is only one digital input configured.
Origin	Normal conditions, stand-by, remote OFF: when the anti-freeze probe value is lower than AL26 for AL28 seconds. With the anti-freeze digital input is active.
Reset	When the anti-freeze probe value is higher than A26+ AL27(differential) With the anti-freeze digital input is active.
Restart	Automatic – Manual after AL29 events per hours (Reset procedure in Menu function). If AL74=1 to reset the alarm is necessary to type the password
Symbol	On the display the symbol ⚠ is blinking
Action	If AL30=0 only the compressors are turned off and than display shows **b1Ac b2Ac,** the buzzer and the alarm relay are not activated. If AL30=0 only the compressors are turned off and than display shows **b1Ac b2Ac,** the buzzer and the alarm relay are activated. If the alarm comes from the digital input also the anti-freeze heaters are turned on.

b1AH - b2AH Anti-freeze alarm / Low outlet air temperaure(Air/Air unit only) on heat pump mode

Label on alarm visualization menu	**b1AH** (anti-freeze alarm of the circuit #1 in heat pump) **b2AH** (anti-freeze alarm of the circuit #2 in heat pump) **b1Ah** (anti-freeze alarm signalling of the circuit #1 in heat pump) **b2Ah** (anti-freeze alarm signalling of the circuit #2 in heat pump) Both the labels are displayed when the alarm is coming from the evaporator inlet probe or evaporator common outlet probe or when there is only one digital input configured.
Origin	Normal conditions, stand-by, remote OFF: when the anti-freeze probe value is lower than AL33 for AL36 seconds. With the anti-freeze digital input is active.
Reset	When the anti-freeze probe value is higher than AL33 + AL34. With digital input ont active
Restart	Automatic – Manual after AL37 events per hour (Reset procedure in Menu function). If AL74=1 to reset the alarm is necessary to type the password
Symbol	On the display the symbol ⚠ is blinking
Action	If AL38=0 only the compressors are turned off and than display shows **b1Ah - b2Ah,** the buzzer and the alarm relay are not activated. If AL38=0 only the compressors are turned off and than display shows **b1AH - b2AH,** the buzzer and the alarm relay are activated. If the alarm comes from the digital input also the anti-freeze heaters are turned on.

Attention

Par. **AL35** anti-freeze alarm delay (low outlet air temperature air/air unit) when the unit starts in heat pump mode.

In stand-by or remote OFF: there is an anti-freeze alarm and the time delay in AL35>0, if the unit is manually turned on in heat pump from keyboard or remote input, the alarm is reset so the unit can start at least for the time set in AL35 in order to heat the water or the air. After the AL35 delay if the anti-freeze probe is still lower than AL33 setpoint for AL36 seconds the unit is locked again with an anti-freeze alarm.

b1hP - b2hP High pressure / Condensing High temperature of the Circuit

Label on alarm visualization menu	**b1hP** (high pressure digital input of the circuit #1) **b2hP** (high pressure digital input of the circuit #2)
Origin	In chiller or heat pump, if the condensing probe is higher than AL09 setpoint.
Reset	If the condensing probe value is lower than AL09 –AL10 (differential)
Restart	Reset procedure in Menu function. Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Regulation	
Condensing fan	If FA02=0 the fan is forced at maximum speed for 60 seconds then switched off If FA02=1 the fan is forced at maximum speed for 60 seconds then regulate according to normal fan regulation

b1LP - b2LP low pressure switch circuit #1 or 2

Label on alarm visualization menu	**b1LP** (low pressure switch circuit #1) **b2LP** (low pressure switch circuit #2)

Origin	• With the digital input is active • If AL08=1, also in stand-by or remote OFF, when the low pressure switch input is active. • In defrost if AL06=1 when the compressor low pressure switch input is active. The alarm is not signalled if : • In defrost for the time AL07 when the 4-way valve is activated. • During the AL01 delay after turning on the compressor.
Reset	Digital input not active
Restart	Automatic - Manual after AL05 events per hour (Reset procedure in Menu function)
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

b1lp - b2lp Low evaporating pressure of the circuit (with pressure transducers only)

Label on alarm visualization menu	**b1lP** (low evaporator pressure from analogue input #1) **b2lP** (low evaporator pressure from analogue input #2)
Origin	The alarm is activated when at least one of the probes , configured as evaporating control, is lower than AL03 setpoint if: • In chiller or heat pump mode; • Stand-by or remote OFF when AL08 = 1 • In defrost when AL06=1 The alarm is not signalled if: • In defrost ,for the time AL07, when the 4-way valve is turned on. • For the time set in AL01 after turning on the compressor.
Reset	When the condensing probe temperature is higher than AL03 + AL04 (differential)
Restart	Automatic– Manual after AL05 events per hour (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

ATTENTION When the pressure transducers are configured the low pressure alarms are related only to transducer values.

b1tF- b2tf Condenser fan overload alarm

Label on alarm visualization menu	**b1tF** (Condenser fan overload alarm of the circuit #1) **b2tF** (Condenser fan overload alarm of the circuit #2)
Origin	When the digital input is active
Reset	When the digital input is not active
Restart	Manual (reset from the function menu)
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON

AEun: Unloading from low temperature of the evaporator water outlet

Label on alarm visualization menu	**b1EU** Unload signalling from evaporator circuit n° 1 **b2EU** Unload signalling from evaporator circuit n° 2
Origin	During normal running condition when the temperature of evaporator water outlet is higher than CO55 setpoint
Reset	▪ If the water temperature is lower than CO55 + CO56 (differential) ▪ With unloading ON after the CO57 time delay.
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer

Regulation	
Compressor	OFF
Other loads	Not modified

C1HP - C2HP - C3HP - C4HP compressor high pressure alarms

Label on alarm visualization menu	**C1HP** (compressor 1 high pressure alarm) – … **C4HP** (compressor 4 high pressure alarm)
Origin	The unit is running and the digital input of the compressor high pressure switch is active
Reset	Digital input not active
Restart	Reset procedure in Menu function Reset procedure in Menu function Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Regulation	
Condensing fan	If FA02=0 the fan is forced at maximum speed for 60 seconds then switched off If FA02=1 the fan is forced at maximum speed for 60 seconds then regulate according to normal fan regulation

C1oP - C2oP - C3oP - C4oP - Pressure switch alarm / compressor oil

Label on alarm visualization menu	**C1oP** (Compressor 1pressure switch … **C4oP** (Compressor 4 pressure switch)
Origin	The alarm is not signalled: during the AL01 delay after turning on the compressor, during the AL12 delay that starts after the AL11 delay when the unit is properly running
Reset	Digital input not active
Restart	Automatic - Manual after AL013 events per hour (Reset procedure in Menu function). If AL76=1 the alarm is only a warning and the compressor remains on
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

OIL ALARM FROM PRESSOSTAT SWITCH OR OIL LEVEL SWITCH (screw)
Occasionally it is possible to find both the safety systems, the delay, the active input duration and the number of events per hour allow to set-up both the protections.

Par. **AL11** Oil alarm delay after on compressor.
It allows to set a time delay before signalling the oil or the oil level switch alarms after the on compressor.
Par. **AL12** Duration of the pressure switch / oil level switch in normal operating conditions.
Duration of the oil level switch activation during normal running condition.
It allows to set the time delay before signalling the alarm. **AL11** defines the delay counting, it helps to override the low pressure or the low oil level determined, for example, by a new partialization step of the compressor itself.
Par. **AL13** Maximum number of alarm events per hour.
It determs the maximum number of alarm events before switching the restart from automatic to manual.

C1Pd - C2Pd – compressor oil differential pressure

Label on alarm visualization menu	**C1Pd (compressor 1)** **C2Pd (compressor 2)**

Origin	Pistons compressor: Compressor oil pressure – evaporating pressure < AL78 Screw compressor: Condensing pressure – compressor oil pressure > AL78
Reset	Pistons compressor: Compressor oil pressure – evaporating pressure > AL78 + AL79 Screw compressor: Condensing pressure – compressor oil pressure < AL78 - AL79
Restart	Automatic – Manual after AL80 events per hour (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay and buzzer on
Compressor / circuit involved	OFF If more than one compressor is configured in the circuressors are OFF

C1dt - C2dt - C3dt - C4dt - High compressor discharge temperature alarm

Label on alarm visualization menu	**C1dt** (High discharge temperature of the compressor 1) -…**C4dt** (High discharge temperature of the compressor 4)
Origin	The compressor discharge temperature is higher than AL39 setpoint. **ATTENTION** The display resolution is 0.1°C until the read-out is 99.9, over 100°C it is 1°C.
Reset	If the probe value of the high discharge temperature is lower than "AL39 - AL40 (differential)"
Restart	Automatic. Manual when there are AL41 per hour (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay and buzzer on
Compressor involved	OFF

C1tr - C2tr - C3tr - C4tr - Compressor overload alarm

Label on alarm visualization menu	C1tr (Compressor 1 overload alarm) -…C4tr (Compressor 4 overload alarm)
Origin	With active digital input. The alarm is not detected within the AL19 time delay after the on compressor
Reset	When the digital input is not active
Restart	AL77=0: • Manual reset in Alrm menu if AL20=1÷16 • Manual reset in cOtr menu; if AL20=0 or number of alarm per hour = AL20, password is requested AL77=1: • Automatic reset if the nummer of alarm per hour < AL20 or if AL20=16 • Manual reset in Alrm menu if the nummer of alarm per hour = AL20
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Compressor involved	OFF if AL47=0 or AL47=1
Compressor not involved	OFF if AL47=1

b1dF – b2dF Defrost alarm

Label on alarm visualization menu	**b1dF** (Defrost alarm of the circuit 1) **b2dF** (Defrost alarm of the circuit 2)

Origin	Only in defrost if DF01 = 1,3 (defrost en temperature/pressure or external contact): when the defrost ends after the DF05 timeout.
Reset	▪ Stand - by or remote ON-OFF. ▪ Next defrost ends for temperature/pressure.
Restart	Automatic if next defrost ends for temperature/pressure, otherwise manual.
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

b1Cu – b2Cu Unloading disabled from High condensing temperature / pressure in chiller

Label on alarm visualization menu	**b1CU** (unloading high temperature from condenser of the circuit 1) **b2CU** (unloading high temperature from condenser of the circuit 2)
Origin	When the temperature/pressure of condenser probe control is higher then CO44
Reset	▪ When the temperature/pressure of condenser probe is lower than CO44 – CO45 (differential) ▪ After unloading is activated and after Par. CO47
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

b1Cu – b2Cu: Unloading from low condensing temperature / pressure in Heat pump

Label on alarm visualization menu	**b1CU** (unloading message from condenser 1) **b2CU** (unloading message from condenser 2)
Origin	During normal running condition when the temperature/pressure of evaporator/condenser probe is lower than < CO46 setpoint
Reset	▪ when the temperature/pressure of evaporator/condenser probe value is higher than CO46 + CO47 ▪ After unloading is activated and after Par. CO48
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

b1rC – b2rC recovery disabled from high condensing temperature/pressure in Chiller

Label on alarm visualization menu	**b1rC** (recovery disabled message from circuit 1) **b2rC** (recovery disabled message from circuit 2)
Origin	In normal running condition when the temperature/pressure probe value is higher than the set rC06
Reset	▪ When the temperature/pressure probe value is lower than the rC06 – rC07(differential) ▪ Unloading start after the time delay Par. rC08
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

b1PH - b2PH: Pump Down stop alarm from pressure switch / Low pressure switch

Label on alarm visualization menu	**b1PH** (Pump down stop alarm of the circuit 1) **b2PH** (Pump down stop alarm of the circuit 2)
Origin	Pressure switch: if CO36 = 1,2,3,4 and ID not active, the pump down stops because of the timeout CO39. Transducer: if CO36 = 1,2,3,4 and the set CO37 is not reached: the pump stops because of the timeout CO39.

Reset	From thermoregulation start-up and ID not active From thermoregulation start-up with evaporating pressure higher than CO37 + CO38 (differential)
Restart	Automatic – Manual and logged after AL21 events per hour (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON when it becomes manual

b1PL - b2PL Alarm during the Pump Down start-up from pump down pressure switch / Low pressure transducer

Label on alarm visualization menu	**b1PL** (pump down alarm in start-up of circuit 1) **b2PL** (pump down alarm in start-up of circuit 2)
Origin	Pump down pressure switch : CO36 = 1, 2, 3, 4 and compressors start-up and digital input not active for the time set in CO39 Pump down transducer: CO36 = 1, 2, 3, 4, compressors start-up and the set CO37 is not reached in the interval time CO39.
Reset	From thermoregulation start-up and ID not active From thermoregulation start-up with evaporating pressure higher than CO37 + CO38 (differential)
Restart	Automatic - Manual and logged after AL21 events per hour if AL23=1 (reset procedure in function menu). If AL23 = 0 it is automatic and not logged.
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON when it becomes manual

C1Mn - C2Mn - C3Mn - C4Mn - Compressor maintenance

Label on alarm visualization menu	**C1Mn** (Compressor 1 maintenance) –…**C4Mn** (Compressor 4 maintenance)
Origin	Compressor running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

AEP1 - AEP2 Pump/ supply fan maintenance

Label on alarm visualization menu	**AEP1** (Evaporator 1 pump maintenance) **AEP2** (Evaporator 2 pump maintenance)
Origin	Pump/supply fan running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

ACP1 - ACP1 Condenser pump mintenance

Label on alarm visualization menu	**ACP1** (Condenser 1 pump maintenance) **ACP1** (Condenser 2 pump maintenance)
Origin	Pump running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

ASAn Domestic hot water pump mintenance

Label on alarm visualization menu	**ASAn** (Domestic hot water pump maintenance)
Origin	Pump running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

ASUn Solar panel water pump mintenance

Label on alarm visualization menu	**ASUn** (Domestic hot water pump maintenance)
Origin	Pump running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

ALSF Phase Sequence

Label on alarm visualization menu	**ALSF**
Origin	Phase sequence digital input active
Reset	Phase sequence digital input not active
Restart	Automatic
Symbol	⚠ blinkling
Action	Alarm relay + buzzer ON
Regulation	
Loads	OFF

ASLA Failed Communication With I/O Expansion

Label on alarm visualization menu	**ASLA**
Origin	Failed communication with I/O expansion

Reset	Automatic when the communication is working
Restart	Automatic
Symbol	⚠ blinking
Action	Alarm relay + buzzer ON
Regolatori	
Loads	OFF

AUAL Failed Communication With Electronic Expansion Valve

Label on alarm visualization menu	**AUAL**
Origin	Failed communication with electronic expansion valve
Reset	Automatic when the communication is working
Restart	Automatic
Symbol	⚠ blinking
Action	Alarm relay + buzzer ON
Regolatori	
Loads	OFF

b1UA, b2UA Expansion valve 1 or Expansion Valve 2 Alarm

Label on alarm visualization menu	**b1UA** (expansion valve 1 alarm) **b2UA** (expansion valve 2 alarm)
Origin	When the electronic expansion valve is on alarm
Reset	Automatic when the alarm is solved
Restart	Automatic
Symbol	⚠ blinking
Action	Alarm relay + buzzer ON
Regolatori	
Loads	Load of the circuit OFF

Alarm relay and buzzer

Alarm relay / buzzer outputs

Origin	Alarms still active Alarms not reset
Reset relay alarm	Whitout alarms In stand- by or remote ON-O FF if AL42 = 1
Buzzer silencing	By pushing one of the key of the front panel

The alarm relay is enabled only by configurating the corresponding output resource.

Keyaboard Alarm

Label on alarm visualization menu	keyaboard Alarm description
noL	No data communication between the keyaboard and the regulator.

48. MANUAL ALARM PROCEDURE

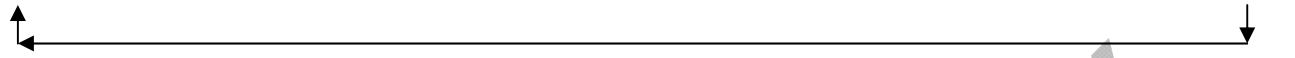
CONCEPT OF NUMBER OF EVENTS PER HOUR

For some alarms is possible to set a number of alarms per hour:

- if the alarm occours a number of time lower than the value set, the alarm is automatic reset
- if the alarm occours a number of time equal the value set, the alarm is manual reset

Each hour is divided in 16th intervals (each interval is 3600 / 16 = 225 seconds).

1°Int	2°Int	3°Int	4°Int	5°Int	6°Int	7°Int	8°Int	9°Int	10°Int	11°Int	12°Int	13°Int	14°Int	15°Int	16°Int



After the unit start-up, each interval is marked as “not active”. During the interval counting, for 255seconds, if at least an alarm event appears, the interval itself is marked “Active”.
Starting from the first interval the instrument calculates the 16 intervals and, at the end, it restats overwriting from the first.
In this way the last hour is always monitored and counted the active intervals. when the number of active intervals reaches the threshold set with the corresponding parameter the alarm becomes manual.
By setting the threshold (parameter)=0 the alarm is manual from its first activation while if the threshold=16 the alarm is always automatic .

48.1 Alarm

Alarm Code	Alarm description	Comp.	Anti freeze heaters Boiler	Support heaters	Evaporator Pump / Supply fan	Condenser Pump	Sanitary Water pump	Solar panel Water pump	Ventilaz. cond. Cir1 Cir2	Auxiliary relay
AP1 ... AP6	Probe alarm	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**
APt1 APt2	Remote keyboard probe alarm	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**
APE1 ... APE8	I/O Expansion probe alarm	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	OFF **(1)**	
APU1 ... APU4	Sonda PB1.. Sonda Pb4 della valvola espansione elettronica	**(7)**	**(7)**	**(7)**	**(7)**	**(7)**	**(7)**	**(7)**	**(7)**	
ALti	Low air temperature of the evaporator inlet (air / air unit) Alarm									
AEFL	Evaporator flow alarm	OFF	OFF (boiler)		OFF **(3)**				OFF	
ACFL	Condenser flow alarm	OFF				OFF **(3)**			OFF	
AHFL	Domestic hot water flow switch alarm	OFF **(6)**				OFF	OFF			
APFL	Solar panel flow switch alarm	OFF **(6)**						OFF	OFF	
AtSF	Fan supply overload alarm	OFF		OFF	OFF				OFF	
AtE1	Evaporator 1 water pump overload alarm	OFF **(4)**	OFF (boiler) **(5)**		OFF				OFF	
AtE2	Evaporator 2 water pump overload alarm	OFF **(4)**	OFF (boiler) **(5)**		OFF				OFF	
AtC1	Condenser 1 water pump overload alarm	OFF **(4)**				OFF			OFF	
AtC2	Condenser 2 water pump overload alarm	OFF **(4)**				OFF			OFF	
AtAS	Domestic hot water pump overload	OFF **(6)**								
AtHS	Sanitary heaters overload									
AEP1	Evaporator 1 water pump maintenance									
AEP2	Evaporator 2 water pump									

	maintenance support									
ACP1	Condenser 1 water pump maintenance									
ACP2	Condenser 2 water pump maintenance									
ASAn	Domestic hot water pump maintenance									
ASUn	Solar panel water pump maintenance									
ASLA	Serial communication failure with I/O expansion	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
AUAL	Serial communication failure with expansion valve driver	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
ArtC	Clock alarm									
ArtF	Clock failure									
ALOC	Generic alarm	OFF			OFF	OFF			OFF	OFF
ALSF	Phase sequence alarm	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
AEE	Eeprom alarm	OFF			OFF	OFF			OFF	OFF
ACF1 ACF12	Configuration alarm	OFF			OFF	OFF			OFF	OFF
ArtF	Faulty clock									
ArtC	Clock error									
AEUn	Unloading signalling from high temp. of evaporator water									
ALti	Low evaporator inlet temperature in air/air unit									
AEht	High water temperature inlat evaporator	OFF								
ALC1	General alarm	OFF			OFF	OFF	OFF	OFF	OFF	
ALC2	Genearl alarm type 2	OFF **(3)**			OFF **(3)**	OFF **(3)**	OFF **(3)**	OFF **(3)**	OFF **(3)**	

(1) = if the probe is the regulation probe
(2) = with probe configured as auxiliary relay control
(3) = with manual alarm procedure
(4) = Off compressors with only 1 water pump configured or with 2 pumps but both in alarm from the corresponding digital inputs.
(5) = Boiler heaters off with only 1 water pump configured or with 2 pumps but both in alarm from the corresponding digital inputs (in this case the boiler heaters are on only with thermoregulation anti-freeze setpoint as evaporator protection function)
(6) Compressors switched off in case of only production of sanitary hot water
(7) In case of expansion valve probe alarm all load of the circuit are OFF

48.2 Alarm: Circuit Alarm

Alarm Code	Alarm description	Compressors of the circuit (*n*)	Compressors of the other circuit	Fan condensing of the circuit (*n*)	Fan condensing of the other circuit
b(*n*)HP	High pressure switch of the circuit **(*n*)**	OFF		OFF after 60 seconds	
b(*n*)LP	Low pressure switch of the circuit **(*n*)**	OFF		OFF	
b(*n*)AC	Anti-freeze in chiller of the circuit **(*n*)**	OFF		OFF	
b(*n*)AH	Anti-freeze in heat pump of the circuit **(*n*)**	OFF		OFF	
b(*n*)hP	High condensing pressure of the circuit **(*n*)**	OFF		OFF after 60 seconds	
b(*n*)hP	High condensing temperature from NTC of the circuit **(*n*)**	OFF		OFF after 60 seconds	
b(*n*)LP	Low condensing pressure - (evaporating with low pressure transducer) with transducer of the circuit of the **(*n*)**	OFF		OFF	
b(*n*)lP	Low condensing temperature NTC circuit **(*n*)**	OFF		OFF	
b(*n*)tF	Fan overload circuit **(*n*)**	OFF		OFF	
b(*n*)PH	Pump down alarm in stop regulation of the circuit **(*n*)**	OFF		OFF	
b(*n*)PL	Pump down in regulation start-up of the circuit **(*n*)**	OFF		OFF	
b(*n*)dF	Bad defrost circuit **(*n*)**				
b(*n*)Cu	Unloading from condenser high temp/press of the circuit **(*n*)**				
b(*n*)Cu	Unloading from evaporator low temp/press of the circuit **(*n*)**	OFF		OFF	
b(*n*)rC	Recovery function disabled in circuit **(n)**				
b(*n*)ds	Circuit **(n)** disabled from keyboard	OFF		OFF	
b(*n*)Ac	Anti-freeze circuit **(n)** message in chiller				
b(*n*)Ah	Anti-freeze circuit **(n)** message in heat pump				

(*n*) identifies the circuit 1 or 2

48.3 Alarm: Compressor Alarm

Alarm Code	Alarm description	Compressor (*n*)	Compressors not involved
C(*n*)HP	Compressor(*n*) high pressure switch	OFF	
C(*n*)oP	Compressor(*n*) oil pressure switch / Oil level switch	OFF	
C(*n*)tr	Compressor(*n*) overload	OFF	
C(*n*)dt	Compressor high discharge temperature	OFF	

C(*n*)Pd	Compressor oil differential	OFF	
C(*n*)dS	Compressor (n) disabled from keyboard	OFF	
C(*n*)Mn	Compressor(*n*) maintenance		

(*n*) identifies the compressor 1, 2 , 3 , 4 , 5 , 6

Cod. Allarme	Alarm description	Compressor	Heaters	Water pump	Fan
noL	Link problem between the Ichill and the remote keyboard				

49. TABLE OF PARAMETERS

Parameter	Description	min	max	M. u.	Resolution
ST 1	Chiller Setpoint	ST02	ST03	°C/°F	dec/int
ST 2	Chiller minimum Setpoint	-50.0 -58	ST01	°C °F	Dec int
ST 3	Chiller maximum Setpoint	ST01	110 230	°C °F	Dec int
ST 4	Heat pump setpoint	ST05	ST06	°C/°F	dec/int
ST 5	Heat pump minimum Setpoint	-50.0 -58	ST04	°C °F	Dec int
ST 6	Heat pump maximum Setpoint	ST04	110 230	°C °F	Dec int
ST 7	Regulation band in chiller mode	0.1 0	25.0 45	°C °F	Dec int
ST 8	Regulation band in chiller heat pump	0.1 0	25.0 45	°C °F	Dec int
ST 9	Regulation probe selection in chiller 0= Temperature probe NTC for evaporator inlet 1= Temperature probe NTC for evaporator outlet 1 2= Temperature probe NTC for evaporator outlet 2 3= Temperature probe NTC for common evaporator outlet 4= Temperature NTC probe from remote panel 1 5= Temperature NTC probe from remote panel 2	0	5		
ST 10	Regulation probe selection in heat pump 0= Temperature probe NTC for evaporator inlet 1= Temperature probe NTC for evaporator outlet 1 2= Temperature probe NTC for evaporator outlet 2 3= Temperature probe NTC for common evaporator outlet 4= Temperature NTC probe from remote panel 1 5= Temperature NTC probe from remote panel 2 6= Temperature probe for water common inlet of the condenser 7= Temperature probe for water inlet of the circuit # 1 condenser 8= Temperature probe for water inlet of the circuit # 2 condenser 9= Temperature probe for water outlet of the circuit # 1 condenser 10= Temperature probe for water outlet of the circuit # 2 condenser 11= Temperature probe for water common otlet of the condenser	0	11		
ST 11	Type of thermoregulation 0= Proportional 1= Neutral zone	0	1		
	Visualizzazione display				
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
dP 1	Default read-out of the top display	0	16		
dP 2	Default read-out of the bottom display	0	20		
dP 3	Default display read-out configuration top / bottom 0= Configurable 1= Top display: Evaporator IN, Bottom display: Evaporator OUT 2= Top display: Condenser IN, Bottom display: Condenser OUT 3=Top display: temperature/Condensing pressure, Bottom Display: evaporating pressure	0	3		
dP 4	Top display default read-out of the remote terminal_1 0= the read-out depends on the paremeters dP01 – dP02 – dP03 1= the read-out shows the NTC probe of the remote panel.	0	1		
dP 5	Top display default read-out of the remote terminal_2 0= the read-out depends on the paremeters dP01 – dP02 – dP03 1= the read-out shows the NTC probe of the remote panel.	0	1		
dP 6	Visograph: firs probe visualized	0	35		
dP 7	Visograph: second probe visualized	0	35		
dP 8	Visograph: third probe visualized	0	35		
dP 9	Visograph: fourth probe visualized	0	35		
dP 10	Visualization in STD-BY 0= "STD-BY" 1= same visualization of dP1 and dP2 2= “OFF”	0	2		
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
	Unità				
CF 1	Type of unit 0= Air / air Chiller 1= Air / water Chiller 2= Water / water Chiller	0	2		

CF 2	Selection type rof unit 1= only chiller 2= only heat pump 3= chiller and heat pump	1	3		
CF 3	Condensing unit 0= no 1= si	0	1		
CF 4	Compressors number for circuit 1 1= 1 2= 2 3= 3 4= 4	1	4		
CF 5	Compressors number for circuit 2 0= 0 1= 1 2= 2 3= 3	0	3		
CF 6	Number of compressor parzialization 0= none 1= 1 2= 2 3= 3	0	3		
CF 7	Pressure or temperature analogue input functioning 0 = Temperature / pressure NTC – 4÷20 mA : The condensing temperature is controlled with NTC probe while for the evaporating pressures of the circuits 1 and 2 and the pressure probe configured as auxiliary output 1 and 2 are controlled with 4÷20mA transducers. 1 = Pressure control with 4÷20 mA: To control the evaporating and condensing pressures it is necessary a 4÷20mA transducer. 2 = Temperature / pressure NTC – 0÷5Vdc: The condensing temperature is controlled with NTC probe while for the evaporating pressures of the circuits 1 and 2 and the pressure probe configured as auxiliary output 1 and 2 are controlled with 0÷5Vdc transducers. 3 = Pressure control with 0÷5Vdc: To control the evaporating and condensing pressures it is necessary a ratiometric 0÷5Vdc transducer.	0	3		
CF 8	PB1 Configuration If configured as digital input	0 o 1	28 c75		
CF 9	PB2 Configuration If configured as digital input	0 o 1	28 c75		
CF 10	PB3 Configuration If configured as digital input	0 o 1	35 c75		
CF 11	PB4 Configuration If configured as digital input	0 o 1	35 c75		
CF 12	PB5 Configuration If configured as digital input	0 o 1	28 c75		
CF 13	PB6 Configuration If configured as digital input	0 o 1	28 c75		
CF 14	Not used	0	0		
CF 15	Not used	0	0		
CF 16	PB1 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 17	PB2 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 18	PB3 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 19	PB4 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 20	PB5 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 21	PB6 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 22	Not used	0	0		
CF 23	Not used	0	0		
CF 24	Pressure value at 4mA or 0.5 Vdc of the PB3 transducer	-1.0 -14	50.0 725	Bar psi	Dec int

CF 25	Pressure value at 20mA or 5 Vdc of the PB3 transducer	-1.0 -14	50.0 725	Bar psi	Dec int
CF 26	Pressure value at 4mA or 0.5 Vdc of the PB4 transducer	-1.0 -14	50.0 725	Bar psi	Dec int
CF 27	Pressure value at 20mA or 5 Vdc of the PB4 transducer	-1.0 -14	50.0 725	Bar psi	Dec int
CF 28	Not used	0	0		
CF 29	Not used	0	0		
CF 30	Configuration of ID1	0 -o1	c75		
CF 31	Configuration of ID2	0 -o1	c75		
CF 32	Configuration of ID3	0 -o1	c75		
CF 33	Configuration of ID4	0 -o1	c75		
CF 34	Configuration of ID5	0 -o1	c75		
CF 35	Configuration of ID6	0 -o1	c75		
CF 36	Configuration of ID7	0 -o1	c75		
CF 37	Configuration of ID8	0 -o1	c75		
CF 38	Configuration of ID9	0 -o1	c75		
CF 39	Configuration of ID10	0 -o1	c75		
CF 40	Configuration of ID11	0 -o1	c75		
CF 41	Configuration of RL1	0 -o1	c74		
CF 42	Configuration of RL2	0 -o1	c74		
CF 43	Configuration of RL3	0 -o1	c74		
CF 44	Configuration of RL4	0 -o1	c74		
CF 45	Configuration of RL5	0 -o1	c74		
CF 46	Configuration of RL6	0 -o1	c74		
CF 47	Configuration of RL7	0 -o1	c74		
CF 48	Configuration of RL8	0 -o1	c74		
CF 49	Not used				
CF 50	Proportional output OUT 1 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V o1..c50 ON / OFF with the same meaning of relè configuration	0 o 1	9 c50		
CF 51	Proportional output OUT 2 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V o1..c50 ON / OFF with the same meaning of relè configuration	0 o 1	9 c50		
CF 52	Proportional output OUT 3 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V 10= modulating condenser fan circuit 1 PWM 11= modulating condenser fan circuit 2 PWM o1..c50 ON / OFF output with the same meaning of relè	0 o 1	11 c50		

CF 53	Proportional output OUT 4 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V 10= modulating condenser fan circuit 1 PWM 11= modulating condenser fan circuit 2 PWM o1..c50 ON / OFF output with the same meaning of relè	0 o 1	11 c50		
CF 54	Remote keyboard 1 configuration 0= Not enabled 1= Enabled model with ambient temperature sensor 2= Enabled model without ambient temperature sensor	0	2		
CF 55	Remote Panel 2 configuration 0= Not enabled 1= Enabled model with ambient temperature sensor 2= Enabled model without ambient temperature sensor	0	2		
CF 56	Offset of the probe of the remote terminal 1	-12.0 -21	12.0 21	°C °F	Dec int
CF 57	Offset of the probe of the remote terminal 2	-12.0 -21	12.0 21	°C °F	Dec int
CF 58	Icon function 0= ❄ chiller / ✹ heat pump 1= ✹ chiller / ❄ heat pump	0	1		
CF 59	0= Chiller / Heat pump selection by keyboard 1= Chiller / Heat pump selection by digital input 2= Chiller / Heat pump selection by analogue input	0	2		
CF 60	Automatic change over setpoint for chiller/ heat pump selection (CF79 = 2)	-50.0 -58	110.0 230	°C °F	Dec int
CF 61	Automatic change over differential (CF79 = 2)	0.1 0	25.0 45	°C °F	Dec int
CF 62	°C or °F selection 0= °C / °BAR 1= °F / °psi	0	1		
CF 63	Power supply frequency 0= 50 Hz 1= 60 Hz 2= Vcc power supply (ATTENTION When CF83 = 2 the proportional outputs for fan control are not enabled)	0	2		
CF 64	Serial address	1	247		
CF 65	Firmware Release (only reading)	Sola lettura			
CF 66	Eeprom parameter map (only reading)	Sola lettura			
CF 67	Compressor 1 capacity	0	100%		
CF 68	Compressor 2 capacity	0	100%		
CF 69	Compressor 3 capacity	0	100%		
CF 70	Compressor 4 capacity	0	100%		
CF 71	Not used	0	0		
CF 72	Not used	0	0		
CF 73	Maximum number of start up of the compressor in 15 minutes 0= Not enabled	0	15		
CF 74	Working mode of the compressor 0 = chiller and heat pump 1 = only chiller 2 = only heat pump	0	2		
CF 75	Enable hybrid exchangers	0	1		
CF 76	Buzzer presence (0=disabled, 1=enabled)	0	1		
CF 77	Chiller operation (1=only compressor; 2=only Free cooling; 3=compressors and Free cooling)	1	3		
CF 78	Enable I/O expansion 0= not enabled 1= enabled	0	1		
CF 79	Enable expansion valve 1 0= not enabled 1= enabled	0	1		
CF 80	Enable expansion valve 2 0= not enabled 1= enabled	0	1		

CF 81	Expansion valve serial address	1	15		
CF 82	Evaporating probe position 0= Ichill 1= Electronic expansion valve IEV	0	1		
CF 83	Compressor delay activation after electronic expansion valve start command	0	250	sec	
CF 84	Enable Visograph remote keyboard 0= no 1= yes	0	1		
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
EI 1	I/O expansion lan address	0	15		
EI 2	I/O expansion Pb1 Configuration	0 o 1	28 c75		
EI 3	I/O expansion Pb2 Configuration	0 o 1	28 c75		
EI 4	I/O expansion Pb3 Configuration	0 o 1	35 c75		
EI 5	I/O expansion Pb4 Configuration	0 o 1	35 c75		
EI 6	I/O expansion Pb5 Configuration	0 o 1	35 c75		
EI 7	I/O expansion Pb6 Configuration	0 o 1	28 c75		
EI 8	I/O expansion Pb7 Configuration	0 o 1	28 c75		
EI 9	I/O expansion Pb8 Configuration	0 o 1	28 c75		
EI 10	I/O expansion Pb1 calibration	-12.0 -21	12.0 21	°C °F	Dec int
EI 11	I/O expansion Pb2calibration	-12.0 -21	12.0 21	°C °F	Dec int
EI 12	I/O expansion Pb3 calibration	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI 13	I/O expansion Pb4 calibration	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI 14	I/O expansion Pb5 calibration	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI 15	I/O expansion Pb6 calibration	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI 16	I/O expansion Pb7 calibration	-12.0 -21	12.0 21	°C °F	Dec int
EI 17	I/O expansion Pb8 calibration	-12.0 -21	12.0 21	°C °F	Dec int
EI 18	I/O expansion Pb3: minimum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 19	I/O expansion Pb3: maximum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 20	I/O expansion Pb4: minimum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 21	I/O expansion Pb4: maximum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 22	I/O expansion Pb5: minimum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 23	I/O expansion Pb5: maximum pressure value	-1.0 -14	50.0 725	Bar psi	Dec int
EI 24	I/O expansion ID1 configuration	0 -o1	c75		
EI 25	I/O expansion ID2 configuration	0 -o1	c75		
EI 26	I/O expansion ID3 configuration	0 -o1	c75		
EI 27	I/O expansion ID4 configuration	0 -o1	c75		
EI 28	I/O expansion ID5 configuration	0 -o1	c75		
EI 29	I/O expansion ID6 configuration	0 -o1	c75		
EI 30	I/O expansion ID7 configuration	0 -o1	c75		
EI 31	I/O expansion ID8 configuration	0 -o1	c75		
EI 32	I/O expansion ID9 configuration	0 -o1	c75		
EI 33	I/O expansion RL1 configuration	0 -o1	c74		
EI 34	I/O expansion RL2 configuration	0 -o1	c74		
EI 35	I/O expansion RL3 configuration	0 -o1	c74		
EI 36	I/O expansion RL4 configuration	0 -o1	c74		

EI 37	I/O expansion RL5 configuration	0 -o1	c74		
EI 38	I/O expansion RL6 configuration	0 -o1	c74		
EI 39	I/O expansion RL7 configuration	0 -o1	c74		
EI 40	I/O expansion 0-10V / 4-20mA output selection	0	1		
EI 41	I/O expansion proportional output OUT 1 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V o1..c50 ON / OFF with the same meaning of relè configuration	0 o 1	9 c50		
EI 42	I/O expansion proportional output OUT 2 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V 10= modulating condenser fan circuit 1 PWM 11= modulating condenser fan circuit 2 PWM o1..c50 ON / OFF output with the same meaning of relè	0 o 1	11 c50		
EI 43	I/O expansion proportional output OUT 3 0= not configured 1= modulation evaporator water pump 0÷10V 2= Free cooling modulating output 0÷10V 3= not used 4= auxiliary output AUX1 0÷10V 5= auxiliary output AUX2 0÷10V 6= inverter compressor 1 0÷10V 7= inverter compressor 2 0÷10V 8= modulating condenser fan circuit 1 0÷10V 9= modulating condenser fan circuit 2 0÷10V 10= modulating condenser fan circuit 1 PWM 11= modulating condenser fan circuit 2 PWM o1..c50 ON / OFF output with the same meaning of relè	0 o 1	11 c50		
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
Sd 1	Maximum dynamic Offset in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 2	Maximum dynamic Offset in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 3	External air setpoint in chiller mode	-50.0 -58	110.0 230	°C °F	Dec int
Sd 4	External air setpoint in heat pump mode	-50.0 -58	110.0 230	°C °F	Dec int
Sd 5	External air differential in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 6	External air differential in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 7	Dynamic set point: summer offset analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 8	Dynamic set point: winter offset analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 9	Summer outside temperature analog 1	-50.0 -58	110.0 230	°C °F	Dec int
Sd 10	Winter outside temperature analog 1	-50.0 -58	110.0 230	°C °F	Dec int
Sd 11	Summer outside temp. differential analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 12	Winter outside temp. differential analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 13	Dynamic set point: summer offset analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 14	Dynamic set point: winter offset analog 2	-30.0 -54	30.0 54	°C °F	Dec int

Sd 15	Summer outside temperature analog 2	-50.0 -58	110.0 230	°C °F	Dec int
Sd 16	Winter outside temperature analog 2	-50.0 -58	110.0 230	°C °F	Dec int
Sd 17	Summer outside temp. differential analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 18	Winter outside temp. differential analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 19	Dynamic set point: summer offset relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 20	Dynamic set point: winter offset relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 21	Summer outside temperature relay AUX1	-50.0 -58	110.0 230	°C °F	Dec int
Sd 22	Winter outside temperature relay AUX1	-50.0 -58	110.0 230	°C °F	Dec int
Sd 23	Summer temperature differential relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 24	Winter temperature differential relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 25	Dynamic set point: summer offset relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 26	Dynamic set point: winter offset relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 27	Summer outside temperature relay AUX2	-50.0 -58	110.0 230	°C °F	Dec int
Sd 28	Winter outside temperature relay AUX2	-50.0 -58	110.0 230	°C °F	Dec int
Sd 29	Summer temperature differential relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 30	Winter temperature differential relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
ES 1	Start of the Time band 1 (0÷24)	0	24.00	Hr	10 Min
ES 2	End of the Time Band 1 (0÷24)	0	24.00	Hr	10 Min
ES 3	Start of the Time band 2 (0÷24)	0	24.00	Hr	10 Min
ES 4	End of the Time Band 2 (0÷24)	0	24.00	Hr	10 Min
ES 5	Start of the Time band 3 (0÷24)	0	24.00	Hr	10 Min
ES 6	End of the Time Band 3 (0÷24)	0	24.00	Hr	10 Min
ES 7	Monday: energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 8	Tuesday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 9	Wednesday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 10	Thursday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 11	Friday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 12	Saturday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 13	Sunday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 14	Energy Saving setpoint offset in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
ES 15	Energy Saving differential in chiller mode	0.1 0	25.0 45	°C °F	Dec int
ES 16	Energy Saving setpoint offset in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
ES 17	Energy Saving differential in heat pump mode	0.1 0	25.0 45	°C °F	Dec int
ES 18	Maximum ON time when the unit is switched on by keyboard starting from OFF state by RTC 0= Not enabled	1	250	10 min	min
ES 19	Start of the Time band 1 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 20	End of the Time band 1 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 21	Start of the Time band 2 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 22	End of the Time band 2 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 23	Start of the Time band 3 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 24	End of the Time band 3 Sanitary water (0÷24)	0	24.00	Hr	10 Min
ES 25	Monday: Sanitary water 2nd set point activation	0	7		
ES 26	Tuesday: Sanitary water 2nd set point activation	0	7		
ES 27	Wednesday: Sanitary water 2nd set point activation	0	7		
ES 28	Thursday: Sanitary water 2nd set point activation	0	7		

ES 29	Friday: Sanitary water 2nd set point activation	0	7		
ES 30	Saturday: Sanitary water 2nd set point activation	0	7		
ES 31	Sunday: Sanitary water 2 set point activation	0	7		
ES 32	2nd set point Sanitary water offset	-30.0 -54	30.0 54	°C °F	Dec int
ES 33	2nd set point Sanitary water differential	0.1 0	25.0 45	°C °F	Dec int
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
Cr1	Type of functioning compressor rack 0= Not enabled 1= regulation by ST09 probe 2 = regolation by pressure probe (Evaporator pressure probe)	0	2		
Cr2	Set point compressor suction probe	Cr03	Cr04	Bar Psi	Dec int
Cr3	Minimum set point compressor suction probe	0	Cr02	Bar Psi	Dec int
Cr4	Maximum set point compressor suction probe	Cr02	50 725	Bar Psi	Dec int
Cr5	Regulation band suction probe	0.1 1	14.0 203	Bar Psi	Dec int
Cr6	Set energy saving compressor rack	0.0 0	14.0 203	Bar psi	Dec int
Cr7	Differential energy savingcompressor rack	0.1 1	14.0 203	Bar Psi	Dec int
Cr8	Number of compressors enabled in case of failure probe 0 ÷ 6	0	6		
Cr9	Number od ventilation step in case of failure probe 0 ÷ 4	0	4		
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
CO 1	Minimum compressor ON time after the start-up.	0	250	10 sec	10 sec
CO 2	Minimum compressor OFF time after the switching off.	0	250	10 sec	10 sec
CO 3	ON delay time between two compressors or compressor and valve. During this time the led of the next resource is blinking.	1	250	Sec	
CO 4	OFF delay time between two compressors or compressor and valve. During this time the led of the next resource is blinking.	0	250	Sec	
CO 5	Output time delay after the main power supply start-up to the unit. All the loads are delayed in case of frequently power failures.	0	250	10 Sec	10 sec
CO 6	Functioning (see Capacity Control) 0= With on/off steps 1= Continuous with steps and direct action 2= Continuous with steps and reverse action 3= Continuous with steps and direct total action	0	3		
CO 7	Start-up with minimum compressor power / automatic start-unloading valve 0 = Only at the compressor start-up (Minimum power automatic start-unloading valve off) 1= At the compressor start-up and during the termoregulation (Minimum power / automatic start-unloading valve off) 2 = Only at the screw compressor start-up (Minimum power automatic start-unloading valve off) 3= At the compressor start-up and during the termoregulation (Minimum power / Unloading valve ON with compressor off)	0	3		
CO 8	Relay ON time of the Solenoid valve Intermittent for screw compressor, with 0 the function is not enabled.	0	250	Sec	
CO 9	Relay OFF time of the Solenoid valve Intermittent for screw compressor	0	250	Sec	
CO 10	Kind of compressor start-up 0= Direct (vedi avviamento compressors) 1= Part - winding	0	1		
CO 11	If CO10= 1 part - winding start-up time. To change the time delay between the two contactors of the two compressor circuits.	0	100	Dec. di Sec	0.1 sec
CO 12	Not used				
CO 13	By-pass gas valve start-up time / automatic start-unloading valve (capacity step control)	0	250	sec	
CO 14	Compressor rotation (See compressor rotation) 0 = Sequential 1 = Compressors rotation based on time running hours 2 = Compressors rotation based on number of starts-up	0	2		
CO 15	Circuit balancing (See Circuit balancing) 0= Circuit saturation 1= Circuit balancing	0	1		

CO 16	Operative mode of the evaporator pump / supply fan (See Evaporator pump function) 0= Not enabled (evaporator pump or supply fan). 1= Continuous. When the unit is running in Chiller or HP the pump or the supply fan is running. 2= With compressor. When a compressor is running also the pump or the supply fan is running.	0	2		
CO 17	ON compressor delay after water pump / supply fan start-up (See water pump functioning).	1	250	sec	10sec
CO 18	OFF delay evaporator water pump / supply fan after compressor switching OFF. This delay is also active when the unit is turned in stand-by (See evaporator water pump function).	0	250	Min	
CO 19	Number of time running hours for pump rotation (See water pump group function)	0	999	10Hr	10Hr
CO 20	Time to make run the pumps together before rotating from one to the other (See water pump group function)	0	250	Sec	
CO 21	Operative mode for condenser water pump (See condenser water pump function) 0= Not enabled. 1= Continuous. When the unit is running in Chiller or HP the is running. 2= With compressor. When a compressor is running also the pump is running.	0	2		
CO 22	Free				
CO 23	OFF delay condenser water pump after compressor switching OFF. This delay is also active when the unit is turned in stand-by (See evaporator water pump function).	0	250	Min	
CO 24	Number of time running hours for pump rotation (See water pump group function).	0	999	10Hr	10Hr
CO 25	Time to make run the pumps together before rotating from one to the other (See water pump group function).	0	250	Sec	
CO 26	Compressor 1 operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 27	Compressor 2 operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 28	Compressor 3 operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 29	Compressor 4 operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 30	Not used	0	0		
CO 31	Not used	0	0		
CO 32	“Evaporator pump / Supply fan” operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 33	2nd Evaporator pump operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 34	Condenser pump operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 35	2nd Condenser pump operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 36	Pump down operating mode (See pump down ON/OFF function) 0= Not enabled 1= Unit off with pump–down, unit on without pump–down 2= Unit off with pump–down, unit on with pump–down 3= Chiller mode off with pump–down, chiller mode on without pump–down 4= Chiller mode off with pump–down, chiller mode on with pump–down	0	4		
CO 37	Pump–down pressure setpoint (See pump down ON/OFF function)	0.0 0	50.0 725	Bar psi	Dec int
CO 38	Pump-down pressure differential (See pump down ON/OFF function)	0.1 1	12.0 174	Bar psi	Dec int
CO 39	Maximum pump–down time duration at start-up and stop (See pump down ON/OFF function)	0	250	Sec	
CO 40	Unloading compressor setpoint in chiller. From high temperature of the evaporator water inlet (See unloading function).	-50.0 -58	110.0 230	°C °F	Dec int
CO 41	Unloading Differential. From high temperature of the evaporator water inlet (See unloading function).	0.1 0	25.0 45	°C °F	Dec int
CO 42	Delay time to engage the Unloading function from high temperature of the evaporator water inlet (See unloading function).	1	250	10 Sec	10 sec
CO 43	Maximum unloading duration time to keep activated the Unloading function from high temperature of the evaporator water inlet (See unloading function).	0	250	Min	
CO 44	Unloading compressor setpoint. From temperature / pressure in chiller mode (See unloading function).	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
CO 45	Unloading Differential. From temperature / pressure in chiller mode (See unloading function).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO 46	Unloading compressor setpoint. From temperature / pressure in HP mode (See unloading function).	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int

CO 47	Unloading Differential. From temperature / pressure in HP mode (See unloading function).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO 48	Maximum unloading duration time from temperature/pressure control.	1	250	Min	
CO 49	Number of steps for circuit with active unloading 1= 1st step 2= 2nd step 3= 3rd step	1	3		
CO 50	Minimum ON time of the capacity step after the unloading function start (only for capacity compressor)	0	250	Sec	
CO 51	Setpoint of the solenoid valve (on) of the liquid injection	0 32	150 302	°C °F	Dec / int int
CO 52	Setpoint of the solenoid valve (off) of the liquid injection	0.1 0	25.0 45	°C °F	Dec int
CO 53	Maximum time of work in neutral zone without insert resource	0	250	Min	10 Min
CO 54	Maximum time of work in neutral zone without rotation resource	0	999	Hr	1Hr
CO 55	Set point unloading compressor from low evaporator water temperature	-50.0 -58	110.0 230	°C °F	Dec int
CO 56	Differential unloading compressor from low evaporator water temperature	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO 57	Maximum unloading duration time from low evaporator water temperature	0	250	Min	
CO 58	maximum time pump-down in stopped CO58 = 0 Not enabled	0	250	Sec	
CO 59	maximum time pump-down in started CO59 = 0 Not enabled	0	250	Sec	
CO 60	Maximum time start up compressor inverter controlled	0	250	sec	
CO 61	Minimum value proportional output from start up compressor	0	100	%	
CO 62	Minimum time capacity variation from start up compressor inverter controlled	0	250	sec	
CO 63	Minimum percentage continuative of work of the compressor inverter controlled before to start counting CO64 time	0	100	%	
CO 64	Maximum time continuative of work of the compressor with percentage less of CO63	0	250	Min	10 Min
CO 65	Time of forcing the compressor inverter controlled to the maximum power	0	250	sec	sec
CO 66	Maximum time continuative of work of the compressor inverter controlled	0	999	Hr	1Hr
CO 67	Minimum value of the compressor 1 inverter controlled	1	CO68	%	
CO 68	Maximum value of the compressor 1 inverter controlled	CO67	100	%	
CO 69	Minimum value of the compressor 2 inverter controlled	1	CO70	%	
CO 70	Maximum value of the compressor 2 inverter controlled	CO69	100	%	
CO 71	Minimum time capacity variation compressor inverter controlled	1	250	sec	
CO 72	Maximum operating time of a single compressor	0	250	Min	
CO 73	Sanitary water pump hour counter	0	999	10 Hr	10 Hr
CO 74	Solar panel water pump hour counter	0	999	10 Hr	10 Hr
CO 75	Forced time to reverse the 4 way valve when the compressor is switched off	0	250	sec	
CO 76	Maximum number of compressors to use in Chiller	1	15		
CO 77	Maximum number of compressors to use in Heat pump	1	15		
CO 78	Maximum number of compressors to use in Sanitary water	1	15		
CO 79	Maximum % output of the inverter compressor in Chiller	1	100	%	
CO 80	Maximum % output of the inverter compressor in Heat pump	1	100	%	
CO 81	Maximum % output of the inverter compressor in Sanitary water	1	100	%	
CO 82	Outside temperature to reduce inverter compressor speed in Heat pump	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
CO 83	Hysteresis temperature to reduce inverter compressor speed in Heat pump	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO 84	Compressor speed if outside temperature > CO82	0	100	%	
CO 85	Evaporator water pump OFF time if the set point is reached	0	250	10 min	
CO 86	Evaporator water pump OFF time if the machine is STD-BY or OFF	0	250	10 Ore	
CO 87	Evaporator water pump ON time	0	250	Sec	10sec
CO 88	Condenser water pump OFF time if the set point is reached	0	250	10 min	
CO 89	Condenser water pump OFF time if the machine is STD-BY or OFF	0	250	10 Ore	
CO 90	Condenser water pump ON time	0	250	Sec	10sec

CO 91	Minimum time between to switch on of the compressor	0	250	sec	
CO 92	Compressor activation delay starting from water solenoid valve activation	0	250	sec	
CO 93	Water solenoid valve de-activation delay starting from compressor de-activation	0	250	sec	
CO 94	% output of the inverter compressor in defrost	1	100	%	
CO 95	Free cooling water pump operation time to generate maintenance warning	0	999	10 Hr	10 Hr
CO 96	% output of the inverter compressor in unloading	1	100	%	
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
US 1	Auxiliary relay 1 operating mode (See graph and auxiliary relay functions) 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 2	Analog input configuration for auxiliary relay 1 control. Allows to select which probe value Pb1..Pb10 controls the relay	1	20		
US 3	Auxiliary relay 1 summer minimum set point	-50.0 -58 0.0 0	US5	°C °F Bar Psi	Dec int Dec int
US 4	Auxiliary relay 1 summer maximum set point	US5	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 5	Auxiliary relay 1 summer set point	US3	US4	°C °F Bar Psi	Dec int Dec int
US 6	Auxiliary relay 1 winter minimum set point	-50.0 -58 0.0 0	US8	°C °F Bar Psi	Dec int Dec int
US 7	Auxiliary relay 1 winter maximum set point	US8	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 8	Auxiliary relay 1 winter set point	US6	US7	°C °F Bar Psi	Dec int Dec int
US 9	Auxiliary relay 1 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 10	Auxiliary relay 1 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 11	Auxiliary relay 2 operating mode (See graph and auxiliary relay functions) 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 12	Analogue input configuration for auxiliary relay 2 control . Allows to select which probe value Pb1..Pb10 controls the relay	1	20		
US 13	Auxiliary relay 2 summer minimum set point	-50.0 -58 0.0 0	US15	°C °F Bar Psi	Dec int Dec int
US 14	Auxiliary relay 2 summer maximum set point	US15	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 15	Auxiliary relay 2 summer set point	US13	US14	°C °F Bar Psi	Dec int Dec int
US 16	Auxiliary relay 2 winter minimum set point	-50.0 -58 0.0 0	US18	°C °F Bar Psi	Dec int Dec int
US 17	Auxiliary relay 2 winter maximum set point	US18	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int

US 18	Auxiliary relay 2 winter set point	US16	US17	°C °F Bar Psi	Dec int Dec int
US 19	Auxiliary relay 2 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 20	Auxiliary relay 2 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 21	Maximum operating time of auxiliary realys	0	250	min	
US 22	Auxiliary proportional output n° 1 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 23	Analogue input configuration for auxiliary control 1 Allows to select which probe value Pb1..Pb10 controls output	1	20		
US 24	Analog output 1 summer minimum set point	-50.0 -58 0.0 0	US26	°C °F Bar Psi	Dec int Dec int
US 25	Analog output 1 summer maximum set point	US26	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 26	Analog output 1 summer set point	US24	US25	°C °F Bar Psi	Dec int Dec int
US 27	Analog output 1 winter minimum set point	-50.0 -58 0.0 0	US29	°C °F Bar Psi	Dec int Dec int
US 28	Analog output 1 winter maximum set point	US29	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 29	Analog output 1 winter set point	US27	US28	°C °F Bar Psi	Dec int Dec int
US 30	Analog output 1 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 31	Analog output 1 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 32	Analog output 1 minimum value	0	US33	%	
US 33	Analog output 1 maximum value	US32	100	%	
US 34	Auxiliary proportional output n° 2 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 35	Analogue input configuration for auxiliary 2 control Allows to select which probe value Pb1..Pb10 controls output	1	20		
US 36	Analog output 2 summer minimum set point	-50.0 -58 0.0 0	US38	°C °F Bar Psi	Dec int Dec int
US 37	Analog output 2 summer maximum set point	US38	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 38	Analog output 2 summer set point	US36	US37	°C °F Bar Psi	Dec int Dec int

US 39	Analog output 2 winter minimum set point	-50.0 -58 0.0 0	US41	°C °F Bar Psi	Dec int Dec int
US 40	Analog output 2 winter maximum set point	US41	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 41	Analog output 2 winter set point	US39	US40	°C °F Bar Psi	Dec int Dec int
US 42	Analog output 2 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 43	Analog output 2 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 44	Analog output 2 minimum value	0	US45	%	
US 45	Analog output 2 maximum value	US44	100	%	
US 46	Operation mode under minimum value	0	1		
US 47	Probe 1 selection for evaporator water pump modulation in chiller	0	20		
US 48	Probe 2 selection for evaporator water pump modulation in chiller	0	20		
US 49	Set point for maximum speed of modulationg evaporator water pump in chiller	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 50	Proportional band for maximum speed of modulationg evaporator water pump in chiller	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 51	Minimum speed of the evaporator water pump in chiller	0	100	%	
US 52	Maximum speed of the evaporator water pump in chiller	0	100	%	
US 53	Probe 1 selection for evaporator water pump modulation in Heat Pump	0	20		
US 54	Probe 2 selection for evaporator water pump modulation in Heat Pump	0	20		
US 55	Set point for maximum speed of modulationg evaporator water pump in Heat Pump	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US 56	Proportional band for maximum speed of modulationg evaporator water pump in Heat Pump	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 57	Minimum speed of the evaporator water pump in Heat Pump	0	100	%	
US 58	Maximum speed of the evaporator water pump in Heat Pump	0	100	%	
US 59	Speed of the water pump in Free Cooling	0	100	%	
US 60	Speed of the water pump when compressor OFF	0	100	%	
US 61	AUX 1 relay operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
US 62	AUX 2 relay operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
US 63	AUX 1 analog output operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
US 64	AUX 2 analog output operation mode 1= only in Chiller 2= only in Heat pump 3= in Chiller and Heat pump	1	3		
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
FA 1	Fan configuration output 0 = Not enabled 1 = Always on 2 = ON/OFF regulation with steps 3 = ON/OFF Continuous regulation 4 = Proportional speed control	0	4		
FA 2	Fan operating mode 0= Dependent from the compressor 1= Independent from the compressor	0	1		

FA 3	If the condenser fan control is the triac output, when the regulation starts the trigger output will drive the condenser fan at the maximum voltage for the time FA 3 then, then the regulation will follow the temperature/pressure of the probe.	0	250	Sec	
FA 4	Phase shifting of the fan motor	0	8	Micro Sec	250μs
FA 5	Number of condensing circuits 0= one condenser circuit 1= tow condenser circuits	0	1		
FA 6	Pre-ventilation time before turning on the compressor in chiller mode. To turn on the fan at the maximum speed before the compressor and reduce the successive condensing temperature/pressure increasing. (only if FA01=4)	0	250	Sec	
FA 7	Minimum speed for condenser fan in Chiller mode. To set the minimum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 8	Maximum speed for condenser fan in Chiller mode. To set the maximim fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 9	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA 7 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 10	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the maximum speed FA 8 ON/OFF regulation FA01 = 2/3 SETpoint step n° 2	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 11	Proportional speed control FA01 = 4 Proportional band for condenser fan control in chiller To set the temperature/pressure differential between the minimum and the maximum of the fan speed regulation. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 1	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 12	Proportional speed control FA01 = 4 CUT-OFF differential in chiller. To set a temperature/pressure differential to stop the fan. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 2	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 13	Over ride CUT- OFF in chiller. To set a temperature/pressure differential to keep the minimum fan speed.	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 14	CUT-OFF time delay. To set a time delay before activating the CUT-OFF function after the fan start-up. If after the compressor start-up the proportional regulator requires to turn off the fan (cut-off) and FA14≠0, the fan is on at the minimum speed for the time set in this parameter. If FA14=0 the function is disabled.	0	250	Sec	
FA 15	Night speed in chiller. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 16	Minimum speed for condenser fan in Heat Pump mode. To set the minimum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 17	Maximum speed for condenser fan in Heat Pump mode. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 18	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA16 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 19	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the maximum speed FA17 ON/OFF regulation FA01 = 2/3 SETpoint step n° 2	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 20	Proportional speed control FA01 = 4 Proportional band for condenser fan control in heat pump To set the temperature/pressure differential between the minimum and the maximum of the fan speed regulation. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 1	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 21	Proportional speed control FA01 = 4 CUT-OFF differential in heat pump. To set a temperature/pressure differential to stop the fan. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 2	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int

FA 22	Over ride CUT- OFF in Heat pump. To set a temperature/pressure differential to keep the minimum fan speed.	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 23	Night speed in Heat pump. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 24	Hot start setpoint	-50.0 -58	110.0 230	°C °F	Dec int
FA 25	Hot start differential	0.1 0	25.0 45	°C °F	Dec int
FA 26	ON/OFF regulation FA01 = 2/3 SETpoint step n° 3	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 27	ON/OFF regulation FA01 = 2/3 SETpoint step n° 4	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 28	ON/OFF regulation FA01 = 2/3 SETpoint step n° 3	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 29	ON/OFF regulation FA01 = 2/3 SETpoint step n° 4	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 30	Pre ventilation in Heat Pump (only if FA01 = 4)	0	250	Sec	Sec
FA 31	Post ventilation in Heat Pump	0	250	Sec	10Sec
FA 32	Outside temperature to enable post ventilation in Heat Pump	-50.0 -58	110.0 230	°C °F	Dec int
FA 33	Condenser fan speed during post ventilation	0	100	%	
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
Ar 1	Anti-freeze heaters/integration heating setpoint for air/air unit in Chiller mode. To set a temperature value, below this value the anti-freeze relay is activated.	-50.0 -58	110.0 230	°C °F	Dec int
Ar 2	Regulation band for antifreeze in Chiller mode.	0.1 0	25.0 45	°C °F	Dec Int
Ar 3	Set Anti-freeze heaters/integration heating setpoint for air/air unit in HP mode. To set a temperature value, below this value the anti-freeze relay is activated.	-50.0 -58	110.0 230	°C °F	Dec int
Ar 4	Regulation band for antifreeze in HP mode.	0.1 0	25.0 45	°C °F	Dec int
Ar 5	Antifreeze heaters / integration heating in defrost 0= ON only with thermoregulation control 1= ON with thermoregulation and during the defrosting cycle	0	1		
Ar 6	Antifreeze probe to manage heaters / support heaters in Chiller mode. 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar 7	Antifreeze probe to manage heaters / support heaters in HP mode. 0= Not enabled 1= Evaporator inlet. 2= Evaporator outlet 1 and 2. 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar 8	Thermoregulation probe for anti-freeze / condenser heaters. 0= not enabled. 1= Condenser common water inlet probe. 2= Condenser common water inlet and condenser inlet 1 / 2 probe. 3= Condenser water outlet 1 / 2 probe. 4= Condenser water outlet 1 / 2 and common outlet 5= External temperature	0	5		
Ar 9	Anti-freeze heaters or condenser/evaporator water pump control with unit in remote OFF or stand-by mode: 0= Control not enable 1=Controlled by anti-freeze thermoregulation.	0	1		
Ar 10	Anti-freeze heaters control for condenser/evaporator faulty probe: 0= Anti-freeze heaters OFF 1= Anti-freeze heaters ON	0	1		
Ar 11	Boiler function 0=Not enabled 1=Enabled for integration heating 2= Enabled for heating	0	2		

Ar 12	External air temperaure setpoint for boiler heaters (on)	-50.0 -58	110.0 230	°C °F	Dec int
Ar 13	Temperature differential for boiler heaters (off)	0.1 0	25.0 45	°C °F	Dec int
Ar 14	Time delay before turning the boiler on	0	250		Min
Ar 15	Setpoint for boiler heaters (on) in chiller	-50.0 -58	110.0 230	°C °F	Dec int
Ar 16	Proportional band for boiler heaters in chiller	0.1 0	25.0 45	°C °F	Dec int
Ar 17	Setpoint for boiler heaters (on) in HP	-50.0 -58	110.0 230	°C °F	Dec int
Ar 18	Proportional band for boiler heaters in HP	0.1 0	25.0 45	°C °F	Dec int
Ar 19	External air setpoint to stop the compressor as integration function	-50.0 -58	110.0 230	°C °F	Dec int
Ar 20	External air differential to stop the compressor as integration function	0.1 0	25.0 45	°C °F	Dec int
Ar21	Termoregulation probe anti freeze alarm in chiller mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar22	Termoregulation probe anti freeze alarm in heat pump mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar23	Termoregulation probe anti freeze alarm water condenser 0= not enabled. 1= Condenser common water inlet probe. 2= Condenser common water inlet and condenser inlet 1 / 2 probe. 3= Condenser water outlet 1 / 2 probe. 4= Condenser water outlet 1 / 2 and common outlet 5= External temperature	0	5		
Ar24	Water pump / antifreeze alarm in OFF/ stand-by 0= Aways in OFF 1= ON only with thermoregulation control	0	1		
Ar25	Termoregulation probe water pump in antifreeze mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar26	Set point starting water pump in antifreeze alarm	-50.0 -58	110.0 230	°C °F	Dec int
Ar27	Differential starting water pump in antifreeze alarm	0.1 0	25.0 45	°C °F	Dec int
Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
dF 1	Defrost configuration: 0= Not enabled 1= Start and stop for temperature / pressure 2= Start depends on probe selected by par. dF24 and stop for time duration (dF05) 3= Start depends on probe selected by par. dF24 and stop for external contact 4= Defrost only with condenser fan 5= Start from digital input and stop on probe selected by par. dF24	0	5		
dF 2	Temperature or pressure of the defrost start-up	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int
dF 3	Temperature or pressure of the defrost stop	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int
dF 4	Minimum defrost duration.	0	250	Sec	
dF 5	Maximum defrost duration.	0	250	Min	
dF 6	Time delay between the defrost of two circuits	0	250	Min	
dF 7	OFF compressor delay before the defrost	0	250	Sec	
dF 8	OFF compressor delay after the defrost	0	250	Sec	
dF 9	Defrost interval time of the same circuit	1	99	Min	
dF 10	Temperature setpoint for combined defrost of the 1st circuit after parameter DF10 counting.	-50.0 -58	110.0 230	°C °F	Dec int

dF 11	Temperature setpoint for combined defrost end of the 1st circuit.	-50.0 -58	110.0 230	°C °F	Dec int
dF 12	Temperature setpoint for combined defrost of the 2nd circuit after parameter DF10 counting.	-50.0 -58	110.0 230	°C °F	Dec int
dF 13	Temperature setpoint for combined defrost end of the 2nd circuit.	-50.0 -58	110.0 230	°C °F	Dec int
dF 14	Activation of all the steps of the 1st circuit during the defrost. 0= Not enabled 1= Enabled	0	1		
dF 15	Activation of all the steps of the 2nd circuit during the defrost. 0= Not enabled 1= Enabled	0	1		
dF 16	Time delay between two compressor ON in defrost mode	0	250	Sec	
dF 17	Fan control during defrost / dripping time 0= Not enabled 1= Only in defrost 2= For both functions defrost / dripping time	0	2		
dF 18	Pressure / temperature setpoint to force the ventilation ON during the defrost.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int
dF 19	Minimum time delay before a forced defrost	0	250	sec	
dF 20	Pressure / temperature setpoint for a forced defrost	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
dF 21	Forced defrost differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 22	Defrost start-up with 2 circuits 0= Independent 1= If both have reached the necessary requirements 2= If one has reached the necessary requirements	0	2		
dF 23	End defrost for two circuits and common ventilation. 0= Independent 1= If both have reached the necessary end defrost requirements 2= If one has reached the necessary end defrost requirements	0	2		
dF 24	Start / stop defrost probe 0= start and stop with condenser temperatur / pressure probe 1= start with evaporator pressure probe / stop with condenser temperatur / pressure probe 2= start with condenser temperatur / pressure probe / stop with evaporator pressure probe 3= start and stop with evaporator pressure probe	0	3		
dF 25	Stop supply fan diuring defrost cycle 0= Not enabled 1= enable	0	1		
dF 26	Set point to enable defrost with condenser fan	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
dF 27	Hybrid exchangers set point 1 in chiller	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
dF 28	Hybrid exchangers set point 2 in chiller	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
dF 29	Hybrid exchangers differential 1 in chiller	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 30	Hybrid exchangers differential 2 in chiller	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 31	Hybrid exchangers set point 1 in heat pump	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
dF 32	Hybrid exchangers set point 2 in heat pump	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int

dF 33	Hybrid exchangers differential 1 in heat pump	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 34	Hybrid exchangers differential 2 in heat pump	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 35	Probe selection of the Hybrid exchangers 0= outside temperature 1= condenser temperature/pressure	0	1		
dF 36	Forced time Hybrid exchangers in chiller mode when the compressor is switched on	0	250	sec	
dF 37	Max. offset of the Defrost dinamic set point	-30.0 -54 -14.0 -203	30.0 54 14.0 203	°C °F Bar Psi	Dec int Dec int
dF 38	Outside temperature set point of the Defrost dinamic set point	-50.0 -58	110.0 230	°C °F	Dec int
dF 39	Outside temperature differential of the Defrost dinamic set point	-30.0 -54	30.0 54	°C °F	Dec int

Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
rC 1	Sanitary water regulation mode	0	2		
rC 2	Recovery modes 0 = not enabled 1 = 2 indipendent circuit 2 = both the circuit in parallel	0	250	Sec	
rC 3	Delay time delay with step forced off	0	250	Sec	
rC 4	Delay time delay with step forced off after the recovery valve activation	0	250	Min	
rC 5	Recovery minimum time	0	250	Min	
rC 6	Minimum interval time between the end and the beginning of the next recovery	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
rC 7	Temperature setpoint to disable the recovery	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
rC 8	Temperature differential to restore the recovery	0	250	Min	
rC 9	Maximum time with recovery disabled (if temperature/pressure within rC6-rC7)	0	1		

Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
FS 1	Sanitary water regulation mode 0= not enabled 1=valves in water circuit 2=valves in gas circuit	0	2		
FS 2	Sanitary water thermoregulation priority 0 = heating / cooling 1 = sanitary water 2 = sanitary water by digital input	0	2		
FS 3	Sanitary water thermoregulation set point	FS05	FS06	°C/°F	dec/int
FS 4	Sanitary water thermoregulation band	0.1 0	25.0 45	°C °F	Dec int
FS 5	Minimum value of the sanitary water set point	-50.0 -58	FS06	°C °F	Dec int
FS 6	Maximum value of the sanitary water set point	FS05	110.0 230	°C °F	Dec int
FS 7	Full loads enabling to reach the sanitary water set point	0	1		
FS 8	Heaters enabling during the sanitary water thermoregulation 0= not enabled 1= compressors + heaters 2= only heaters 3= only compressors	0	1		
FS 9	Operation working time to activate the heaters during the sanitary water thermoregulation	0	250	Min	
FS 10	Time delay to activate the sanitary water valve	0	999	sec	int
FS 11	Reversing cycle delay during sanitary water thermoregulation	0	999	sec	int
FS 12	Antilegionella function operating mode 0 = interval time 1= weekly 2= daily	0	2		
FS 13	Delay time between two Antilegionella cycles	0	250	Hr	0
FS 14	Antilegionella Set point	FS15	FS16	°C/°F	dec/int

FS 15	Minimum value of the Antilegionella set point	-50.0 -58	FS14	°C °F	Dec int
FS 16	Maximum value of the Antilegionella set point	FS14	110.0 230	°C °F	Dec int
FS 17	Hour selection for the Antilegionella activation	0	24.00	Hr	10 min
FS 18	Day selection for the Antilegionella activation	0	7		
FS 19	Minimum operating working time of the Antilegionella cycle	1	250	min	
FS 20	Temperature band for heaters deactivation during Antilegionella cycle	0.1 0	25.0 45	°C °F	Dec int
FS 21	Temperature differential to enable the freecooling function	0.1 0	25.0 45	°C °F	Dec int
FS 22	Temperature differential for the free cooling regulation	0.1 0	25.0 45	°C °F	Dec int
FS 23	Set point for solar panel activation	FS25	FS26	°C/°F	dec/int
FS 24	Differential value for solar panel deactivation	0.1 0	25.0 45	°C °F	Dec int
FS 25	Minimum value of the solar panel set point	-50.0 -58	FS23	°C °F	Dec int
FS 26	Maximum value of the solar panel set point	FS23	110.0 230	°C °F	Dec int
FS 27	Delay time to activate the sanitary water valve starting from pump activation	0	250	sec	
FS 28	Delay time to deactivate the sanitary water pump starting from valve deactivation	0	250	sec	
FS 29	Maximum operating working time of the Antilegionella cycle	0	250	min	
FS 30	Sanitary water: security set point	-50.0 -58	110.0 230	°C °F	
FS 31	Sanitary water: security differential	0.1 0	25.0 45	°C °F	
FS 32	Sanitary water: minimum interruption time	0	250	min	
FS 33	Sanitary water pump operation mode	0	1		
FS 34	Free cooling water pump OFF time if chiller only Free cooling	0	250	min	
FS 35	Free cooling water pump ON time if chiller only Free cooling	0	250	sec	
FS 36	Free cooling maximum time	0	250	min	
FS 37	Set point Free cooling	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
FS 38	Proportional band Free coling	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FS 39	Minimum value Free cooling analog output	0	100	%	
FS 40	Maximum value Free cooling analog output	0	100	%	
FS 41	T1 probe selection for Free cooling 0=disabled, 1=Pb1, 2=Pb2, etc.	0	20		
FS 42	T2 probe selection for Free cooling 0=disabled, 1=Pb1, 2=Pb2, etc.	0	20		
FS 43	Outside temperature set point to force the maximum speed of condenser fan	-50.0 -58	110.0 230	°C °F	
FS 44	Outside temperature differential to force the maximum speed of condenser fan	0.1 0	25.0 45	°C °F	
FS 45	Delay time of condenser fan regulation during Free cooling	0	250	min	
FS 46	Antilegionella cycle opreration mode 0= compressors and heaters 1= compressors are first inserted and then heaters 2= only heaters 3= only compressors	0	3		
FS 47	Evaporator water pump enabled is Sanitary water 0= enabled 1= disabled	0	1		
FS 48	Probe selection to force exit from Sanitary water 0= disabled 1= probe Pb1 2= probe Pb2 ...	0	20		
FS 49	Start production Sanitary water 0= when all compressors are requested 1= when at least one compressor is requested	0	1		
FS 50	Set point to force OFF the compressors during antilegionella cycle	-50.0 -58	110.0 230	°C °F	

FS 51	Compressors safety time in sanitary water 0= safety time enabled 1= safety time disabled	0	1		
FS 52	Set point to enable heaters for low sanitary water temperature	-50.0 -58	110.0 230	°C °F	
FS 53	Proportional band to enable heaters for low sanitary water temperature	0.1 0	25.0 45	°C °F	
FS 54	Probe selection for low sanitary water temperature 0= disabled 1= Pb1 2= Pb2 ...	0	20		
FS 55	Solar panel opration mode for sanitary water 0= disabled 1= integration to heat pump 2= substitution to heat pump	0	2		
FS 56	Solar panel opration mode for heating 0= disabled 1= integration to heat pump 2= substitution to heat pump	0	2		
FS 57	Probe selection to calculate Dt of solar panel in sanitary water 0= disabled 1= Pb1 2= Pb2 …	0	20		
FS 58	Probe selection to calculate Dt of solar panel in heating 0= disabled 1= Pb1 2= Pb2 …	0	20		
FS 59	Dt to enable solar panel in sanitary water	0.1 0	25.0 45	°C °F	Dec int
FS 60	Dt to enable solar panel in heating	0.1 0	25.0 45	°C °F	Dec int
FS 61	Maximum operation time of solar panel if set point not reached	0	250	min	
FS 62	Probe selection to disable the Free cooling for low temperature	0	20		
FS 63	Set point to disable the Free cooling for low temperature	-50.0 -58	110.0 230	°C °F	
FS 64	Differential to disable the Free cooling for low temperature	0.1 0	25.0 45	°C °F	

Parameter	**Description**	**min**	**max**	**M. u.**	**Resolution**
AL 1	Low pressure alarm delay from analog and digital input	0	250	Sec	
AL 2	Low pressure alarm delay from digital input after compressor stop if the low pressure switch is used for the pump down. AL02= 0 low pressure alarm not enable with compressor OFF AL02≠ 0 low pressure alarm enable after AL02 time with compressor OFF	0	250	10 Sec	
AL 3	Low pressure alarm setpoint from analogue input	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
AL 4	Low pressure alarm differential from analogue input	0.1 0 0.1 1	25.0 45 14.0 203	°C °F bar psi	Dec int Dec Int
AL 5	Maximum number of low pressure events from digital/analogue inputs: Manual reset if AL05 = 0 Automatic reset if AL05 =16 From automatic to manual reset if AL05= 1..15	0	16		
AL 6	Low temperature/pressure alarm during defrost 0= Not enabled 1= Enabled	0	1		
AL 7	Low temperature/pressure alarm delay during defrost	0	250	Sec	
AL 8	Low temperature/pressure alarm with unit in OFF or stand – by: 0 = Not enabled 1= Alarm enabled	0	1		
AL 9	High temperature/pressure alarm from analogue input	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
AL 10	High temperature/pressure alarm differential from analogue input	0.1 0 0.1 1	25.0 45 14.0 203	°C °F bar psi	Dec int Dec int
AL 11	Low oil pressure / level delay from digital input	0	250	Sec	

AL 12	Minimum time for low oil pressure / level from digital input activation in normal working condition.	0	250	Sec	
AL 13	Maximum number of low oil pressure/level events: Always manual reset if AL13= 0 Always automatic reset if AL13 =16 From automatic to manual reset if AL13 = 1..15	0	16		
AL 14	Configuration 0= Not enabled 1= Only for chiller 2= Only for heat pump 3= For both chiller and heat pump	0	3		
AL 15	"Flow switch / supply fan overload" alarm delay after pump/fun activation.	0	250	Sec	
AL 16	Flow switch time activation before blocking evaporator water pump	0	250		
AL 17	"Flow switch / supply fan overload" activation time to generate the alarm	0	250	Sec	
AL 18	"Flow switch / supply fan overload" de-activation time to reset the alarm	0	250	Sec	
AL 19	Compressor overload alarm delay after compressor start-up	0	250	Sec	
AL 20	Maximum number of compressor overload alarm events Always manual reset if AL20 = 0 Always automatic reset if AL20 =16 From automatic to manual reset if AL20 =1..15	0	16		
AL 21	Maximum number of pump down alarm events per hour in stop condition. After this number the alarm is logged, displayed and signalled with alarm relay + buzzer. Manual reset if AL21 = 0 Automatic reset if AL21 =16 From automatic to manual reset if AL21 =1..15	0	16		
AL 22	Maximum number of pump down alarm events per hour in start-up condition. After this number the alarm is logged, displayed and signalled with alarm relay + buzzer. Always manual reset if AL22 = 0 Always automatic reset if AL22 =16 From automatic to manual reset if AL21 =1..15 and parameter AL23 config.	0	16		
AL 23	Select if the pump down alarm must change from automatic to manual reset: 0= Always automatic reset 1= Manual reset after AL21 alarm events	0	1		
AL 24	Minimum antifreeze setpoint in chiller (from –30 °C to AL24)	-50.0 -58	AL26	°C °F	Dec int
AL 25	Maximum antifreeze setpoint in chiller (from AL24 to 70 °C)	AL26	110.0 230	°C °F	Dec int
AL 26	Setpoint temperature for low anti-freeze alarm, low ambient temperature (air/air), low temperature air outlet (air/air). From AL24 to AL25.	AL24	AL25	°C/°F	Dec/int
AL 27	Differential of alarm reset in Chiller mode for anti-freeze, low ambient air temperature or low outlet air temperature alarms.	0.1 0	25.0 45	°C °F	Dec int
AL 28	Alarm delay for anti-freeze, low ambient air temperature or low outlet air temperature. The temperature must be lower than AL26 for this time duration before having the alarm event.	0	250	Sec	
AL 29	Maximum number of alarm events anti-freeze, low ambient air temperature or low outlet air temperature before changing from automatic to manual alarm reset: Always manual reset if AL29 = 0 Always automatic reset if AL29 = 16 From automatic to manual if AL29 = 1. .15	0	16		
AL 30	Anti-freeze alarm configuration in chiller 0= to turn the compressors off when the anti-freeze control probe is lower than AL26 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are not activated. 1= to turn the compressors off when the anti-freeze control probe is lower than AL26 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are activated.	0	1		
AL 31	Setpoint of the minimum limit in heat pump (va da – 30 °C a AL32)	-50.0 -58	AL33	°C °F	Dec int
AL 32	Setpoint of the maximum limit in heat pump (va da AL31 a 70 °C)	AL33	110.0 230	°C °F	Dec int
AL 33	Anti-freeze alarm setpoint in heat pump Setpoint temperature for low anti-freeze alarm, low ambient temperature (air/air), low temperature air outlet (air/air). (from AL31 to AL32)	AL31	AL32	°C/°F	Dec/int
AL 34	Alarm differential in heat pump. To reset the anti-freeze, low ambient Temperature (air/air), low temperature air outlet (air/air) alarms.	0.1 0	25.0 45	°C °F	Dec int

AL 35	Anti-freeze alarm delay in HP for low outlet air temperature (air/air) Attention If during the Stand-by or remote off there is an anti-freeze alarm event, and the AL35 <>0, starting the heat pump mode, from keyboard or digital input. In this case the anti-freeze alarm is aborted and the compressor starts for the AL35 time to heat the air or the water. After the AL35 time if the antifreeze probe value is still lower than AL33 setpoint, for maximum AL36 seconds, the unit is stopped and the anti-freeze alarm is generated again.	0	250	Sec	
AL 36	Anti-freeze alarm delay for low air ambient temperature or low outlet air temperature in heat pump normal condition. The detected temperature must be lower than AL33 for the time AL36 before giving the alarm	0	250	Sec	
AL 37	Maximum number of anti-freeze alarm events for low air ambient temperature or low outlet air temperature in heat pump. It sets the alarm reset condition: Always manual reset AL37 = 0 Always automatic reset AL37 = 16 From automatic to manual reset if AL37 = 1..15	0	16		
AL 38	Anti-freeze alarm configuration in heat pump 0= to turn the compressors off when the anti-freeze control probe is lower than AL33 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are not activated. 1= to turn the compressors off when the anti-freeze control probe is lower than AL33 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are activated.	0	1		
AL 39	Compressor high discharge temperature setpoint	0 32	150 302	°C °F	Dec / int int
AL 40	Compressor high discharge temperature differential	0.1 0	25.0 45	°C °F	Dec int
AL 41	Number of compressor high discharge temperature events per hour to determine the alarm reset condition: Always manual reset if AL41 = 0 Always automatic reset if AL41 =16 From automatic to manual if AL41 = 1..15	0	16		
AL 42	Maximum number of generic alarm events (each event stop the regulation) before turning the alarm from automatic to manual: Always manual AL42 = 0 Always automatic AL42 =16 From manual to utomatic if AL42 value is between 1 and 15	0	16		
AL 43	Generic alarm delay time after the digital input activation	0	250	Sec	
AL 44	Generic alarm delay time after the digital input is not activate	0	250	10 sec	10 sec
AL 45	Enable alarm relay with unit in off or stand – by: 0= Alarm output not enabled 1= Alarm output enabled	0	1		
AL 46	Password value to reset the alarm log, the compressor overload alarm and antifreeze alarm	0	999		
AL 47	Thermal alarm of the compressor 0= lock the compressor 1= lock the whole circuit	0	1		
AL 48	Thermal alarm when the compressor is OFF 0 = Not enabled 1= Alarm enabled	0	1		
AL 49	Oil alarm when the compressor is OFF 0 = Not enabled 1= Alarm enabled	0	1		
AL50	Functioning generic alarm n° 2 0= only signal always automatic reset 1= the alarm block the unit reset depends on the value of parameter AL51	0	1		
AL51	Maximum number of generic alarm events before turning the alarm from automatic to manual: Always manual AL51 = 0 Always automatic AL51 =16 From manual to utomatic if AL51 value is between 1 and 15	0	16		
AL52	Generic alarm delay time after the digital input activation	0	250	Sec	sec
AL53	Generic alarm delay time after the digital input is not activate	0	250	sec	sec
AL54	Maximum number of high pressure / temperature alarm events before turning the alarm from automatic to manual: Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15	0	16		
AL55	"Flow switch water condenser alarm delay after pump activation.	0	250	Sec	
AL56	Maximum time flow switch alarm active befor to block the water pump	0	250	Sec	
AL57	Minimum "Flow switch water condenser active time duration.	0	250	Sec	
AL58	Minimum "Flow switch water condenser not active time duration.	0	250	Sec	

AL59	Maximum number of high water temperature alarm events Always manual reset if AL59 = 0 Always automatic reset if AL59 =16 From automatic to manual reset if AL59 =1..15	0	16		
AL60	High water temperature alarm delay time from ON compressor	0	250	sec	10 sec
AL61	Set point higt water temperature	-50.0 -58	110 230	°C °F	Dec int
AL62	Differential higt water temperature	0.1 0	25.0 45	°C °F	Dec int
AL63	Analogue input configuration.Allows to select which probe value NTC/PTC (Pb1..Pb10)	0	20		
AL64	Low pressure alarm delay	0	250	sec	
AL65	Sanitary water flow switch alarm delay	0	250	Sec	
AL66	San. water flow switch delay to stop pump	0	250	Sec	
AL67	Sanitary water flow switch activation time	0	250	Sec	
AL68	San. water flow switch de-activation time	0	250	Sec	
AL69	Solar panel flow switch alarm delay	0	250	Sec	
AL70	Solar panel flow switch delay to stop pump	0	250	Sec	
AL71	Solar panel flow switch activation time	0	250	Sec	
AL72	Solar panel flow switch de-activation time	0	250	Sec	
AL73	Max. number per hour sanitary water heaters overload alarm Always manual if AL73 = 0 Always automatic if AL73 =16 If 16>AL73>0: • automatic if number of alarm < AL73 • manual if number of alarm = AL73	0	16		
AL74	Password request to reset manual antifreeze alarm 0= password requested 1= password not requested	0	1		
AL75	Max. number per hour sanitary water pump overload Always manual if AL75 = 0 Always automatic if AL75 =16 If 16>AL75>0: • automatic if number of alarm < AL75 • manual if number of alarm = AL75	0	16		
AL76	Compressor oil level alarm only signalling 0= automatic / manual reset oil alarm (see AL13) and compressor switch off 1= oil alarm signal only (compressor stays ON)	0	1		
AL77	Compressor overload alarm operation mode 0= always manual reset 1= always automatic reset	0	1		
AL78	Dt temperature to generate compressor/circuit differential oil alarm	0.1 1	14.0 203	bar psi	Dec int
AL79	Differential to reset compressor/circuit differential oil alarm	0.1 1	14.0 203	bar psi	Dec int
AL80	Max. number per hour compressor/circuit differential oil alarm Always manual if AL80 = 0 Always automatic if AL80 =16 If 16>AL80>0: • automatic if number of alarm < AL80 • manual if number of alarm = AL80	0	16		
AL81	Compressor/circuit differential oil alarm operation mode 0= disabled 1= enabled for pistons compressors 2= enabled for screw compressors	0	2		
AL82	By pass time of the FC flow switch alarm starting from water pump activation	0	250	Sec	
AL83	FC flow switch time activation before blocking FC water pump	0	250	Sec	
AL84	FC flow switch activation time to generate the alarm and block the compressor	0	250	Sec	
AL85	FC flow switch de-activation time to reset the alarm	0	250	Sec	
AL86	Flow switch alarm reset mode 0= Always manual 1= automatic reset after 1 minute 2= automatic reset after 2 minutes ... 250= automatic reset after 250 minutes	0	250	min	
AL87	Evaporator/sanitary water flow switch by-pass time during Out1 / Out2 commutation	0	250	Sec	

50. BLACK-OUT

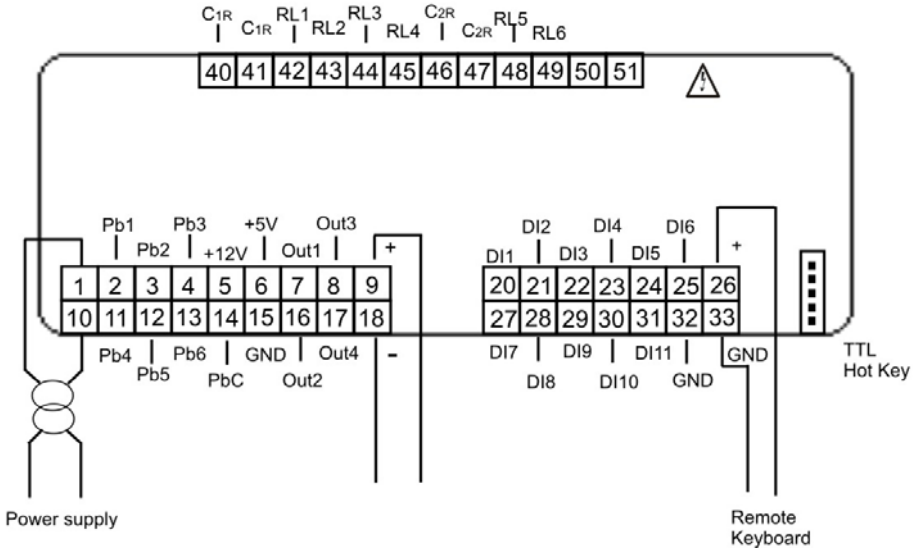
After the black-out is restored:
1. The instrument resores the same operating mode lost after the supply failure.
2. If active, the defrost is aborted.
3. All the timers and time parameters are reloaded.
4. The manual alarm is not reset.

51. WIRING CONNECTIONS

51.1 HARDWARE RESOURCES FOR IC206CX MODEL

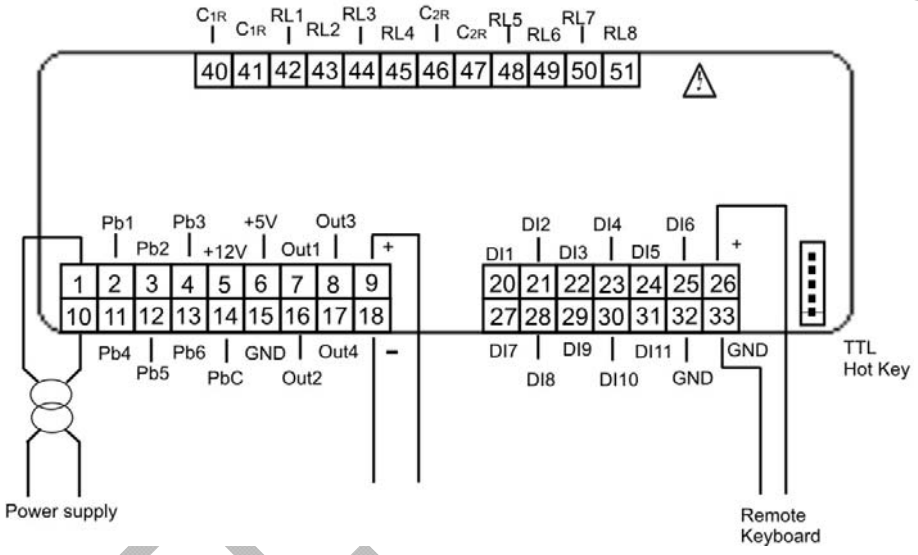
- 6 digital outputs (relays): MAX current on the relay contacts relè 5(2)A 250V - MAX common current 10A 250V
- 11 digital inputs: (free of voltage)
- analogue inputs:
  - 4 NTC / PTC probes
  - 2 NTC / PTC / pressure transducer 4÷20 mA / pressure transducer ratio-metric 0÷ 5.0 Volt
- 4 modulating outputs:
  - 2 configurable 0 ÷ 10 Volt
  - 2 configurable 0 ÷ 10.0 Volt or PWM (for modulating condenser fan)
- 1 output to connect a remote keyboard (max 2 remote keyboards)
- 1 LAN to connect an i-o expansion module (ICX207D)
- 1 TTL output for “hot key 64” or for XJ485CX (interface module for monitoring system)

C_{1R} = common line for RL1, RL2, RL3, RL4 C_{2R} = common line for RL5, RL6



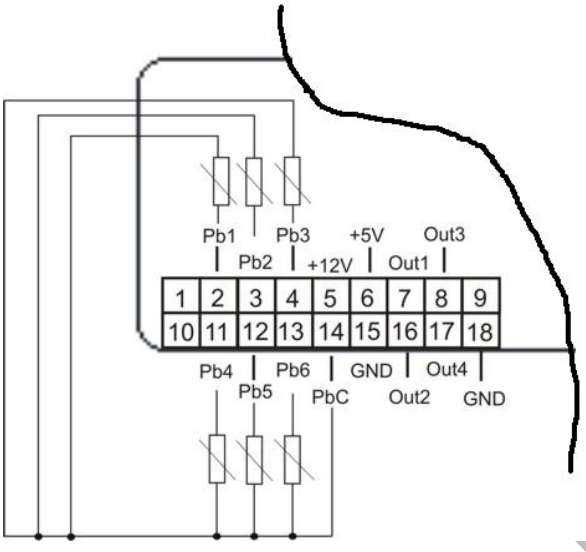
51.2 HARDWARE RESOURCES FOR 208CX MODELS

- 8 digital outputs (relays): MAX current on the relay contacts relè 5(2)A 250V - MAX common current 10A 250V
- 11 digital inputs: (free of voltage)
- analogue inputs:
  - 4 NTC / PTC probes
  - 2 NTC / PTC / pressure transducer 4÷20 mA / pressure transducer ratio-metric 0÷ 5.0 Volt
- 4 modulating outputs:
  - 2 configurable 0 ÷ 10 Volt
  - 2 configurable 0 ÷ 10.0 Volt or PWM (for modulating condenser fan)
- 1 output to connect a remote keyboard (max 2 remote keyboards)
- 1 LAN to connect an i-o expansion module (ICX207D)
- 1 TTL output for “hot key 64” or for XJ485CX (interface module for monitoring system)



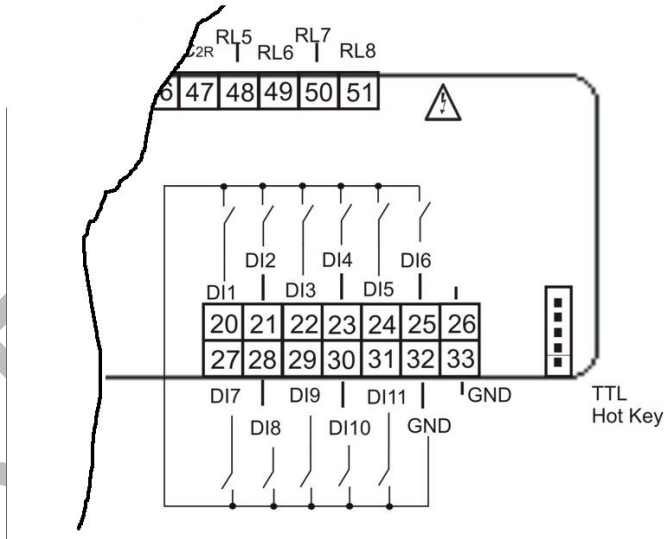
51.3 ANALOG INPUTS NTC – PTC PROBES

PbC = common terminal
Pb1…Pb6 = probe inputs



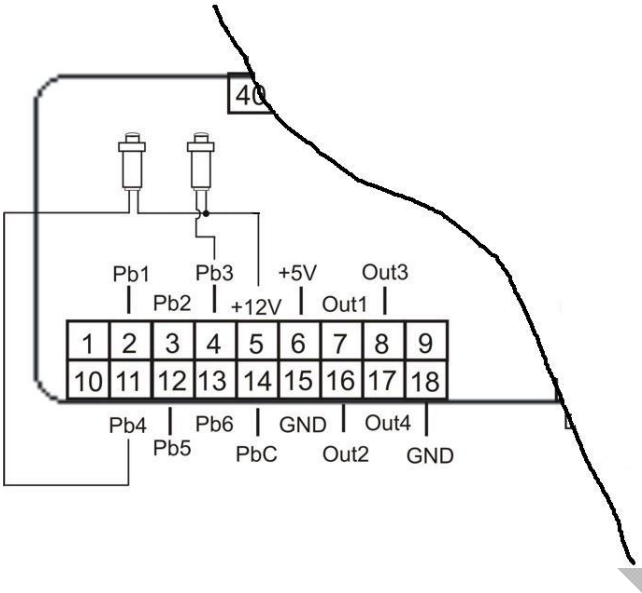
51.4 DIGITAL INPUTS

GND = common terminal
ID1…ID11 = digital inputs



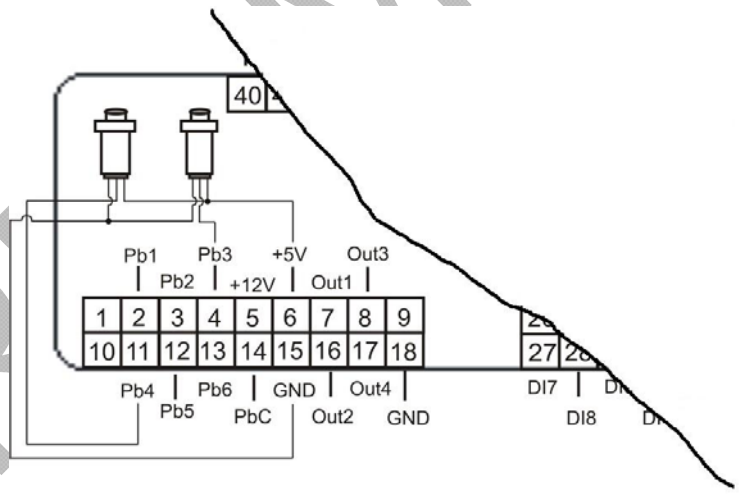
51.5 ANALOG INPUT FOR PRESSURE TRANSDUCER PP30 (4 ÷ 20MA SIGNAL)

12V = power supply for pressure transducers
Pb3 and Pb4 = pressure transducer inputs



51.6 ANALOG INPUT FOR PRESSURE RATIOMETRIC TRANSDUCER PPR30 (0 ÷ 5V SIGNAL)

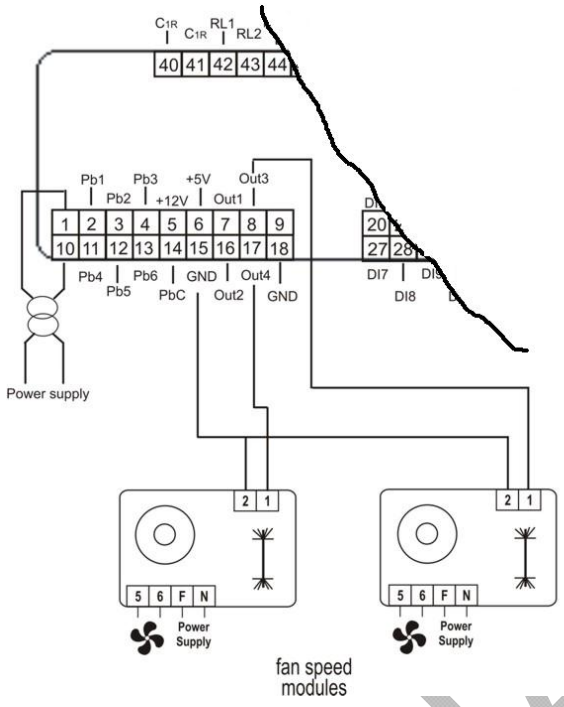
+5V = power supply for pressure transducers
GND = ground for pressure transducers
Pb3 and Pb4 = pressure transducer inputs



52. PWM OUTPUT FOR CONDENSING FAN SPEED CONTROL

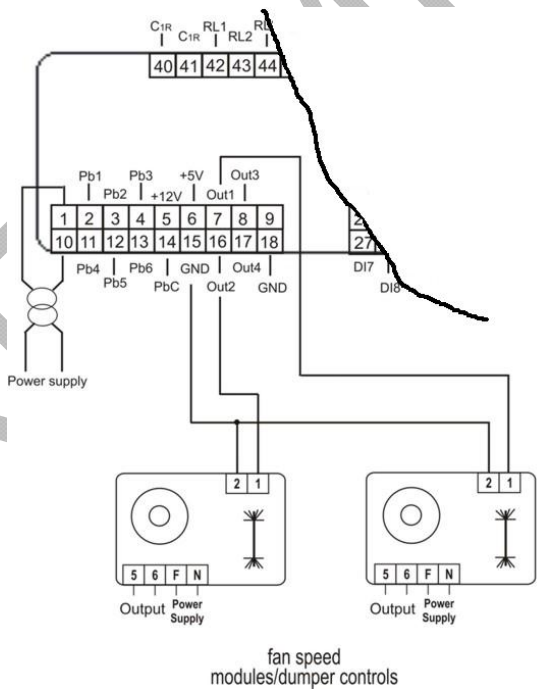
OUT3 and OUT4 = signals for the modulation of the condenser fan
GND = ground for pressure transducers

The compatible modules are the following:
XV05PK mono-phase 500 Watt (2A)
XV10PK mono-phase 1000 Watt (4A)
XV22PK mono-phase 2200 Watt (9A)



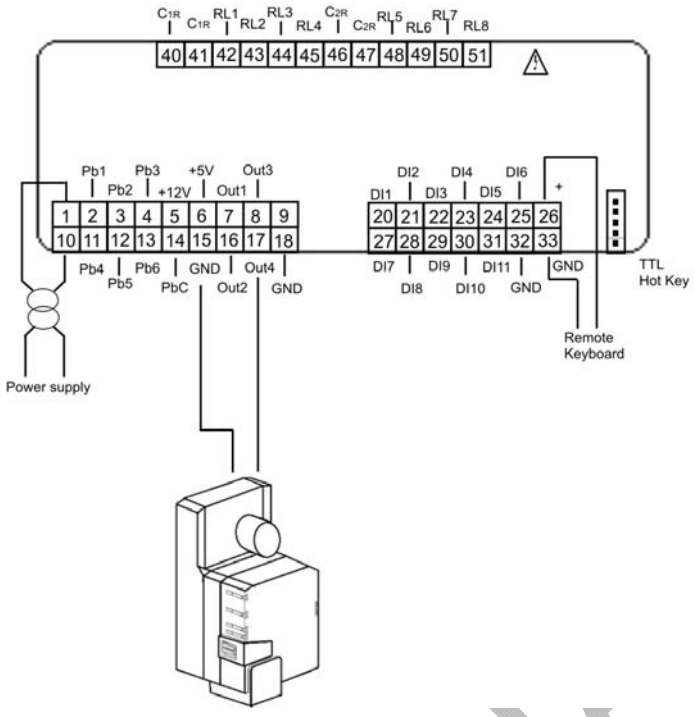
52.1 PROPORTIONAL OUTPUT FOR FAN CONDENSING CONTROL OR FOR COMPRESSOR INVERTER CONTROLLED OR FOR AUXILIARY OUTPUTS

OUT1…OUT4 = signals for the modulation of the condenser fan
GND = ground for pressure transducers

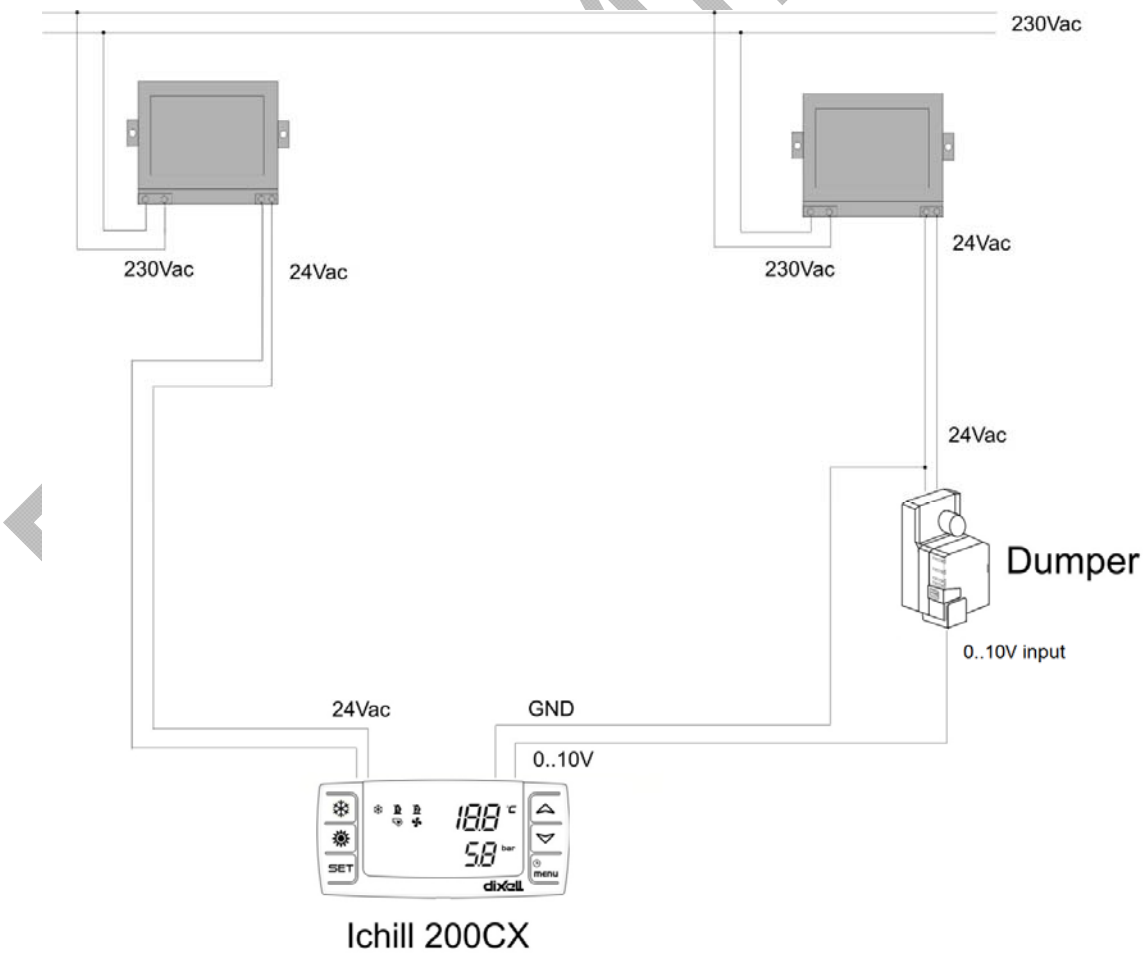


52.2 PROPORTIONAL OUTPUT 0..10V TO CONTROL DUMPER MOTORS

OUT1…OUT4 = signals for the modulation of the dumper motor
GND = ground

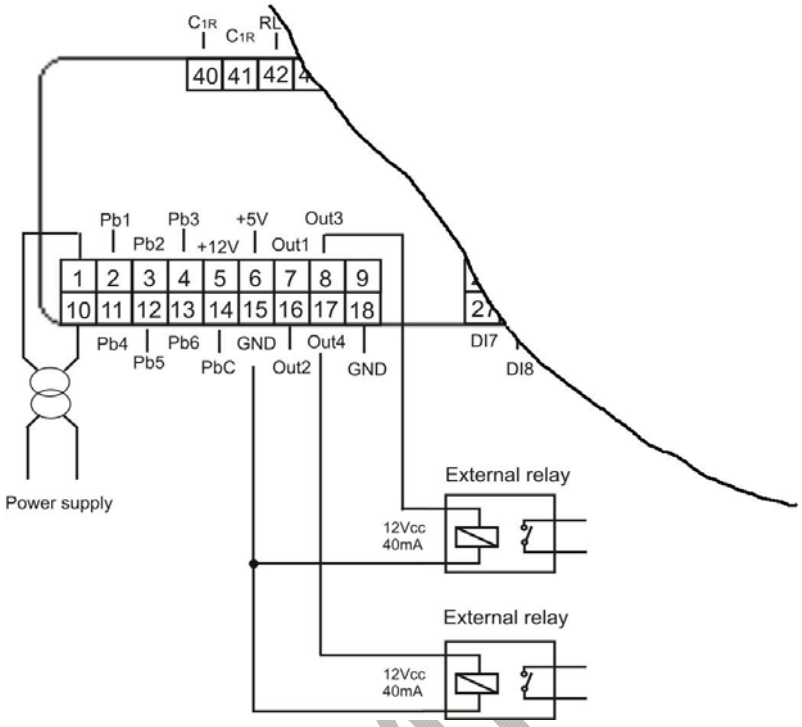


If the dumper motor has a common line between a pole of the power supply and the "–" pole of the 0..10V signal, it is necessary to use two transformers for the power supply of the controller Ichill and the power supply of the dumper motor.

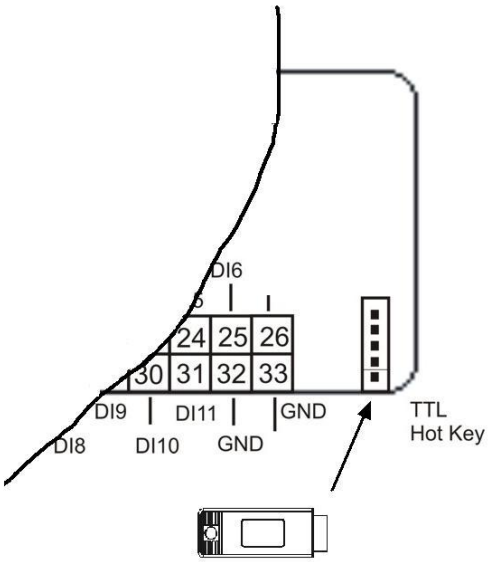


52.3 PROPORTIONAL OUTPUTS CONFIGURED FOR AUX RELAY CONTROL

OUT1…OUT4 = signals for relays
GND = ground

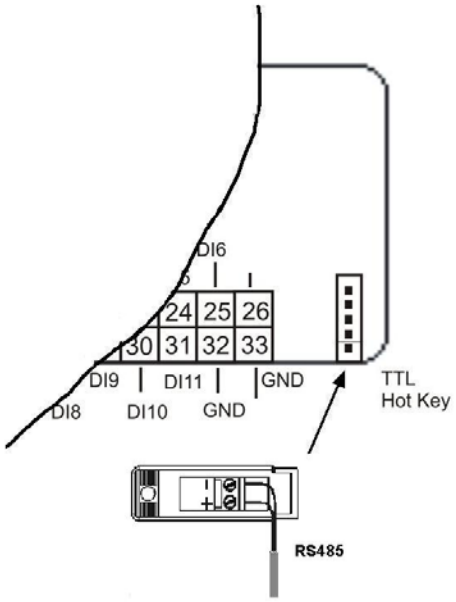


52.4 HOT KEY 64 CONNECTION



52.5 XJ485CX CONNECTION

The XJ485CX interface is a signal converter (from TTL to RS485). The RS485 uses two terminals (+) and (-) that must be connected respecting the polarity. Use the CAB/RS02 to connect the XJ485 interface to the TTL connector.

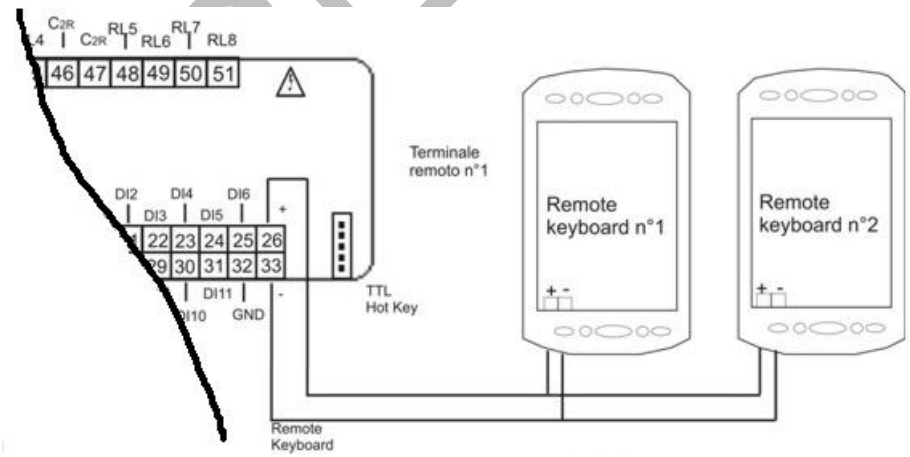


52.6 REMOTE KEYBOARD VI620CX

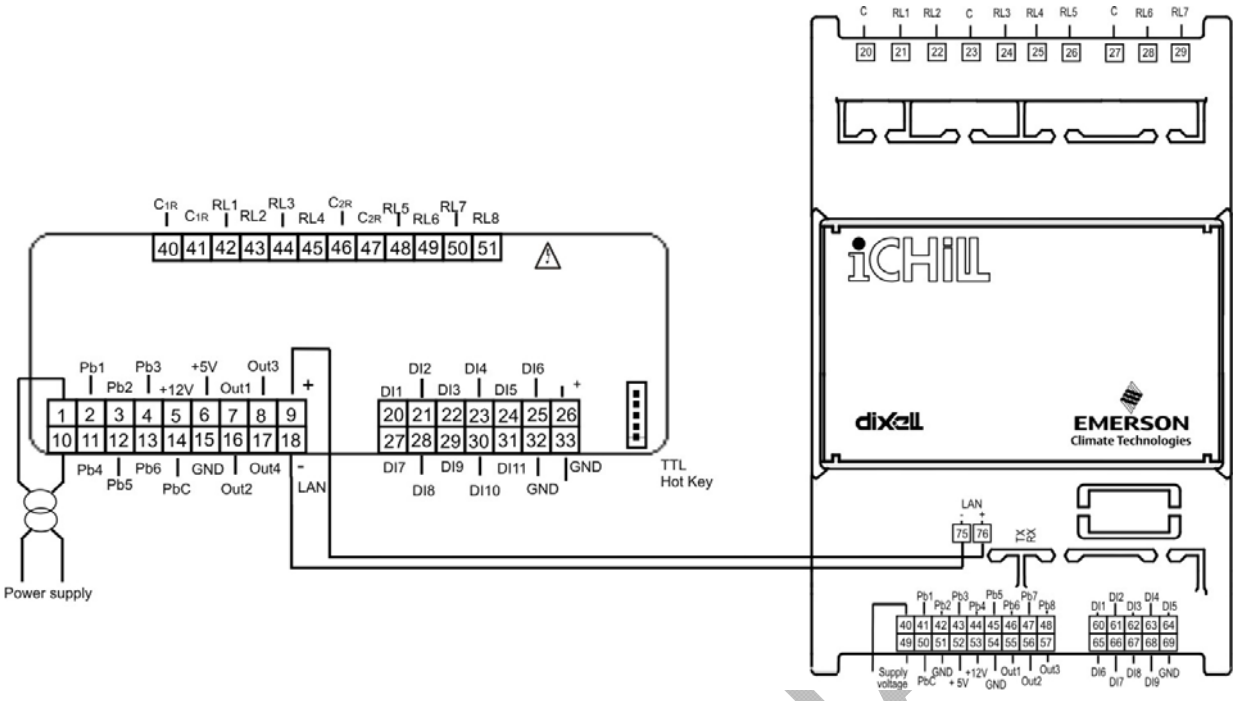
It is possible to connect max. 2 VI620CX remote keyboards:

- set the dip switch of the keyboard 1 to “1” position and enable remote keybord 1 (parameter CF54)
- set the dip switch of the keyboard 2 to “ON” position and enable remote keybord 2 (parameter CF55)

A shielded cable has to be used for the connection up to 150 mt maximum.
In case of communication failure the upper display shows “**noL”** (no link).
Use the CAB/CJ30 to interface the ichill connector to the shielded cable.



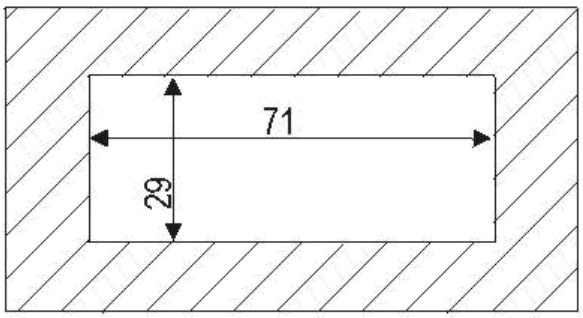
52.1 I/O EXPANSION MODULE CONNECTION



53. INSTALLING AND MOUNTING

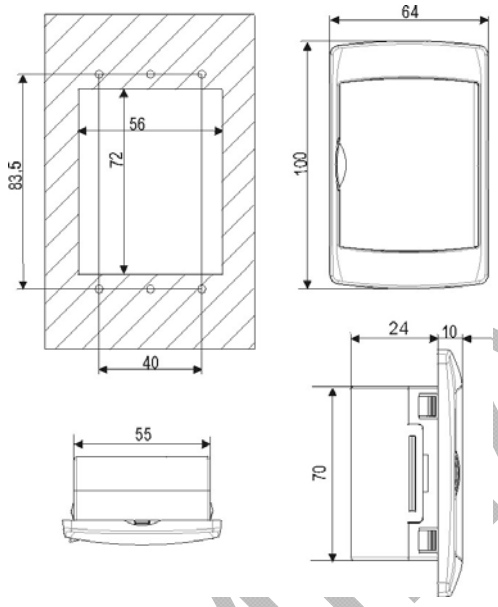
53.1 PANEL CUT- OUT

The instrument must be mounted on vertical panel, with panel cut-out 71x29mm, and fixed using the special bracket supplied.
Avoid locations subject to heavy vibration, corrosive gases or excessive dirt. Ensure ventilation around the instrument.

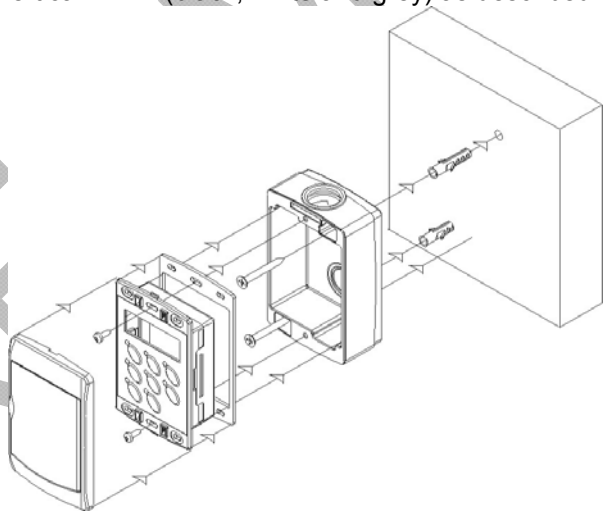


53.2 VI620CX PANEL CUT-OUT

The remote terminals are designer for panel mounting (panel cut-out 72x56 mm) and screwed with two screws.
For IP65 use gasket RGW-V (optional).



WALL MOUNTING: use the vertical V-KIT (black, white and grey) as described in the following scheme:



54. ELECTRICAL CONNECTIONS

The instrument is provided with:
- 2 removable terminal blocks MOLEX MICROFIT 14 and 18 ways for power supply voltage / digital and analogue inputs and modulating outputs
- 1 removable terminal blocks AMP 12 ways for the relay outputs
- 5 ways connector for TTL RS485 interface outputs

Wiring cables:

CWCXA15-KIT	IC206CX 1.5mt
CWCXA30-KIT	IC206CX 3.0mt
CWCXB15-KIT	IC208CX 1.5mt
CWCXB30-KIT	IC208CX 3.0mt

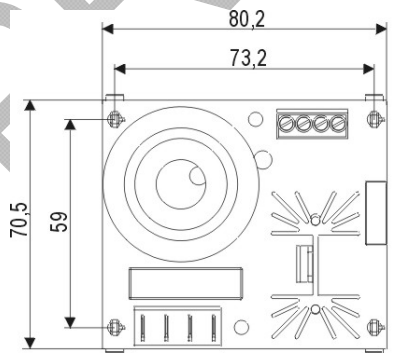
Wire size:
- signal cable AWG 24
- power supply cable AWG 22
- relay output AWG 17

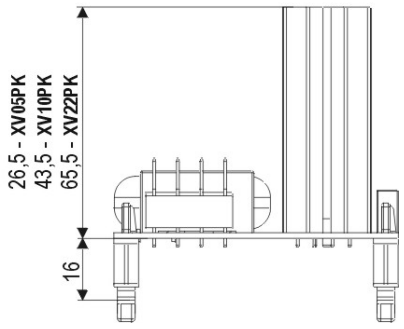
General notes:
- Check the connecitons and the line voltage before turning on the power supply.
- Keep low voltage cables, such as analogue/digital inputs/outputs and probes, away from power cables and terminals.
- Respect the maximum load current of each relay output, in case of power loads use filtered contactors.

55. ACCESSORIES

55.1 MONOPHASE FAN CONTROL: 230VAC AND CUT PHASE CONTROL

Models	XV05PK	XV10PK	XV22PK
Power	500W	1000W	2200W
Ampere	2A	4A	9.5A





Power supply	
230Vac	Input
0 - 230Vac	output
-10 - 65°C	Operating temperature

Naylon supports			
D	15mm		
Height			
Model	**XV05PK**	**XV10PK**	**XW22PK**
Y	25mm	42mm	64mm
Connections			
A 1(+), 2(-)	**PWM** input control		
B 3(+), 4(-)	**PWM** output repetition signal		
F	Phase		
N	Neutral		
5 - 6	Fan output		
Terminals 3 and 4 allows to connect another board in parallel to control two separate fans with the same input control.			
Terminals 1 / 2 / 3 / 4 are for screw for a 2.5mm wire			
Terminals 5 / 6 / F / N are 6,3mm faston			

55.2 WIRING KIT

CWCXA15-KIT e CWCXA30-KIT: wiring kit for IC206CX (lenght of 1,5mt or 3mt)
CWCXB15-KIT e CWCXB30-KIT: wiring kit for IC208CX (lenght of 1,5mt o 3mt)

55.3 TRANSFORMER

The **TF10** trasnformer models: **230/12 Vac** , **230 /24 Vac**, **110 / 12 Vac, 24 / 12 Vac**

55.4 **XJ485CX**

TTL/RS485 converter to connect the Ichill to a monitoring system

55.5 RT314 KIT

Relay module (DIN rail mounting)

55.6 HOT KEY:

Parameters copying key

56. TECHNICAL DATA

Housing: self extinguishing ABS
Case: frontal 32x74 mm; depth 60mm
Mounting: panel mounting in a 29x71mm panel cut-out
Frontal protection: IP65
Display:
Top Display 4 digits with d.p.
Bottom Display 4 digits with d.p.
Power supply:
12Vac -10% ÷ +15% 50/60 Hz or
24 Vac/dc ±10% 50/60 Hz
Power absorption: 10VA max.
Analog Inputs: 4 configurable (NTC/PTC/digital input) + 2 configurable (NTC/PTC/4÷20ma/0÷5Volt/digital input)
Digital inputs: 11 (free voltage)
Relay outputs: IC206CX: 6 SPDT 5(2) A, 250Vac, **IC208CX:** 8 SPDT 5(2) A, 250Vac
Max. current on common line: 10A
Data storing: on the non-volatile memory (EEPROM).
Operating temperature: -10÷55 °C
Storage temperature: -30÷85 °C
Relative humidity: 20÷85% (no condensing)
Measuring range: - 50÷110 °C (- 58 ÷ 230 °F) NTC / -50.0÷150 °C (-58÷302 °F) PTC or 0÷ 50 bar (0÷725 psi)
Resolution: 0,1 °C or 1 °F
Accuracy of the controller at 25°C: ±0,7 °C ±1 digit