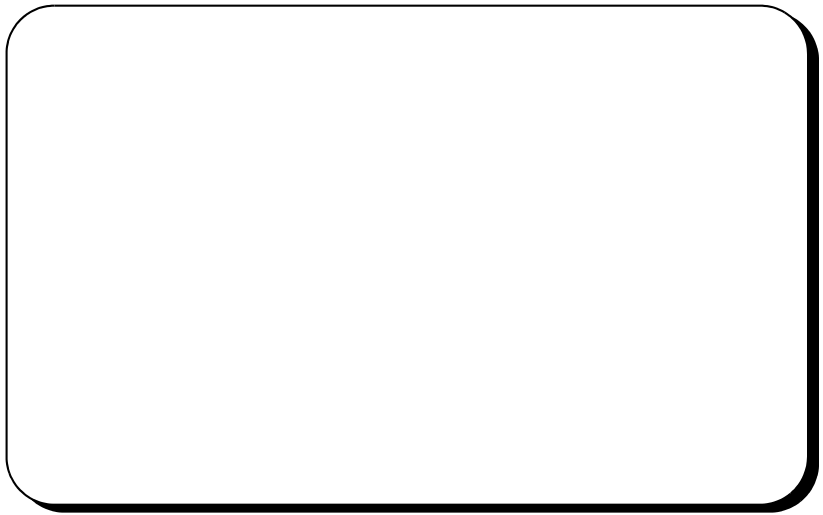


## Precision Water Chillers

NPC 015 - 230 60 Hz UL



OPERATING AND MAINTENANCE MANUAL



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CHAPTER 1

# ELECTRONIC BOARD

## 1.1 User interface

### 1.1.1 Display

The display is divided in 3 zones.



Top-left zone

It displays the temperature of temperature regulation probe.

**NOTE**

The displaying depends on the setting of parameter **CF36** (see chapter 1.12 "Values displayed").



Bottom-left zone

It displays the operating setpoint, OFF with stand-by unit.

**NOTE**

The displaying depends on the setting of parameter **CF42** (see chapter 1.12 "Values displayed").




Right zone

Signalling icons.

### 1.1.2 Display icons

ICON	MEANING	ICON	MEANING
°C	Celsius degrees (If displayed)	L	Low pressure alarm
	Fahrenheit degrees (If not displayed)	⚡	Antifreeze resistance
bar	Bar/Psi	⏸	Pump on
1	Compressor 1	Flow!	Flow meter alarm
2	Compressor 2	⌚	Time to defrost starting (Not enabled function)
Zz	Stand-by unit	🌀	Fan on
⚠	General alarm	Menu	Indication for Function Menu entering
H	High pressure alarm		

## 1.2 Function of buttons



BUTTON	FUNCTION
	It selects water temperature in the top part of the display. During programming phase it scrolls the parameter's codes or increases their values.
	If pressed for 5 seconds, it allows to switch on or off the unit. It selects water temperature in the top part of the display. During programming phase it scrolls the parameter's codes or decreases their values.
	If pressed for 5 seconds, it allows to display or modify the set point. During programming phase it selects a parameter or confirms a value.
	It allows to enter Function Menu.

### 1.2.1 Function of combined buttons

BUTTONS	FUNCTION
+	To enter programming phase (pressed for 5 sec).
+	To exit programming phase.
+	If pressed for more than 5 seconds they allow to start a manual defrosting cycle (Not enabled function)

## 1.3 Symbols and leds on the display

LED	LED STATUS	MEANING	LED	LED STATUS	MEANING
		Not enabled			Not enabled
	Steady	Unit on in chiller modality			Not enabled
	Flashing	Programming phase (if flashes together with  led)			Clock adjustment
		Not enabled			

## 1.4 Remote terminal

### 1.4.1 Function of buttons



BUTTON	FUNCTION
	It allows to enter Function Menu.
	If pressed for 5 sec., it allows to display or modify the set point. During programming phase it selects a parameter or confirms a value.
	It selects water temperature in the top part of the display (*). During programming phase it scrolls the parameter's codes or increases their values.
	It selects water temperature in the top part of the display (*). During programming phase it scrolls the parameter's codes or decreases their values.
	If pressed for 5 seconds it allows to switch on or off the unit.
	Not enabled

#### NOTE

(\*) CF43-44 parameters allows to fix the data to be displayed.

If there is no communication between the unit and the remote terminal, in the top part of the display it appears the message "noL" (no link).

## 1.5 Displaying during an alarm



During normal operation (no alarm), when an alarm occurs the alarm code and the appropriate icon flash in the bottom part of the display, alternated to the temperature / pressure.

### 1.5.1 Alarm icons

There are four icons for alarm signalling:

	General alarm
	High pressure alarm
	Low pressure alarm
	Flow meter alarm

## 1.6 How to silence the buzzer

**Automatic silencing:** it happens when the cause of the alarm has been eliminated.

**Manual silencing:** press and release one of the four buttons; the buzzer silences even if the alarm condition persists.

## 1.7 First start up

At the first start up of the unit in the bottom part of the display it could appear the message “rtc” alternated with the temperature. It indicates that it is necessary to regulate the clock.

If the probes used to control the unit are not connected or are damaged, the appropriate alarm will be displayed.

However, it is possible to regulate the clock or to programme the unit.

## 1.8 How to regulate the clock (NOT ENABLED IN THESE UNITS)

1. Press **M** button for some seconds until the message “Hour” appears in the bottom of the display, and in the top of the display it appears the store.
2. Press **SET** button: the hour starts flashing.
3. Regulate the hour using and buttons.  
Confirm the new hour pressing **SET** button; the controller will display the following setting.
4. Repeat points 2. and 3. for the other parameters of the clock:
  - **Min:** minutes (0÷60)
  - **UDAY:** week day (**Sun** = Sunday, **Mon** = Monday, **tue** = Tuesday, **Wed** = Wednesday, **thu** = Thursday, **Fri** = Friday, **Sat** = Saturday).
  - **dAY:** month day (0÷31)
  - **MntH:** month (1÷12)
  - **YEAR:** year (00÷99)

## 1.9 Programming by “Hot Key”

### 1.9.1 How to programme the unit by a programmed key (Download)

With unit switched off:

1. Insert the key.
2. Switch on the unit.
3. It starts the download of data from the key to the unit.

During download phase the adjustments are blocked and in the bottom of the display it appears the flashing message “dOL”.

At the end, in the top of the display it appears the message:

“End” If the programming was good (after 15 seconds it starts the adjustment).

“Err” If the programming was not good.

### ATTENTION

*The the event of error, the unit must be switched off and on again to repeat the operation or to start with normal regulation.*

## 1.9.2 How to store the parameters of the unit in the key “UPL”

Instrument on:

1. Insert the key.
2. Press **M** to enter function menu (see paragraph 1.15.1 “Access to Function menu” )
3. Use **▼** or **▲** buttons to select the function **UPL** in the bottom part of the display.
4. Press **SET**.

It starts the upload of data from the unit to the key.

During upload phase in the bottom of the display it appears the flashing message “UPL”.

At the end of programming phase the following messages appear in the top of the display:

“End” If the programming was good.

“Err” If the programming was not good

To exit “UPL” function, press **M** button or wait for time-out.

## 1.10 Programming by keyboard

The parameters of electronic control are divided in two groups and in two levels:

1. USER (Pr1);
2. SERVICE (Pr2).

USER level allows to access user parameters, SERVICE level allows to access the parameters of unit configuration (it is protected by a password).

The level of the parameters is decided during the designing, however it is possible to move the parameter from the higher (service Pr2) level to the lower (user Pr1), see 1.10.3 “How to move a parameter from a level to another” .

### ATTENTION



Only the level Pr2 “SERVICE” needs the password, which is 004.

The parameter’s groups, indicated by some “Label”, are divided as follows:

LABEL	ACTION
<b>ALL</b>	It displays all parameters
<b>ST</b>	It displays Thermoregulation parameters
<b>CF</b>	It displays Configuration parameters
<b>Sd</b>	It displays only the parameters of the Dynamic Setpoint (NOT ENABLED FUNCTION)
<b>ES</b>	It displays only the parameters of the Energy Saving (NOT ENABLED FUNCTION)
<b>CO</b>	It displays Compressor parameters
<b>FA</b>	It displays Fan parameters
<b>Ar</b>	It displays only the parameters of the Antifreeze Resistance
<b>dF</b>	It displays only the parameters of the Defrosting (NOT ENABLED FUNCTION)
<b>AL</b>	It displays only the Alarm parameters
<b>LS</b>	It displays only the LASER parameters (NOT ENABLED FUNCTION)

### 1.10.1 Access to “Pr1” parameters (User level)

To enter the menu of “Pr1” parameters which can be access by the user:

1. Press for some seconds **SET** + **▼** buttons (  and  start flashing), in the top of the display appears “ALL”, the first group of parameters.
2. Select the various groups using **▲** and **▼** buttons.
3. After selecting a group, press **SET** button: if the selected group is part of the selected menu or any parameter of this group has been moved in this menu, in the bottom of the display it appears the “Label” and the code of the group’s first parameter present in “Pr1”, its value appears in the top of the display.  
It will not be possible to enter a parameter’s group which is not part of this menu.
4. It is possible to scroll or modify the parameters contained in the group.

### 1.10.2 Access to “Pr2” parameters (Service level)

The menu of “Pr2” parameters can be enter by means of a password:

1. Enter “Pr1”
2. Select “Pr2” parameter in the bottom of the display and “PAS” in the top of the display
3. Press **SET** “PAS” in the bottom of the display, “0” flashes in the top of the display
4. Insert the password using **▲** and **▼** buttons.
5. Press **SET** button to confirm.

### ATTENTION

The password Pr2 “service” is 004.



### 1.10.3 How to move a parameter from a level to another

1. Enter the parameter's menu "Pr2" and select the desired parameter;
2. Keeping **SET** pressed, press and release **▼**.
3. A steady led near the "Label" will indicate the possibility to display that parameter also in "Pr1" level.
4. To move the parameter in "Pr2" again, keeping **SET** button pressed, press and release **▼** button. The steady led near the "Label" will unlit and the parameter "Pr2" will be displayed.

#### ATTENTION

The parameter of the PAS group can not be moved.

### 1.10.4 How to modify a parameter's value

1. Enter the programming procedure.
2. Select the desired parameter.
3. Press **SET** button to enable the value's adjustment.
4. Modify the value by means of **▲** and **▼** buttons.
5. Press **SET** to store the new value and to pass to the code of the following parameter.
6. To exit the procedure: Press **SET** + **▲** when a parameter is displayed, or wait (about 240 seconds) without pressing any button.

#### NOTE

The new value is stored also when the programming procedure is terminated for "time out", without pressing **SET** button.

#### ATTENTION

You can modify the parameter of the CF (configuration parameters) family only when the unit is in stand by.

## 1.11 How to modify the password

To modify a password it is necessary to know the old one.

The password modification is possible only in "Pr2" level.

1. Enter in programming phase in "Pr1" level.
2. Select one of the functions which divide the parameters in groups. For the available groups see Chapter 1 "Alarm codes and actions".
3. Press **SET** button.
4. Inside this group select the function "Pr2 - PAS", then press **SET** button. In the bottom of the display it appears the message "PAS", and in the top of the display it flashes "0".
5. Using **▲** and **▼** buttons insert the current PASSWORD.
6. Press **SET** button to enter "Pr2" level.
7. Select parameter "Pr2" in the bottom of the display and the password value in the top of the display.
8. Press **SET** button to enable the modification procedure (flashing value).
9. Insert the new password using **▲** and **▼** buttons.
10. Press **SET** button to confirm the new value.
11. The top of the display will flash for some seconds and it will appear the following function.
12. Exit the programming procedure pressing **SET** + **▼** or wait (15 seconds) without pressing any button.

## 1.12 Values displayed

The values visualized on the display change according to the configuration of parameters **CF36** for the top part and **CF42** for the bottom part. For remote terminal it changes according to the configuration of parameters **CF43** for the top part and **CF44** for the bottom part.

**Parameter CF36/CF43 = 0**

In the top part of the display it appears the probe **BEWOT**

**Parameter CF36/CF43 = 1**

In the top part of the display it appears the probe **BTWOT**

**Parameter CF36/CF43 = 2**

No value will appear in the top part of the display

**Parameter CF36/CF43 = 3**

In the top part of the display it appears the probe **BAT1**

**Parameter CF36/CF43 = 4**

In the top part of the display it appears the chiller set; off when unit in stand-by

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**Parameter CF36/CF43 = 5**

In the top part of the display it appears “OnC” when the unit is operating; off when unit in stand-by

**Parameter CF36/CF43 = 6**

In the top part of the display it appears the LASER set (NOT ENABLED FUNCTION)

**Parameter CF36/CF43 = 7**

No value will appear in the top part of the display

**Parameter CF36/CF43 = 8**

In the top part of the display it appears the operating differential

**Parameter CF42/CF44 = 0**

In the bottom part of the display it appears the probe **BEWOT**

**Parameter CF42/CF44 = 1**

In the bottom part of the display it appears the probe **BTWOT**

**Parameter CF42/CF44 = 2**

In the bottom part of the display it appears the probe **BCP1**

**Parameter CF42/CF44 = 3**

In the bottom part of the display it appears the probe **BAT1**

**Parameter CF42/CF44 = 4**

In the bottom part of the display it appears the chiller set; off when unit in stand-by

**Parameter CF42/CF44 = 5**

In the bottom part of the display it appears “OnC” when the unit is operating; off when unit in stand-by

**Parameter CF42/CF44 = 6**


In the bottom part of the display it appears the LASER set (NOT ENABLED FUNCTION)


**Parameter CF42/CF44 = 7**

No value will appear in the bottom part of the display



**Parameter CF42/CF44 = 8**


In the bottom part of the display it appears the operating differential


If the probe **BEWOT** has been selected has default, every time you press  for 30 sec the top display visualizes the **BTWOT** probe, in the bottom part of the display it will appear the “Label” **BTWOT** than the default value will return to be displayed.

If the probe **BTWOT** has been selected has default, every time you press  for 30 sec the top display visualizes the **BEWOT** probe, in the bottom part of the display it will appear the “Label” **BEWOT** than the default value will return to be displayed.

### 1.13 Unit switching on / off


The pressure of  button for 5 seconds allows to switch on or off the unit in chiller modality if parameter **CF31=0**; while the pressure of  button for 5 seconds allows to switch on or off the unit if parameter **CF31=1**.

The pressure of  button for 5 seconds allows to switch on or off the unit in chiller modality if parameter **CF31=0**, or in heat pump modality if parameter **CF31=1**.

The led of icon  flashes for 5 seconds then it remains lit.

### 1.14 How to put the unit in stand by

Stand-by modality is obtained every time the unit is switched off.

It is indicated by the symbol  lit.

Also in stand-by modality the controller can:

1. Display the measured values
2. Manage the alarms by displaying and signalling.

### 1.15 Function menu ( button)

The access to Function Menu allows to:

1. Display the alarms (see 1.15.3 “How to display the alarms “ALrM””).  
Reset the alarms (see 1.15.3.6 “How to reset an alarm “rSt””).
2. Display the alarm history (see 1.15.4 “How to display the alarm historic “ALoG””).  
Reset the alarm history (see 1.15.4.6 “How to reset the alarm history “ArSt””).
3. Upload the parameters from the unit to the key (see 1.9.2 “How to store the parameters of the unit in the key “UPL””).
4. Display the operating hours of the controlled loads (see 1.15.5 “Displaying the operating hours of loads “C1Hr - C2Hr - PFHr””).  
Reset the operating hours of the controlled loads (see 1.15.5.4 “Reset of the load operating hours”).
5. Display the time to the defrost starting (see 1.15.6 “Displaying the time to defrost starting”).

#### 1.15.1 Access to Function menu

Press and release  button (menu).

The icon “Menu” will appear.

### 1.15.2 Exit Function menu

Press and release **M** button or wait for time out (30 seconds).

The icon “Menu” disappears.

### 1.15.3 How to display the alarms “ALrM”

1. Press **M** to enter Function menu.
2. Press **▲** or **▼** to select “ALrM” function.
3. Press and release **SET** button.
4. Press **▲** or **▼** to scroll all alarms.
5. To exit press **M** or wait for time out (30 seconds).

#### 1.15.3.6 How to reset an alarm “rSt”

1. Press **M** to enter Function menu.
2. Select “ALrM” function.
3. Press **SET**, in the bottom of the display it appears the alarm code.
4. If the alarm can be reset in the top of the display it appears the Label “rSt”, if the alarm can not be reset it appears the Label “NO”.
5. Use **▲** or **▼** button to scroll all the alarms.
6. When the Label “rSt” is displayed, press **SET** to reset the alarm and go to the following one.
7. To exit press **M** button or wait for time out (30 seconds).

### 1.15.4 How to display the alarm historic “ALoG”

1. Press **M** button to enter Function menu.
2. Use **▲** or **▼** button to select the function “ALoG”.
3. Press **SET** until the Label with the alarm code will appear in the bottom of the display, and the Label “n°” with a progressive number will appear in the top of the display.
4. Using **▲** or **▼** button scroll all the alarms.
5. To exit “ALoG” function and to return to normal displaying, press **M** button or wait for time out (30 seconds).


The memory contains until 50 alarms, a further alarm will cancel from the memory the oldest one (the displaying is in increasing order, from the oldest one to the most recent one).

#### 1.15.4.6 How to reset the alarm history “ArSt”

1. Enter Function menu.
2. Select “ALoG” function in the bottom of the display.
3. Press **SET** button.
4. Inside “ALoG” function, using **▲** or **▼** button, select the function “ArSt” in the bottom of the display and “PAS” in the top of the display.
5. Press **SET**: the password is required. In the bottom of the display it appears “PAS”, “0” flashes in the top of the display.
6. Insert the password for resetting.
7. If the password is correct the Label “ArSt” flashes for 5 seconds to confirm the resetting.

After resetting the unit returns to normal displaying.

### 1.15.5 Displaying the operating hours of loads “C1Hr - C2Hr - PFHr”

1. Press **M** button to enter Function menu.
2. Press **▲** or **▼** button until the Label of a single load appears in the bottom of the display: **C1Hr** (operating hours of compressor 1), **C2Hr** (operating hours of compressor 2), **PFHr** (operating hours of water pump and of outlet fan).  
The operating hours will appear in the top of the display.
3. The icon  will be lit.

#### 1.15.5.4 Reset of the load operating hours

1. Press **M** button to enter Function menu.
2. Press **▲** or **▼** button until the Label of a single load appears in the bottom of the display (**C1Hr**, **C2Hr** “only 201÷351” units, **PFHr**) and the operating hours appear in the top of the display.
3. Press **SET** button for 3 seconds: in the top of the display it will appear “0”. It indicates that the reset has happened.
4. To exit Function menu, press **M** button or wait for time out (15 seconds).
5. For the other loads repeat the operations from point 2. to point 4.

### 1.15.6 Displaying the time to defrost starting

1. Press **M** button to enter Function menu.
2. Press **▲** or **▼** button until the upper display shows:
  - the "Label" **dEF** (if the parameter is **dF02=1** or **dF02=2**), and the lower display shows the missing time (minutes and seconds according to the parameter **dF10**);
  - the "Label" **dt, dEFS, trdF** (if the parameter **dF02=3**) where **dt=Δt**, **dEFS=** calculated Set-point to the defrost starting, **trdF=** missing time (minutes and seconds) according to the delay time of the defrosting control (parameter **dF23**);
3. The icon **⌚** flashes.
  1. To exit Function menu, press **M** button or wait for time out (15 seconds).

## 1.16 Other functions by keyboard

### 1.16.1 How to display the Set Point

Press and release **SET** button.

In the bottom part of the display it appears **SetC** (chiller set); or **SetH** (heat pump set).

The adjusted value appears in the top part of the display.

(SetH only for heat pump units).

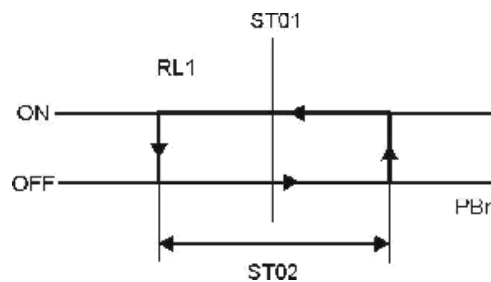
### 1.16.2 How to modify the Set Point

1. Press **SET** button for 5 seconds at least.
2. The set point will flash.
3. Use **▲** or **▼** button to modify the set point value.
4. To store the new set point value press **SET** button or wait for time out to exit programming procedure.

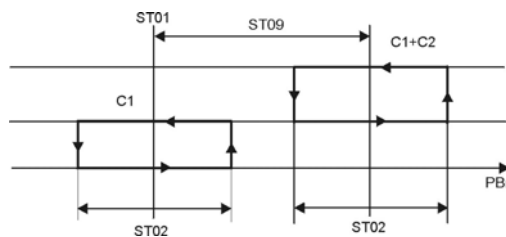
## 1.17 Compressors operation

### 1.17.1 Compressors regulation graphic in Chiller modality

Parameter **CF21= 0, 3** (one compressor)



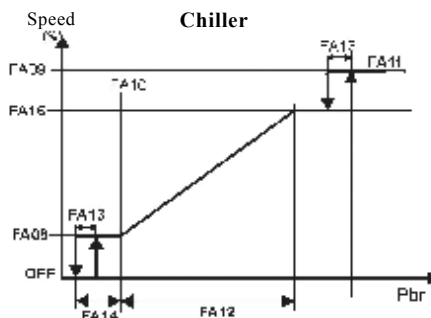
Parameter **CF21= 2** (two compressors)



## 1.18 Operating of the condensation ventilation

In these units the STEP regulation is carried out by means of pressure switches (FP), while the fan electronic regulation is directly managed by the electronic control.

### 1.18.1 Ventilation regulator graphic in Chiller



## 1.19 Alarm codes and actions

CODE	MEANING	CAUSE	ACTION	RESET
P1	Alarm of <b>BEWOT</b> probe	Probe damaged or resistive value out of range	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic If the resistive value returns within the envisaged range.
P2	Alarm of <b>BTWOT</b> probe	Probe damaged or resistive value out of range	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic If the resistive value returns within the envisaged range.
P4	Alarm of <b>BATI</b> probe	Probe damaged or resistive value / power value out of range	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic If the resistive value returns within the envisaged range.
A01	High pressure switch alarm	Digital input / high pressure switch enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for high pressure alarm flashes The alarm code is displayed	Manual The digital input is disabled and the resetting procedure is carried out
	Fan thermal protection alarm	Digital input enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for high pressure alarm flashes The alarm code is displayed	Manual The digital input is disabled and the resetting procedure is carried out
A02	Low pressure switch alarm	Digital input / low pressure switch enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for low pressure alarm flashes The alarm code is displayed	Automatic It becomes manual after the value set of “tripping per hour” ( <b>AL02</b> ) Manual The digital input is disabled and the resetting procedure is carried out
A03	Ambient air low temperature alarm IT CAN NOT BE ENABLED	Analogue input enabled If <b>CF01</b> =0,1 with <b>BEWOT</b> < <b>AR03</b> for <b>AR05</b> seconds	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic If <b>BEWOT</b> > ( <b>AR03</b> + <b>AR04</b> )
A04	Unit outlet air low temperature alarm IT CAN NOT BE ENABLED	Analogue input enabled If <b>CF01</b> =0,1 with <b>BTWOT</b> < <b>AR03</b> for <b>AR05</b> seconds	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic It becomes manual after <b>Ar06</b> Manual Disabled if <b>BTWOT</b> > ( <b>AR03</b> + <b>AR04</b> ) and the resetting procedure is carried out
A05	High temperature High pressure	Analogue input enabled if <b>BCP1</b> or <b>BAT1</b> > of “set value” ( <b>AL11</b> )	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	manual Disabled if <b>BCP1</b> or <b>BAT1</b> < “set value” ( <b>AL11</b> - <b>AL12</b> ) and the resetting procedure is carried out
A06	Low pressure / low temperature	Analogue input enabled if <b>BCP1</b> or <b>BAT1</b> < “set value” ( <b>AL14</b> )	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic It becomes manual after <b>AL16</b> Manual Disabled if <b>BCP1</b> or <b>BAT1</b> > “set value” ( <b>AL14</b> + <b>AL15</b> ) and the resetting procedure is carried out
A07	Antifreeze alarm	Digital input enabled if <b>BTWOT</b> < “set value” ( <b>AR03</b> ) and activates for the “time set” ( <b>AR05</b> )	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic It becomes manual after “tripping per hour” ( <b>Ar06</b> ) Manual Disabling: - when the antifreeze regulation probe <b>BTWOT</b> > ( <b>AR03</b> + <b>AR04</b> ) in chiller modality; and resetting procedure

CODE	MEANING	CAUSE	ACTION	RESET
A07	Antifreeze alarm	Digital input enabled if	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic It becomes manual after “tripping per hour” (Ar06) Manual Disabling: digital input disabled and the resetting procedure is carried out
A07	Antifreeze alarm mottocondensing units IT CAN NOT BE ENABLED	Digital input enabled CF02=1 with CF05=2 with ID enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic It becomes manual after “alarms interventions” (Ar06) Manual Disabling: digital input disabled and the resetting procedure is carried out
A08	Flow meter alarm and/or pump thermal protection (water/water units)	Digital input enabled enabled for “time set” (AL06)	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for flow meter alarm flashes The alarm code is displayed	Automatic It becomes manual after “tripping per hour” (AL05) Manual Disabling: Digital input disabled for “time set” (AL07) and reset procedure
A09	Compressor 1 thermal alarm	Digital input enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Digital input disabled and the resetting procedure is carried out After AL09, digital input disabled, parameter AL10=0 and the resetting procedure is carried out
A10	Compressor 2 thermal alarm	Digital input enabled	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Digital input disabled and the resetting procedure is carried out After AL09, digital input disabled, parameter AL10=0 and the resetting procedure is carried out
A09- A10	Compressor 1-2 thermal alarm	The alarm is visualized but not enabled during “compressor thermal delay time” (AL08) after compressor start up	Relay alarm + buzzer activated	If ID is not activated Manual More than AL09 compressor tripping per hour. To reset the alarm enter the programming
A11	Pump thermal alarm IT CAN NOT BE ENABLED	Digital input enabled	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Digital input disabled and the resetting procedure is carried out
A12	Error during defrosting alarm IT CAN NOT BE ENABLED	Defrosting terminated for dF07 (max. time) with dF02=2	The alarm code is displayed Signalling only	Automatic Follows a correct defrosting cycle Manual Resetting procedure is carried out
A13	Compressor 1 maintenance alarm	Operating hours > “set threshold” CO14	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Operating hours reset
A14	Compressor 2 maintenance alarm	Operating hours > “set threshold” CO15	“open collector” outlet / alarm relay are activated The buzzer is activated The alarm code is displayed	Manual Operating hours reset
A15	Water pump maintenance alarm	Operating hours > “set threshold” CO16	“open collector” outlet / alarm relay are activated The buzzer is activated The alarm code is displayed	Manual Operating hour reset
A20	Low water temperature alarm at evaporator outlet	Only units operating if the temperature measured by PB2 is lower than AL23	“open collector” outlet / alarm relay activated The buzzer is activated The alarm code is displayed	Automatic

CODE	MEANING	CAUSE	ACTION	RESET
<b>A2T</b>	High water temperature alarm at evaporator outlet	Only units operating if the temperature measured by PB2 is higher than AL24	“open collector” outlet / alarm relay are activated The buzzer is activated The alarm code is displayed	Automatic
<b>rtC</b>	Clock alarm	Clock to be regulated	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Clock regulation and resetting procedure
<b>rtF</b>	Clock alarm	Clock damaged Clock malfunction	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Resetting procedure If after resetting the alarm persists replace the clock
<b>EE</b>	Eeprom error alarm	Memory data lost	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Manual Resetting procedure If after resetting the alarm persists the device remains blocked
<b>ACF1</b>	Configuration alarm	Unit configured as heat pump with commutation valve not configured If <b>dF02</b> =3 and <b>CF07</b> ≠3 or <b>CF06</b> ≠2.	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic With correct re-programming
<b>ACF2</b>	Configuration alarm	<b>CF01</b> = 0-1-2-3 and <b>FA02</b> =1-2, Condensation control probe not configured. Se <b>CF01</b> =7 and <b>CF07</b> ≠6 or <b>CF07</b> ≠3 or <b>Ar18</b> =2	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic With correct re-programming
<b>ACF3</b>	Configuration alarm	Two digital inputs with the same configuration	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic With correct re-programming
<b>ACF4</b>	Configuration alarm	<b>CF28</b> = 1 and the digital input not configured or <b>CF28</b> = 2 probe <b>BAT1</b> different from 3	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic With correct re-programming
<b>ACF5</b>	Configuration alarm	<b>CF02</b> = 1 and ( <b>CF04</b> ≠ 2,3 and <b>CF05</b> ≠ 3) or ( <b>CF04</b> = 2 and <b>CF05</b> = 3) If <b>CF01</b> =6 and <b>CF02</b> =1	“open collector” outlet / alarm relay is activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic With correct re-programming
<b>FErr</b>	Operating manual	<b>CF04</b> = 3 and <b>CF05</b> = 2 with digital inputs simultaneously activated	The buzzer is activated The icon for general alarm flashes	Manual Disabling of the not active digital inputs + reset procedure
<b>AFr</b>	Net frequency alarm	Net frequency out of range	“open collector” outlet / alarm relay are activated The buzzer is activated The icon for general alarm flashes The alarm code is displayed	Automatic Net frequency into operating range

CODE	MEANING	CAUSE	ACTION	RESET
ALOC	General alarm	ID configured as unit blocked generic alarm "time set" AL21	The buzzer is activated The icon for general alarm flashes	ID configured as unit blocked generic alarm "fixed time" (AL22) Automatic: It becomes manual after "tripping per hour set" (AL20) (reset procedure in function menu). It is memorized in the alarm historic only with manual rearm

## 1.20 Outlet blocking

Alarm code	Alarm Description	Comp. 1	Comp. 2	Antifreeze Resistances	Pump
P1	BEWOT probe	Yes	Yes	Yes with Ar19 =0	
P2	BTWOT probe	Yes	Yes	Yes with Ar19 =0	
P3	BCP1 probe	Yes	Yes	Yes with Ar19 =0	
P4	BAT1 probe	Yes	Yes	Yes with Ar19 =0	
A01	High pressure switch	Yes	Yes		
	Fan thermal protection	Yes	Yes		
A02	Low pressure switch	Yes	Yes		
A03	Ambient air low temperature				
A04	Air low temperature at unit outlet	Yes	Yes	Yes	
A05	High temperature High pressure	Yes	Yes		
A06	Low pressure Low temperature	Yes	Yes		
A07	Analogue input antifreeze	Yes	Yes		
A07	Digital input antifreeze	Yes	Yes		
A07	Motorcondensing antifreeze	Yes	Yes		
A08	Flow meter or pump thermal protection	Yes	Yes	Boiler res. Yes	Yes
A09	Compressor 1 thermal protection	Yes			
A10	Compressor 2 thermal protection		Yes		
A09-A10	Compressor 1-2 thermal protection	Yes	Yes		
A11	Condensation fan thermal protection	Yes	Yes		
A12	Error during defrosting				
A13	Compressor 1 maintenance				
A14	Compressor 2 maintenance				
A15	Water pump maintenance				
A20	Low water temperature BTWOT				
A21	High water temperature BTWOT				
rtC	Clock alarm				
rtF	Clock alarm				
EE	Eeprom error	Yes	Yes	Yes	Yes
ACF1	Configuration alarm	Yes	Yes	Yes	Yes
ACF2	Configuration alarm	Yes	Yes	Yes	Yes
ACF3	Configuration alarm	Yes	Yes	Yes	Yes
ACF4	Configuration alarm	Yes	Yes	Yes	Yes
ACF5	Configuration alarm	Yes	Yes	Yes	Yes
ACF6	Configuration alarm	Yes	Yes	Yes	Yes
FErr	Error during operation (motorcond.)	Yes	Yes		Yes
Afr	Net frequency alarm	Yes	Yes	Yes	Yes
ALOC	Generic alarm	Yes	Yes	Yes	Yes

## 1.21 Parameters description

### 1.21.1 Thermoregulation parameters

Parameters	Description
ST01	It allows to fix the operating set point during chiller operation (from ST05 to ST06)
ST02	It allows to fix the differential during chiller operation
ST03	It allows to fix the operating set point during heat pump operation (from ST07 to ST08)



Parameters	Description
<b>ST04</b>	It allows to fix the differential during heat pump operation
<b>ST05</b>	It fixes the min. limit which can be used for the adjustment of operating set point during chiller operation (from -40°C / °F to <b>ST01</b> )
<b>ST06</b>	It fixes the max. limit which can be used for the adjustment of operating set point during chiller operation (from <b>ST01</b> to 110 °C / 230°F)
<b>ST07</b>	It fixes the min. limit which can be used for the adjustment of operating set point during heat pump operation (from -40°C / °F to <b>ST03</b> )
<b>ST08</b>	It fixes the max. limit which can be used for the adjustment of operating set point during heat pump operation (from <b>ST03</b> to 110 °C / 230°F)
<b>ST09</b>	Regulation band
<b>ST10</b>	It allows to set the setpoint in LASER modality
<b>ST11</b>	Chiller unit function without accumulation tank 0= disabled 1= enabled
<b>ST12</b>	Set point min. water outlet temperature without accumulation tank during chiller operation
<b>ST13</b>	Set point max. water outlet temperature without accumulation tank during heat pump operation
<b>ST14</b>	Delta set point during chiller / heat pump operation
<b>ST15</b>	Delta differential during chiller / heat pump operation
<b>ST16</b>	Compressor operation time, over this value the delta set point and the delta differential are decreased during chiller / heat pump operation
<b>ST17</b>	Constant value for the calculation of set point and differential values during chiller / heat pump operation
<b>ST18</b>	Delay time for operating set point adjustment
<b>Pr2</b>	Password: it allows to set the numeric code of the password (from 0 to 999)

### 1.21.2 Configuration parameters

Parameters	Description
<b>CF01</b>	It allows to select the type of unit to be controlled, according to the parameter value you can see or not the Labels of parameter's groups (see 1.10 "Programming by keyboard" ) Type of unit: <ul style="list-style-type: none"> <li>• 0= Air/air chiller</li> <li>• 1= Air/air chiller with heat pump</li> <li>• 2= Air/water chiller</li> <li>• 3= Air/water chiller with heat pump</li> <li>• 4= Water/water chiller</li> <li>• 5= Water/water chiller with heat pump</li> <li>• 6= Water/Water chiller with LASER modality</li> <li>• 7= Water/Water chiller with heat pump and water side inversion</li> </ul>
<b>CF02</b>	Motorcondensing unit: <ul style="list-style-type: none"> <li>• 0= Not</li> <li>• 1= Yes</li> </ul>
<b>CF03</b>	It allows to select the probe for thermoregulation: <ul style="list-style-type: none"> <li>• 0= Regulates on <b>BEWOT</b> probe</li> <li>• 1= Regulates on <b>BTWOT</b> probe</li> </ul>
<b>CF04</b>	Configuration of analogue input <b>BEWOT</b> <ul style="list-style-type: none"> <li>• 0 = Probe absent</li> <li>• 1= NTC temperature probe evaporator water inlet (ambient air to be conditioned). It appears in the top of the display.</li> <li>• 2 = Digital input (for units configured as motorcondensing). According to the selected polarity, with energized contact, it puts the unit in stand-by and starts it. ON is displayed in the top. With de-energized contact the unit is in stand-by, OFF is displayed in the top. If ON appears in the top of the display, using UP-DOWN buttons it is possible to select the operating modality (chiller - heat pump). During chiller modality: with <b>CF21=2</b> and <b>CO08=1</b> compressor 1 starts, with <b>CF21=2</b> and <b>CO08=0</b> a compressor required by the thermoregulator starts. "OnC" is displayed in the top. During heat pump modality: with <b>CF21=2</b> and <b>CO08= 1</b> compressor 1 starts, with <b>CF21=2</b> and <b>CO08= 0a</b> compressor required by the thermoregulator starts. "OnH" is displayed in the top. When the modality has been chosen, the digital input enabling or disabling will switch on or off the unit and the appropriate loads (compressor). Only when the contact is energized, if the unit was switched off by keyboard, it must be switched on again by keyboard.</li> <li>• 3 = Digital input (for units configured as motorcondensing), according to the selected polarity it gives the possibility to switch on the unit in chiller modality ONLY. With de-energized contact, unit in stand-by, OFF displayed in the top. With energized contact, unit in chiller operation. "OnC" displayed in the top. The digital input enabling or disabling will switch on or off the unit and the appropriate loads (compressor). Only when the contact is energized, if the unit was switched off by keyboard, it must be switched on again by keyboard.</li> </ul>

Parameters	Description
<b>CF05</b>	<p>Configuration of analogue input <b>BTW01</b></p> <ul style="list-style-type: none"> <li>0=Probe absent</li> <li>1=NTC temperature probe evaporator water outlet / evaporator air outlet. It appears in the top of the display.</li> <li>2=It becomes a digital input which, according to the selected polarity, generates the antifreeze alarm.</li> <li>3=Digital input (for unit configured as motorcondensing). According to the selected polarity it gives the possibility to switch on the unit in heat pump modality ONLY. With de-energized contact, unit in stand-by, OFF displayed in the top. With energized contact, unit in chiller operation. “OnH” displayed in the top. The digital input enabling or disabling will switch on or off the unit and the appropriate loads (compressor). Only when the contact is energized, if the unit was switched off by keyboard, it must be switched on again by keyboard.</li> </ul>
<b>CF06</b>	<p>Configuration of analogue input <b>BCP1</b></p> <ul style="list-style-type: none"> <li>0=Probe absent</li> <li>1=NTC temperature probe for the control of the condensation fan speed regulation. It appears in the bottom of the display.</li> <li>2=Input 4÷20mA, condensation pressure. It is the transducer for the control of the condensation fan speed regulation. It appears in the bottom of the display.</li> <li>3=Input 4÷20mA, dynamic set point. It enables the operation of the dynamic set point according to a proportional signal fixed by the user.</li> <li>4=NTC temperature probe condenser antifreeze alarm (water/water or water/water with heat pump). It appears in the bottom of the display.</li> </ul>
<b>CF07</b>	<p>Configuration of analogue input <b>BAT1</b></p> <ul style="list-style-type: none"> <li>0 = Probe absent</li> <li>1 = NTC temperature probe for the control of the condensation fan speed regulation. It appears in the bottom of the display.</li> <li>2 = Adjustable digital input</li> <li>3 = NTC temperature probe which measures the external air temperature. It enables the management of the dynamic set point, of boiler function and of automatic “change-over”.</li> <li>4 = NTC temperature probe condenser antifreeze alarm (water/water or water/water with heat pump). It appears in the bottom of the display.</li> <li>5 = NTC temperature probe which measures the evaporating coil temperature during heat pump operation, it allows the management of combined defrosting cycle. It fixes the starting and stopping of defrosting cycle.</li> <li>6 = NTC probe, used to measure the temperature only.</li> </ul>
<b>CF08</b>	Configuration of digital input ID1
<b>CF09</b>	Configuration of digital input ID2
<b>CF10</b>	Configuration of digital input ID5
<b>CF11</b>	<p>Configuration of analogue input <b>BAT1</b>, if configured as digital input</p> <ul style="list-style-type: none"> <li>0= Compressor 1 thermal protection, according to the selected polarity the enabled input generates a compressor thermal protection alarm.</li> <li>1= Condensation fan thermal protection, according to the selected polarity the enabled input generates a condensation fan thermal protection alarm.</li> <li>2= Outlet fan thermal protection (air/air units) / Flow meter thermal protection (water/air or water/water units). According to the selected polarity and to the unit configuration, the enabled input generates an outlet fan thermal protection alarm or a flow meter thermal protection alarm.</li> <li>3= remote ON / OFF, according to the selected polarity the enabled input generates the remote OFF. It is possible to switch on or off the unit by keyboard only when the input is disabled.</li> <li>4= Remote chiller / heat pump. It is possible to switch on or off the unit only during the selected operating modality (see the section about the way to select the operating modality, parameter <b>CF28=1</b>).</li> <li>5= Compressor 2 thermal protection, according to the selected polarity the enabled input generates a compressor thermal protection alarm.</li> <li>6= Compressor 2 / capacity step required, according the selected polarity (unit configured as motorcondensing) the enabled input switches on or off a compressor or the capacity control solenoid valve.</li> <li>7= Defrosting end, according to the selected polarity the enabled input fixes the defrosting cycle end.</li> <li>8= Energy Saving, according to the selected polarity the enabled input fixes the unit operation with the set point of Energy Saving.</li> <li>9= Antifreeze alarm, according to the selected polarity the enabled input generates the antifreeze alarm (also when the unit is configured as motorcondensing). ID3= high pressure switch input (not adjustable). According to the selected polarity the enabled input generates the condensation high pressure alarm. ID4= low pressure switch input (not adjustable). According to the selected polarity the enabled input generates the evaporation low pressure alarm.</li> <li>10= Compressor thermal 1 and 2.</li> <li>11= Generic alarm</li> </ul>
<b>CF12</b>	Polarity of digital input ID1

Parameters	Description
<b>CF13</b>	Polarity of digital input ID2
<b>CF14</b>	Polarity of digital input ID3
<b>CF15</b>	Polarity of digital input ID4
<b>CF16</b>	Polarity of digital input ID5
<b>CF17</b>	Polarity of analogue input <b>BEWOT</b> configured as digital input
<b>CF18</b>	Polarity of analogue input <b>BTWOT</b> configured as digital input
<b>CF19</b>	Polarity of analogue input <b>BATI</b> configured as digital input: <ul style="list-style-type: none"> <li>• 0 = Enabled with closed contact</li> <li>• 1 = Enabled with opened contact</li> </ul>
<b>CF20</b>	Configuration of relay 4: <ul style="list-style-type: none"> <li>• 0 = Alarm relay</li> <li>• 1 = Compressor 1 with capacity step</li> <li>• 2 = Compressor 2</li> <li>• 3 = fan ON/OFF</li> <li>• 4 = Reversing cycle valve</li> <li>• 5 = Antifreeze resistance</li> <li>• 6 = Solenoid valve water side</li> <li>• 7 = Solenoid valve water side in heat pump modality</li> </ul> Polarity of relay 4 If <b>CF20</b> = 0 the polarity of the cycle commutation valve is fixed by parameter <b>df18</b> .
<b>CF21</b>	Configuration of relay 5 <ul style="list-style-type: none"> <li>• 0 = alarm relay</li> <li>• 1 = compressor 1 with a capacity step</li> <li>• 2 = compressor 2</li> <li>• 3 = fan ON/OFF</li> <li>• 4 = Reversing cycle valve</li> <li>• 5 = Antifreeze resistance</li> <li>• 6 = Solenoid valve water side</li> <li>• 7 = Solenoid valve water side in heat pump modality</li> </ul> Relay 5 polarity If <b>CF21</b> = 0 the polarity of the alarm relay is fixed by parameter <b>AL18</b> . If <b>CF21</b> = 1 the polarity of the capacity control is fixed by parameter <b>CO10</b> .
<b>CF22</b>	It allows to fix a pressure value which corresponds to a current of 4 mA ( <b>PB3</b> probe <b>BCP1</b> )
<b>CF23</b>	It allows to fix a pressure value which corresponds to a current of 20 mA ( <b>PB3</b> probe <b>BCP1</b> )
<b>CF24</b>	<b>BEWOT</b> Offset allows to balance the error between the measured temperature and the real one.
<b>CF25</b>	<b>BTWOT</b> Offset allows to balance the error between the measured temperature and the real one.
<b>CF26</b>	<b>BCP1</b> Offset allows to balance the error between the measured temperature / pressure and the real ones.
<b>CF27</b>	<b>BATI</b> allows to balance the error between the measured temperature and the real one.
<b>CF28</b>	It allows to select the operating modality (chiller / heat pump) by keyboard or by digital / analogue input. <ul style="list-style-type: none"> <li>• 0 = Selection by keyboard which has the priority on the digital / analogue input.</li> <li>• 1 = Selection by digital input. The selection is enabled if a digital input is configured as 4 (remote chiller / heat pump). If the polarity of the digital input is 0: the “opened” status forces the unit to chiller operation, the “closed” status to heat pump operation. If the polarity of the digital input is 1: the “opened” status forces the unit to heat pump operation, the “closed” status to chiller operation. If no digital input has been configured to 4, the unit remains in stand-by. The selection to chiller or heat pump by keyboard is disabled. It is possible to switch on or off the unit by keyboard only during the selected operating modality.</li> <li>• 2 = Selection by analogue input, it has the priority on the digital input. In the event of external air temperatures included in the differential <b>CF30</b>, it is possible to change the operating modality by keyboard.</li> </ul> Both with <b>CF28</b> =1 and <b>CF28</b> =2, if the unit is operating as chiller or as heat pump and the modification of the operating modality is required, the controller stops all the outlets and wait for a certain delay time (fixed), signalled by the chiller led or heat pump led flashing. The flashing led indicates the operating modality used when the unit will be restarted, respecting the protection time of the compressor.
<b>CF29</b>	It allows to fix the set point of “change over”. If the selection of the operating modality by analogue input is enabled, it indicates the temperature value measured by <b>BATI</b> , under this value the unit can operate in heat pump only.
<b>CF30</b>	It allows to fix the differential of “change over”. If the selection of the operating modality by analogue input is enabled, it indicates the temperature differential which imposes the chiller operation.
<b>CF31</b>	It allows to select the operating modality logic: <ul style="list-style-type: none"> <li>• 0 = To switch on / off the unit in chiller modality use ❄️ button, to switch on / off the unit in heat pump modality use ☀️ button.</li> <li>• 1 = To switch on / off the unit in chiller modality use ☀️ button, to switch on / off the unit in heat pump modality use ❄️ button</li> </ul>

Parameters	Description
CF32	It allows to select the unit of measurement: <ul style="list-style-type: none"> <li>• 0 = Centigrade degrees / bar</li> <li>• 1 = Fahrenheit degrees / psi</li> </ul>
CF33	Selection of the net frequency operation: <ul style="list-style-type: none"> <li>• 0 = 50 Hz</li> <li>• 1 = 60 Hz</li> <li>• 2 = continuous power supply</li> </ul>
CF34	Serial address
CF35	Recognition of button number by remote terminal: <ul style="list-style-type: none"> <li>• 0 = 4 buttons</li> <li>• 1 = 6 buttons</li> <li>• 2 = 6 buttons with NTC probe</li> </ul>
CF36	It allows to select the default displaying of the top and bottom. <ul style="list-style-type: none"> <li>• 0 = <b>BEWOT</b> temperature is displayed in the top</li> <li>• 1 = <b>BTWOT</b> temperature is displayed in the top</li> <li>• 2 = no displaying in the top</li> <li>• 3 = <b>BAT1</b> temperature is displayed in the top</li> <li>• 4 = unit set point is displayed in the top (*)</li> <li>• 5 = unit status is displayed in the top (**)</li> <li>• 6 = Laser set is displayed in the top</li> <li>• 7 = no displaying in the top</li> <li>• 8 = the operating differential is displayed in the top</li> </ul> (*) the chiller set is displayed when the unit is in chiller modality, the heat pump set when the unit is in heat pump modality or off with stand-by unit (**) OnC is displayed when the unit is in chiller modality, OnH when the unit is in heat pump modality or off with stand-by unit.
CF37	Firmware release
CF38	Eeprom parameters map
CF39	Relay 2 configuration: <ul style="list-style-type: none"> <li>0= alarm relay</li> <li>1= compressor 1 capacity control</li> <li>2= compressor 2</li> <li>3= fan ON/OFF</li> <li>4= reversing valve</li> <li>5= antifreeze resistance/support</li> <li>6= solenoid valve water side</li> <li>7= solenoid valve water side only heat pump modality</li> </ul>
CF40	Proportional outlet configuration 0÷10 V 0 = outlet 0 ÷ 10 V used for the condensing fins control; ≠ 0 outlet tension value to control the laser valve, if the laser valve value is 0 ÷ 10 V used as control for the laser valve.
CF41	Valve inversion time when the compressor/s stop
CF42	It allows to select the default displaying of the bottom: <ul style="list-style-type: none"> <li>• 0 = <b>BEWOT</b> temperature is displayed in the bottom</li> <li>• 1 = <b>BTWOT</b> temperature is displayed in the bottom</li> <li>• 2 = <b>BCP1</b> temperature is displayed in the bottom</li> <li>• 3 = <b>BAT1</b> temperature is displayed in the bottom</li> <li>• 4 = unit set point is displayed in the bottom (*)</li> <li>• 5 = unit status is displayed in the bottom (**)</li> <li>• 6 = Laser set is displayed in the bottom</li> <li>• 7 = no displaying in the bottom</li> <li>• 8 = the operating differential is displayed in the bottom</li> </ul> (*) the chiller set is displayed when the unit is in chiller modality, the heat pump set when the unit is in heat pump modality or off with stand-by unit (**) OnC is displayed when the unit is in chiller modality, OnH when the unit is in heat pump modality or off with stand-by unit.

Parameters	Description
<b>CF43</b>	<p>It allows to select the default displaying of the top by remote control:</p> <ul style="list-style-type: none"> <li>• 0 = <b>BEWOT</b> temperature is displayed in the top</li> <li>• 1 = <b>BTWOT</b> temperature is displayed in the top</li> <li>• 2 = no displaying in the top</li> <li>• 3 = <b>BAT1</b> temperature is displayed in the top</li> <li>• 4 = unit set point is displayed in the top (*)</li> <li>• 5 = unit status is displayed in the top (**)</li> <li>• 6 = Laser set is displayed in the top</li> <li>• 7 = no displaying in the top</li> </ul> <p>(*) the chiller set is displayed when the unit is in chiller modality, the heat pump set when the unit is in heat pump modality or off with stand-by unit (**) OnC is displayed when the unit is in chiller modality, OnH when the unit is in heat pump modality or off with stand-by unit.</p>
<b>CF44</b>	<p>It allows to select the default displaying of the bottom by remote control:</p> <ul style="list-style-type: none"> <li>• 0 = <b>BEWOT</b> temperature is displayed in the bottom</li> <li>• 1 = <b>BTWOT</b> temperature is displayed in the bottom</li> <li>• 2 = <b>BCP1</b> temperature is displayed in the bottom</li> <li>• 3 = <b>BAT1</b> temperature is displayed in the bottom</li> <li>• 4 = unit set point is displayed in the bottom (*)</li> <li>• 5 = unit status is displayed in the bottom (**)</li> <li>• 6 = Laser set is displayed in the bottom</li> <li>• 7 = no displaying in the bottom</li> <li>• 8 = the operating differential is displayed in the bottom</li> </ul> <p>(*) the chiller set is displayed when the unit is in chiller modality, the heat pump set when the unit is in heat pump modality or off with stand-by unit (**) OnC is displayed when the unit is in chiller modality, OnH when the unit is in heat pump modality or off with stand-by unit.</p>
<b>Pr2</b>	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.3 Dynamic set point parameters (NOT ENABLED FUNCTION)

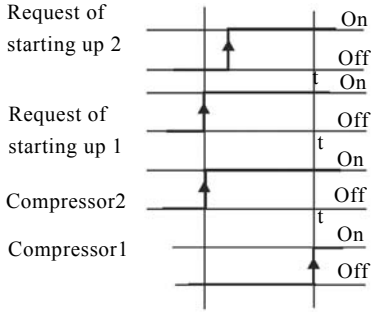
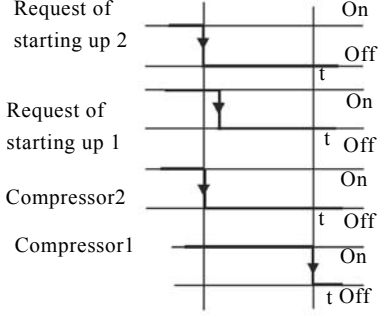
Parameters	Description
<b>Sd01</b>	<p>Enable the dynamic set point function</p> <p>0 = not enabled function 1 = enabled function</p>
<b>Sd02</b>	Maximum increase of the dynamic setpoint in chiller modality. Set the maximum operating dynamic setpoint variation in chiller modality.
<b>Sd03</b>	Maximum increase of the dynamic setpoint in heat pump modality. Set the maximum operating dynamic setpoint variation in heat pump modality.
<b>Sd04</b>	External air set of the dynamic setpoint in chiller modality
<b>Sd05</b>	External air set of the dynamic setpoint in heat pump modality
<b>Sd06</b>	External air temperature differential of the dynamic setpoint in chiller modality
<b>Sd07</b>	External air temperature differential of the dynamic setpoint in heat pump modality
<b>Pr2</b>	Password: it allows to fix a numeric code for the password (from 0 to 999)

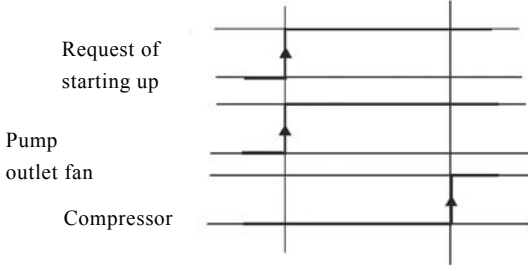
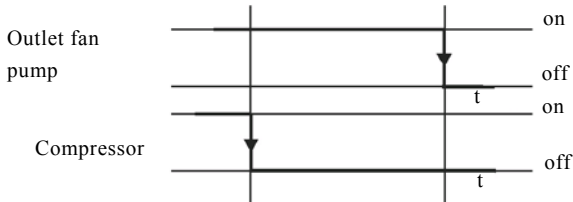
### 1.21.4 Energy Saving parameters (NOT ENABLED FUNCTION)

Parameters	Description
<b>ES01</b>	Energy saving start up (hour)
<b>ES02</b>	Energy saving stop (hour)
<b>ES03</b>	Monday 0 = not enabled 1 = enabled
<b>ES04</b>	Tuesday 0 = not enabled 1 = enabled
<b>ES05</b>	Wednesday 0 = not enabled 1 = enabled
<b>ES06</b>	Thursday 0 = not enabled 1 = enabled
<b>ES07</b>	Friday 0 = not enabled 1 = enabled

Parameters	Description
ES08	Saturday 0 = not enabled 1 = enabled
ES09	Sunday 0 = not enabled 1 = enabled
ES10	Energy saving set increase in chiller modality
ES11	Energy saving differential in chiller modality
ES12	Energy saving set increase in heat pump modality
ES13	Energy Saving differential in heat pump modality
Pr2	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.5 Compressor parameters

Parameters	Description
CO01	Min. operating time. It fixes the time during which the compressor must remain on after its switching on.
CO02	Min. stopping time. It fixed the time during which the compressor must remain off, even if its starting is required. During this phase the compressor led flashes.
CO03	<p>Delay between two compressor's starting up / capacity control. It fixes a delay time between the starting up of the two compressors, in order to reduce the absorptions. During this phase the compressor's led flashes. The unit starts with a reduced capacity compressor. If the starting up at compressor's full capacity is required, the capacity control solenoid valve is energized and after 5 seconds the compressor relay is enabled. After CO03 delay, if the thermoregulator doesn't request the starting up, the solenoid valve de-energizes.</p>  <p style="text-align: center;">Delay between two compressor's starting up <b>CO03</b></p>
CO04	<p>It fixes a delay time between the stopping of the two compressors.</p>  <p style="text-align: center;">Delay between two compressor's starting up <b>CO04</b></p>
CO05	<p>Delay at control start up. It delays the enabling of all outlets used to distribute the net absorptions and to avoid too frequent starting up of compressor/s in the event of frequent net supply losses.</p> <p><b>ATTENTION</b></p> <p><i>Only during power on, if an operating modality different from stand-by has been selected, the led indicating the selected operating modality flashes during all the time fixed by CO05. It indicates the delay at starting up. Then it becomes steady.</i></p>

Parameters	Description
<b>CO06</b>	<p>Compressor starting delay from water pump / outlet fan starting up. Both during chiller and heat pump operation, if parameter <b>CO11</b> = 2 (pump / outlet fan operation required by compressor), in the event of compressor starting's request, it starts first the water circulation pump (air/air outlet fan) and then the compressors. If parameter <b>CO11</b> = 1 (continuous operation), the water pump / outlet fan start, the unit starts (selection of chiller / heat pump operation). If after the selection of the operating modality the thermoregulator requests the compressor/s starting up, it is carried out after the delay time set by <b>CO06</b>.</p>  <p style="text-align: center;">Compressor starting delay from pump water pump <b>CO06</b></p>
<b>CO07</b>	<p>Stopping delay of water pump / outlet fan from compressor's stopping. Both during chiller and heat pump operation, if parameter <b>CO11</b> = 2 (pump / outlet fan operation required by compressor), in the event of compressor stopping's request, it stops first the compressors and then the water circulation pump (air/air outlet fan). If parameter <b>CO11</b> = 1 (continuous operation), the water pump / outlet fan stop only when the unit is stopped (stand-by unit).</p>  <p style="text-align: center;">Stopping delay of water pump / outlet fan from compressor's stopping <b>CO07</b></p>
<b>CO08</b>	<p>If fixes the sequence of compressor's starting and stopping.  0 = Rotation enabled. According to the number of operating hours, the first compressor to be started up is the one with the lower number of operating hours. The first compressor to be stopped it the one with the higher number of operating hours. In unit with a reduced capacity compressor, the compressor's rotation is automatically disabled.  1 = Fixed sequence. It always starts first compressor 1, then compressor 2. Compressor 1 stops only when compressor 2 is stopped. If the event of an alarm which block compressor 1, compressor 2 stops immediately.</p>
<b>CO09</b>	Relay disabling delay time configured as water side valve from compressor OFF ( <b>CF39</b> = 2 / 3)
<b>CO10</b>	<p>Selection of the polarity of the capacity control valve:</p> <ul style="list-style-type: none"> <li>• 0 = capacity control with valve ON</li> <li>• 1 = capacity control with valve OFF</li> </ul>
<b>CO11</b>	<p>Operating modality of pump / outlet fan:</p> <ul style="list-style-type: none"> <li>• 0 = Absent, the pump and outlet fan are not managed.</li> <li>• 1 = Continuous operation, the starting and stopping of pump and of outlet fan are connected to the starting and stopping of the unit.</li> <li>• 2 = Operation requested by compressor, the starting and stopping of pump and outlet fan are connected to the starting and stopping of compressor (parameters <b>CO06</b>, <b>CO07</b> different to 0).</li> </ul>
<b>CO12</b>	<p>Operating modality selection of compressor 1:</p> <ul style="list-style-type: none"> <li>• 0 = ON</li> <li>• 1 = OFF</li> </ul> <p>It allows to put the first compressor in OFF for maintenance or for a malfunctioning.  It doesn't permit the compressor starting with the selection of every operating modality.  To start the compressor again, it is necessary to put parameter <b>CO12</b>=0 again, compressor ON.</p>
<b>CO13</b>	<p>Operating modality selection of compressor 2 / capacity control:</p> <ul style="list-style-type: none"> <li>• 0 = ON</li> <li>• 1 = OFF</li> </ul> <p>It allows to put the second compressor or the capacity control solenoid valve in OFF for maintenance or for a malfunctioning.  It doesn't permit the compressor or solenoid valve starting with the selection of every operating modality.  To start the compressor again or to enable the solenoid valve operation again, it is necessary to put parameter <b>CO13</b>=0 again, compressor ON.</p>
<b>CO14</b>	Hour counter set of compressor 1 operating hours. It fixes the max. number of compressor's operating hours, if this limit is exceeded the alarm A13 trips (if the operating hour threshold is fixed to zero, the function is disabled).
<b>CO15</b>	Hour counter set of compressor 2 operating hours. It fixes the max. number of compressor's operating hours, if this limit is exceeded the alarm A14 trips (if the operating hour threshold is fixed to zero, the function is disabled).

Parameters	Description
CO16	Hour counter set of water pump / outlet fan operating hours. It fixes the max. number of water pump / outlet fan's operating hours, if this limit is exceeded the alarm A15 trips (if the operating hour threshold is fixed to zero, the function is disabled).
CO17	If the unloading is enabled.
CO18	Unloading enabling differential.
CO19	Unloading enabling delay time.
CO20	Unloading maximum time.
CO21	If the pressure unloading is enabled.
CO22	Pressure unloading enabling differential
CO23	Compressor setpoint unloading in heat pump modality
CO24	Unloading compressor pressure differential in heat pump modality
CO25	Condenser unloading maximum time
Pr2	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.6 Ventilation parameters

Parameters	Description
FA01	It allows to select the outlet for the control of condensation fans: <ul style="list-style-type: none"> <li>0 = Outlet absent</li> <li>1 = Outlet present</li> </ul>
FA02	It allows to select the parameter FA03 and the condensing fan operation: <ul style="list-style-type: none"> <li>0 = With FA03=0 the condensation fans are operating when the compressor is operating (parallel operation)</li> <li>0 = With FA03=1 the condensation fans are operating independently from the compressor (except for stand-by unit)</li> <li>1 = With FA03=0 the condensation fans are operating when the compressor is operating with ON/OFF regulation according to the temperature / condensation pressure. When the compressor stops the fans stop independently from the temperature / condensation pressure.</li> <li>1 = With FA03=1 the condensation fans stop / start with ON/OFF regulation according to the temperature / condensation pressure.</li> <li>2 = With FA03=0 the condensation fans are operating when the compressor is operating with proportional regulation (triac outlet 4÷20ma) according to the temperature / condensation pressure. When the compressor stops the fans stop independently from the temperature / condensation pressure.</li> <li>2 = With FA03=1 the condensation fans stop / start with proportional regulation (triac outlet 4÷20mA) according to the temperature / condensation pressure.</li> </ul>
FA03	It allows to select the operating modality of fans: <ul style="list-style-type: none"> <li>0 = It depends from compressor</li> <li>1 = It doesn't depend from compressor</li> </ul>
FA04	It allows to fix a starting time of fans at the max. speed after the starting up. If FA02=2 and the condensation fan is connected to triac outlet: At every starting up, independently from the temperature / condensation pressure, the fan is powered on to the max. tension for FA04 time. After this time, the fan continues to operate to the speed fixed by the regulator. If FA04 = 0 the function is disabled.
FA05	Time lag of fans: It fixes a delay (in micro-seconds) to compensate the different characteristics of electrical motors.
FA06	Not used
FA07	It allows to fix an operating time of fans at max. speed (in chiller modality) before the starting up of compressor, in order to anticipate the increasing of temperature / condensation pressure and to optimise the regulation. If FA07 = 0 the function is disabled.
FA08	Min. speed of fan operation in chiller modality. It allows to fix a min. value for proportional regulation of fans in chiller modality.
FA09	Max. speed of fan operation in chiller modality. It allows to fix a max. value for proportional regulation of fans in chiller modality.
FA10	It allows to fix a value of temperature / condensation pressure during chiller modality which corresponds to the min. speed of fan.
FA11	It allows to fix a value of temperature / condensation pressure during chiller modality which corresponds to the max. speed of fan.
FA12	Proportional band of fan regulation in chiller modality: it allows to fix a temperature / pressure differential which corresponds to modification from the min. value to the max. value of fan speed.
FA13	It allows to fix a temperature / pressure differential in chiller modality for fan stopping.
FA14	It allows to fix a temperature / pressure differential in chiller modality during which the fan remains at the min. speed.
FA15	It allows to fix a delay time on CUT-OFF function activation at compressor starting up. If at compressor starting up the proportional regulator requests the fan stopping (cut-off) and FA15=0 for the pre-set time, the fan will be forced to the min. speed. If FA15=0 the function is disabled.
FA16	"Night function" in chiller modality. It allows to fix a max. value for the proportional regulation of fans in chiller modality.
FA17	Min. speed of fan operation during heat pump modality. It allows to fix a min. value for the proportional regulation of fans in heat pump modality.
FA18	Max. speed of fan operation during heat pump modality. It allows to fix a max. value for the proportional regulation of fans in heat pump modality.



Parameters	Description
<b>FA19</b>	It allows to fix a temperature / condensation pressure value during heat pump modality which corresponds to the min. speed of fan.
<b>FA20</b>	It allows to fix a temperature / condensation pressure value during heat pump modality which corresponds to the max. speed of fan.
<b>FA21</b>	Proportional band of fan regulation during heat pump modality. It allows to fix a temperature / pressure differential which corresponds to a modification from the min. to the max. speed of fans.
<b>FA22</b>	It allows to fix a temperature / pressure differential during heat pump modality for fan stopping.
<b>FA23</b>	It allows to fix a temperature / pressure differential during heat pump modality during which the fan remains to the min. speed.
<b>FA24</b>	“Night function” in heat pump modality. It allows to fix a max. value for the proportional regulation of fans in heat pump modality.
<b>FA25</b>	“Hot start” set point It allows to fix a temperature value measured by <b>BTWOT</b> , under this value the outlet fan is blocked. This function is enabled only when air/air unit is configured as heat pump, it allows the outlet fan to start only if the condensing coil temperature is sufficiently warm. Cold air flows in the ambient are avoided.
<b>FA26</b>	“Hot start” differential. It allows to fix a differential on “hot start” function.
<b>Pr2</b>	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.7 Antifreeze heater - boiler (NOT ENABLED FUNCTION) - support (NOT ENABLED FUNCTION) parameters

Parameters	Description
<b>Ar01</b>	Set point min. antifreeze limit (from -40°C to <b>Ar03</b> )
<b>Ar02</b>	Set point max. antifreeze limit (from <b>Ar03</b> to 110°C)
<b>Ar03</b>	Antifreeze alarm set It allows to fix a temperature value under which the following alarms are enabled: antifreeze, ambient air low temperature (air/air unit on <b>PB1</b> ), outlet air low temperature (air/air unit on <b>BTWOT</b> ). (From <b>Ar01</b> to <b>Ar02</b> )
<b>Ar04</b>	Antifreeze alarm differential, ambient air low temperature, outlet air low temperature. It allows to fix a temperature differential which fix the alarm reset.
<b>Ar05</b>	Antifreeze alarm delay, ambient air low temperature, outlet air low temperature. It allows to fix a time during which the temperature must remain under the set value fixed by parameter <b>Ar03</b> to enable the antifreeze alarm.
<b>Ar06</b>	Max. number of hour tripping of antifreeze alarm, outlet air low temperature. It fixes the max. number of hour tripping of antifreeze alarm, ambient air low temperature, outlet air low temperature. When this limit is exceeded the alarm passes from automatic reset to manual reset.
<b>Ar07</b>	Delay of antifreeze alarm outlet air low temperature at unit starting up in heat pump modality. It is enabled only if the unit is configured as heat pump, it allows to fix a delay time at compressor starting up, because the unit warms the water or the air. If after the delay time the temperature remains lower than the set value fixed by <b>Ar03</b> the unit is blocked.
<b>Ar08</b>	Set point of antifreeze / support resistances (air/air unit) during chiller operation. It allows to fix a temperature value under which the antifreeze resistances of probe NTC <b>BEWOT-BTWOT</b> are activated.
<b>Ar09</b>	Set point of antifreeze / support resistances (air/air unit) during heat pump operation. It allows to fix a temperature value under which the antifreeze resistances of probe NTC <b>BCP1 -BAT1</b> are activated.
<b>Ar10</b>	Set point of antifreeze resistances during heat pump operation (water/water unit). It allows to fix a temperature value under which the antifreeze resistances of probe NTC <b>BCP1 -BAT1</b> are activated.
<b>Ar11</b>	Differential of antifreeze / support resistances during chiller operation.
<b>Ar12</b>	Differential of antifreeze / support resistances during heat pump operation.
<b>Ar13</b>	Enabling of antifreeze / support resistances: <ul style="list-style-type: none"> <li>• 0 = Activated only if requested by the thermoregulator</li> <li>• 1 = Activated if requested by the thermoregulator and when defrost function is enabled (always activated during defrosting).</li> </ul>
<b>Ar14</b>	It enables the operation of antifreeze / support resistances during chiller modality: <ul style="list-style-type: none"> <li>• 0 = OFF during chiller modality</li> <li>• 1 = ON during chiller modality (activated according to the thermoregulator)</li> </ul>
<b>Ar15</b>	It enables the operation of antifreeze / support resistances during heat pump modality: <ul style="list-style-type: none"> <li>• 0 = OFF during heat pump modality</li> <li>• 1 = ON during heat pump modality (activated according to the thermoregulator)</li> </ul>
<b>Ar16</b>	Thermoregulation of antifreeze / support resistances during chiller modality If fixes the regulation probe of antifreeze resistances during chiller modality <ul style="list-style-type: none"> <li>• 0 = Regulation on <b>BEWOT</b> probe</li> <li>• 1 = Regulation on <b>BTWOT</b> probe</li> </ul>
<b>Ar17</b>	Thermoregulation of antifreeze / support resistances during heat pump modality If fixes the regulation probe of antifreeze resistances during heat pump modality <ul style="list-style-type: none"> <li>• 0 = Regulation on <b>BEWOT</b> probe</li> <li>• 1 = Regulation on <b>BTWOT</b> probe</li> </ul>

Parameters	Description
<b>Ar18</b>	Regulation of antifreeze resistances It fixes the operation of antifreeze resistances when the unit is in OFF or in stand-by <ul style="list-style-type: none"> <li>• 0 = always stopped in off or in stand-by</li> <li>• 1 = operating in off or in stand-by (operating according to the thermoregulator)</li> <li>• 2 = Water pump/antifreeze resistance regulation on <b>BAT1</b> probe configured as ambient</li> <li>• 3 = Water pump/antifreeze resistance regulation on <b>BAT1</b> probe configured as ambient with separated set.</li> </ul>
<b>Ar19</b>	It fixes the enabling of antifreeze resistances in the event of damage of a probe used for their control <ul style="list-style-type: none"> <li>• 0 = stopped in the event of probe damage</li> <li>• 1 = operating in the event of probe damage</li> </ul>
<b>Boiler operation parameters</b>	
<b>Ar20</b>	Boiler function It allows to control the electrical resistances during heat pump operation <ul style="list-style-type: none"> <li>• 0 = Control during integration</li> <li>• 1 = Control during warming</li> </ul>
<b>Ar21</b>	External air set point, boiler resistance enabling
<b>Ar22</b>	Boiler resistance differential
<b>Ar23</b>	Delay time for boiler resistance enabling. If this delay time is fixed as zero boiler function is disabled.
<b>Pr2</b>	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.8 Defrosting parameters (NOT ENABLED FUNCTION)

Parameters	Description
<b>df01</b>	Defrosting procedure <ul style="list-style-type: none"> <li>• 0 = NO</li> <li>• 1 = YES</li> </ul>
<b>df02</b>	Set the defrosting modality <ul style="list-style-type: none"> <li>• 0 = Temperature / pressure defrosting. The delay time counting at defrosting request <b>df10</b> starts when the temperature/pressure are lower than <b>df03</b>. The temperature / pressure fix the defrosting cycle stopping.</li> <li>• 1 = Timed defrosting. The delay time counting at defrosting request <b>df10</b> starts when the temperature/pressure are lower than <b>df03</b>. The max. time <b>df07</b> fixes the defrosting cycle stopping.</li> <li>• 2 = External contact defrosting. The delay time counting at defrosting request <b>df10</b> starts when the temperature/pressure are lower than <b>df03</b>. The defrosting cycle starts with digital input disabled and stops with digital input enabled.</li> <li>• 3 = <math>\Delta T</math> defrosting.</li> </ul>
<b>df03</b>	Temperature / pressure at counting starting, it fixes the delay between two successive defrosting. It allows to fix a temperature / pressure set under which the counting of <b>df10</b> time starts.
<b>df04</b>	Temperature / pressure at defrosting end. It allows to set a temperature / pressure value which fixes the defrosting cycle end.
<b>df05</b>	Min. waiting time before a forced defrosting cycle. The function is enabled if parameter <b>df05</b> is different to zero. It allows to carry out a defrosting cycle (even if <b>df10</b> time is not passed), if the temperature / pressure remain lower than <b>df19</b> set and for <b>df05</b> time. If during the counting of <b>df05</b> time the temperature / pressure increase over than <b>df19</b> set + <b>df20</b> differential, the function is disabled and <b>df05</b> time is reset.
<b>df06</b>	Min. defrosting cycle length. When defrosting cycle has been started up (even if the defrosting end conditions have been reached), it allows to set a time which fixes the min. defrosting cycle length.
<b>df07</b>	Max. length for defrosting cycle. If <b>df02</b> =1 fixes the defrosting end, it allows to fix a max. time for defrosting cycle. In the other cases it fixes the max. length.
<b>df08</b>	Waiting time before defrosting (during this phase the compressor led flashes). After the time fixed by <b>df10</b> , before the defrosting cycle has started, the compressor is stopped for <b>df08</b> time. When compressor is stopped after a time which corresponds to half time set by <b>df08</b> , the four-way valve reverses. This waiting time is used to equilibrate the pressures inside the cooling circuit. When all time set by <b>df08</b> has passed, the compressor starts again and the defrosting is carried out. With this procedure the compressor protection times are not respected, so the compressor stopping and re-starting are immediate. If <b>df08</b> =0 the compressor is not stopped and the commutation valve reverses immediately.
<b>df09</b>	Waiting time after defrosting (during this phase the compressor led flashes). When defrosting cycle is finished, the compressor is stopped for <b>df09</b> time. When compressor is stopped after a time which corresponds to half time set by <b>df09</b> , the four-way valve reverses. This waiting time is used to equilibrate the pressures inside the cooling circuit, and an eventual drainage of the external coil. When all time set by <b>df09</b> has passed, the operation in heat pump re-starts. With this procedure the compressor protection times are not respected, so the compressor stopping and re-starting are immediate. If <b>df09</b> =0 the compressor is not stopped and the commutation valve reverses immediately.
<b>df10</b>	Min. waiting time between two successive defrosting cycles. The counting is increased if the temperature / pressure measured by the condensation probe ( <b>BCP1/BAT1</b> ) is lower than <b>df03</b> set. The counter is reset to <b>df10</b> in the event of power supply loss or after the defrosting cycle is carried out or when the operating modality is modified. The counter stops if the compressor stops or if the temperature / pressure measured by the probe is higher than <b>df03</b> .
<b>df11</b>	Temperature set of combined defrosting cycle starting. This function is enabled when the analogue input is configured as <b>BAT1 CF07</b> =5 and <b>BCP1 CF06</b> = 1 or 2. The counting of defrosting cycle delay starts according to the temperature / pressure measured by <b>BCP1</b> probe parameter <b>df03</b> . When the counting of <b>df10</b> time is passed, the temperature measured by <b>BAT1</b> probe is controlled: if it is lower than <b>df11</b> set the defrosting procedure is carried out, otherwise the unit continues to operate in heat pump modality. When the temperature decreases under <b>df11</b> set the defrosting cycle is carried out.

Parameters	Description
<b>df12</b>	Temperature set of defrosting cycle end. It allows to fix a temperature set, over this value the combined defrosting cycle finishes. The configuration of the analogue input <b>BAT1 CF07</b> =5 enables the control of combined defrosting cycle end. The combined defrosting cycle stops when the temperature measured by <b>BAT1</b> probe reaches the set value.
<b>df13</b>	Second compressor in defrosting phase forced in ON <ul style="list-style-type: none"> <li>• 0 = Disabled</li> <li>• 1 = Enabled</li> </ul> If the unit is configured with two compressors <b>CF21</b> = 2 and <b>df13</b> = 1, during defrosting cycle, the compressors are both on. With this procedure the compressor protection times are not respected, so the compressor starting and stopping are immediate.
<b>df14</b>	Enabling to ON the condensation ventilation during defrosting <ul style="list-style-type: none"> <li>• 0 = Disabled</li> <li>• 1 = Enabled</li> <li>• 2 = Dripping</li> </ul> If <b>df14</b> =1 and the pressure / condensation temperature increase over the set fixed by <b>df15</b> , the fans are forced to start up. The regulation of fans is the same both in heat pump and in chiller modality operation.
<b>df15</b>	Pressure / temperature set of forcing to ON the fans during defrosting.
<b>df16</b>	Low pressure alarm during defrosting cycle. <ul style="list-style-type: none"> <li>• 0= Enabled</li> <li>• 1= Disabled</li> </ul>
<b>df17</b>	Low pressure alarm delay during heat pump modality. With parameters <b>df08</b> and <b>df09</b> set to 0 (the compressor is not stopped and the commutation valve reverses immediately), the defrosting cycle starting and stopping cause big pressure fluctuations inside the cooling circuit. The delay counting starts every time the valve is enabled and disabled, avoiding an eventual stopping due to low pressure and allowing unit normal operation.
<b>df18</b>	Polarity of cycle commutation valve: <ul style="list-style-type: none"> <li>• 0 = Enabled during chiller operation</li> <li>• 1 = Enabled during heat pump operation</li> </ul>
<b>df19</b>	Pressure / temperature set of defrosting cycle forcing.
<b>df20</b>	Differential of defrosting cycle forcing.
<b>df21</b>	“a” parameter: defrosting dynamic set calculation (a+ b*x)
<b>df22</b>	“b” parameter: defrosting dynamic set calculation (a+ b*x)
<b>df23</b>	Defrosting control delay time
<b>df24</b>	Time that has to pass before the defrosting request
<b>df25</b>	Max. number of defrosting cycles per hour
<b>df26</b>	Freon type: 0=R22 1=R407C 2=R134a 3=R404a 4=R410
<b>df27</b>	Discharge fan blockage during defrosting (AIR/AIR units only) 0= Not enabled 1= Enabled
<b>Pr2</b>	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.9 Alarm parameters

Parameters	Description
<b>AL01</b>	Digital input low pressure alarm delay. It allows to fix a delay time for low pressure alarm tripping at compressor starting up.
<b>AL02</b>	Max. number of tripping per hour of digital input low pressure alarm. It fixes a max. number of tripping per hour of low pressure alarm. Over this limit the alarm passes from automatic reset to manual reset type.
<b>AL03</b>	Low pressure alarm with unit in remote OFF or in stand-by. <ul style="list-style-type: none"> <li>• 0 = Alarm detection disabled</li> <li>• 1 = Alarm detection enabled</li> </ul>
<b>AL04</b>	It allows to fix a delay on flow meter alarm detection at water pump starting up. It allows the flow level to normalize.
<b>AL05</b>	Max. number of flow meter's tripping per hour. It fixes a max. number of tripping per hour of flow meter alarm. Over this limit the alarm passes from automatic reset to manual reset type. When the flow meter alarm is of manual reset type, the water pump is blocked. When the unit is configured as <b>CF01</b> =2,3,4,5, the number of tripping per hour can not be fixed to a value lower than 1.

Parameters	Description
<b>AL06</b>	<p>Duration of flow meter inlet enabled.</p> <p>It allows to fix a time during which the flow meter alarm must remain enabled, after this time the alarm condition is signalled. The counting starts after <b>AL04</b> time. It allows to detect eventual flow decreasing or the presence of air in the water circuit.</p> <p>Notes about flow meter alarm: the relay / “open collector” outlet alarm is enabled only if the flow meter alarm is enabled during unit normal operation. Otherwise the alarm is signalled only by means of a flashing icon. During boiled operation, a flow meter alarm stops the resistances.</p> <p>The evaporator protection is carried out by the antifreeze set.</p> <p><b>CO11=0</b> Water pump absent.</p> <p>The alarm is managed only if the digital input is configured as flow meter, it is always of automatic reset type.</p> <p><b>CO11=1</b> Water pump operation continuous.</p> <p>The alarm is managed only if as digital input is configured as flow meter, it is always of automatic reset type with unit in stand-by or in remote OFF (pump stopped), it becomes of manual reset type after <b>AL05</b> number of tripping only in chiller or in heat pump operation. The water pump continues to operate until <b>AL05</b> number of tripping is reached, then it is blocked.</p> <p><b>CO11=2</b> Water pump operation required by compressor.</p> <p>The alarm is managed only if as digital input is configured as flow meter, it is always of automatic reset type with unit in stand-by or in remote OFF (pump stopped), it becomes of manual reset type after <b>AL05</b> number of tripping in chiller or in heat pump operation if the alarm detected is different from a normal operating phase (e.g.: the unit stops because the operating set has been reached). The water pump starts after <b>CO06</b> time, stops after <b>CO07</b> time and, when <b>AL05</b> number of tripping is reached, it is blocked.</p> <p>Flow meter alarm manual reset.</p> <p>When <b>AL05</b> number of tripping is reached it is necessary to enter the operating menu and to reset the alarm. “Flow!” signalling DOESN’T DISHAPPEAR until the alarm is enabled. The water pump (if managed) can start and the alarm is by-passed for <b>AL04</b>, allowing the unit normal starting up, if during this interval of time the alarm has been reset.</p>
<b>AL07</b>	<p>Duration of flow meter alarm disabled.</p> <p>It allows to fix a time during which the flow meter alarm must remain disabled, after this period of time the signalling of flow meter enabled is reset.</p>
<b>AL08</b>	<p>Delay of thermal protection alarm of compressors 1-2 at starting up.</p> <p>It allows to fix a delay time on thermal protection alarm detection at compressor starting up.</p>
<b>AL09</b>	<p>Max. number of thermal protection alarm tripping per hour of compressors 1-2.</p> <p>It fixes a max. number of tripping per hour of compressor thermal protection alarm. Over this limit the alarm passes from automatic reset type to manual reset type.</p>
<b>AL10</b>	<p>Thermal protection alarm reset of compressors 1-2 after <b>AL09</b>.</p> <p>Notes about thermal protection alarm reset of compressors 1-2 after <b>AL09</b> number of tripping per hour:</p> <p>When the max. number of thermal protection alarm tripping per hour for compressors 1-2 is exceeded, the parameter <b>AL10</b> is set to 1.</p> <p>To reset the alarm it is necessary to enter in programming phase and change its value to 0.</p> <p>This modality is useful to avoid non-specialized personnel to reset the alarm and to start the unit again, causing big damages to the compressor’s electrical motor.</p>
<b>AL11</b>	<p>High temperature / condensation pressure alarm set point.</p> <p>It allows to fix a temperature / pressure set, over this limit a high temperature / condensation pressure alarm is detected.</p>
<b>AL12</b>	<p>High temperature / condensation pressure differential which fixes the alarm reset.</p>
<b>AL13</b>	<p>Low temperature / analogue input pressure alarm delay.</p> <p>It allows to fix a delay time in the detection of low temperature / pressure alarm at compressor’s starting up.</p>
<b>AL14</b>	<p>Low temperature / analogue input pressure alarm set point.</p> <p>It allows to fix a temperature / pressure set, under this value a low temperature / pressure alarm is detected.</p>
<b>AL15</b>	<p>Low temperature / analogue input pressure alarm differential.</p> <p>It allows to fix a temperature / pressure differential to reset the alarm.</p>
<b>AL16</b>	<p>Max. number of analogue input low pressure alarm tripping per hour, over this limit the alarm passes from automatic reset type to manual reset type.</p>
<b>AL17</b>	<p>It enables the alarm outlet “open collector” and the operation of alarm relay with unit in remote OFF or in stand-by:</p> <ul style="list-style-type: none"> <li>• 0= Alarm outlet enabled</li> <li>• 1= Alarm outlet disabled</li> </ul>
<b>AL18</b>	<p>It allows to configure the polarity of the alarm relay:</p> <ul style="list-style-type: none"> <li>• 0= Enabled outlet, closed contact</li> <li>• 1= Enabled outlet, opened contact</li> </ul>
<b>AL19</b>	<p>Antifreeze alarm:</p> <p>0= related to the parameters <b>Ar16</b> in chiller modality - <b>Ar17</b> in heat pump modality.</p> <p>1= <b>BEWOT</b> probe</p> <p>2= <b>BTWOT</b> probe</p> <p>3= <b>BCP1</b> probe</p> <p>4= <b>BAT1</b> probe</p>

Parameters	Description
AL20	Maximum number of generic alarm “unit blocked” tripping per hour Maximum number of generic alarm “unit blocked” tripping per hour, over this number the reset will become manual Always manual if AL20 = 0 always automatic if AL20 =16 From automatic to manual if AL20 from 1 to 15
AL21	Unit blocked generic alarm delay with enabled digital input
AL22	Unit blocked generic alarm delay with not enabled digital input
AL23	Low water temperature alarm at evaporator outlet. It allows to fix the starting set.
AL24	High water temperature alarm at evaporator outlet. It allows to fix the starting set.
Pr2	Password: it allows to fix a numeric code for the password (from 0 to 999)

### 1.21.10 LASER operating parameters (NOT ENABLED FUNCTION)

Parameters	Description
LS01	Laser function proportional band (pb)
LS02	Laser functioning calculated time (integral) (int)
LS03	Laser functioning calculated time (derivative) (det)
LS04	Laser T1 functioning period (Cyt)
LS05	Minimum time of functioning with the outlet in ON if T2 enabled (on)
LS06	Minimum time of functioning with the outlet in OFF if T2 enabled T3
LS07	Sampling time of the derivative (Sr)
LS08	Band adjustment (rS)
LS09	Integral band limitation (Ar)
Pr2	Password: it allows to fix a numeric code for the password (from 0 to 999)

#### NOTE

LS parameters can be displayed only if parameter CF1=6.

## 1.22 Parameter setting

All adjustable parameters and their level are listed below.

U= user level

S= service level

### ATTENTION

It is important to follow these indication in order to avoid a wrong operation of unit.

### 1.22.1 Thermoregulation parameters

### ATTENTION

The values of the probes can be displayed using a measurement system other than the manufacturer's factory setting. This operation does not automatically convert the parameter values, which retain the measurement unit set by the manufacturer. To change the measurement unit from one system to the net proceed with the utmost caution and ensure the operation is carried out by skilled personnel.

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
ST01	U	Summer set point	ST05	ST06	°C °F °C °F	Dec Int	9°C with 1 compr. 48°F with 1compr. 8°C with 2 compr. 47°F with 2compr.
ST02	U	Summer differential	00.0 00.0	25.0 45.0	°C °F °C °F	Dec Int	4°C with 1 compr. 7°F with 1 compr. 2°C with 2 compr. 4°F with 2 compr.
ST03	U	Winter set point	ST07	ST08	°C °F	Dec Int	45.0°C 113°F
ST04	U	Winter differential	00.0 00.0	25.0 45.0	°C °F	Dec Int	02.0°C 4°F
ST05	U	Summer min. set	-40.0 -40.0	ST01	°C °F	Dec Int	5.0°C 41°F
ST06	S	Summer max. set	ST01	110 230	°C °F	Dec Int	30°C 86°F
ST07	S	Winter min. set	-40.0 -40.0	ST03	°C °F	Dec Int	10.0°C 50°F
ST08	S	Winter max. set	ST03	110 230	°C °F	Dec Int	50.0°C 122°F
ST09	S	Regulation band	00.0 00.0	25.0 45.0	°C °F	Dec Int	0°F (1 compr.) 4°F (2 compr.)

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
ST10	S	LASER setpoint	-40.0 -40.0	110 230	°C °F	Dec Int	15.0°C 59°F
ST11	S	Function chiller unit without accumulation tank: 0= disabled 1= enabled	0	1			0
ST12	S	Set point min. water outlet temperature without accumulation tank during chiller operation	-40.0 -40.0	110 230	°C °F	Dec Int	04.0°C 39°F
ST13	S	Set point max. water outlet temperature without accumulation tank during heat pump operation	-40.0 -40.0	110 230	°C °F	Dec Int	55.0°C 131°F
ST14	S	Delta set point during chiller / heat pump operation	00.0 00.0	25.0 45.0	°C °F	Dec Int	0,5°C 1°F
ST15	S	Delta differential during chiller / heat pump operation	00.0 00.0	25.0 45.0	°C °F	Dec Int	0,5°C 1°F
ST16	S	Compressor operation time, over this value the delta set point and delta differential are decreased during chiller / heat pump operation	0	250	Sec	10 Sec	6
ST17	S	Constant value for the calculation of set point and differential values during chiller / heat pump operation	0	250			2
ST18	S	Delay time for operating set point adjustment	0	250	Sec	10 Sec	1
Pr2		Password	0	999		-	-

### 1.22.2 Configuration parameters

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CF01	S	Unit type: 0 = air/air chiller 1 = air/air chiller with heat pump 2 = air/water chiller 3 = air/water chiller with heat pump 4 = water/water chiller 5 = water/water chiller with heat pump 6 = water/air Chiller with LASER 7 = water/water Chiller with heat pump and water side reversing cycle	0	7			2
CF02	S	Motorcondensing unit 0 = Not 1 = Yes	0	1			0
CF03	S	Regulation probe 0 = regulation on <b>BEWOT</b> probe 1 = regulation on <b>BTWOT</b> probe	0	1			1
CF04	S	<b>BEWOT</b> configuration 0 = probe absent 1 = NTC temperature at evaporator inlet 2 = thermoregulator request digital input 3 = cold request digital input	0	3			1
CF05	S	<b>BTWOT</b> configuration 0 = probe absent 1 = NTC temperature at evaporator outlet 2 = antifreeze alarm digital input 3 = warm request digital input	0	3			1
CF06	S	<b>BCPI</b> configuration 0 = probe absent 1 = NTC temperature condensation control 2 = In 4.20ma condensation pressure 3 = In 4.20ma dynamic set point 4 = NTC temperature antifreeze alarm (water/water unit)	0	4			0
CF07	S	<b>BATI</b> configuration 0 = probe absent 1 = NTC temperature condensation control 2 = In multi function digital 3 = external air temperature 4 = NTC temperature antifreeze alarm (water/water unit) 5 = NTC temperature defrosting 6 = NTC temperature recording	0	6			0 3 with antifreeze protection

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CF08	S	<b>ID1</b> configuration 0 = compressor 1 thermal protection 1 = pump thermal protection 2 = outlet fan / flow meter thermal protection 3 = remote on/off 4 = cool/heat 5 = compressor 2 thermal protection 6 = compressor 2 / step request 7 = defrosting end 8 = Energy saving 9 = antifreeze alarm 10 = compressor 1 and 2 thermal protection 11 = generic alarm	0	11			2
CF09	S	<b>ID2</b> configuration 0 = compressor 1 thermal protection 1 = pump thermal protection 2 = outlet fan / flow meter thermal protection 3 = remote on/off 4 = cool/heat 5 = compressor 2 thermal protection 6 = compressor 2 / step request 7 = defrosting end 8 = Energy saving 9 = antifreeze alarm 10 = compressor 1 and 2 thermal protection 11 = generic alarm	0	11			0 (1 compr.) 10 (2 compr.)
CF10	S	<b>ID5</b> configuration 0 = compressor 1 thermal protection 1 = pump thermal protection 2 = outlet fan / flow meter thermal protection 3 = remote on/off 4 = cool/heat 5 = compressor 2 thermal protection 6 = compressor 2 / step request 7 = defrosting end 8 = Energy saving 9 = antifreeze alarm 10 = compressor 1 and 2 thermal protection 11 = generic alarm	0	11			3
CF11	S	<b>BAT1</b> configuration if selected as digital input 0 = compressor 1 thermal protection 1 = pump thermal protection 2 = outlet fan / flow meter thermal protection 3 = remote on/off 4 = cool/heat 5 = compressor 2 thermal protection 6 = compressor 2 / step request 7 = defrosting end 8 = Energy saving 9 = antifreeze alarm 10 = compressor 1 and 2 thermal protection 11 = generic alarm	0	11			4
CF12	S	ID1 polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			1
CF13	S	ID2 polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			1
CF14	S	ID3 polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			1
CF15	S	ID4 polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			1
CF16	S	ID5 polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			1
CF17	S	<b>BEWOT</b> polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			0

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CF18	S	<b>BTWOT</b> polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			0
CF19	S	<b>BAT1</b> polarity 0 = Enabled, closed contact 1 = Enabled, opened contact	0	1			0
CF20	S	RL4 configuration 1 = 1 compressor with 1 reduced capacity compressor 2 = 2 compressors 3 = condensation fan ON/OFF 4 = reversing valve 5 = antifreeze resistance/supply 6 = solenoid valve water side 7 = solenoid valve water side only in heat pump modality	0	7			4
CF21	S	RL5 configuration 1 = 1 compressor with 1 reduced capacity compressor 2 = 2 compressors 3 = condensation fan ON/OFF 4 = reversing valve 5 = antifreeze resistance/supply 6 = solenoid valve water side 7 = solenoid valve water side only in heat pump modality	0	7			0 (1 compr.) 2 (2 compr.)
CF22	S	Pressure value to 4ma	00.0 00.	50.0 725	Bar Psi	Dec Int	0 bar 0 psi
CF23	S	Pressure value to 20ma	00.0 00.0	50.0 725	Bar Psi	Dec Int	30 bar 435 psi
CF24	S	<b>BEWOT</b> Offset	-12.0 -21.6	12.0 21.6	°C °F	Dec Int	0°C 0°F
CF25	S	<b>BTWOT</b> Offset	-12.0 -21.6	12.0 21.6	°C °F	Dec Int	0°C 0°F
CF26	S	<b>BCPI</b> Offset	-12.0 -21.6 -12.0 -174	12.0 21.6 12.0 174	°C °F Bar Psi	Dec Int Dec Int	0°C 0°F 0 bar 0 psi
CF27	S	<b>BAT1</b> Offset	-12.0 -21.6	12.0 21.6	°C °F	Dec Int	0°C 0°F
CF28	S	Chiller / heat pump selection 0 = keyboard 1 = digital input 2 = analogue input	0	2			0
CF29	S	Automatic Set Change Over	-40 -40	110 230	°C °F	Dec int	-20°C -4°F
CF30	S	Operating modality selection differential	-40 -40	110 230	°C °F	Dec int	4°C 7°F
CF31	S	Operating logic 0 = ❄️ chiller / ☀️ heat pump 1 = ☀️ chiller / ❄️ heat pump	0	1			0
CF32	S	Selection of °C or °F 0 = °C / × Bar 1 = °F / × psi	0	1			1
CF33	S	Net frequency selection 0= 50 Hz 1= 60 Hz 2= continuous power supply	0	1			1
CF34	U	Serial address	1	247			1
CF35	S	Remote terminal 0= 4 buttons 1= 6 buttons 2= 6 buttons with NTC probe	0	2			1



Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CF36	U	Default displaying of top part: <ul style="list-style-type: none"> <li>• 0 = BEWIT</li> <li>• 1 = BEWOT</li> <li>• 2 = none</li> <li>• 3 = BAT1</li> <li>• 4 = unit setpoint</li> <li>• 5 = unit status (**)</li> <li>• 6 = Laser set</li> <li>• 7 = none</li> <li>• 8 = operating differential</li> </ul>	0	8			1
CF37	S	Firmware Release					3.2
CF38	S	Eprom parameters map					0
CF39	S	RL2 configuration 0 = alarm relay 1 = compressor with 1 reduced capacity compressor 2 = compressors 2 3 = fan ON/OFF 4 = reversing valve 5 = antifreeze resistance/supply 6 = solenoid valve water side 7 = solenoid valve water side only in heat pump modality	0	7			5
CF40	S	Proportional outlet configuration 0=10 V 0 = outlet 0 ÷ 10 V used for the condensing fins control;  ≠ 0 outlet tension value to control the laser valve, if the laser valve value is 0 ÷ 10 V used as control for the laser valve.	0.0	10.0	v		0
CF41	S	Valve inversion time when the compressor/s stop	0	120	sec		0
CF42	U	Default displaying of bottom part: <ul style="list-style-type: none"> <li>• 0 = BEWOT</li> <li>• 1 = BTWOT</li> <li>• 2 = BCP1</li> <li>• 3 = BAT1</li> <li>• 4 = unit setpoint</li> <li>• 5 = unit status (**)</li> <li>• 6 = Laser set</li> <li>• 7 = none</li> <li>• 8 = operating differential</li> </ul>	0	8			4
CF43	U	Default displaying of top part by remote control: <ul style="list-style-type: none"> <li>• 0 = BEWOT</li> <li>• 1 = BTWOT</li> <li>• 2 = BCP1</li> <li>• 3 = BAT1</li> <li>• 4 = unit setpoint</li> <li>• 5 = unit status (**)</li> <li>• 6 = Laser set</li> <li>• 7 = none</li> <li>• 8 = operating differential</li> </ul>	0	8			1
CF44	U	Default displaying of bottom part by remote control: <ul style="list-style-type: none"> <li>• 0 = BEWOT</li> <li>• 1 = BTWOT</li> <li>• 2 = none</li> <li>• 3 = BAT1</li> <li>• 4 = unit setpoint</li> <li>• 5 = unit status (**)</li> <li>• 6 = Laser set</li> <li>• 7 = none</li> <li>• 8 = operating differential</li> </ul>	0	6			4
Pr2		Password	0	999			-

### 1.22.3 Dynamic Set-Point Parameters (NOT ENABLED FUNCTION)

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
Sd01	S	Dynamic Set point 0= Non enabled 1= not enabled	0	1			0
Sd02	S	Maximum setpoint offset of the summer d.	-30 -54	30 54	°C °F	Dec Int	0°C 0°F

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
Sd03	S	Maximum setpoint offset of the winter d.	-30 -54	30 54	°C °F	Dec Int	0°C 0°F
Sd04	S	External air temp. set and summer d. differential	-40 -40	110 230	°C °F	Dec Int	0°C 32°F
Sd05	S	External air temp. set and winter d. differential	-40 -40	110 230	°C °F	Dec Int	0°C 32°F
Sd06	S	Differential external air temp. set and summer d. differential	-30 -54	30 54	°C °F	Dec Int	0°C 0°F
Sd07	S	Differential external air temp. set and winter d. differential	-30 -54	30 54	°C °F	Dec Int	0°C 0°F
Pr2		Password	0	999			

#### 1.22.4 Energy Saving Parameters (NOT ENABLED FUNCTION)

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
ES01	S	Begin (0=24)	0	23.50	Min	10 Min	0
ES02	S	End (0=24)	0	23.50	Min	10 Min	0
ES03	S	Monday 0 = not enabled 1 = enabled	0	1			0
ES04	S	Tuesday 0 = not enabled 1 = enabled	0	1			0
ES05	S	Wednesday 0 = not enabled 1 = enabled	0	1			0
ES06	S	Thursday 0 = not enabled 1 = enabled	0	1			0
ES07	S	Friday 0 = not enabled 1 = enabled	0	1			0
ES08	S	Saturday 0 = not enabled 1 = enabled	0	1			0
ES09	S	Sunday 0 = not enabled 1 = enabled	0	1			0
ES10	S	Increase of the energy saving set in chiller modality	-30.0 -54	30.0 54	°C °F	Dec Int	0°C 0°F
ES11	S	Energy saving differential in chiller modality	-0.1 -0	25.0 45	°C °F	Dec Int	0.1°C 1°F
ES12	S	Increase of the energy saving set in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec Int	0°C 0°F
ES13	S	Energy saving differential in heat pump modality	-0.1 -0	25.0 45	°C °F	Dec Int	0.1°C 1°F
Pr2		Password	0	999			-

#### 1.22.5 Compressor parameters

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CO01	S	Min. starting time	0	250	sec	10 sec	12
CO02	S	Min. stopping time	0	250	sec	10 sec	18
CO03	S	Delay between startings of the two compressors / capacity control	1	250	Sec		10
CO04	S	Delay between stoppings of the two compressors / capacity control	0	250	Sec		10
CO05	S	Delay at compressor starting by power ON	0	250	Sec	10 sec	3
CO06	S	Delay at compressor starting from pump / outlet fan starting up	1	250	Sec		20
CO07	S	Delay at pump / outlet fan stopping from compressor stopping	0	250	Sec		20
CO08	S	Compressor's rotation 0= enabled 1= fixed sequence	0	1			0

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
CO09	S	Compressor rotation					0
CO10	S	Polarity of capacity control valve 0= capacity control ON 1= capacity control OFF	0	1			0
CO11	S	Operating modality of pump / outlet fan 0= absent 1= continuous operation 2= operation requested by the compressor	0	2			1
CO12	S	Compressor 1 0 = ON 1 = OFF	0	1			0
CO13	S	Compressor 2 / capacity control 0 = ON 1= OFF	0	1			1 (1 compr.) 0 (2 compr.)
CO14	S	Hourcounter set of compressor 1	000	999		10 HR	0
CO15	S	Hourcounter set of compressor 2	000	999		10 HR	0
CO16	S	Hourcounter set of pump / outlet fan	000	999		10 HR	0
<b>EVAPORATOR UNLOADING</b>							
CO17	S	Setpoint activation of the evaporator unloading	0 32	110 230	°C °F	Dec Int	35°C 95°F
CO18	S	Differential activation of the evaporator unloading	0.1 0	25.0 45	°C °F	Dec Int	5.0°C 9°F
CO19	S	Activation delay of the evaporator unloading	0	250	Sec	10 Sec	0
CO20	S	Maximum unloading duration time with high temperature of evaporator water inlet.	0	250	Sec	10 Sec	30
<b>CONDENSER UNLOADING</b>							
CO21	S	Unloading compressor set point: pressure in chiller mode	0.0 0	50 725	Bar Psi	Dec Int	25,3 bar 367 psi
CO22	S	Unloading compressor differential: pressure in chiller mode	0.0 0	12 174	Bar Psi	Dec Int	1,5 bar 22 psi
CO23	S	Unloading compressor set point: pressure in heat pump mode	0.0 0	50.0 725	Bar Psi	Dec Int	1,8 bar 26 psi
CO24	S	Unloading compressor differential: pressure in heat pump mode	0.0 0	12 174	Bar Psi	Dec Int	0.5 bar 7 psi
CO25	S	Maximum time condenser unloading	0	250	Sec	10 Sec	30
Pr2		Password	000	999			-

### 1.22.6 Fan parameters

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
FA01	S	Fan outlet 0= absent 1= present	0	1			0
FA02	S	Fan regulation 0= ON 1= ON/OFF regulation 2= proportional speed regulator	0	2			0
FA03	S	Fan operating modality 0= depending from the compressor 1= not depending from the compressor	0	1			0
FA04	S	Fan starting time at max. speed after switching on	0	250	Sec		10
FA05	S	Fan time lag	0	20	Micro Sec	250µs	4
FA06	S	Not used					/
FA07	S	Pre-ventilation in chiller modality before compressor's switching on	0	250	Sec		0
FA08	S	Min. speed of fans during chiller modality	30	100	%		30
FA09	S	Max. speed of fans during chiller modality	30	100	%		100
FA10	S	Temperature set / min. pressure of fan speed in chiller modality	-40.0 -40.0 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	14,0 bar 203 psi

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
FA11	S	Temperature set / max. pressure of fan speed in chiller modality	-40.0 - 40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	230°F
FA12	S	Fan's proportional band in chiller modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	45°F
FA13	S	CUT-OFF differential in chiller modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	1 bar 15 psi
FA14	S	CUT-OFF over ride in chiller modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	2 bar 29 psi
FA15	S	CUT-OFF delay time	0	250	Sec		0
FA16	S	Night function speed in chiller modality	30	100	%		90
FA17	S	Min. speed of fans during heat pump modality	30	100	%		30
FA18	S	Max. speed of fans during heat pump modality	30	100	%		100
FA19	S	Temperature set / min. pressure of fan speed in heat pump modality	-40.0 - 40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	7.5 bar 108 psi
FA20	S	Temperature set / max. pressure of fan speed in heat pump modality	-40.0 - 40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	4.5 bar 65 psi
FA21	S	Fan's proportional band in heat pump modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	2 bar 29 psi
FA22	S	CUT-OFF differential in heat pump modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	1 bar 15 psi
FA23	S	CUT-OFF over ride in heat pump modality	0.0 0 0.0 0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	2 bar 29 psi
FA24	S	Night function speed in heat pump modality	30	100	%		90
<b>HOT START</b>							
FA25	S	Hot start set point	-40 -40	110 230	°C °F	Dec Int	25°C 77°F
FA25	S	Hot start differential	0.0 0	25.0 45	°C °F	Dec Int	5°C 9°F
Pr2		Password	000	999			-

### 1.22.7 Antifreeze heater - supply parameters

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
Ar01	S	Antifreeze minimum setpoint	-40.0 -40.0	Ar03	°C °F	Dec Int	-13°C 9°F
Ar02	S	Antifreeze maximum setpoint	Ar03	110 230	°C °F	Dec Int	15°C 59°F
Ar03	U	Antifreeze alarm set	Ar01	Ar02	°C °F	Dec Int	3°C 38°F
Ar04	S	Antifreeze alarm differential	0 0	25.0 45.0	°C °F	Dec Int	4.0°C 7°F
Ar05	S	Antifreeze alm delay	0	250	Sec		5
Ar06	S	Maximum number alarm tripping per hour	0	16			3
Ar07	S	Antifreeze alarm delay in heat pump modality	0	250	Sec		60
Ar08	S	Antifreeze resistance setpoint in chiller modality	-40 -40	110 230	°C °F	Dec int	4°C 39°F
Ar09	S	Antifreeze resistance setpoint in heat pump modality	-40 -40	110 230	°C °F	Dec int	4°C 39°F

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
Ar10	S	External antifreeze resistances set point (water/water units)	-40 -40	110 230	°C °F	Dec Int	4°C 39°F
Ar11	S	Antifreeze resistance differential in chiller modality	0 0	25.0 45.0	°C °F	Dec Int	3°C 5°F
Ar12	S	Antifreeze resistance differential in heat pump modality	0 0	25.0 45.0	°C °F	Dec Int	3°C 5°F
Ar13	S	Antifreeze resistance enabling: 0= Enabling by thermoregulator 1= Enabling by thermoregulator during defrosting	0	1			0
Ar14	S	Antifreeze resistance enabling in chiller modality: 0= OFF in chiller modality 1= ON in chiller in chiller modality	0	1			0
Ar15	S	Antifreeze resistance regulation in heat pump modality 0= OFF in heat pump modality 1= ON in heat pump modality	0	1			0
Ar16	S	Antifreeze resistance thermoregulation in chiller modality 0= BEWOT probe 1= BTWOT probe 2= BCP1 probe 3= BAT1 probe	0	3			3
Ar17	S	Antifreeze resistance thermoregulation in heat pump modality 0= BEWOT probe 1= BTWOT probe 2= BCP1 probe 3= BAT1 probe	0	3			3
Ar18	S	Water pump/antifreeze resistance in OFF-stand-by 0= Disabling 1= Enabled 2= Regulation of the water pump on the BAT1 probe configured as ambient probe 3 = Water pump/antifreeze resistance regulation on BAT1 probe configured as ambient with separated set.	0	3			3
Ar19	S	Water pump /antifreeze resistance enabling if the probe is damaged 0= OFF if the probe is damaged 1= ON if the probe is damaged	0	1			1
<b>BOILER FUNCTION (NOT ENABLED FUNCTION)</b>							
Ar20	S	Boiler function 0= Control during integration 1= Control during heating	0	1			1
Ar21	S	External air setpoint for boiler resistance enabling	-40.0 -40	110 230	°C °F	Dec Int	-21°C -6°F
Ar22	S	Boiler resistance differential	0 0	25.0 45	°C °F	Dec Int	1°C 2°F
Ar23	S	Reserved					/
Ar24	S	Antifreeze alarm set in heat pump modality	Ar01	Ar02	°C °F	Dec Int	0°C 32°C
Ar25	S	Antifreeze alarm differential in heat pump modality	0 0	25.0 45	°C °F	Dec Int	0°C 0°C
Ar26	S	Water pump enabling set on ambient probe	-40.0 -40	110 230	°C °F	Dec Int	-21°C -6°F
Ar27	S	Water pump enabling differential on ambient probe	0 0	25.0 45	°C °F	Dec Int	2°C 4°F
Pr2		Password	000	999			-

## 1.22.8 Defrosting parameters (NOT ENABLED FUNCTION)

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
dF01	S	Defrosting cycle carrying out: 0= No 1= Yes	0	1			0
dF02	S	Defrosting cycle modality: 0= Temperature / pressure 1= Time 2= External contact 3= ΔT defrosting	0	3			3
dF03	S	Pressure temperature at defrosting starting	-40.0 -40.0 00.0 00.0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	4°C 39°F
dF04	S	Pressure temperature at defrosting ending	-40.0 -40.0 00.0 00.0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	14°C 57°F
dF05	S	Min. time to a forced defrosting cycle	0	250	Sec		10
dF06	S	Defrosting min. duration	0	250	Sec		30
dF07	S	Defrosting max. duration	0	250	Min		5
dF08	S	Compressor OFF time before defrosting	0	250	Sec		20
dF09	S	Compressor OFF time after defrosting	0	250	Sec		60
dF10	S	Min. time between two successive defrosting cycles	0	99	Min		10
dF11	S	Temperature set at the starting of combined defrosting cycle after the counting of parameter dF10	-40.0 -40.0	110 230	°C °F	Dec Int	3°C 37°F
dF12	S	Temperature set at the stopping of combined defrosting cycle	-40 -40	110 230	°C °F	Dec Int	10°C 50°F
dF13	S	Forcing to ON status of the second defrosting compressor: 0= Disabled 1= Enabled	0	1			1
dF14	S	Ventilation's enabling during defrosting cycle: 0= Disabled 1= Enabled 2= Dripping	0	2			2
dF15	S	Pressure set / ventilation ON forcing temperature during defrosting	-40.0 - 40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	15 bar 217 psi
dF16	S	Low pressure alarm during defrosting: 0= Disabled 1= Enabled	0	1			0
dF17	S	Low pressure alarm delay at four-way valve commutation	0	250	Sec		60
dF18	S	Four-way valve for cycle commutation: 0= ON during cooling 1= ON during heating	0	1			0
dF19	S	Temperature set / defrosting cycle forcing pressure	-40.0 -40.0 00.0 00.0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	1°C 34°F
dF20	S	Defrosting cycle forcing differential	0 0	25.0 45	°C °F	Dec Int	0.5°C 1°F
dF21	S	"a" parameter: defrosting dynamic set calculation (a+ b*x)	1	20		Dec Int	32
dF22	S	"b" parameter: defrosting dynamic set calculation (a+ b*x)	0	1		Dec Int	8
dF23	S	Defrosting control delay time	0	250	Min		15
dF24	S	Time that has to pass before the defrosting request	0	250	Min		2
dF25	S	Max. number of defrosting cycles per hour	0	16			5
dF26	S	Freon type: 0= R22 1= R407C 2= R134a 3= R404a 4= R410	0	4			1

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
dF27	S	Discharge fan blockage during defrosting: 0 = not enabled 1 = enabled	0	1			0
Pr2		Password	0	999			-

### 1.22.9 Alarm parameters

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
AL01	S	Digital input low pressure alarm delay	0	250	Sec		120
AL02	S	Max. number of tripping per hour of digital input low pressure alarm	0	16			3
AL03	S	Low pressure alarm with unit in remote OFF or in stand-by: 0 = alarm detection disabled 1 = alarm detection enabled	0	1			1
AL04	S	Delay of flow meter alarm / outlet fan thermal protection alarm from pump / outlet fan enabling	0	250	Sec		5
AL05	S	Max. number of tripping per hour of outlet fan thermal protection / flow meter	0/1	16			1
AL06	S	Duration of flow meter inlet / outlet fan thermal protection enabled	0	250	Sec		5
AL07	S	Duration of flow meter inlet / outlet fan thermal protection disabled	0	250	Sec		5
AL08	S	Thermal protection alarm delay of compressors 1-2 at starting up	0	250	Sec		1
AL09	S	Thermal protection max. number of tripping per hour of compressors 1-2	0	16			3
AL10	S	Thermal protection alarm resetting of compressors 1-2 after AL09	0	1			0
AL11	S	High temperature / condensation pressure alarm set point	-40.0 -40.0 00.0 00.0	110 230 50.0 725	°C °F bar Psi	Dec Int Dec Int	26°C 230°F 79°F
AL12	S	High temperature / pressure differential	00.0 00.0 00.0 00.0	25.0 45 50.0 725	°C °F Bar Psi	Dec Int Dec Int	4°C 45°F 39°F
AL13	S	Delay of low temperature alarm / analogue input pressure alarm	0	250	Sec		120
AL14	S	Set point of low temperature alarm / analogue input pressure alarm	-40.0 -40 0.0 0	110 230 50.0 725	°C °F bar psi	Dec int Dec int	1,5 bar 22 psi
AL15	S	Differential of low temperature alarm / analogue input pressure alarm	0.0 0 0.0 0	25.0 45 50.0 725	°C °F bar psi	Dec int Dec int	1°C 15°F
AL16	S	Max. number of tripping per hour of low temperature alarm / analogue input pressure alarm	0	16			0
AL17	S	Enabling of open collector outlet of alarm relay in remote OFF or in stand-by: 0= alarm outlet enabled 1= alarm outlet disabled	0	1			0
AL18	S	Alrm relay polarity 0= outlet enabled, contact close 1= outlet enabled, contact open	0	1			1
AL19	S	Antifreeze alarm: 0= depends on Ar16 parameters in Chiller modality- Ar17 in heat pump modality 1= BEWOT probe 2= BTWOT probe 3= BCP1 probe 4= BAT1 probe	0	4			1
AL20	S	Maximum number of events of unit blocked generic alarm, after which the reset becomes manual. Always manual if AL20=0 Always automatic if AL20=16 From automatic to manual if AL20 from 1 to 15	0	16			5
AL21	S	Unit blocked generic alarm delay with enabled digital input	0	250	Sec		10

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
AL22	S	Unit blocked generic alarm delay with disabled digital input	0	250	Sec	10 sec.	1
AL23	S	Signalling set point for low water temperature at evaporator outlet	-40 -40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	-40°C -40°F
AL24	S	Signalling set point for high water temperature at evaporator outlet	-40 -40 0.0 0	110 230 50.0 725	°C °F Bar Psi	Dec Int Dec Int	100°C 212°F
Pr2		Password	0	999			4

### 1.22.10 LASER parameters (NOT ENABLED FUNCTION)

Parameter	Level	Description	Min.	Max.	Udm	Resolution	Factory setting
LS01	S	Proportional band laser function (pb)	0.1 1	25.0 250	°C °F		1.5°C 3°F
LS02	S	Laser functioning calculated time (integral) (int)	0	250	Sec		70
LS03	S	Laser functioning calculated time (derivative) (det)	0	250	Sec		20
LS04	S	Laser T1 functioning period (Cyt)	2	20	Sec		11
LS05	S	Minimum time of functioning with the outlet in OFF if T2 enabled (on)	1	T1 2	Sec		3
LS06	S	Minimum time of functioning with the outlet in OFF if T3 disabled	1	T1 2	Sec		1
LS07	S	Sampling time of the derivative (Sr)	1	10	Sec		1
LS08	S	Band adjustment (rS)	-12.0 120	12.0 120	°C °F		0
LS09	S	Integral band limitation (Ar)	0		°C °F		0
Pr2		Password	0	999			-

#### NOTE

LS parameters can be displayed only if parameter CF1=6.

### 1.23 Compressors unloading function

This procedure is necessary when sudden peaks in cooling demand occur, for instance if the machine is restarted after a long period of inactivity. Under these conditions the evaporator inlet water temperature might be so high as to require a cooling delivery in excess of system capacity. The consequent system overload would require the start-up of all the compressors at once, which would be forced to operate in near-limit conditions.

The overburdened compressors would thus be subject to dangerous overheating which would cause the activation of the thermal protections, or the pressure of the refrigerant gas could reach alarm levels which would cause the machine to shut down.

This function enables the machine to run (through the switch-off or capacity step operation of the compressors) even when the temperature of the water at the evaporator's inlet is high (summer start-up with hot water accumulation), preventing the possible triggering of high pressure alarms. It is not present in one compressor units.

The following messages will flash on the display:

AEUn= evaporator unloading function

ACUn= condensation unloading function

### 1.24 Probe key

In this chapter are indicated the probes BEWOT, BTWOT, BCP1 and BAT1, for their positioning consult the refrigerant drawing.

Their description is indicated in the following table

Name in the manual	Borne name	Description
-BEWOT	PB1	EVAPORATOR WATER OUTLET TEMPERATURE PROBE
-BTWOT	PB2	TANK WATER OUTLET TEMPERATURE PROBE
-BCP1	PB3	CONDENSING PRESSURE TRANSDUCER (only with electronic regulation)
-BAT1	PB4	AMBIENT AIR TEMPERATURE PROBE (Only with antifreeze protection function)