



Series:
BETA REV
CORE
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IC208CX EVO rel. firmware 4.2



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1. GENERAL WARNINGS



Carefully read the general warnings and safety precautions before installing and using the controller.

This manual forms an integral part of the product and must be kept near the instrument for easy and quick reference.

The device must not be used with functions other than those described below and in particular, it cannot be used as a safety device. Dixell Srl reserves the right to change the composition of their products without informing the customer, while guaranteeing their same and unchanged functionality in any case.

1.1 SAFETY PRECAUTIONS

Verify the data plate of the instrument before connecting the loads (power as well as others), the probes and the digital inputs.

Expose only the front of the instrument to the elements; the protection of the front is IP65.

The device must not be installed in particularly hot environments; temperatures that are too high may damage the device (electronic circuits and/or plastic covering components). Comply with the temperature and humidity limits specified in the manual and on the label affixed to the instrument.

Connect the instrument to the mains only after verifying the information found on the label affixed to the instrument itself.

Uninstall the instrument only after having disconnected the power from the electrical panel.

Do not open the instrument; in case of malfunction or a fault, send the instrument to your dealer/distributor or to DIXELL s.r.l. with an accurate description of the fault.

For the instrument to function properly, the probe cables, the power cables of the instrument, the cables of the digital inputs and connection to the loads must be positioned as far away as possible, otherwise electromagnetic interference may cause malfunctions.

Mains filters in parallel to the inductive loads may be required in the case of applications in particularly critical industrial environments (our mod. FT1).

Do not clean the device with harsh chemicals, solvents or aggressive detergents.

The device must not be used in application environments other than those specified below.

- The  symbol indicates the presence of uninsulated "dangerous voltage" within the area of the product and of sufficient magnitude to constitute a risk of electric shock to persons.
- The  symbol indicates the presence of important operating and maintenance (assistance) instructions in the documentation attached to the device.
-  Separate the power supply of the device from other electrical devices connected inside the electrical panel. The secondary of the transformer must never be connected to earth.

1.2 PRODUCT DISPOSAL (WEEE)

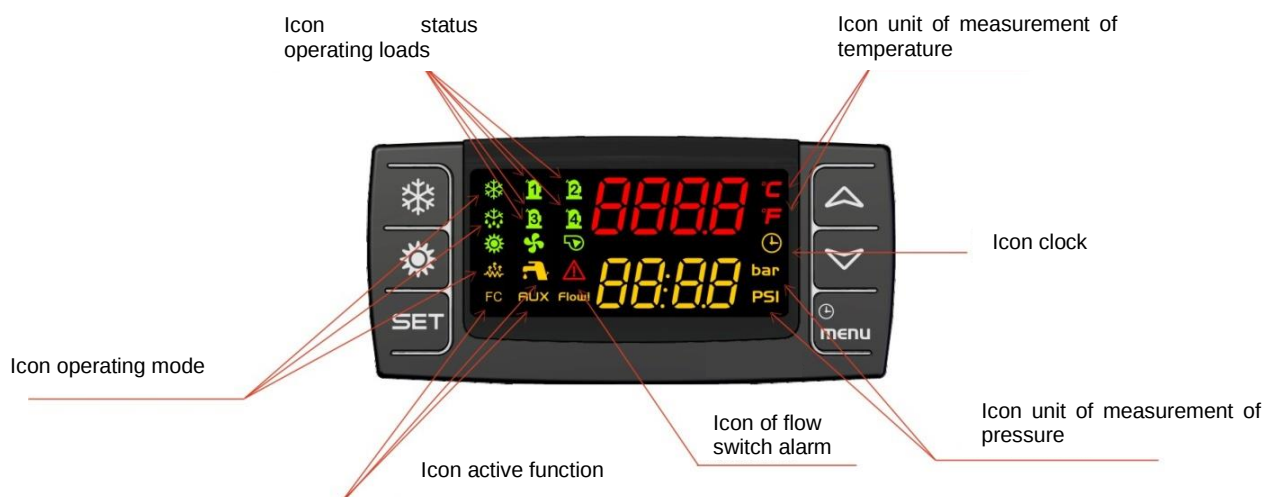
With reference to Directive 2002/96/EC of the European Parliament and the Council of 27 January 2003 and the related national implementing regulations, please note that:

- There is an obligation not to dispose of electrical and electronic waste as municipal waste but to separate the waste.
- Public or private waste collection facilities indicated by local legislation must be used for disposal purposes. The equipment can also be returned to the distributor at the end of its lifetime when purchasing a new one.
- The equipment may contain hazardous substances; its improper use or incorrect disposal may have adverse effects on human health and the environment.
- The symbol on the product or its packaging indicates that the product was put on the market after 13 August 2005 and must be separated when disposed of.
- Fines can be imposed if disposed of incorrectly, as defined by applicable local regulations concerning waste disposal.

2. ICHILL IC208CX HARDWARE CHARACTERISTICS

IC208CX	
RELAYS	
6	default
DIGITAL INPUTS	
11 (voltage-free)	default
PROBES	
4 (NTC/PTC)	default
2 (NTC/PTC/0..5V/4..20mA)	default
ANALOGUE OUTPUTS	
2 0÷10V or PHASE CUT	default
2 0÷10V	default
SERIAL OUTPUTS	
TTL	default
Remote keyboard output	default
LAN	default
POWER SUPPLY	
24 Vac/dc (± 10%)	default
OTHER	
Internal clock	default
Buzzer	default

3. USER INTERFACE



3.1 ICONS AND LEDS OF DISPLAY

°C -°F BAR-PSI	On when a circuit temperature or pressure is displayed
	On in programming if the displays view temperature or pressure set points or differentials
	On when the lower display views the time. On in programming if the lower display views the working hours of the loads or the time. Flashing in functions menu if time remaining to the start of defrosting is viewed.
	Flashes if at least one alarm is triggered
menu	On during menu navigation
	On if the heaters (antifreeze/support) are on
Flow!	Flashes if the digital input of the flow meter is active with pump running
	On if at least one of the water pumps or the supply fan is on
	On if at least one condensation fan is on
	On if the relative compressor is on; flashes if compressor switch-on is timed
AUX	On if the auxiliary output is active
	On if the machine is on and represents the Heating or Cooling mode depending on the logic set in parameter CF58
	The icon flashes during the interval count between defrosts; the icon is on steady during the defrost phase

3.2 VIEW DISPLAY OF THE ICHILL AND REMOTE TERMINALS WITH THE DEVICE SET TO REMOTE OFF

If the device is set to remote OFF with the contact open, the display shows the OFF label with the LED flashing.



3.3 VIEW DISPLAY OF THE ICHILL AND REMOTE TERMINALS WITH THE DEVICE IN STD-BY

The information to be displayed must be selected by setting parameter dP10.

View "Stby" label displayed with the unit OFF from the key or supervision.



Probe value display



OFF label display



3.4 VIEW DISPLAY WITH UNIT CONFIGURED AS CONDENSING

If the controller is configured to manage motocondensing units (CF03=1):

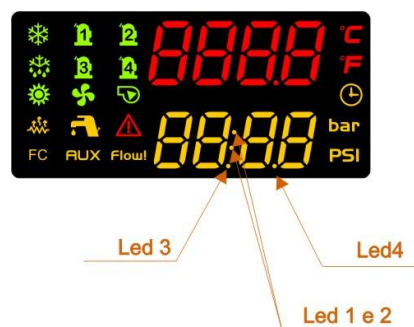
- a digital input must be configured as "cooling request"; if the input is active, the unit is on in chiller mode and the upper display views "OnC"
- a digital input can be configured as "heating request"; if the input is active, the unit is on in heat pump mode and the upper display views "OnH".

Or if the controller is configured to manage condensing units (CF03=1) and a digital input is configured as "thermoregulation request":

- if the input is active:
 - the unit can be switched on in chiller mode via the keyboard and the display shows "OnC"; the STD-BY mode can be selected via the keyboard and the display shows "On"
 - the unit can be switched on in heat pump mode via the keyboard and the display shows "OnH"; the STD-BY mode can be selected via the keyboard and the display shows "On"
- if the input is not active, the unit is off and the display shows "OFF"



3.5 LEDS OF THE LOWER DISPLAY



LEDS OF THE FUNCTIONS MENU

LEDS 1 and 2 flash in the functions menu when the remaining time for the defrost cycle of circuits 1 and 2 to start is displayed

PARAMETER PROGRAMMING LEDS

During the parameter programming phase the "Cir1" and "Cir2" icons flash.

From level Pr1: if LEDs 1 and 2 flash it means that the parameter can be viewed but not modified

From level Pr2: if all the LEDs are off it means that the parameter can only be viewed in Pr2

From level Pr2: if LED 3 is on it means that the parameter can only be viewed in Pr1

From level Pr2: if LEDs 1 and 2 flash and LED 3 is on it means that the parameter can be modified in Pr2 and it can be viewed in Pr1 but not modified

From level Pr2: if LEDs 1, 2 and 3 flash it means that the parameter can be viewed but not edited in Pr2 and Pr1

From level Pr2: if LEDs 1 and 2 flash it means that the parameter can be viewed but not modified in Pr2

4. VIEW THE CONTROLLED VARIABLES

Circuit 1 is always displayed by default in normal operation.
The displayed circuit is indicated by the **Cir1** (circuit 1) or **Cir2** (circuit 2) icon.

4.1 HOW TO DISPLAY ALL VARIABLES INSIDE A CIRCUIT

Press keys  or  to display the values of the probes connected to the instrument.
A label corresponds with each selected probe, which identifies the temperature or pressure values shown on the display (see upper and lower display tables)

Example:

Fig.1: the upper display shows the circuit 1 evaporator output temperature and the lower display shows the Out1 label. Press the **SET** key to display the same probe of circuit 2, if configured.

Fig.1



Fig.2 : the upper display shows the circuit 2 evaporator output temperature and the lower display shows the Out2 label. Press the **SET** key to display the same probe of circuit 1.

Fig.2



5. OTHER DISPLAY VIEWS

5.1 HOW TO VIEW THE SET POINT

Press and release the **SET** key; the icons identifying the circuit switch off and the work set point is displayed.

With the unit on stand by, the first time the **SET** key is pressed, the lower display views **SetC** (set chiller) and the second time it is pressed **SetH** (set heat pump). With unit on in heating or cooling mode, only the set point relative to the operating status is displayed.

5.2 HOW TO MODIFY THE SET POINT

- 1) Press the **SET** key for at least **3** seconds.
 - 2) Modify the value by pressing the **UP** or **DOWN** keys
- To store the new set point, press the **SET** key or wait for the time out to exit programming.

5.3 HOW TO VIEW THE ACTUAL OPERATING SET POINT WITH ENERGY SAVING (DOUBLE SET POINT) OR THE ACTIVATED DYNAMIC SET POINTS

With the unit in chiller mode: the first time the **SET** key is pressed, **SEtC** (chiller set point) appears on the lower display and the set value appears on the upper display. The second time the **SET** key is pressed with the energy saving or dynamic set point activated, the **SEtr** (actual working set point) appears on the lower display and the actual working set point of the machine appears on the upper display.

With the unit in the heat pump mode: the first time the **SET** key is pressed, **SEtH** (heat pump set point) appears on the lower display and the set value appears on the upper display. The second time the **SET** key is pressed with the energy saving or dynamic set point activated, the **SEtr** (actual working set point) appears on the lower display and the actual working set point of the machine appears on the upper display.

CAUTION

The actual **SETR** set point is only displayed if the energy saving or dynamic set point are active.

5.4 VIEWING THE DISABLED COMPRESSORS ON THE DISPLAY

If one of the compressors is set to OFF from the keyboard, a flashing label appears on the lower display that alternates with the variable shown at that moment:

compressor 1 disabled: label c1ds
compressor 2 disabled: label c2ds
compressor 3 disabled: label c3ds
compressor 4 disabled: label c4ds

5.5 FUNCTION OF THE KEYS



KEY	ACTION	FUNCTION
	Press and release with default display	Displays the set point in chiller mode (SetC label) and/or in heat pump mode (SetH label)
	Press and release twice with default display	With the unit in chiller or heat pump mode, if the energy saving function or the dynamic set point is enabled, the actual working set point (Setr label) is displayed; the Vset icon is on.
	Press for 3 seconds and release with default display	Modify chiller/heat pump set point (only chiller if the unit is in this mode, only heat pump if the unit is in this mode, chiller and heat pump with unit in std-by)
	Press and release in programming	Grant access to modify the parameter value; confirms the parameter value.
	Press and release in ALrM menu	Allows you to reset the alarm
	Press and release with view of one probe label in lower display	Allows you to alternate the display view of the quantities of circuit 1 and of circuit 2
	Press and release	Allows you to view the temperatures/pressures in the upper/lower display.
	Press and release in parameter programming	Allows you to scroll the groups of parameters and the parameters; increases the value of the parameter when editing.
	Press for 1 second and release when programming the parameters and viewing Password (Pr1, Pr2)	If pressed once from view "Pr1", it views Pr2 If pressed once from view "Pr2", it views Pr3
	Press and release	Allows you to view the temperatures/pressures in the upper/lower display.
	Press and release in programming	Allows you to scroll the groups of parameters and the parameters; decreases the value of the parameter when editing.
	Press and release	Switches the machine on/off (in chiller/heat pump depending on instrument programming)
	Press and release	Switches the machine on/off (in chiller/heat pump depending on instrument programming)
	Press and release	Grants access to the functions menu
	Press for 3 seconds and release	Allows you to adjust the time.
	Press and release in programming	Exits the display of the parameter families or parameter editing

Combined functions of the keys

KEY	ACTION	FUNCTION
 + 	Press for 3 seconds and release	Enter programming
	With SET key pressed, press and release the DOWN key in programming; the options are:	Function active only from level Pr2 and Pr3: allows you to modify visibility of the parameters
	• Press and release once	Parameter visible in Pr1 / Pr2, led n° 3 – 4 ON
	• Press and release twice	Parameter visible in Pr2, led n° 4 ON
 + 	• Press and release 3 times	Parameter visible only in Pr3, led n° 3 – 4 OFF
	Press and release	Exit programming
	Press for 5 seconds	Manual defrost (if in heat pump mode and if conditions so allow)
 + 	In parameter programming: with SET key pressed, press and release the Menu key; the options are:	Function active only from level Pr3: allows you to set visibility and editability of the parameters in the 2 visibility levels of the parameters (Pr1 and Pr2)
	• Press and release once	Parameter visible but not editable in Pr1 / visible and editable in Pr2; led n° 3 flashing led n° 4 on steady
	• Press and release twice	Parameter visible but not editable in Pr1 / visible and not editable in Pr2 (editable only in Pr3); led n° 3 flashing led n° 4 flashing
	• Press and release 3 times	Parameter visible and editable in Pr1 / visible and editable in Pr2; led n° 3 on steady led n° 4 on steady

6. REMOTE TERMINAL VICX620 EVO

Viewing the display and the key functions replicate exactly the same as controller IC208CX; refer to the previous paragraphs for their use.



7. FIRST INSTALLATION

7.1 INSTRUMENT WITH CLOCK ON BOARD

If when you power the instrument, the lower display views the message “rtc” alternated with the temperature/pressure, **it means that you must adjust the clock.**

If the probes that are set up to check the unit are not connected or are faulty, the corresponding alarm will appear on the two displays. You can still set the clock or proceed with the programming.

7.2 HOW TO ADJUST THE CLOCK

1. Press the **Menu** button for a few seconds until the lower display reads “Hour” and the upper display the stored time.
2. Press the **SET** key: the time starts to flash.
3. Adjust the time with the down and UP keys. Confirm the time by pressing the **SET** key; the controller displays the next setting.
4. Repeat operations 2. 3. and 4. on the other clock parameters:
 - **Min:** minutes (0÷60)
 - **UdAy:** day of the week (**Sun** = Sunday, **Mon** = Monday, **tuE** = Tuesday, **UEd** = Wednesday, **tHu** = Thursday, **Fri** = Friday, **SAt** = Saturday)
 - **dAy:** day of the month (0÷31)
 - **MntH:** month(1÷12)
 - **yEAR:** year (00÷99)

8. PARAMETER PROGRAMMING

It is possible to program the controller parameters directly from the keyboard or using the dedicated software (Wizmate). Each parameter can be made visible at a specific level of visibility:

- **Pr1** user level; the parameters to which the final user may have access are normally set on this level
- **Pr2** service level; the parameters to which Service may have access are normally set on this level
- **Pr3** manufacturer level; all the parameters of the controller are normally found on this level

The default values to access the parameters are:

- **Pr1** user level = 34
- **Pr2** service level = 93

8.1 PROGRAMMING WITH HOT KEY

8.1.1 How To Program The Instrument With A Preset "Hot Key 64" (Download)

With the instrument off:

1. Insert the USB.
2. Switch the instrument on.
3. Start to download the data from the USB to the instrument.

During this phase the settings are blocked and the flashing message "**doL**" appears on the lower display.

At the end, the following message appears on the upper display:

"**End**" if the programming is successful (the setting starts after 30s).

"**Err**" if the programming is not successful.

If an error occurs the instrument must be switched off and on again to repeat the operation or to start with the normal adjustment (in this case the USB must be disconnected with the instrument off).

8.1.2 How To Save The Instrument Parameters On The "Hot Key" (Upload)

With the instrument on:

1. Insert the USB.
2. Enter the functions menu
3. Select the **UPL** function on the lower display
4. Press **SET** Start to download the data from the instrument to the USB.

During this phase the flashing message "**UPL**" appears on the lower display.

Once the programming phase is completed, the instrument shows the following messages on the upper display:

"**END**" if the programming is successful

"**Err**" if the programming is not successful.

To exit the UPL function press the MENU key or wait for the time-out to elapse (15 sec)

8.2 KEYBOARD PROGRAMMING OF THE ICHILL OR FROM THE REMOTE TERMINAL

8.2.1 How To Enter In Programming In Levels Pr1 - Pr2

Level Pr1:

Simultaneously press **SET + DOWN** for 3 sec; the upper display will view the label PAS, the lower display label Pr1 (level Pr1), the two led's cir1 / cir2 of the UP and DOWN keys flash signalling that you have actually entered programming.

Level Pr2:

Having entered programming, when lower display views label Pr1, upper display PAS, press **UP** for 2 seconds, the lower display will view label Pr2 second level.

8.2.2 How To Change The Value Of A Parameter

Enter In Programming

1. Press the **SET + DOWN** keys simultaneously for 3 sec
2. Select the desired parameter
3. Press the **SET** key to enable the value to be changed
4. Modify the value with the **UP** or **DOWN** keys
5. Press "**SET**" to save the new value and go to the code of the next parameter
6. Output: Press **SET + UP** when a parameter is displayed or wait a few minutes without pressing any key

NOTE: The new value is saved even when the time-out elapses without having pressed the **SET** key.

8.2.3 How To Change The Passwords

LEVEL Pr1

You must know the current password in order to change it.

- 1) Enter in programming level **Pr1**
- 2) Select a set of parameters.
- 3) Select the **Pr1** label in this set; the value of the current password appears in the upper display (1 by default). Press **SET** to enable the change; the flashing value appears on the upper display.
- 4) Use the **UP** or **DOWN** keys to enter the NEW PASSWORD and then press the **SET** key to confirm the new value
- 5) The upper display will flash for a few seconds and then displays the next parameter
- 6) Exit the programming mode by pressing **SET + UP** or wait for the time-out to elapse without pressing a key.

LEVEL Pr2

You must know the previous password in order to change it.

1. Enter in programming level **Pr2**
2. Select a set of parameters
3. Select the **Pr2** function in this set; the value of the current password appears in the upper display (2 by default). Press **SET** to enable the change; the flashing value appears on the upper display.
4. Use the **UP** or **DOWN** keys to enter the NEW PASSWORD and then press the **SET** key to confirm the new value
5. The upper display will flash for a few seconds and then displays the next parameter
6. Exit the programming mode by pressing **SET + UP** or wait for the time-out to elapse without pressing a key.

The password of level Pr1 can also be changed in level Pr2

8.2.4 How To Enter In Programming In Level Pr1

Enter the parameter menu at level Pr1 "user" as follows:

1. Simultaneously press **SET + DOWN** for 3 sec; the PAS label will appear on the upper display and the Pr1 label on the lower display
2. Press **SET**; a flashing 0 will appear on the upper display. Use **UP** or **DOWN** to enter the password of level Pr1 and then press **SET**. If the password is correct the selected programming level is accessed; **ALL** appears on the upper display (the first set of parameters); if the password is incorrect you are prompted once again to enter the password.
3. Select the various sets with the **DOWN** and **UP** keys.
4. Once the set is selected, press **SET** and the instrument displays the label and the code of the first parameter in the set on the lower display, and its value on the upper one.

Only the parameters in the selected set can now be browsed and edited.

Parameter visibility / changeability from Pr1



Led 1 e 2

If the selected parameter is visible but not editable, LED's n° 1 and n° 2 flash

Parameters of passwords of levels Pr2 / Pr3 cannot be accessed or changed in level Pr1

If you are in a set of parameters, press the **MENU** key to re-select another set while maintaining the programming level Pr1.

EXIT THE PROGRAMMING AND RETURN TO THE NORMAL DISPLAY BY PRESSING THE SET + UP KEYS SIMULTANEOUSLY

8.2.5 How To Enter In Programming In Level Pr2

Enter the parameter menu at level Pr2 "assistance" as follows:

1. Simultaneously press **SET + DOWN** for 3 sec; the PAS label will appear on the upper display and the Pr1 label on the lower display.
2. Press **UP** for 2 sec; the PAS label will appear on the upper display and the Pr2 label on the lower display.
3. Press **SET** for a flashing 0 to appear on the upper display; use **UP** or **DOWN** to enter the password of level Pr2 and then press **SET**. If the password is correct the selected programming level is accessed and **ALL** appears on the upper display (the first set of parameters), otherwise the password is requested once again.
4. Select the various sets of parameters with the **DOWN** and **UP** keys.
5. Once the set is selected, press **SET** and the instrument displays the label and the code of the first parameter in the set on the lower display, and its value on the upper one.

Only the parameters in the selected set can now be browsed and edited.

Parameter visibility / changeability from Pr2



If the selected parameter is visible but not editable, LEDS 1 and 2 flash

If all the LED are off, it means that the viewed parameter is not visible at level Pr1

If LED 3 is on, it means that the viewed parameter is also visible at level Pr1

If LED 1 and 2 flash and LED 3 is on steady, it means that the viewed parameter is editable in Pr2 and visible but not editable in Pr1

If LED 1, 2 and 3 flash it means that the viewed parameter is visible but not editable in Pr2 / Pr1

Inside level Pr2 it is not possible to view the parameters or password of level Pr3

If the label of a set of parameters is displayed in level Pr2, press **MENU** to go back to the programming level Pr1

EXIT THE PROGRAMMING BY PRESSING THE SET + UP KEYS SIMULTANEOUSLY

9. FUNCTIONS MENU

Press the "menu" key allows you to:

- Views and reset alarms present (**ALrM**)
- Views and delete alarm log (**ALOG**)
- Upload parameters from instrument in key (**UPL**)
- Enable-disable functioning of a single circuit from keyboard (**CrEn**)
- Enable-disable functioning of a single compressor from keyboard (**COEn**)
- View and reset the working hours of the controlled loads (**Hour**)
- View and reset the number of start-ups of each compressor (**COSn**)
- View the value of the probe for the dynamic set point (**PbdS**)
- View the supply temperature of the compressors (**COdt**)
- View the operating percentage of the proportional outputs to control the speed of the condensation fans (**Cond**)
- View the operating percentage of the 4 proportional outputs (**Pout**)
- Enable-disable functioning of the evaporator and condenser pumps (**PoEn**)
- View the time remaining to start defrost of the two circuits (only if the unit is configured as heat pump) (**dF**)
- View the temperature of the probes controlling the auxiliary outputs (**uS**)
- View the temperature of the probes on board the remote terminals VICX 620 (**trEM**)
- Enable or disable the recovery function (**REC**)

9.1 ALARM: HOW TO VIEW THE STATUS OF AN ALARM AND RESET

All alarms in the machine are displayed in the **Alrm** function.

If the alarm is reset automatically, the alarm message will also be removed when the alarm is restored.

If the alarm is reset manually, the alarm code and the word "rst" or "no" will be displayed, depending on whether the alarm can be reset or not.

After resetting a number of alarms manually, the password may be set to be requested to access the AlrM menu via parameters AL97 and AL98:

- If AL97=0 and AL98=0 no password is required to access the alarms menu
- If AL97=1 the password is always requested to access the alarms menu
- If AL97=0 and AL98>0 the alarms menu can be accessed as long as the number of manually reset alarms is less than AL98, otherwise the password must be entered

RESETTING AN ALARM MANUALLY

- enter the functions menu
- use the UP or DOWN keys to select the **Alrm** function
- press the SET key; the label that identifies the circuit breaker alarm of the compressor **C1tr** (for example) appears on the lower display and the upper display shows:
 - **rSt** if the alarm can be reset
 - **no** if the alarm cannot be reset

Press the UP or DOWN keys allows you to scroll the labels of the other active alarms.

Press the SET key in correspondence with label **rSt** to reset the alarm.

RESETTING PASSWORD-PROTECTED ALARMS MANUALLY

- enter the functions menu by pressing the **menu** key
- the label that identifies the alarm (Circuit breaker of the compressor **C01r** for example) appears on the lower display and the upper display shows:
 - label **rSt** if the alarm can be reset
 - label **no** if the alarm cannot be reset

Press the UP or DOWN keys allows you to scroll the labels of any other active alarms.

Press the **SET** key in correspondence with label **rSt** to reset the following after the password is entered:

- press **SET**; the lower display views **PAS** and the upper display **0** flashing
- enter the password using the UP or DOWN keys (password value = parameter AL46) and press the **SET** key. If the password is correct, label **ArSt** flashes for 3 sec (reset confirmation); if the password is incorrect, **PAS** appears on the lower display and **0** flashes on the upper display.
- to exit the reset alarms function and to go back to the normal view, press the MENU key or wait for time to run out.

Repeat the above steps for any other compressor circuit breaker alarms.

COMPRESSOR CIRCUIT BREAKER ALARMS RESET PASSWORD

The default password is **93**

9.2 ALOG: ALARMS LOG

The alarms are stored within increasing index; the first alarm is stored with index "n00", the other alarms with increasing index.

Display procedure:

- enter the functions menu
- select the **ALOG** function
- press **SET** (if no alarms are triggered, the SET key is not enabled); the lower display views the alarm code, the upper display views the label "n" followed by a progressive number from 00 to 99
- press the UP or DOWN keys to view all the stored alarms

To exit the ALOG function and to go back to the normal view, press the MENU key or wait for time to run out

HOW TO CANCEL THE SAVED ALARMS LOG

Procedure to cancel the saved alarms log:

- enter the functions menu
- using the **UP** or **DOWN** keys, select the **ALOG** function
- press the **SET** key
- within the **ALOG** function, press the UP or DOWN keys to search for the item **ArSt** in the lower display; the upper display views **PASS**
- press **SET**; a flashing 0 will appear on the upper display
- enter the password for cancellation 93
- if the password is correct, the label **ArSt** flashes for 5 sec, confirming that the alarm log has been cancelled. After cancellation, you automatically exit the functions menu and go back to the normal display.
- If the password is not correct, you must repeat the previous step
- to go back to the normal view, press MENU or wait for the time-out to elapse

There are 100 alarms stored in the memory. Any alarm detected above this number, automatically cancels the oldest alarm from the memory.

9.3 HOW TO ENABLE OR DISABLE A CIRCUIT VIA A FUNCTION KEY

You can disable the operation of a single refrigerant circuit via the keyboard for maintenance to be performed on it or a "capacity-controlled" function of the unit.

CrEn FUNCTION circuit enabled - disabled via a key

Labels of the circuits in the CrEn function: **Cr1E** = circuit 1 / **Cr2E** = circuit 2

DISABLING THE OPERATION OF A CIRCUIT

Enter the functions menu

Select the CrEn function on the lower display by using the **UP** or **DOWN** keys

Press the **SET** key on the lower display **Cr1E**, the upper display views **En**

Select the label Cr1E or Cr2E by pressing the UP or DOWN keys

Press **SET** for 3 seconds on the label Cr1E or Cr2E. The upper display views **En** flashing. Press UP or DOWN to select the **diS** label (circuit operation disabled) or **En** (circuit operation enabled). Press SET to confirm the set function and pass to the next circuit (only the loads relative to the circuit are disabled)

To exit the CrEn function and to go back to the normal view, press the MENU key or wait for time to run out.

9.4 VIEWING THE DISABLED CIRCUIT ON THE DISPLAY

In normal operation, if one of the circuits is set to **diS**, the lower display will view a flashing label alternated with the quantity viewed at that moment

If circuit 1 is set at **diS** the label viewed by the lower display is **b1dS** = circuit 1 disabled

If circuit 2 is set at **diS** the label viewed by the lower display is **b2dS** = circuit 2 disabled

Label b2sS is only present if circuit 2 is configured

9.5 HOW TO ENABLE OR DISABLE A COMPRESSOR VIA A FUNCTION KEY

You can disable the operation of a single compressor in a circuit for maintenance to be performed on it or to isolate it in case of malfunction

COEn FUNCTION compressor operating status

Labels of the compressor status in the COEn function:

CO1E = compressor n° 1 operating status

...

CO4E compressor n° 4 operating status

The labels that identify the individual compressors are displayed within the COEn function only if the respective outputs are configured in programming

- Enter the functions menu
- Select the COEn function by using the **UP** or **DOWN** keys
- Press the **SET** key on the lower display **CO1E**, the upper display views **En**
- Select the labels CO1E - CO2E - CO3E - CO4E on the lower display using the UP or DOWN keys, the upper display views En
- Press SET for 3 seconds on the label identifying the compressor to disable CO1E - CO2E - CO3E - CO4E. The upper display views En flashing. Press UP or DOWN to select the function **diS** (compressor operation disabled) or **En** (compressor operation enabled). Press SET to confirm the set function and pass to the next load
- To exit the COEn function and to go back to the normal view, press the MENU key or wait for time to run out.

9.6 VIEWING THE DISABLED COMPRESSOR ON THE DISPLAY

If one of the compressors is disabled, the lower display will view a flashing label alternated with the quantity viewed at that moment

C1dS = compressor n° 1 disabled

...

C4dS = compressor n° 6 disabled

9.7 HOW TO ENABLE OR DISABLE A WATER PUMP VIA A FUNCTION KEY

You can disable the operation of a single pump for maintenance to be performed on it or to isolate it in case of malfunction. It is displayed in the functions menu with label **POEn**; inside the folder, the display is the following:

PE1E = evaporator pump n° 1 operating status

PE2E = evaporator pump n° 2 operating status

PC1E = condenser pump n° 1 operating status

PC2E = condenser pump n° 2 operating status

The labels that identify the individual pumps are shown in the POEn function only for the pumps actually present.

Access the functions menu:

- scroll the various items using the **UP** or **DOWN** keys and select the function "**POEn**"
- press **SET**; the lower display views "**PE1E**", the upper display views "**En**"
- select the pump to disable by pressing the **UP** or **DOWN** keys (labels "**PE1E**", "**PE2E**", "**PC1E**", "**PC2E**" present according to the configuration of the unit)
- press **SET** for 3 seconds; the upper displayed views "**En**" flashing. Pressing the **UP** or **DOWN** keys allows you to alternate the view of the upper display between "**En**" and "**dis**"; press SET to confirm the selected status (**En**= enabled, **dis**= disabled)

The POEN menu is exited by pressing the MENU key or by time-out.

The controller manages disabling of a pump to allow the unit to operate normally:

- if the pump disabled at that moment was running, the controller switches on the deactivated pump
- if the pump disabled at the moment was off, the controller keeps the other pump on and will not allow operating rotation
- if the pump disabled at that moment was running, but the other is not available, the controller will not allow the pump to switch off

9.8 VIEWING THE DISABLED WATER PUMP ON THE DISPLAY

In normal operation, if one of the pumps is disabled, the lower display views the flashing label P1Ed, P2Ed (evaporator pump 1 and 2), P1Cd or P2Cd (condenser pump 1 and 2), alternated with the quantity viewed at that moment.

9.9 HOW TO VIEW THE NUMBER OF START-UPS OF THE COMPRESSORS

COSn FUNCTION number of compressor start-ups

Labels which identify the individual compressors in the COSn function:

C1S n° peaks of compressor n° 1

..

C4S n° peaks of compressor n° 4

The labels that identify the individual compressors are displayed in the functions menu only if the respective outputs are configured in programming.

The number of start-ups is viewed on the lower display with a resolution of 10 start-ups (if 2 is displayed, the number of start-ups of that compressor is 20).

Enter the functions menu :

- **Select the COSn function by using the UP or DOWN keys**
- Press **SET**
- Use the **UP** or **DOWN** keys to select label C1S or C2S or C3S or C4S with which the operating hours of every individual compressor correspond (the lower display views the number of start-ups expressed in tens).
- Press the UP or DOWN keys to view all the configured compressors
- To go back to the normal view, press the MENU key or wait for time to run out.

9.10 HOW TO RESET THE NUMBER OF COMPRESSOR START-UPS

Enter the functions menu:

- Use the **UP** or **DOWN** keys in the COSn function to select label C1S or C2S or C3S or C4S with which the operating hours of every individual compressor correspond
- Press **SET** for 3 sec on the load C1S or C2S or C3S or C4S; the lower display views the number of time start-ups flashing (reset in progress) followed by the value "0" indicating that reset is complete
- Afterwards the start-ups of the next compressor are viewed
- To exit the reset function and to go back to the normal view, press the MENU key or wait for time to run out.

9.11 HOW TO VIEW THE PROBES CONFIGURED AS COMPRESSOR SUPPLY TEMPERATURE ON THE DISPLAY

You can view the temperature value of the probes that control the supply temperature of the compressor in the functions menu

COdt FUNCTION displays the temperature value

Identification labels in the **COdt** function:

CO1t value measured by the supply temperature probe of compressor 1

...

CO4t value measured by the supply temperature probe of compressor 4

1. Select the **COdt** function by using the **UP** or **DOWN** keys
2. Press **SET**. The label CO1t is viewed on the lower display, while the upper display views the measured temperature
3. Using the UP or DOWN keys, select the label **CO1t** or **CO2t** or **CO3t** or **CO4t** to view the measured temperature value of compressor n° 1 or 2 or 3 or 4

To go back to the normal view, press the MENU key or wait for time to run out.

CAUTION

The COdt function is present in the functions menu only if the analogue inputs are configured as compressor supply temperature

9.12 HOW TO VIEW THE WORKING HOURS OF THE LOADS

You can view the working hours of each compressor and water pump on the evaporator/condenser side

Hour FUNCTION working hours of the controlled loads

Labels which identify the individual loads in the Hour function:

CO1H working hours of compressor 1.. **CO4H** working hours of compressor 6

EP1H working hours of the evaporator water pump, supply fan (air/air unit)

EP2H working hours of the support evaporator water pump

CP1H condenser water pump working hours

CP2H support condenser water pump working hours

The labels that identify the individual loads are displayed in the functions menu only if the respective outputs are configured in programming.

The number of working hours is viewed on the upper display with a resolution of 10 hours (if 2 is displayed, the number of working hours of that load is 20)

Enter the functions menu

Select the Hour function by using the **UP** or **DOWN** keys

Press **SET**. The label of the single load is viewed on the upper display, while the upper display views the operating hours x10. The  icon is lit up.

Press the UP or DOWN keys to view all the configured loads

To go back to the normal view, press the MENU key or wait for time to run out.

9.13 HOW TO RESET THE WORKING HOURS OF THE LOADS

Access the Functions menu.

- When in the "Hour" function page, press the **UP** or **DOWN** buttons to select one of the following labels: CO1H, CO2H, CO3H, CO4H, EP1H, EP2H, CP1H, or CP2H.
- When the **SET** button alongside the CO1H or CO2H or CO3H or CO4H label is pressed for 3 seconds, resetting requires entry of a password.
- Enter the password using the UP or DOWN button (password value = parameter AL46) and then press the **SET** button. If the password is correct, the top display shows "0" to indicate that the reset process was successful.
- To exit the Reset function and return to normal display mode, press the MENU button or wait for the end of the time-out.

9.14 VIEW THE PERCENTAGE OF WORK OF THE TWO PROPORTIONAL OUTPUTS ON THE DISPLAY TO CONTROL THE SPEED OF THE CONDENSER FANS

You can view the percentage of work of the proportional output of circuit 1 and 2 in the functions menu

The labels appear according to the configured outputs and display the percentage of work of the output in figures.

Cond FUNCTION proportional outputs to control the speed of the condensation fans of circuit 1 and 2

Identification labels of the outputs in the Cond function

Cnd1 Proportional output condensation fan control of circuit 1

Cnd2 Proportional output condensation fan control of circuit 2

TO SEE THE WORK PERCENTAGE OF AN OUTPUT:

Enter the functions menu

Select the **Cond** function by using the **UP** or **DOWN** keys

Press **SET**. The lower display views Cnd1, while the upper display views the working percentage

Select the label Cnd1 or Cnd2 on the lower display using the **UPPER DOWN** keys. The upper display views the working percentage from 0% to 100% of circuit n° 1 or n° 2 at that moment

To go back to the normal view, press the **MENU** key or wait for time to run out.

9.15 VIEW THE NUMBER OF ON/OFF STEPS OF THE RELAY OUTPUTS ON THE DISPLAY TO CONTROL THE SPEED OF THE CONDENSATION FANS

You can view the number of ventilation steps entered in circuit 1 and 2 in the functions menu.

The labels appear if at least one output is configured and the number of active steps is displayed

Identification labels of the outputs in the **Cond** function

- **Cnd1** view the condensation fan steps of circuit 1
- **Cnd2** view the condensation fan steps of circuit 2

HOW TO VIEW THE NUMBER OF STEPS ENTERED IN THE CIRCUIT:

Enter the functions menu

Select the **Cond** function by using the **UP** or **DOWN** keys

Press **SET**. The lower display views Cnd1, while the upper display views the number of steps entered

Select the label Cnd1 or Cnd2 on the lower display by pressing the **UP** or **DOWN** keys and the upper display will show the following:

if FA01 = 2 the number of active ventilation steps at that time in circuit 1 or 2

if FA01 = 3 the number of active ventilation steps at that time in circuit 1 or 2

To go back to the normal view, press the **MENU** key or wait for time to run out.

9.16 VIEW THE WORK PERCENTAGE OF THE PROPORTIONAL OUTPUTS ON THE DISPLAY

You can view the work percentage of the four proportional outputs in the functions menu.

Pout FUNCTION proportional outputs

Identification labels of the output in the Pout function. The labels appear according to the configured outputs and display the percentage of work of the output in figures.

I200CX controller outputs:

Pou1 Proportional output control of actuators / servo-motor or to pilot the external relays 1

Pou2 Proportional output control of actuators / servo-motor or to pilot the external relays 2

Pou3 Proportional output control of actuators / servo-motor or to pilot the external relays 3

Pou4 Proportional output control of actuators / servo-motor or to pilot the external relays 4

ICX207D expansion outputs:

PoE1 Proportional output control of actuators / servo-motor or to pilot the external relays 1

PoE2 Proportional output control of actuators / servo-motor or to pilot the external relays 2

PoE3 Proportional output control of actuators / servo-motor or to pilot the external relays 3

TO SEE THE WORK PERCENTAGE OF AN OUTPUT:

Enter the functions menu

Select the **Pout** function by using the **UP** or **DOWN** keys

Press **SET**. The lower display views Pou1, while the upper display views the working percentage

Select the label **Pou1** or **Pou2** or **Pou3** or **Pou4** on the lower display using the **UP** or **DOWN** keys. The upper display views the work percentage from 0% to 100% at that moment

To go back to the normal view, press the **MENU** key or wait for time to run out.

The labels Pou1... Pou4 are only present if the relative outputs are configured

CAUTION:

if the proportional outputs Pou1 - Pou2 - Pou3 - Pou4 are configured as piloting of an external relay, the display of the functions menu will not be shown as a percentage but 100 with the active output relay ON / 0 with non-active output relay in OFF).

9.17 HOW TO VIEW THE REMAINING TIME FOR THE DEFROST TO BEGIN ON THE DISPLAY

You can view the remaining time for defrosting to begin in circuit 1 or 2 in the functions menu

df FUNCTION views the time left for defrosting to begin

Identification labels in the **df** function

df1 view the time left for defrosting to begin in circuit 1

df2 view the time left for defrosting to begin in circuit 1

The labels appear only if the unit is configured as a heat pump.

Enter the functions menu :

Select the **df** function by using the **UP** or **DOWN** keys

Press **SET**. The df1 is viewed on the upper display, while the lower display views the time left for defrosting to begin in minutes/seconds.

The  icon is lit up.

Using the UP or DOWN keys, select the label df1 or df2 to view the time of circuit 1 or 2

To go back to the normal view, press the MENU key or wait for time to run out.

9.18 HOW TO VIEW THE PROBES CONFIGURED AS AN AUXILIARY OUTPUT ON THE DISPLAY

You can view the temperature / pressure value of the probes that control the auxiliary outputs in the functions menu.

us FUNCTION displays the temperature / pressure value; identification label in the **us function**:

- **ust1** value measured by the auxiliary probe 1
- **ust2** value measured by the auxiliary probe 2

To display the values of the probes:

- Use the **UP** or **DOWN** keys to select the **us** function and press **SET**
- Label **ust1** will appear on the lower display (if the auxiliary probe is configured in temperature) or **usp1** (if the auxiliary probe is configured in pressure) and the upper display will show the measured temperature / pressure value
- Use the UP or DOWN keys to view the pressure value measured by auxiliary output 2 if present
- To go back to the normal view, press the MENU key or wait for time to run out.

9.19 HOW TO VIEW THE TEMPERATURE OF THE PROBES ON BOARD THE REMOTE TERMINALS 1 AND 2

You can view the temperature value of the probe on board the remote terminal in the functions menu

trEM FUNCTION displays the temperature value of the remote terminals; identification label in the **trEM function**:

- **trE1** value measured by the NTC probe of remote terminal 1
- **trE2** value measured by the NTC probe of remote terminal 2

To display the values of the probes:

- Use the **UP** or **DOWN** keys to select the **trEM** function and press **SET**
- The **trE1** label will appear on the lower display, whereas the measured temperature will appear on the upper display.
- Use the UP or DOWN keys to view the temperature value of remote terminal 2

To go back to the normal view, press the MENU key or wait for time to run out.

CAUTION:

The trEm function and label trE1 or trE2 appear in the functions menu only if parameters CF74 and CF75 are not zero

9.20 HOW TO ENABLE/DISABLE THE RECOVERY AND VIEW THE OUTPUT STATUS

The following is possible in the rEC menu:

- enable /disable the recovery:
 - the upper display shows the status of the recovery (En /diS)
 - press the SET key for a few seconds
 - En / diS flashes
 - press the arrow keys to change the status (enable or disable)
 - press the SET key to confirm
- press the arrow keys to view the status of the recovery outputs
 - rEC1 is displayed on the lower display and ON / OFF on the upper display
 - rEC2 is displayed on the lower display and ON / OFF on the upper display

9.21 CLOCK MENU

the presence of the clock is recognised by an Internal parameter.
In this status you can enter in two ways:

1. From "OPERATION ON STAND BY - IN HP - IN CHILLER" status.
2. In the presence of an RTC alarm. Press the RTC button. The lower display reads "**ArtC**" and the upper display the stored time

9.22 PROCEDURE TO VIEW THE DATE AND TIME

Press the M key for three seconds
Use the UP and DOWN keys to scroll the labels (Hour, Min, UdAy, dAy, Mnth, yEA, lower display.)
Saved value upper display

This status is exited by pressing the MENU key or by time-out (30 sec)

9.23 PROCEDURE TO SET THE DATE AND TIME

Press the M key for three seconds:

- Press the SET key and the time starts to flash.
- Adjust the time with the UP and DOWN keys
- Confirm the time by pressing the SET key; the controller displays the next parameter.
- Repeat the above steps for any adjustment of the other clock parameters.

Min: minutes (0÷60)

UdAy: day of the week

Sun = Sunday

Mon = Monday

tuE = Tuesday

Ued = Wednesday

tHu = Thursday

Fri = Friday

Sat = Saturday

dAy: day of the month (0÷31)

Mnth: month(1÷12)

yEA: year (00÷99)

This status is exited by pressing the MENU key or by time-out (30 sec)

10. UNIT SELECTION - OPERATING MODE - ENABLING - SWITCH-ON - SWITCH-OFF

THE MACHINE CAN BE SWITCHED ON AND OFF AS FOLLOWS:

- From the keyboard
- From time bands (see switch-on and switch-off with time bands)
- From a digital input configured as remote ON/OFF

The unit can be configured as a chiller only, heat pump only or as a chiller and heat pump.

CF02	Selecting unit operation 1= chiller only 2= heat pump only 3= chiller with heat pump	1	3		
------	---	---	---	--	--

When only the heat pump is enabled, alarm ACF1 is not generated if the inversion valves are not configured in the circuits provided.

10.1 SWITCHING THE MACHINE ON AND OFF FROM A KEYBOARD

SWITCHING THE UNIT ON AND OFF IN CHILLER - HEAT PUMP MODE FROM A KEYBOARD

Press and release the  key to switch the unit on and off if parameter CF58 = 0 in chiller mode and if parameter CF58 = 1 in heat pump mode. The LED near the key is on when the unit is on.
You can switch from chiller mode to heat pump mode by simply switching the unit off.

Press and release the  key to switch the unit on and off if parameter CF58 = 0 in heat pump mode and if parameter CF58 = 1 in chiller mode. The LED near the key is on when the unit is on.
You can switch from chiller mode to heat pump mode by simply switching the unit off.

SETTING THE UNIT IN (STAND BY)

The instrument is on stand by when the LED near the  or  key is off. The stand by mode is set every time the unit is switched off in chiller or heat pump mode. Even on stand by mode the controller can:

- View the measured variables on the display
- Manage the alarm situations by viewing and reporting it.

10.2 SWITCHING THE MACHINE ON AND OFF FROM A DIGITAL INPUT

SWITCHING ON OR OFF FROM A DIGITAL INPUT

From a digital input configured as remote ON/OFF that generates OFF operation according to the selected or active polarity

- It is priority compared to the keyboard
- The unit can be switched on and off from the keyboard only with the input disabled
- With the input disabled, the instrument returns to the status before activation

10.3 SELECTING THE CHILLER - HEAT PUMP OPERATING MODE

Parameter CF59 allows you to choose and enable the switch-on mode of the unit.

Par. CF59 = 0

The switch-on selection of a unit configured as a chiller with heat pump is carried out by keyboard.

AUTOMATIC SWITCH-ON OF THE UNIT IN CHILLER - HEAT PUMP MODE FROM REMOTE WITH A DIGITAL INPUT

Par. CF59 = 1

The switch-on selection of a unit configured as a chiller with heat pump is carried out by digital inputs configured as remote heat pump / chiller request.

- The selection is enabled is a digital input is configured as a chiller request or heat pump request). If no digital input has been configured, the unit **REMAINS on stand by**
- the chiller, heat pump selection from a keyboard is disabled; the unit can only be switched on and off from a keyboard in the operating mode selected by the digital input

10.4 SELECTING THE CHILLER - HEAT PUMP OPERATING LOGIC

DEPENDS ON THE VALUE OF PARAMETER CF59

Allows the operating logic to be selected.

10.5 SELECTION FROM THE KEYBOARD

CF59 = 0 Press the ❄️ key for the unit to be switched on in chiller mode and press the ☀️ key to switch the unit on in heat pump mode.

11. COMPRESSOR ADJUSTMENT

11.1 SAFETY TIMES OF THE COMPRESSORS

The following safety times are active for each compressor:

- CO01 Minimum compressor switch-on time
- CO02 Minimum compressor switch-off time
- CO91 Minimum time between two switch-ons of the same compressor

12. CHOOSING THE TYPE OF COMPRESSOR ADJUSTMENT

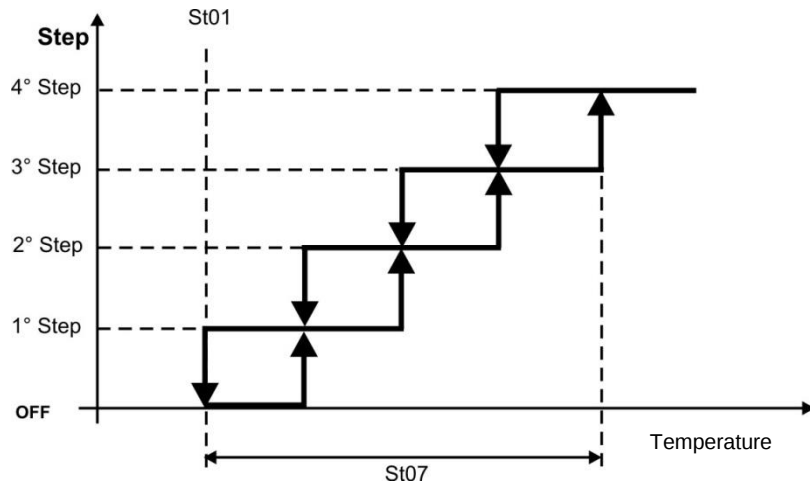
Par **ST11** Defines the type of thermoregulation of the unit

0= Proportional

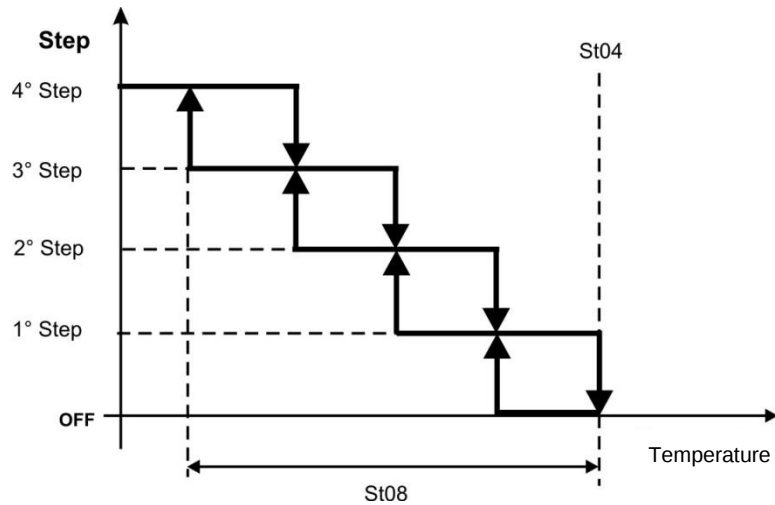
1= Neutral zone

12.1 COMPRESSOR PROPORTIONAL ADJUSTMENT GRAPH

Graph of the regulator operation of the compressors in cooling mode; if capacity controlled compressors are used with steps and the proportional band is divided by the total number of steps.

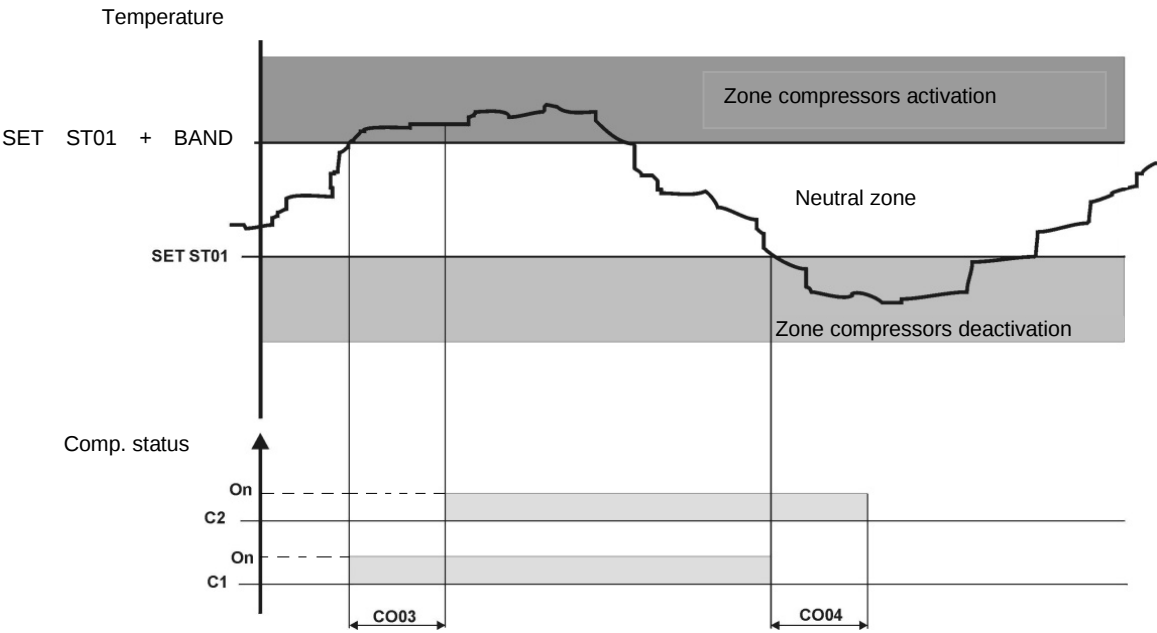


Graph of the regulator operation of the compressors in heating mode; if capacity controlled compressors are used with steps and the proportional band is divided by the total number of steps.

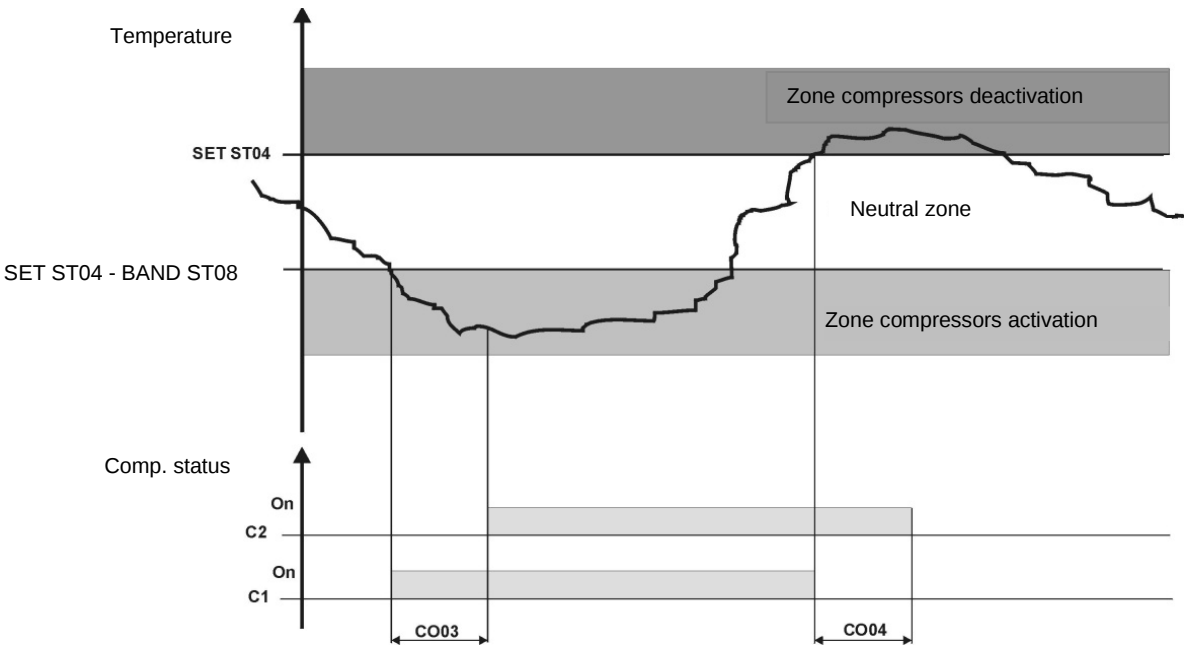


12.2 COMPRESSOR NEUTRAL ZONE ADJUSTMENT GRAPH

Graph of the regulator operation of the compressors in chiller mode



Graph of the regulator operation of the compressors in heat pump mode



COMPRESSOR OPERATION IN THE NEUTRAL ZONE

There is a special function that actuates the rotation or forced connection of the compressors (or capacity steps) if the adjustment temperature remains within the neutral zone.

MAXIMUM TIME IN NEUTRAL ZONE WITHOUT INSERTION OF COMPRESSORS (OR CAPACITY CONTROLS) WITH AT LEAST ONE COMPRESSOR ON

Par. CO53

With at least one compressor on, when the adjustment temperature remains within the neutral zone, the time set in par. CO53 is counted, after which compressor insertion or capacity control step is forced.

The resolution is fixed in tens of minutes; if the parameter value is 0 the function is disabled.

MAXIMUM TIME IN NEUTRAL ZONE WITHOUT ROTATION OF RESOURCES

Par. CO54

With at least one compressor on, when the control temperature is inside the neutral zone, the time set in par CO54 is counted, after which the engaged compressor is switched off and, depending on the compressor insertion selection (working hours or number of start-ups), insertion of another compressor is forced.

The resolution is fixed in hours; if the parameter value is 0 the function is disabled.

12.3 COMPRESSOR ROTATION

Parameter **CO14** determines the sequence of switching the compressors on and off.

CO14= 0

Fixed sequence. In the two circuits, first compressor 1 is connected and then compressor 2, followed by compressor 3. Compressor 1 is only switched off if compressor 2 and compressor 3 are off.

CO14= 1

Rotation enabled. Based on the number of working hours, the first compressor to be switched on is the one with the less number of hours. The first compressor to be switched off is the one with the greater number of hours. In units with only one capacity control compressor per circuit, compressor rotation is disabled automatically.

CO14= 2 used by the manufacturer

Rotation enabled. Based on the number of time start-ups, the first compressor to be switched on the one with the less number of start-ups. The first compressor to be switched off is the one with the less number of start-ups. In units with only one capacity control compressor per circuit, compressor rotation is disabled automatically.

12.3.1 SATURATION - CIRCUIT BALANCING

SATURATION OPERATION

CO15 = 0

Saturation of circuits, in case of thermoregulation demand, first the power steps of one circuit are switched on and then those of the other circuit.

E.g. two circuits two steps per circuit, 4 steps in all

Switch-on:

Thermoregulation requires 4 steps: these are selected in the two circuits that the compressor/s have according to the value of Par. CO14, the least operating hours or the least start-ups per hour. Once the compressor/s is/are selected and the category circuit is determined, the compressor with the least operating hours or the least start-ups per hour is switched on within that circuit and then the second compressor in the same circuit and the same logic is applied to the other circuit.

Switch-off:

The circuit that has the least resources lit is first chosen from the thermoregulation request, in the case of the same number of resources the compressor/s with the most operating hours or the least start-ups per hour, according to the value of Par. CO14, are selected in the two circuits, within that circuit the compressor with the most operating hours or the least start-ups per hour is switch off, then the second compressor in the same circuit and then the same logic is applied to the other circuit.

BALANCING FUNCTION used by the manufacturer

Parameter **CO15 = 1** circuit balancing is only significant if there are 2 circuits and 2 steps per circuit.

Circuit balancing, power steps are switched on so that both circuits supply the same power or that the difference is one step at maximum.

E.g. two circuits two steps per circuit, 4 steps in all

Switch-on:

Thermoregulation requires 4 steps: these are selected in the two circuits that the compressor/s have according to the value of Par. CO14, the least operating hours or the least start-ups per hour. If circuit 1 is selected, the compressor with the least operating hours or the least start-ups per hour is switched on within that circuit, circuit 2 is next and the compressor with the least operating hours or the least start-ups per hour is switched on, circuit 1 is next and the second compressor is switched on and circuit 2 is next and the second compressor is switched on.

Switch-off:

The circuit that has the most operating hours or the least start-ups per hour of the compressors is first chosen from the thermoregulation request. If circuit 1 is selected, the compressor with the most operating hours or the least start-ups per hour is switched off within that circuit, circuit 2 is next and the compressor with the lowest number of operating hours or lowest number of start-ups per hour is switched on, circuit 1 is next and the second compressor is switched on and circuit 2 is next and the second compressor is switched on.

NOTES ON THE COMPRESSOR REGULATOR

- After each compressor is activated, it must remain on for at least CO01. The exceptions to this rule are causes of switch-off due to an **alarm, to remote STAND BY / ON OFF or defrost or capacity control via NTC probe transducer**
- After each compressor is deactivated, it must remain off for at least CO02.
- If the regulator requires two compressors to switch on / steps with the fixed sequence as well as with the rotation enabled, the start-up between the two is delayed by CO03 seconds

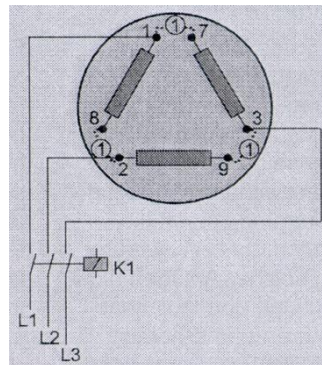
- If the regulator requires two compressors to switch off / steps with the fixed sequence as well as with the rotation enabled, the switch-off between the two is delayed by CO04 seconds
- In the case of no mains voltage, once it is restored **ALL OUTPUTS** are forced to OFF for the time CO05.

12.4 COMPRESSOR SWITCH-ON

The type of compressor start-up is selected via parameter CO10:
CO10=0 (direct start-up)

12.4.1 DIRECT START-UP

You must configure a relay output for the compressor (Relay K1) Each relay output controls 1compressor and you can configure the relay outputs up to a MAX of 6 compressors



12.5 BYPASS GAS VALVE FUNCTION UPON COMPRESSOR START-UP

It allows you to control any external valve to the compressor intended for an "empty" start-up in parallel to the capacity control valve already present in the compressor

Valve switch-on time for the gas bypass compressor start-up

The function is enabled if CO13 is different from 0 and at least one relay is configured as a gas bypass valve compressor start-up 1 or 2 or 3 or 4.

Operation: the relay goes ON for each thermoregulation call 1 second before (fixed time set by us) and the compressor switches on and goes OFF after the time set in Par. CO13.

After each compressor switch-off the time CO13 is reloaded.

13. COMPRESSORS WITH INVERTER

Compressors with inverter are controlled using the 0 ÷ 10V signal emitted by analogue outputs of the IChill (configured appropriately).

The control of compressors with inverter is only enabled with the proportional type of adjustment (parameter ST11=0).

The configurations allowed are:

- 1 circuit with 1 modulating compressor
- 1 circuit with 1 modulating compressor and maximum 2 non-modulating compressors (relay-controlled)
- 2 circuits with 1 modulating compressor per circuit
- 2 circuits with 1 modulating compressor per circuit and maximum 2 non-modulating compressors (relay-controlled)

The first step to be inserted is always the inverter compressor; the compressor is switched on when there is the 100% power request of the compressor itself.

Upon request to insert another step, the non-modulating compressor will be switched on (relay-controlled, if the configuration of the unit requires it).

From this moment onwards, the compressor with inverter will be controlled proportionally by the regulator.

If the set point is reached or the switch-off temperature of the compressor with inverter is reached, the compressor is switched off even if it has not reached the minimum power.

Upon the start-up request, the compressor with inverter is forced to the maximum speed (set value in parameter CO61); at this point, if parameter CO62 is set to 0, the compressor will keep the maximum speed for the time CO60, and will then modulate according to the request of the thermoregulator, whereas if parameter CO62≠0, the compressor will be forced to reach 100% (always with an increase of 1% of the power every CO62 seconds) and will then modulate the actual request.

During regular operation, the increase/decrease of the power takes place with variations of 1% of the power delayed by CO71 seconds.

When the adjustment temperature approaches the set point, the modulating compressor/s are the last to be deactivated to allow for power modulation.

You can limit the output % of the compressor with inverter in Chiller, Heat Pump or DHW mode

- maximum output % of the compressor with inverter in Chiller mode (parameter CO79)
- maximum output % of the compressor with inverter in Heat Pump mode (parameter CO80)
- maximum output % of the compressor with inverter in DHW mode (parameter CO81)

Summer mode operation

Fig. 1 regulation 0 – 100% of a modulating compressor
Fig. 2 unit adjustment of a multi-compressor fitted with a compressor with an inverter and a step-controlled compressor; the first compressor to be switched on will always be the compressor with inverter and then the other compressor will be switch-on.
The figure shows the condition of both the compressors on and modulation obtained via the compressor with inverter.

Fig. 1

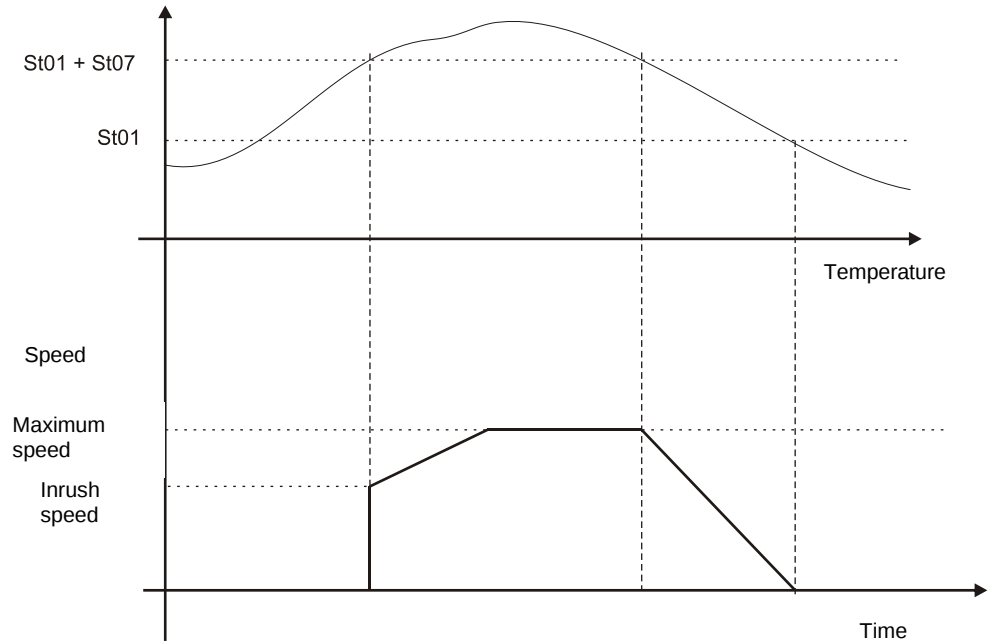
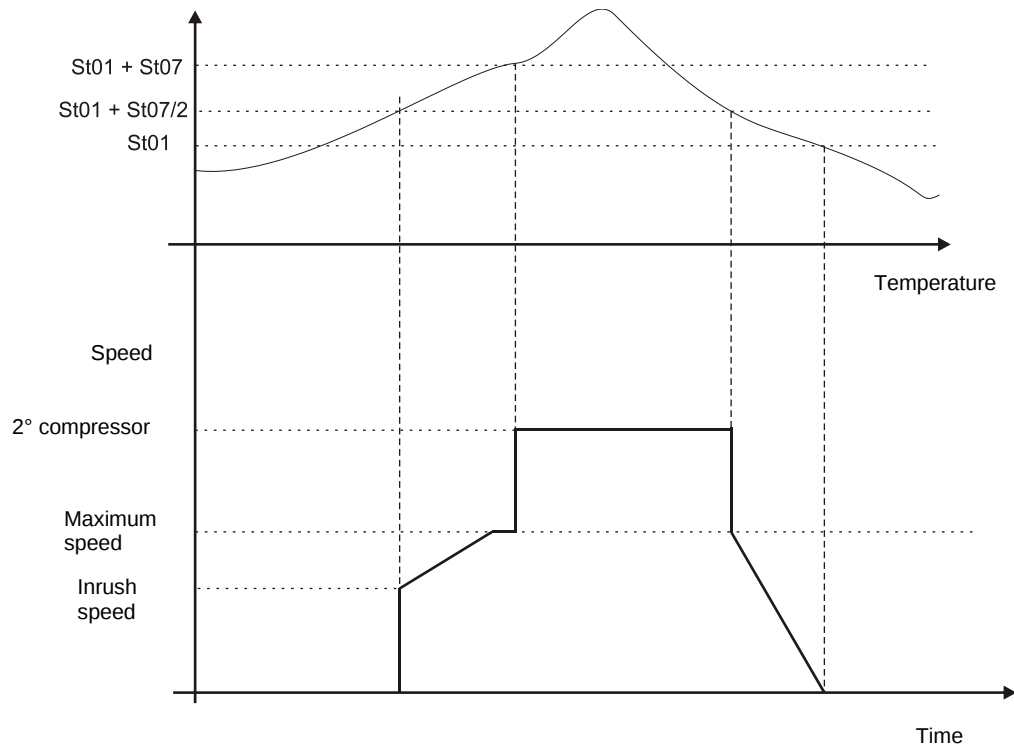


Fig. 2



Operating in winter mode

Fig. 1 regulation 0 – 100% of a compressor with inverter
Fig. 2 unit adjustment of a multi-compressor fitted with a compressor with an inverter and a step-controlled compressor; the first compressor to be switched on will always be the compressor with inverter and then the other compressor will be switch-on.
The figure shows the condition of both the compressors on and modulation obtained via the compressor with inverter.

Fig. 1

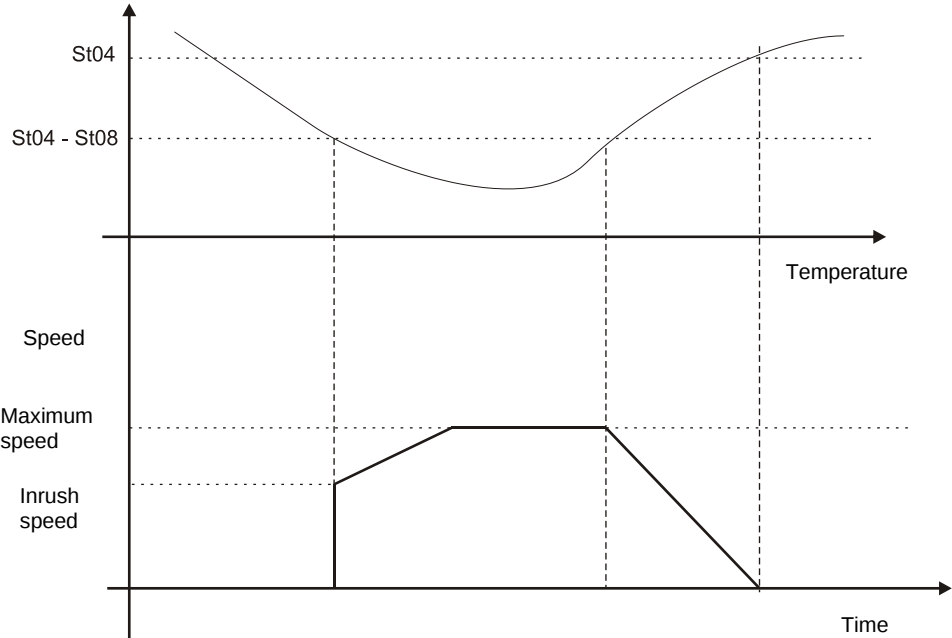
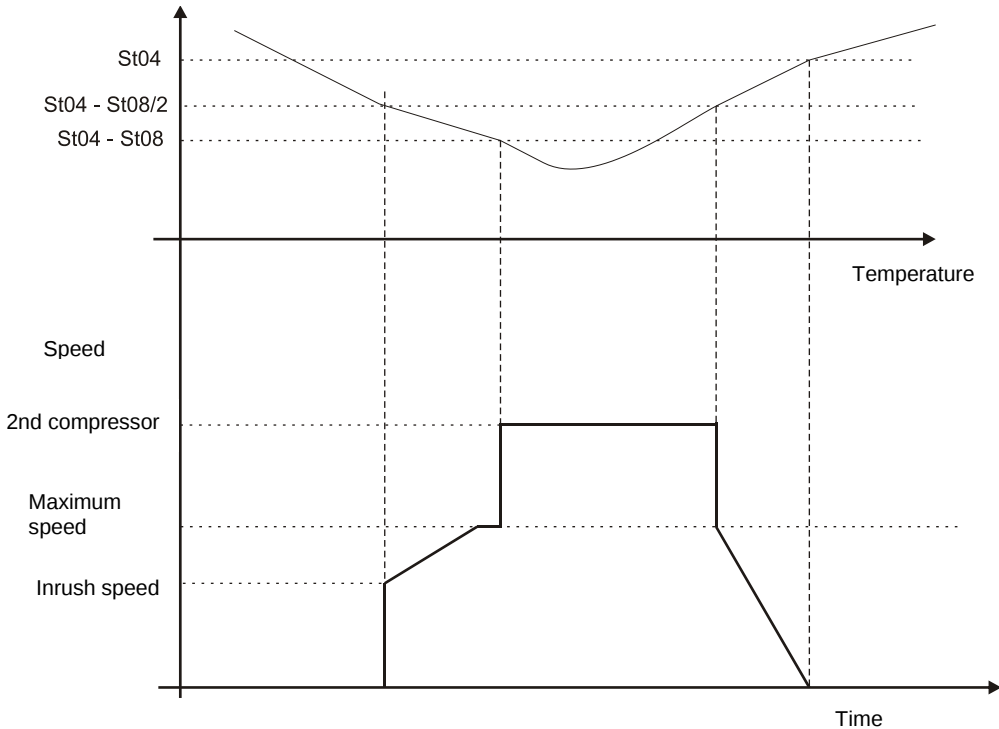
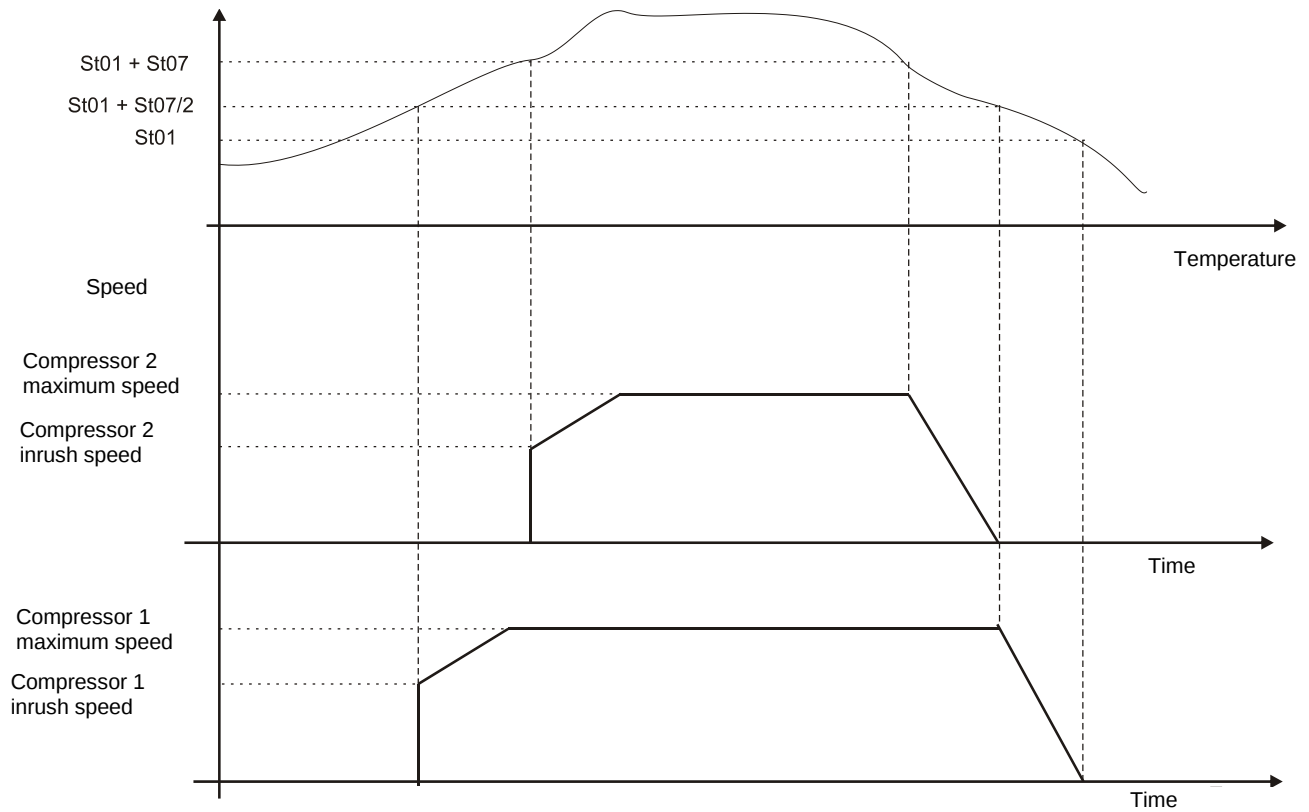


Fig. 2

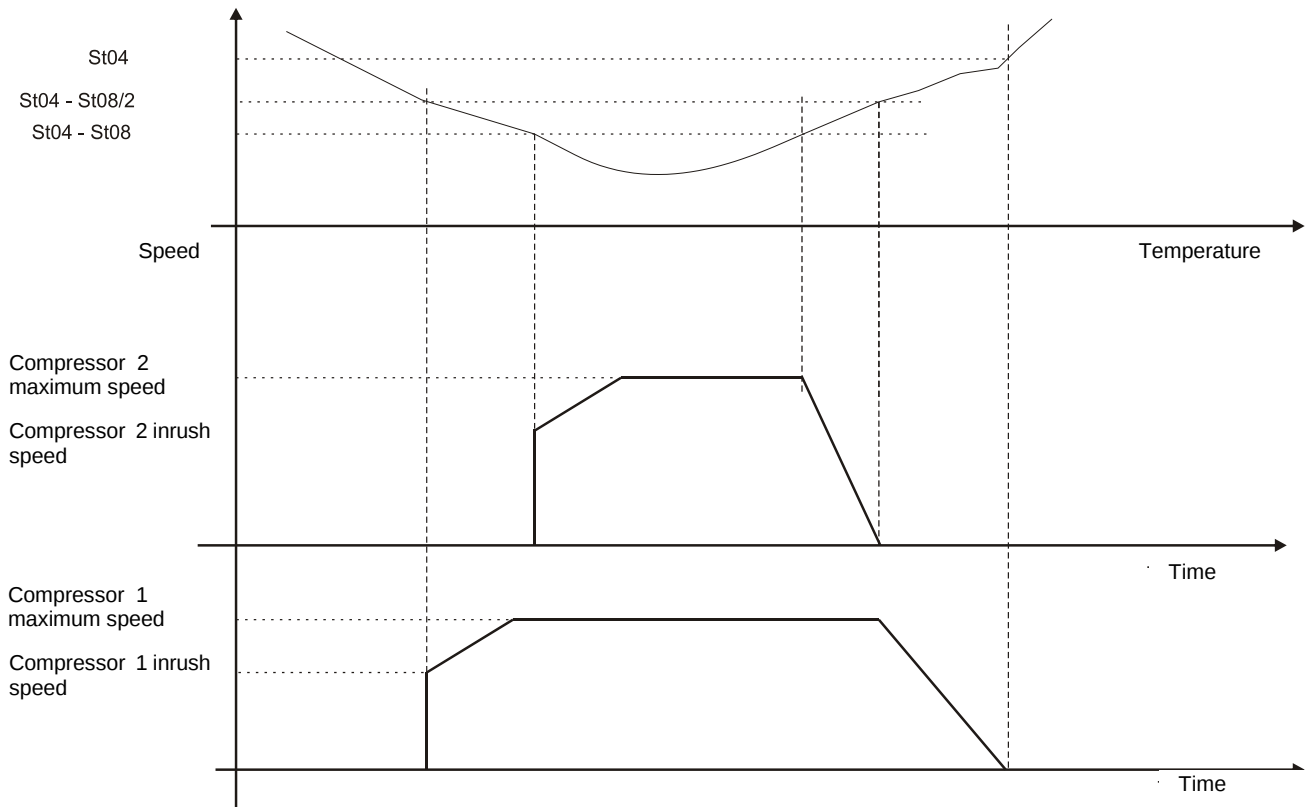


Operating in summer mode: 2 compressors with inverter (1 per circuit)



A compressor switches on when there is the request for its maximum power.
The dotted part represents the modulation phase of the compressors.

Operating in winter mode: 2 compressors with inverter (1 per circuit)



A compressor switches on when there is the request for its maximum power.
The dotted part represents the modulation of the compressors.

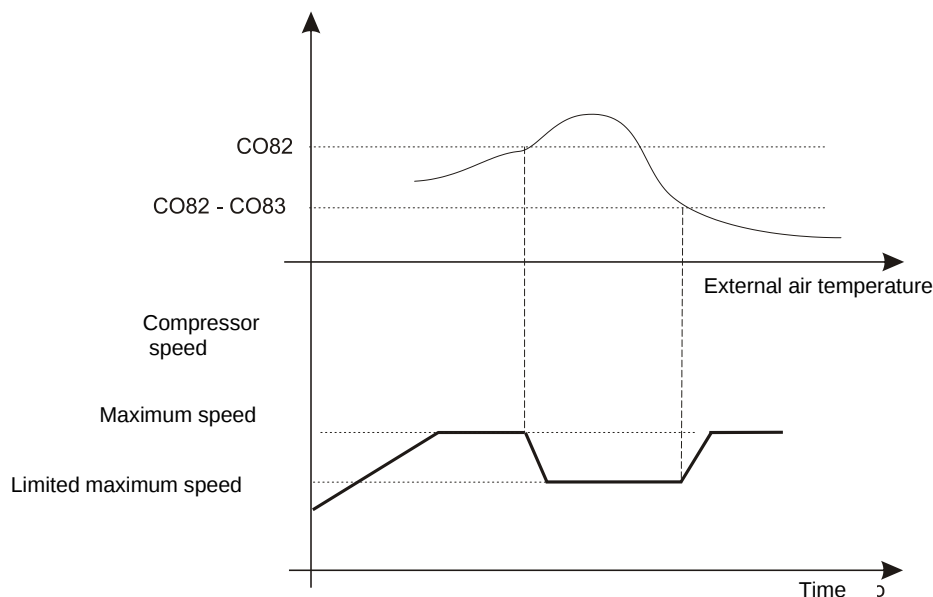
Parameters involved in the operation of the compressor with inverter:

- CO60** operating time at the power set in parameter CO61 during the switch-on phase of the compressor
- CO61** power value of the compressor during the switch-on phase
- CO62** delay between power increments upon the start-up of the compressor to reach 100% power
- CO63** minimum power percentage below which the CO64 time starts counting
- CO64** maximum operating time of the compressor with power percentage lower than the value set in parameter CO63
- CO65** operating time at maximum power if the compressor has been running at a power percentage less than CO63 for the time set in parameter CO64
- CO66** maximum operating time of the compressor with inverter; once the time elapses, the compressor with inverter is switched off and the first free compressor among those available in the same circuit is switched on
- CO67** minimum power value of the compressor with inverter of circuit 1 (expressed as a %)
- CO68** maximum power value of the compressor with inverter of circuit 1 (expressed as a %)
- CO67** minimum power value of the compressor with inverter of circuit 2 (expressed as a %)
- CO70** maximum power value of the compressor with inverter of circuit 2 (expressed as a %)
- CO71** delay between power increments during regular operation of the compressor

Compressor with modulating control					
CO60	Compressor operating time at full speed by thermoregulation request 0 = disabled function	0	250	sec	
CO61	Value for the analogue output of the compressor with inverter at start-up	0	100	%	
CO62	Power implement interval at start-up	0	250	sec	
CO63	Minimum continuous operating percentage of the compressor with inverter below which the CO64 time starts counting 0 = disabled function	0	100	%	
CO64	MAX continuous operating time of the compressor with inverter with operation percentage below CO63 0 = disabled function	0	250	Min	10 Min
CO65	Operating time forced to maximum speed	0	250	sec	10sec
CO66	Maximum continuous operating time of the compressor 0 = disabled function	0	999	Hr	1Hr
CO67	Minimum value for the analogue output of the compressor with inverter of circuit 1	1	CO68	%	
CO68	Maximum value for the analogue output of the compressor with inverter of circuit 1	CO67	100	%	
CO69	Minimum value for the analogue output of the compressor with inverter of circuit 2	1	CO70	%	
CO70	Maximum value for the analogue output of the compressor with inverter of circuit 2	CO69	100	%	
CO71	Power implement interval during regular operation	1	250	sec	

13.1 COMPRESSOR WITH INVERTER IN HEATING MODE AND OUTDOOR AIR TEMPERATURE

You can reduce the speed of the compressor with inverter control (both compressors if the machine requires two) in heating mode (not during defrost) if the external air temperature exceeds a threshold set by parameter.



14. LIMITATION OF THE COMPRESSOR SWITCH-ON TIME

If a circuit has several compressors but only one is switched on, after the CO72 operation time the compressor is switched off and another compressor is switched on (the first free according to the operating hours or number of start-ups). The overlap time of compressor operation can be set with parameter CO98.

CO72	Maximum continuous operating time of the compressor	0	250	Min	
CO98	Simultaneous compressor operating time for rotation	0	250	Sec	

15. LOADS MAINTENANCE REQUEST FUNCTION

Via parameter you can determine the number of operating hours over and above which a warning is displayed. The warning does not involve any action in the controller, all adjustments continue normally.

CO26 ... CO29: number of operating hours of each compressor to display the warning

CO32 ... CO35: number of operating hours of each water pump to display the warning

The function is disabled by setting the value to zero.

CO73, CO74 and CO95: number of operating hours of the pump in the sanitary circuit, of the solar panels and the free cooling

16. UNLOADING FUNCTION

16.1 COMPRESSOR UNLOADING FUNCTION FROM THE EVAPORATOR WATER INPUT HIGH TEMPERATURE

The function is active in any mode if the machine has at least 2 power steps in a circuit or if a compressor with inverter is configured. The function is used to allow the machine to operate (via capacity control of the compressors or reduced operating frequency of the compressors) even with high evaporator input water temperatures (summer start-up with a very hot storage tank) or to avoid possible high pressure intervention.

The unloading function is controlled via the analogue input configured as a probe evaporator water input (see table of CO set of parameters).

When the function is active steps (defined as compressors or capacity controls) configured in parameter CO49 remain active; in the case of a compressor with inverter, this is forced to the speed set in parameter CO96.

Unloading operating examples:

- machine with 1 compressor + 1 capacity control: if the unloading is activated, the compressor runs with capacity control
- machine with 1 compressor with several capacity controls: if the unloading is activated, the compressor runs with the capacity control set in Par. CO49
- machine with 2 compressors in the same circuit: the compressor with most operating hours is switched off

OPERATION

If the evaporator input water temperature is equal to or exceeds the set CO40, the unloading function of the circuits is activated after the delay time CO42 and the steps that remain active are those selected in par. CO49.

With the function active on the lower display label **AEun** flashes alternating with the measured quantity.

If the temperature is maintained higher than the activation set, the function ALWAYS remains engaged

If the temperature drops below the set CO40 - the differential CO41, the function is disabled.

When the evaporator input temperature drops below the set CO40, the count of the time set in Par. CO43 is activated and once this elapses, the function is disabled even if the temperature has not dropped below the set CO40 – diff CO41.

16.2 COMPRESSOR UNLOADING FUNCTION FROM THE EVAPORATION PRESSURE, CONDENSATION PRESSURE / TEMPERATURE

The function is active in any mode if the machine has at least 2 power steps in a circuit or if a compressor with inverter is configured.

The function is used to allow the machine to run (via capacity control of the compressors) in chiller mode even with high outdoor air temperatures (summer start-ups with very hot batteries), and to avoid possible high pressure intervention, or in Heat pump mode with critical outdoor air temperatures (winter start-ups with frozen batteries) and to avoid possible minimum pressure intervention.

If the evaporation transducer/s of circuit 1 or 2 have not been configured, the function is controlled via the analogue input configured as a condensation probe (circuit 1 or 2).

Depending on the value set in Par **CF07**, the control will take place in temperature or pressure (**CF07=0** temperature control, **CF07=1** pressure control).

If the evaporation transducer/s of circuit 1 or 2 in heat pump mode have not been configured, the unloading of the compressors is controlled by the condensation transducer.

Unloading operating examples:

- machine with 1 compressor + 1 capacity control: if the unloading is activated, the compressor runs with capacity control
- machine with 1 compressor with several capacity controls: if the unloading is activated, the compressor runs with the capacity control set in Par. CO49
- machine with 2 compressors in the same circuit: the compressor with most operating hours is switched off

OPERATING IN CHILLER MODE

The unloading of the compressors is controlled via the analogue input configured as a condensation probe of circuit 1 or condensation probe of circuit 2.

If the condensation pressure / temperature is equal to or exceeds the set CO44 in chiller mode, the unloading function of the circuit that the transducer / probe belongs to is activated and the only steps that remain engaged are those selected in par. CO49.

With the function active on the lower display label **b1Cu** or **b2Cu** flashes alternating with the measured quantity.

If the condensation pressure or temperature drops below the set CO44 - the diff. CO45 in chiller mode, the function is disabled.

When the condensation pressure / temperature drops below the set CO44 in chiller mode, the time set in Par. CO48 is counted and once this elapses, it is disabled even if the pressure / temperature has not dropped below the chiller set – differential.

ATTENTION:

If the temperature / pressure remains equal to or exceeds the activation set, the function ALWAYS remains engaged.

If compressors are used with capacity control steps, in case of unloading mode, to avoid oscillations within the circuit, once a step is engaged (capacity control valve) this step remains activated for a minimum time set in Par. CO50, even if the unloading condition is recalled and 100% operation is required. If Par. CO50 is set to 0 the function is disabled.

OPERATION IN HEAT PUMP MODE

The unloading of the compressors is controlled via the analogue input configured as an evaporation probe of circuit 1 or evaporation probe of circuit 2.

If the condensation / evaporation pressure is equal to or less than the set CO46, the unloading function of the circuit that the transducer / probe belongs to is activated and the steps that remain engaged are those selected in par. CO49; in the case of a compressor with inverter, this is forced to the speed set in parameter CO96.

With the function active on the lower display label **b1Cu** or **b2Cu** flashes alternating with the measured quantity.

If the evaporation pressure rises more than the set CO46 + the differential CO47, the function is disabled.

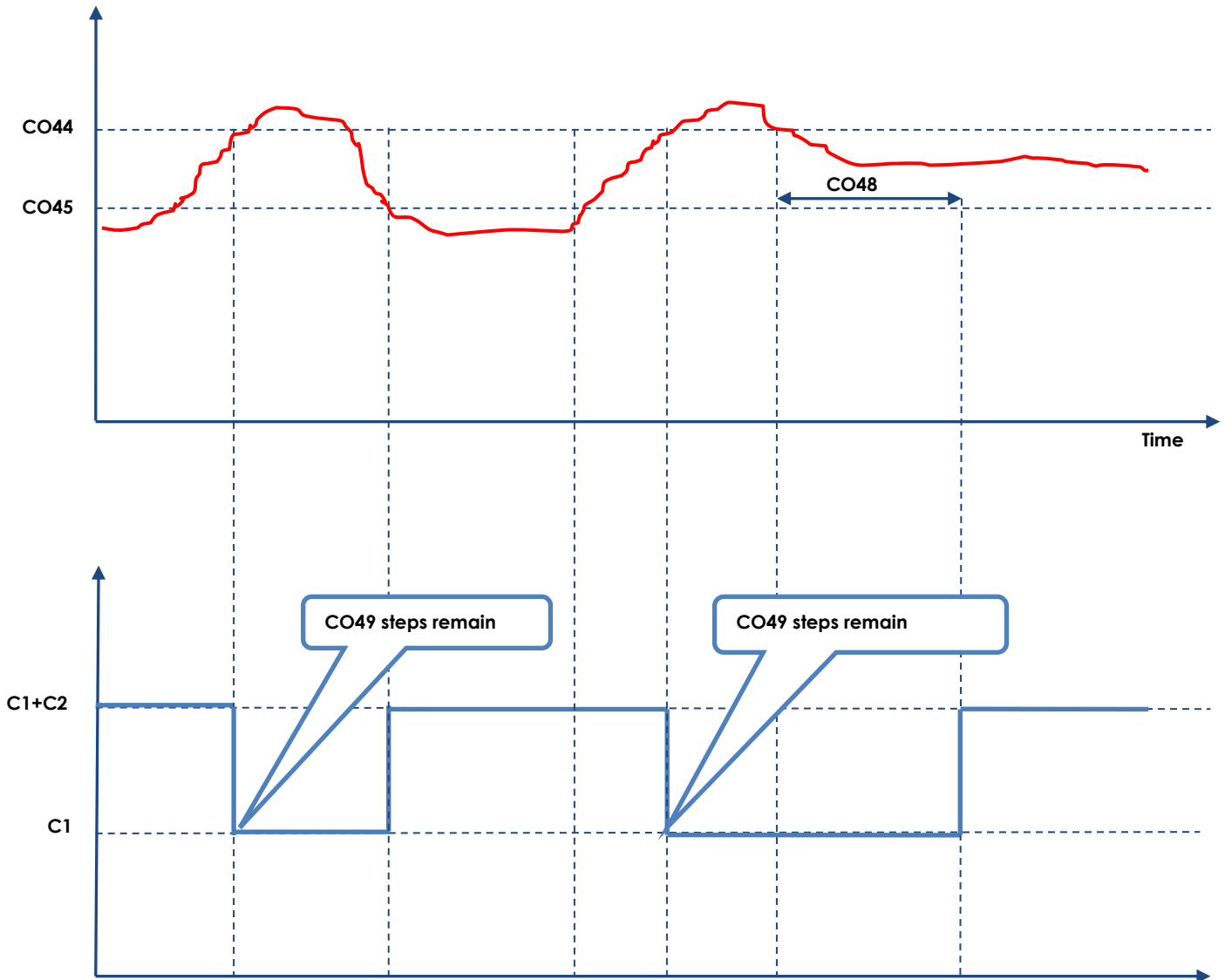
When the condensation / evaporation rises more than the set CO46, the time set in Par. CO48 is counted and once this elapses, it is disabled even if the pressure has not risen over (heat pump set + differential).

ATTENTION:

if the temperature / pressure remains equal to or exceeds the activation set, the function ALWAYS remains engaged

If compressors are used with capacity control steps, in case of unloading mode, to avoid oscillations within the circuit, once a step is engaged (capacity control valve) this step remains activated for a minimum time set in Par. CO50, even if the unloading condition is recalled and 100% operation is required. If Par. CO50 is set to 0 the function is disabled.

The graph below shows the logic in chiller mode:



16.3 COMPRESSOR UNLOADING FUNCTION FROM LOW EVAPORATOR WATER TEMPERATURE IN CHILLER MODE

The function is always active and enabled in chiller mode with at least 2 power steps in a circuit.

The function allows the machine to run (via the capacity control of the compressors) even with low evaporator water temperatures.

The unloading function is controlled via the analogue input configured as an NTC evaporator water input probe, common output and circuit output.

Unloading operating examples:

- machine with 1 compressor + 1 capacity control: if the unloading is activated, the compressor runs with capacity control
- machine with 1 compressor with several capacity controls: if the unloading is activated, the compressor runs with the capacity control set in Par. CO49
- machine with 2 compressors in the same circuit: the compressor with most operating hours is switched off

OPERATION

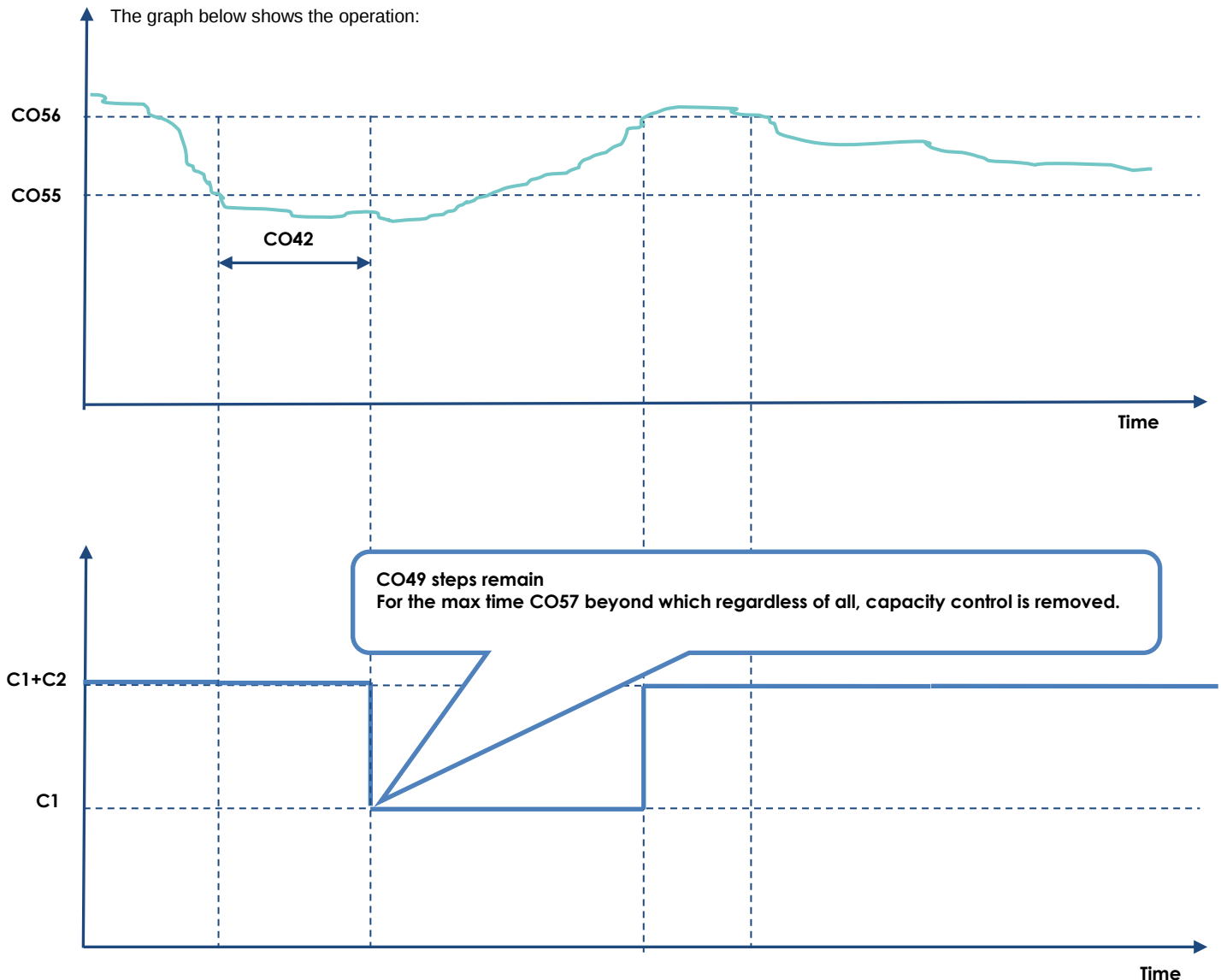
If the water temperature is equal to or less than the set CO55, the unloading function of the circuits is activated after the delay time CO42. When the function is active steps (compressors or capacity controls) configured in parameter CO49 remain active; in the case of a compressor with inverter, this is forced to the speed set in parameter CO96.

With the function active on the lower display label **b1EU – b2EU** flashes alternating with the measured quantity.

If the temperature rises more than the set CO55 - the differential CO56, the function is disabled.

Unloading cannot last for more than the time set in parameter CO57; once this time elapses, the function is disabled even if the temperature is below the set-point.

The graph below shows the operation:



16.4 COMPRESSOR UNLOADING FUNCTION FROM A DIGITAL INPUT

The function is always active and enabled in chiller mode with at least 2 power steps in a circuit.

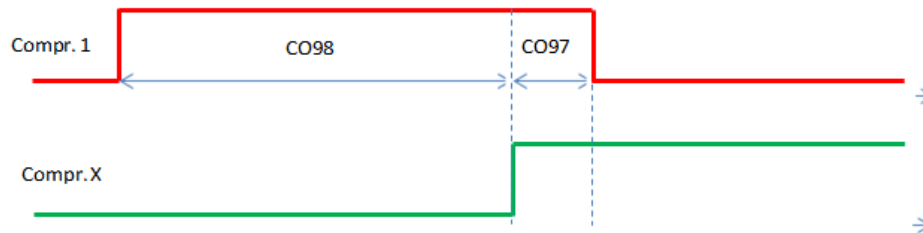
If unloading is activated from a digital input the display shows b1CU and/or b2CU.

If the Digital input is activated (together with all types of current unloading) the number of compressors of the circuit switched on goes to the value set in parameter CO49 and in case of a compressor with inverter, this goes to the value set in parameter CO96.

Unloading lasts for as long as the digital input will not be disabled.

In unloading the maximum switch-on counting time function of a single compressor in multi-compressor machines remains active; if a compressor (others available are off) remains on for the time set in CO72, another compressor among those available will be switched on (according to the logic given by CO14) and once the CO97 time elapses, the first compressor is switched off.

The time CO48 "Max unloading working time" is not used for the unloading function from a digital input.



17. COMPRESSOR LIQUID INJECTION SOLENOID VALVE FUNCTION

There are two relay outputs available to control a liquid injection solenoid valve for compressor 1 or 2.

The function is active for compressor if:

- a relay output is configured as a liquid injection solenoid valve of compressor 1 and an analogue input is configured as a PTC supply temperature probe of compressor 1.

The function is active for compressor 2 if:

- a relay output is configured as a liquid injection solenoid valve of compressor 2 and an analogue input is configured as a PTC supply temperature probe of compressor 2.

OPERATION

With the compressor off the relay output that controls the liquid injection solenoid valve is always OFF. With the compressor on, if the temperature measured by the PTC compressor supply temperature probe reaches set point CO51, the solenoid valve is activated. The valve is disabled when the measured temperature drops below set point CO51 - the differential CO52.

18. WATER SIDE SOLENOID VALVE FUNCTION

You can configure a water side solenoid valve for each circuit; this valve will have the following effect:

- The valve is activated in advance of CO92 seconds after the start-up of the first compressor in the circuit
- The valve is disabled with a delay of CO93 seconds after the last compressor of the circuit is switched off

19. CONDENSING OPERATION

Enable the function as condensing by configuring parameter CF03 = 1.

In this mode the adjustment probes are not used and the start-up of the compressors is related to the state of the digital inputs that activate each compressor.

The protection times of the compressors (CO01, CO02, CO03, CO04, CO91) remain active even in a condensing configuration.

19.1 OPERATION WITH A DIGITAL INPUT CONFIGURED AS A THERMOREGULATION REQUEST

Thermoregulation request digital input (condensing)

- With contact NOT ACTIVE and unit on stand by, the upper display shows **OFF**
- With contact ACTIVE and unit on stand by, the upper display shows **On**

With contact active, the chiller mode (the upper display shows **OnC**) or heat pump (the upper display shows **OnH**) must be selected from the keyboard; once the operating mode has been selected the step is also activated and the others (if available) will be recalled by the digital inputs configured as resources in the circuits (each digital input will consent for a compressor to switch on).

With contact active, if the unit was switched off from the keyboard, it must be switched back on from the keyboard. If the unit was switched off from the keyboard and is to be switched on from a digital input, it must be deactivated and reactivated.

The number of configured digital inputs must be the same as the number of steps required in the machine (compressors and capacity controls).

19.2 OPERATION WITH A DIGITAL INPUT CONFIGURED AS A CHILLER REQUEST

Unit configured as condensing CF03 = 1
Chiller request digital input (condensing)

- With contact NOT active and unit on stand by, the upper display shows **OFF**
- With contact active and unit on, the upper display shows **OnC**

With contact active, the unit is in chiller mode and a compressor is also activated; the others, if available, will be switched on by the activation of the digital inputs configured as resources in the circuits (each digital input will consent for a compressor to switch on).

With contact active, if the unit was switched off from the keyboard, it must be switched back on from the keyboard. If the unit was switched off from the keyboard and is to be switched on from a digital input, it must be deactivated and reactivated.

The number of configured digital inputs must be the same as the number of steps required in the machine (compressors and capacity controls).

19.3 OPERATION WITH A DIGITAL INPUT CONFIGURED AS A HEAT PUMP REQUEST

Unit configured as condensing CF03 = 1
Heat pump request digital input (condensing)

- With contact NOT active and unit on stand by, the upper display shows **OFF**
- With contact ACTIVE and unit on, the upper display shows **OnH**

With contact active, the unit is in chiller mode and a compressor is also activated; others, if available, will be illuminated by the activation of the digital inputs are configured as resources circuits (each digital input will give permission for 'turning on a compressor).

With contact active, if the unit was switched off from the keyboard, it must be switched back on from the keyboard. If the unit was switched off from the keyboard and is to be switched on from a digital input, it must be deactivated and reactivated.

20. ENERGY SAVING FUNCTION

20.1 ENERGY SAVING FUNCTION FROM A DIGITAL INPUT (DOUBLE SET POINT)

If one of the digital inputs is configured as Energy Saving, upon its activation:

- at the set point of the machine is applied to an offset of the parameters ES14 and ES16 (differentiated for chiller and heat pump);
- the disconnection differential of the compressors is set at the value set in parameters ES15 and ES17 (differentiated for chiller and heat pump modes)

20.2 ENERGY SAVING FUNCTION AND SWITCH-ON AND SWITCH-OFF WITH TIME BANDS

The function can be used if the controller has the clock on board.

Programming time bands:

parameters ES01 - ES06 let you set the start and end time bands

Enabling time bands:

parameters ES07 - ES13 allow the time bands to be enabled for each day of the week.

The parameters are structured in the following way; the parameter consists of two figures:

- the left digit "X" allows you to enable or disable the time bands concerning the Energy Saving (see the table below)
- the right digit "Y" allows you to enable or disable the time bands concerning machine switch-off (see the table below)

Energy saving or unit ON/OFF from time bands	0= operation from time bands is disabled 1= operation from time band 1 is enabled 2= operation from time band 2 is enabled 3= operation from time band 1 + 2 is enabled 4= operation from time band 3 is enabled 5= operation from time band 1 + 3 is enabled 6= operation from time band 2 + 3 is enabled 7= operation from time band 1 + 2 + 3 is enabled
Values of Par. ES07 – ES13	X Y where X ranges from 0 to 7 and represents enabling/operation with time bands for energy saving where Y ranges from 0 to 7 and represents enabling/operation with time bands for automatic switch-on/off

VIEWING THE ENERGY SAVING / AUTOMATIC SWITCH-ON AND OFF CONFIGURATION PARAMETERS ON THE DISPLAY



Energy Saving Set Point:

parameters ES10 - ES13 let you set the offsets to be added to/subtracted from the standard set points and differential values to be used when the function is active

ES10 Increase in the energy saving set point in chiller mode

ES11 Energy saving differential in chiller mode

ES12 Increase in the energy saving set point in heat pump mode

ES13 Energy saving differential in heat pump mode

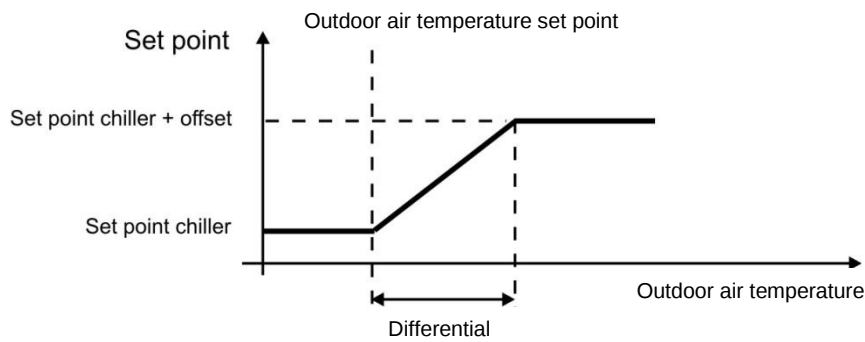
21. DYNAMIC SET-POINT FUNCTION

The regulator allows you to change the working set-point by adding or subtracting a proportional value depending on the temperature of the outdoor air (the outdoor air temperature probe must be configured). This function has two purposes: to save energy or to operate the machine with particularly harsh outdoor temperatures.

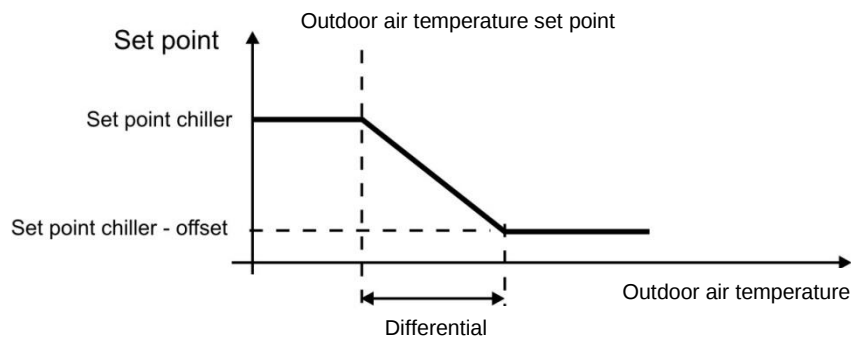
The regulator is active if:

- activation parameter Sd01 > 0 in chiller mode
- activation parameter Sd02 > 0 in heat pump mode
- a probe is configured as an outdoor air probe

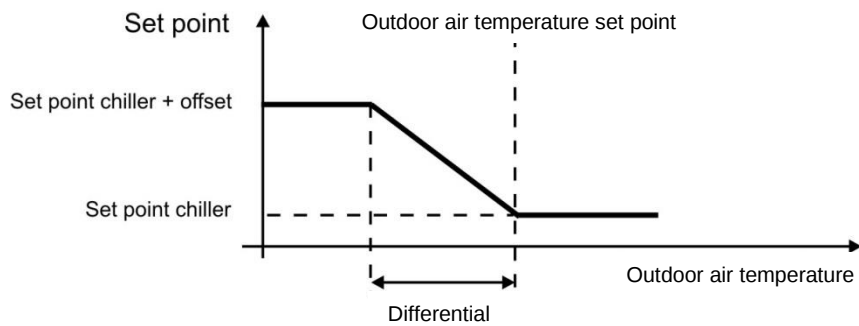
21.1 DYNAMIC SET-POINT FUNCTION GRAPHS



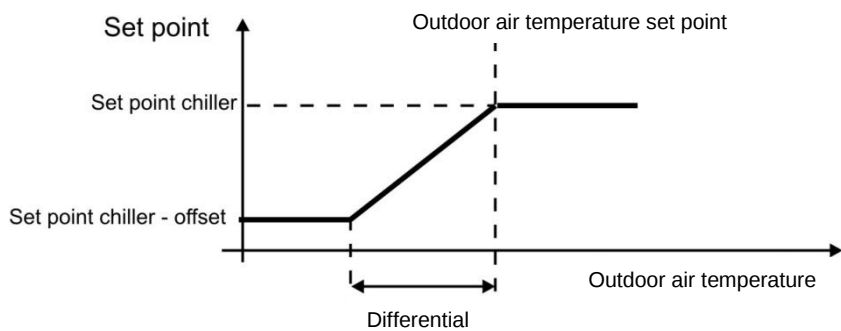
Outdoor air temperature probe with positive differential and positive offset



Outdoor air temperature probe with negative differential and positive offset



Outdoor air temperature probe with negative differential and offset



22. ANTIFREEZE / SUPPORT / BOILER HEATER REGULATOR

22.1 EVAPORATOR ANTIFREEZE HEATERS

22.1.1 ADJUSTMENT IN CHILLER MODE

Ar06 parameter allows you to choose the probe/s with which to adjust in chiller mode.

Ar06=0 disabled thermoregulation

Ar06=1 adjustment on the evaporator input temperature

Ar06=2 adjustment on the evaporator output temperature 1 / 2

Ar06=3 adjustment on the evaporator outlet temperature 1 / 2 and common output; if all three are configured according to the present probe the adjustment is carried out on the circuit or on the machine (common output)

Ar06=4 adjustment on the outdoor air temperature

One/two relays must be configured as a heater of circuit 1 and heater of circuit 2.

The adjustment set point is Ar01 and the differential is defined by parameter Ar02.

22.1.2 ADJUSTMENT IN HEAT PUMP MODE

Ar07 parameter allows you to choose the probe/s with which to adjust in heat pump mode.

Ar07=0 disabled thermoregulation

Ar07=1 adjustment on the evaporator input temperature

Ar07=2 adjustment on the evaporator output temperature 1 / 2

Ar07=3 adjustment on the evaporator outlet temperature 1 / 2 and common output; if all three are configured according to the present probe the adjustment is carried out on the circuit or on the machine (common)

Ar07=4 adjustment on the outdoor air temperature

One/two relays must be configured as a heater of circuit 1 and heater of circuit 2.

The adjustment set point is Ar03 and the differential is defined by parameter Ar04.

22.1.3 HEATERS IN CASE OF A FAULTY PROBE

You can determine the behaviour of the evaporator heaters in case of a fault in the adjustment probe:

- Ar10=0 the heaters are off
- Ar10=1 the heaters are forced off

22.1.4 HEATERS WITH DEVICE SET TO OFF OR STD-BY

You can determine the behaviour of the evaporator heaters when the controller is OFF and STD-BY:

- Ar09=0 the heaters are off
- Ar09=1 the heaters are enabled to work according to their regulator

0=always in remote OFF or STAND BY

1=on in remote OFF or STAND BY (on according to the thermoregulator request)

22.1.5 ANTIFREEZE HEATER OPERATION DURING THE DEFROST CYCLE

Parameter Ar05 determines the operation of the antifreeze heaters during the defrost cycle; Ar05= 0 during the defrost cycle the heaters are only activated by their normal adjustment, if Ar05=1 the heaters are always switched on during the defrost cycle (they go on when the inversion valve converts the mode from heat pump to chiller and they go off when the dripping time elapses).

22.2 ADJUSTMENT OF THE AIR/AIR UNIT SUPPORT HEATERS

You can configure two relay outputs as a support heater of circuit 1 and a support heater of circuit 2; the reference probe is the adjustment probe of the chiller / heat pump.

The set point is defined by parameters:

- Ar01 = support heaters set point in chiller mode
- Ar02 = support heaters differential in chiller mode
- Ar03 = support heaters set point in heat pump mode
- Ar04 = support heaters differential in heat pump mode

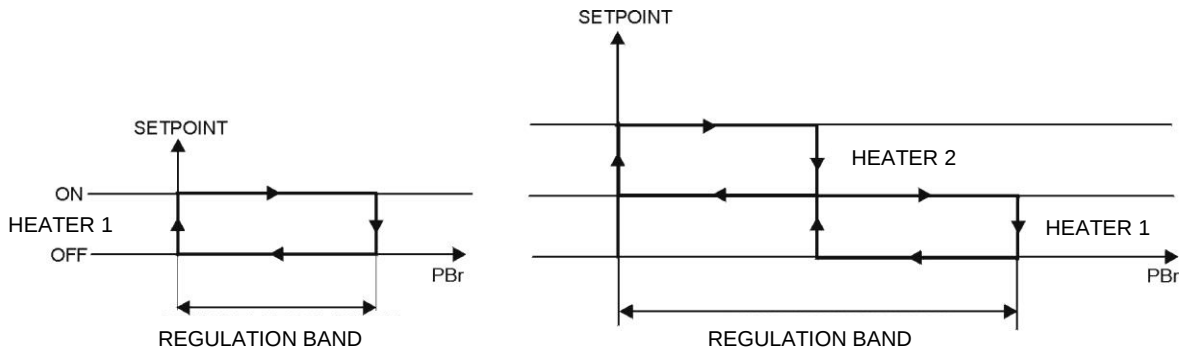
SUPPORT HEATER OPERATION DURING THE DEFROST CYCLE

Parameter Ar05 determines the operation of the support heaters during the defrost cycle; if the value is 0, during the defrost cycle the heaters are only activated by their normal adjustment; if the value is 1, the heaters are activated by their thermoregulation and are always switched on during the defrost cycle:

they go on when the inversion valve converts the mode from heat pump to chiller and they go off when the dripping time elapses and the compressor starts.

ATTENTION: the support heaters are always off if the supply fan is off, if the unit is on standby or remote OFF and also if the probe that controls them is faulty even if Par Ar10=1.

SUPPORT HEATERS OPERATION GRAPHS



22.3 THE THERMOREGULATION OF THE CONDENSER ANTIFREEZE HEATERS

Parameter Ar08 allows you to choose the probe on which to carry out the thermoregulation of the heaters in chiller and heat pump mode.

Par. **Ar08 = 0**

The adjustment of the heaters is disabled.

Par. **Ar08 = 1**

The adjustment of the heaters of circuit 1 and 2 is carried out **ONLY** via the NTC probe configured as a condenser water input

Par. **Ar08 = 2**

The adjustment of the heaters of circuit 1 and 2 (controlled in parallel) can be carried out via the NTC probes configured as condenser water inputs of circuit 1 or 2 or a common input, or if all three are configured, from the first probe that detects a temperature lower than the activation set point.

Par. **Ar08 = 3**

The adjustment of the heater relay output of circuit 1 is carried out via the NTC probe configured as a condenser water output of circuit 1.

The adjustment of the heater relay output of circuit 2 is carried out via the NTC probe configured as a condenser water output of circuit 2.

The heater relay output of circuit 1 cannot be controlled with the condenser water output NTC probe of circuit 2 and vice versa

Par. **Ar08 = 4**

The adjustment of the heaters of circuit 1 and 2 (controlled in parallel) can be carried out via the NTC probes configured as condenser water outputs of circuit 1 or 2 or a common output, or if all three are configured, from the first probe that detects a temperature lower than the activation set point.

Par. **Ar08 = 5**

The parallel adjustment of the two heater relay outputs of circuit 1 and 2 is carried out **ONLY** via the NTC probe configured as an outdoor air temperature probe

The adjustment set points are:

- Operating in chiller mode
 - Ar28 Condenser antifreeze heaters set point in chiller mode
 - Ar29 Condenser antifreeze heaters differential in chiller mode
- Operating in heat pump mode
 - Ar30 Condenser antifreeze heaters set point in heat pump mode
 - Ar31 Condenser antifreeze heaters differential in heat pump mode

22.3.1 HEATERS IN CASE OF A FAULTY PROBE

You can determine the behaviour of the condenser heaters in case of a fault in the adjustment probe:

- Ar33=0 the heaters are off
- Ar33=1 the heaters are forced off

22.3.2 HEATERS WITH DEVICE SET TO OFF OR STD-BY

You can determine the behaviour of the condenser heaters when the controller is OFF and STD-BY:

- Ar32=0 the heaters are off
- Ar32=1 the heaters are enabled to work according to their regulator

0=always in remote OFF or STAND BY

1=on in remote OFF or STAND BY (on according to the thermoregulator request)

22.4 ADJUSTMENT OF THE BOILER HEATERS (HP UNIT STOP FUNCTION BY TEMPERATURES BELOW THE OPERATING LIMIT AND ANY INTEGRATION

The boiler heaters can be used as integration/heating to the heat pump and, in particular applications, in chiller mode.

The function is enabled if:

1. a probe is configured as an NTC dynamic set point / boiler function outdoor air temperature probe
2. the Ar11 parameter is other than zero

Integration check Ar11=1

In normal operation, when the outdoor air temperature drops below the set point values Ar12, the Ar14 delay begins.

If during the Ar14 count the outdoor air temperature rises above the value set in par. Ar12 + differential Ar13 the function is cancelled and the Ar14 time is reloaded.

Once the Ar14 time elapses, if the outdoor air temperature drops below the Ar12 set point and the adjustment temperature is below the Ar15 set point in chiller mode or Ar17 in heat pump mode the heaters are engaged.

When the adjustment temperature rises above the Ar15 or Ar17 set point plus the differential Ar16 or Ar18, the heaters are off (if two heaters are configured, one per circuit, they will then be switched off in steps by dividing the differential in two).

During operation with the heaters active, if the outdoor air temperature exceeds the Ar12 set value + the Ar13 differential, the heaters are switched off and the Ar14 time reloaded

With boiler heaters engaged, if the outdoor air temperature drops below the set point in Ar19, the compressors are switched off.

The compressors are switched back on if the outdoor air temperature returns above the Ar19 set + Ar20 differential.

Heating check Ar11=2

In normal operation, when the outdoor air temperature drops below the set point values Ar12, the Ar14 delay begins.

If during the Ar14 count the outdoor air temperature rises above the value set in par. Ar12 + differential Ar13 the function is cancelled and the Ar14 time is reloaded.

Once the Ar14 time elapses, if the outdoor air temperature remains below the Ar12 set point and the adjustment temperature is below the Ar15 set point in chiller mode or Ar17 in heat pump mode the heaters are switched on and the compressor/s and the heating takes place via the heaters.

The heaters are off when set point Ar15 + regulation band Ar16 are reached in chiller mode or Ar17 + regulation band Ar18 in heat pump mode.

During operation with the heaters active, if the outdoor air temperature exceeds the Ar12 set value + the Ar13 differential, the heaters are switched off and the compressor/s is/are switched on (according to the delay times) and the Ar14 time is reloaded

BOILER HEATER OPERATION DURING THE DEFROST CYCLE

Parameter Ar05 also determines the operation of the boiler heaters during the defrost cycle:

- Ar05=0 the heaters are off during the defrost cycle
- Ar05=1 the heaters are always switched on during the defrost cycle (they go on when the inversion valve converts the mode from heat pump to chiller and they go off when the dripping time elapses).

ATTENTION

The heaters are switched off by the following when in boiler mode:

- with an active flow switch alarm
- with 1 evaporator water pump configured with an active water pump circuit breaker alarm
- with 2 evaporator water pumps configured with an active water pump circuit breaker alarm and neither water pump is available (in this case the boiler heaters are only activated by the antifreeze set point so as to protect the evaporator)

23. SUPPLY FAN / EVAPORATOR WATER PUMP OPERATION

23.1 ONLY ONE RELAY IS CONFIGURED AS A SUPPLY FAN / EVAPORATOR WATER PUMP (AIR / AIR UNIT)

Supply fan / evaporator pump operating mode

If **CO16=0**= Absent the pump and supply fan are not managed.

If **CO16=1**= Continuous operation.

Switching on of the pump or of the supply fan is linked to switching on of the unit.

When the water pump first switches on, the compressors will only switch on if the time set in **CO17** has elapsed since the pumps switched on.

The water pump and supply fan are only deactivated when the unit switches off (unit on stand by). If the parameter **CO18>0**, by setting the unit on stand by, the water pump or supply fan switch off only after the time set in the parameter **CO18**.

If **CO16 = 2**= Operation upon compressor call.

Switching on and off of the pump and supply fan are linked to the compressor switching on and off. Both in chiller and heat pump mode, when thermoregulation requests that the compressors switch on and the parameter **CO17>0**, first the water pump (or air/air supply fan) is activated and, after the time set in **CO17**, the compressors switch on.

When the compressors are requested to switch off, if the parameter **CO18>0**, first the compressors will be deactivated and then, after the time set in **CO18**, the water pump (or air/air supply fan).

The pump is off if:

- the machine is in remote OFF
- the evaporator water pump circuit breaker protection is active
- the evaporator water flow switch circuit is active with a manual alarm

In defrost during periods when the compressor is dripping OFF, the pump / supply fan remain on.

24. EVAPORATOR SUPPORT WATER PUMP / EVAPORATOR WATER PUMP PUMPING UNIT OPERATION

If 2 relays are configured as an evaporator water pump and evaporator support water pump, pumping unit management has been enabled. The evaporator pump is always on upon the first machine start-up; the water pump with the least operating hours will be activated upon the subsequent start-ups.

If an alarm blocks the water pump that is active at that time, the disabled pump will be switched on.

24.1 EVAPORATOR WATER PUMP ROTATION VIA PARAMETER

If par. **CO19>0**, if one of the two water pumps reaches the working hours set in the parameter, the pump running at that moment switches off and the other switches on.

During rotation, the pumps run simultaneously for the time set in the parameter **CO20** and then the one with the greatest number of working hours switches off.

24.2 EVAPORATOR PUMP ANTIFREEZE MANAGEMENT

Ar24 determines the operation of the water pump according to the antifreeze when the instrument is in OFF or Stand by.

Par. Ar24

0= always in remote OFF or Stand by

1= on if the temperature of the probe determined by Ar24 is lower than set point Ar26 (with switch-off hysteresis equal to Ar27).

Par. Ar25= Pump/s operation for antifreeze thermoregulation probe

0= disabled

1= controls on evaporator input

2= controls on evaporator 1 / 2 output

3= controls on evaporator 1 / 2 output and common output

4= controls on external air temperature

Par. Ar26 = Pump activation set point in antifreeze mode on thermoregulation probe

Par. Ar27 = Pump deactivation differential in antifreeze mode on thermoregulation probe

If the evaporator antifreeze heaters are on by antifreeze the water pump will also be on in parallel.

24.3 PERIODIC SWITCH-ON OF THE WATER PUMP

If the water pump is off (by normal adjustment or because the machine is in Std-by or OFF), periodic start-ups are possible to move the water inside the pipes and detect the adjustment temperature or to prevent the pump from blocking due to prolonged inactivity.

If the machine is switched on at the end of the forced pump switch-on, the detection of the temperature adjustment will be carried out (in the case of air/water and water/water machine); if there is a request to activate the compressor/s, they will be switched on.

In the case of the condenser pump, once the forced switch-on is complete, if the adjustment probe of the heat pump (determined by parameter St10) is the condenser water input/output probe, the water temperature will be detected and if there is a request to switch the compressor/s on, they will be switched on.

Parameters CO85 and CO88 are active if the machine is on, whereas parameters CO86 and CO89 are active if the machine is OFF or on Std-by.

If there is regulation request upon machine start-up, the forced switch-on cycle of the water pump/s will be activated.

25. CONDENSER WATER PUMP OPERATION

Condenser pump operating mode

If **CO21=0**= Absent the pump and supply fan are not managed.

Switching on of the condenser pump is linked to switching on of the unit.

When the water pump first switches on, the compressors will only switch on if the time set in **CO17** has elapsed since the pumps switched on.

The condenser pump is only disabled when the machine switches off (unit on stand by). If the parameter **CO23>0**, by setting the unit on stand by, the water pump switches off after the time set in the parameter **CO23**.

If **CO21 = 2**= Operation upon compressor call.

Switching on and off of the pump and supply fan are linked to the compressor switching on and off. Both in chiller and heat pump mode, when thermoregulation requests that the compressors switch on and parameter **CO16>0**, first the water circulation pump is activated and, after the time set in **CO16**, the compressors switch on.

When the compressors are requested to switch off, if the parameter **CO23>0**, first the compressors will be deactivated and then, after the time set in **CO23**, the water pump (or air/air supply fan).

The pump is off if:

- the machine is in remote OFF
- the evaporator water pump circuit breaker protection is active
- the evaporator water flow switch circuit is active with a manual alarm

25.1 CONDENSER SUPPORT WATER PUMP / CONDENSER WATER PUMP PUMPING UNIT OPERATION

If 2 relays are configured as an condenser water pump and condenser support water pump, pumping unit management has been enabled. The evaporator pump is always on upon the first machine start-up; the water pump with the least operating hours will be activated upon the subsequent start-ups.

If an alarm blocks the water pump that is active at that time, the disabled pump will be switched on.

25.2 CONDENSER WATER PUMP ROTATION VIA PARAMETER

If par. **CO24>0**, if one of the two water pumps reaches the working hours set in the parameter, the pump running at that moment switches off and the other switches on.

During rotation, the pumps run simultaneously for the time set in the parameter **CO25** and then the one with the greatest number of working hours switches off.

25.3 CONDENSER PUMP MANAGEMENT BY ANTIFREEZE

During normal operation, if the temperature of the probe defined by parameter Ar35 drops below the threshold Ar36, the water pump is activated.

Switch-off occurs if the temperature exceeds the threshold $Ar36 + Ar37$.

Ar34 determines the operation of the pump/s according to the antifreeze when the instrument is in OFF or Stand by.

Ar34= determines the operation of the pump/s for antifreeze when the instrument is in OFF or Stand-by

Ar34=0 The pump is in remote OFF or Stand by

Ar34=1 The pump is enabled to operate with the probe determined by parameter Ar35 and set point Ar36

Par. Ar35= Pump/s operation for antifreeze regulation probe

0 = disabled regulation

1 = common condenser input probe

2 = common condenser input probe + condenser input probe of circuit 1 + condenser input probe of circuit 2

3 = condenser output probe of circuit 1 + condenser output probe of circuit 2

4 = common condenser output probe + condenser output probe of circuit 1 + condenser output probe of circuit 2

5 = outdoor air temperature

Par. Ar36 = Pump activation set point in antifreeze mode on thermoregulation probe

Par. Ar37 = Pump deactivation differential in antifreeze mode on thermoregulation probe

26. CONDENSATION FAN REGULATOR

Parameters FA01 and FA02 allow you to manage the various types of operation of the condensation fans.

In the case of modulating ventilation, one or two analogue outputs must be configured as a condensation fan of circuit 1 and circuit (if necessary).

Par. FA01 fan adjustment

0 = no ventilation output/s

1 = always on

2 = step ON/OFF regulation

3 = continuous step ON/OFF regulation

4 = proportional speed adjustment

Par. FA02 fan operating mode

0 = dependent on the active fan compressor only if the compressor is active

1 = active fans independent from the compressor with their mode selected as off on stand by / remote OFF

FA01 – FA02 PARAMETER COMBINATIONS

Par. FA01 = 1 + Par. FA02 = 0

ON when the compressor is active (parallel operation)

Par. FA01 = 1 + Par. FA02 = 1

Switched on independently from the compressor (unless unit is on stand by)

Par. FA01 = 2 + Par. FA02 = 0

ON when the compressor is active with ON/OFF step regulation (with at least one relay configured as step condensation control) controlled by condensation temperature/pressure / evaporation pressure. When the compressor switches off, the fans switch off regardless of the condensation temperature / pressure / evaporation pressure.

Par. FA01 = 2 + Par. FA02 = 1

ON when the compressor is active with ON/OFF step regulation (with at least one relay configured as step condensation control) controlled by condensation temperature/pressure / evaporation pressure. When the compressor switches off, the fans switch off according to the value) controlled by the condensation temperature / pressure / evaporation pressure.

Par. FA01 = 3 + Par. FA02 = 0

ON when the compressor is active with continuous ON/OFF step regulation (with at least one relay configured as step condensation control) controlled by condensation temperature/pressure / evaporation pressure. When the compressor switches off, the fans switch off regardless of the condensation temperature / pressure / evaporation pressure.

Par. FA01 = 3 + Par. FA02 = 1

ON when the compressor is active with continuous ON/OFF step regulation (with at least one relay configured as step condensation control) controlled by condensation temperature/pressure / evaporation pressure. When the compressor switches off, the fans switch off according to the value) controlled by the condensation temperature / pressure / evaporation pressure.

Par. FA01 = 4 + Par. FA02 = 0

ON when the compressor is active with proportional adjustment (PHASE CUT / 0÷10V / 4÷20mA output) controlled by condensation temperature/pressure. When the compressor switches off, the fans switch off regardless of the condensation temperature / pressure.

Par. FA01 = 4 + Par. FA02 = 2

ON when the compressor is active with proportional adjustment (PHASE CUT / 0÷10V / 4÷20mA output) controlled by condensation temperature/pressure. When the compressor switches off, the fans switch off according to the value of the condensation temperature / pressure.

26.1 PHASE CUT / 4÷20MA / 0÷10V PROPORTIONAL OUTPUT

Set parameter FA01=4 for the condensation fan/s to be connected to the proportional output.

Both in Chiller mode and Heat pump mode, upon every start-up, regardless of the condensation temperature / pressure, the fan is powered at the maximum voltage for a certain time (set in parameter), after which the fan continues at the speed set by the regulator.

Parameter FA04 determines a delay in micro seconds to compensate for the different characteristics of electric motors; the inductive component of the fan motor involves the phase shift between current and voltage, which must be considered during the piloting of the fan. Parameter FA14 determines the switch-off delay of the fan when the compressor is off; If FA01=4 and upon compressor start-up the proportional regulator requires the fan to switch-off:

- if FA14=0, the function is not enabled.
- if FA14>0, the fan will be forced to minimum speed for the set time and then switched off

The analogue output and digital ON/OFF output are interlinked:

- if the analogue output value >0, the digital output will be active
- if the analogue output value <0, the digital output will be disabled.

26.2 IF STEP RELAY OUTPUTS ARE USED

There are up to 4 relay outputs to control the condensation fans, each relay configured as a ventilation step is assigned its own activation / deactivation set point and differential

OPERATING LOGIC

Par FA01 = 3 continuous ON / OFF step connection

They can all be connected / disconnected in the case of an evap. cond. temperature / pressure request and depending on the polarity chosen.

In the case of an evap. cond. temperature / pressure request only the requested step is connected/disconnected and the others remain according to the all connected/disconnected polarity chosen.

1 circuit with four ventilation steps

Direct continuous step connection

OUT relay	Step 1	Step 2	Step 3	Step 4
Relay out step 1	Step 1 ON	Step 1 ON	Step 1 ON	Step 1 ON
Relay out step 2	Step 2 OFF	Step 2 ON	Step 2 ON	Step 2 ON
Relay out step 3	Step 3 OFF	Step 3 OFF	Step 3 ON	Step 3 ON
Relay out step 4	Step 4 OFF	Step 4 OFF	Step 4 OFF	Step 4 ON

26.3 SINGLE OR SEPARATE CONDENSATION

FA05 Determines how many condenser fan batteries there are

Parameter FA05 allows you to configure the 2-circuit machines with a single condenser.

Parameter FA05 type of condensation

0= single condensation

1= separate condensers

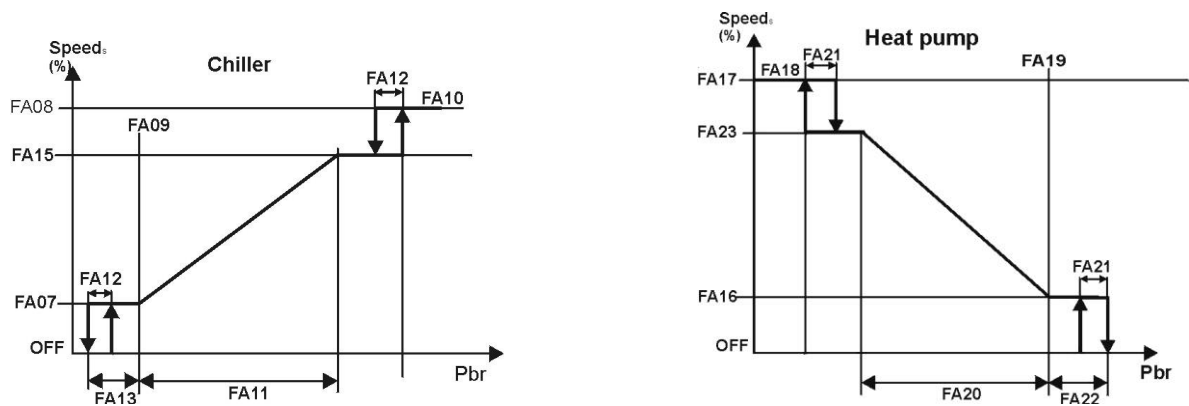
If par. FA05 = 1 the two circuits of the condensation ventilation (if the probes are not configured in evaporation pressure) in chiller or heat pump mode they are independent and depend on the condensation pressures / temperatures and the status of the compressors of the circuits. (if the evaporation transducers are configured in hp, the ventilation depends on the values of the evaporation pressure and in chiller mode on the condensation detected in the two circuits)

If FA05 = 0 and FA01 = 4 the outputs of the 2 fans are in parallel (**if the second proportional output is also configured as a condensation control it will work in parallel**) and the adjustment is made:

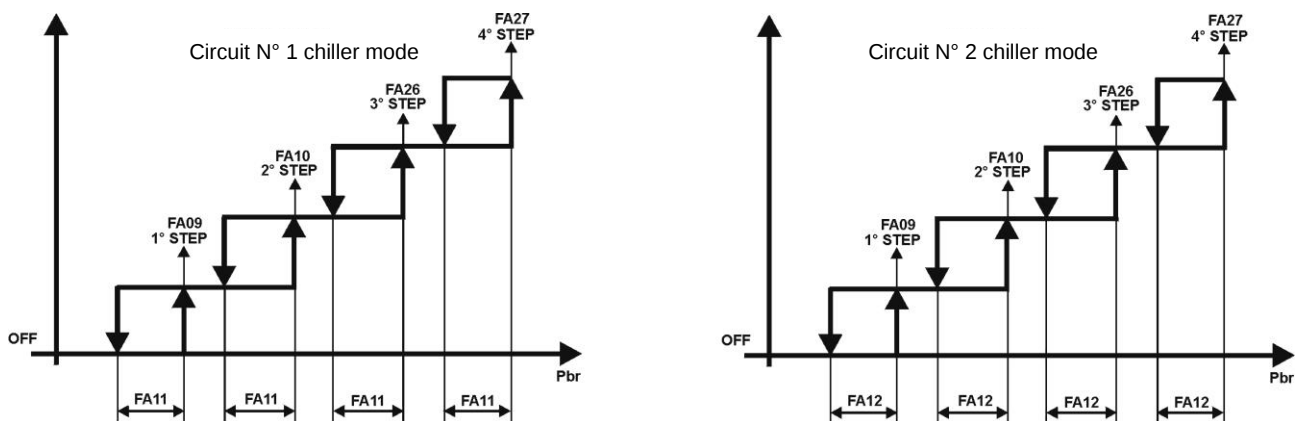
- in **CHILLER mode on the maximum** between the condensation temperature / pressure probes of the circuits
- in **HEAT PUMP mode (if the evaporation probe is not configured) on the minimum** between the condensation temperature / pressure probes of the circuits
- in **HEAT PUMP mode (if the evaporation probe is configured) on the minimum** between the evaporation pressure probes of the circuits

ATTENTION: if Par FA01 = 2/3 and Par FA05 = 0 the step adjustment in both exchange and continuous will occur by configuring the resources of circuit 1 (relay outputs), using the differential of circuit 1 and the ventilation circuit breaker alarm from the common fan circuit breaker input.

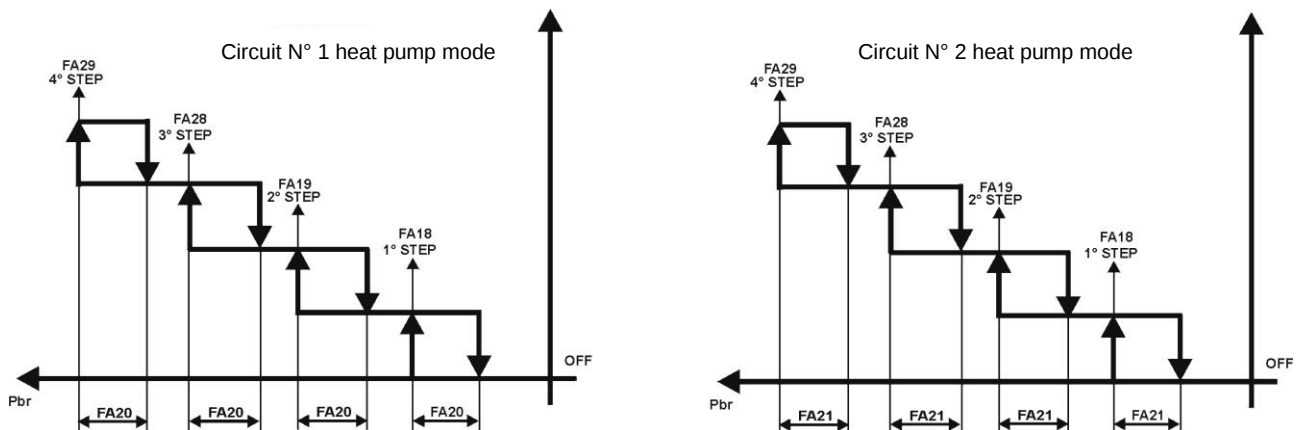
26.4 PROPORTIONAL FAN REGULATOR GRAPH



26.5 CONDENSATION FAN REGULATOR IN CHILLER MODE ON / OFF GRAPH



26.6 CONDENSATION FAN REGULATOR IN HP MODE ON / OFF GRAPH



26.7 PRE-VENTILATION

Pre-ventilation:

in chiller and heat pump mode, when it is required to switch on the first compressor of the circuit, if the parameter FA06≠0 (pre-ventilation time in chiller mode) and/or parameter FA30≠0 (pre-ventilation time in heat pump mode) pre-ventilation will take place at the maximum fan speed.

26.8 MODULATION OF THE CONDENSATION FANS IN DEFROST

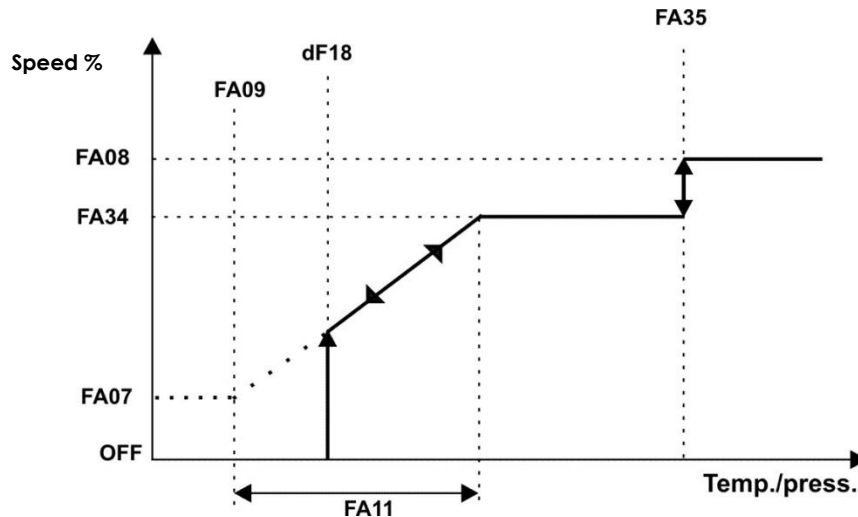
During defrost the condensation fans adjust as shown in the figure below.

The basic adjustment is that of chiller mode, with the following differences:

- the temperature / pressure threshold to enable the fans is determined by parameter dF18
- once the fans are started, modulation occurs between the pressure values dF18 and FA09+FA11
- the speed at the end of modulation is determined by parameter FA34
- in case of an increase in the temperature/pressure to a value higher than FA35, the fans are forced to the maximum speed of FA08

Note:

for proper operation FA35 must be greater than FA09+FA11.



27. DEFROST FUNCTION

The defrost can be configured if:

- The machine is air/air or air/water type with heat pump
- The defrost enabling parameter dF01>0

A relay can be set which will only be activated if the defrost is active; the relay will be active as soon as the defrost procedure begins and will be disabled when the procedure ends (therefore after the dripping phase is complete).

FORCED DEFROST

The function is enabled if parameter dF19>0. It allows you to run a forced defrost cycle if the condensation or evaporation temperature / pressure remains below set point dF20 for dF19 time. If during the dF19 time the condensation or evaporation temperature / pressure rises above set point dF20 + differential dF21, the dF19 time is reloaded.

PERFORM THE FOLLOWING STEPS IN ORDER TO START AN AUTOMATIC DEFROST CYCLE:

STEP 1: dF09 count DEFROST INTERVAL

If at least one compressor is on and the conditions allow the defrost to begin, counter dF09 begins to decrease.

Notes on the count of the interval between two defrosts:

1. **The dF09 counter is reloaded** if there is a power cut or after the defrost cycle or when the operating mode is changed.
2. **The dF09 counter stops** if the compressor is switched off or if the condensation or evaporation temperature / pressure measured by the probe is higher than dF02
3. **The dF09 counter is decreased** if the condensation or evaporation temperature / pressure detected by the condensation probe is lower than set point dF02
4. Move on to step 2 when the counter is zero

STEP 1: INTERVAL BETWEEN TWO DEFROSTS

If at least one compressor is on and the conditions allow the defrost to begin, the interval counter between two defrosts dF09 begins to decrease.

Possible conditions of defrost start:

- condensation pressure/temperature < dF02, or
- evaporation pressure < dF02, or
- the defrost start digital contact is active

Note:

manual defrost as well as forced defrost do not consider the delay times set in Par. dF06 / dF09 and the defrost process (with the conditions fulfilled) will be executed immediately on both circuits.

STEP 2: START DEFROST

If once the interval count between two defrosts ends the defrost conditions are still ongoing, the procedure begins:

1. All compressors in the machine/circuit are switched off
2. The dF07/2 time count begins
3. Once dF07/2 elapses the status of the inversion valve is inverted
4. The dF07/2 time count begins
5. The defrost cycle begins; if by adjustment or by parameter, the start of more than one compressor per circuit is required by the compressors of that circuit being switched on once the dF16 time elapses.

During the defrost, the compressor is forced to 100% power.

You can force all steps/compressors of the circuit via parameter dF14 (dF14=1).

If the compressor with inverter is used the operating frequency is set by parameter CO94.

If dF07=0 the status of the inversion valve is inverted without switching the compressor/s off.

The defrost lasts a minimum of dF04 seconds.

The condensation fans can be switched off or on by setting a temperature/pressure (dF18) threshold and they follow the chiller adjustment according to the value of the condensation probe.

STEP 3: END OF DEFROST

The defrost ends if:

1. If dF02=1
 - temperature/pressure detected by the condensation probe/s > dF03
 - in the case of combined defrost probes being used, if the combined defrost temperature > dF11 or dF13
2. If dF01=2, the maximum defrost time dF05 has been reached
3. If dF01=3, if the digital input configured as end of defrost is disabled

End of defrost procedure:

1. All compressors that are switched on for the defrost are switched off
 2. The dF08/2 time count begins
 3. Once dF08/2 elapses the status of the inversion valve is inverted
 4. The dF08/2 time count begins
 5. Once dF08/2 elapses the machines resumes its normal operation
- If dF08=0 the status of the inversion valve is inverted without blocking the compressor.

MANUAL DEFROST

If the condensation temperature/pressure is less than parameter dF03 (end of defrost temperature/pressure), press the SET key and then the UP key for 5 seconds to force the defrost to start, which ends with the standard procedure (by temperature/pressure or maximum time or external contact).

MACHINES WITH SINGLE DEFROST

In the case of a machine with two circuits, the defrost is single if the machine has a single condenser selected via parameter FA05.

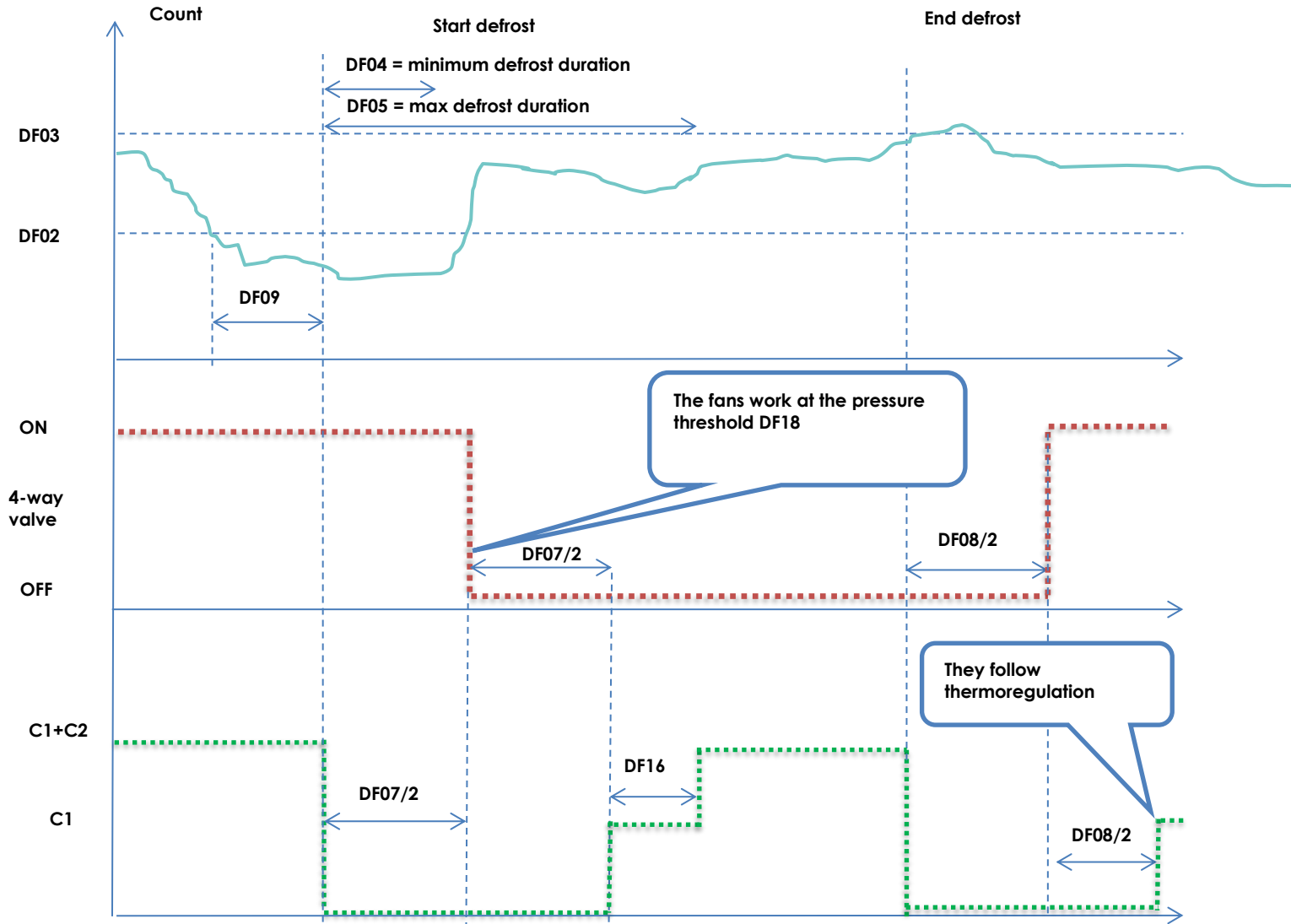
Parameter FA05 type of condensation

FA05=0 single condensation

FA05=1 separate condensation

In single defrost machines the circuits must start defrosting at the same time.

The graph below shows the defrost phase:



27.1 START AND END OF DEFROST IN A MACHINE WITH TWO CIRCUITS

STARTING THE DEFROST CYCLE IN A UNIT WITH TWO CIRCUITS

Depends on the value of parameter dF22

0= independent

1= if both have reached the start defrost request

2= if at least one has reached the start defrost request

END OF DEFROST CYCLE IN A UNIT WITH TWO CIRCUITS AND SINGLE CONDENSATION VENTILATION

Depends on the value of parameter dF23

0= independent

1= if both have reached the end of defrost request

2= if at least one has reached the end of defrost request

Singe condensation: possible configurations

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

CAUTION:

A configuration error ACF1 is generated if parameters dF22 and dF23 have values that are not allowed (see table).

Separate condensation: possible configurations

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

CAUTION:

A configuration error ACF1 is generated if parameters dF22 and dF23 have values that are not allowed (see table).

27.2 DESCRIPTION OF THE DEFROST PARAMETERS

dF01 Determines the type of defrost

0= Disabled defrost

1 = Defrost in temperature / pressure. The time count of the defrost interval dF09 occurs when the temperature drops below set point dF02. The defrost cycle ends due to temperature or pressure.

2 = Timed defrost. The time count of the defrost request delay dF09 occurs when the temperature / pressure drops below set point dF02 (see the start probe par. dF24). The defrost cycle ends due to the maximum time dF05.

3 = Defrost by external contact. The time count of the defrost request delay dF09 occurs when the temperature / pressure drops below set point dF02 (see the start probe par. dF24). The defrost cycle ends with the digital input active.

4 = Defrost is carried out with only the condensation fans if the outdoor air temperature is higher than the value of parameter dF26; at lower temperatures the defrost will be carried out with cycle inversion using the compressors.

5 = Defrost starts when the external contact is active and ends if the temperature/pressure of the end of defrost probe configured in parameter dF24 exceeds the end of defrost set point dF03. When the external contact is active, the delay time between two defrosts begins; once the count ends the defrost starts if the end of defrost temperature/pressure is lower than the end of defrost set point.

dF02 Count start temperature / pressure that determines the request delay between two subsequent defrosts.

It allows a temperature / pressure set point to be set below which the count begins.

dF03 Temperature / pressure of end of defrost.

It allows a temperature / pressure set point to be set which determines the end of the defrost cycle.

dF04 Minimum defrost duration

It allows you to set a time that determines the minimum duration of this once the defrost cycle begins (even if the end situations are exceeded).

dF05 Maximum duration of the defrost cycle

It allows you to set a maximum defrost time if dF01 = 2 it determines the end. In other cases it determines the maximum duration.

dF06 delay between the next defrost between two circuits once the interval time dF09 elapses, relating to the requested circuit, before the defrost input the time set in par. dF06 must have elapsed

Active if you configure a machine with 2 cooling circuits.

dF07 Waiting time before defrost (the compressor LED flashes during this phase)

Once the time set from dF09 elapses, before the actual activation of the defrost cycle, the instrument stops the compressor for time dF07. With the compressor stopping after a time equal to half the set time dF07 the 4-way valve rotates.

This wait allows the pressures inside the cooling circuit to balance.

Once the set time dF07 elapses the compressor restarts and the defrost is carried out.

With this procedure the compressor protection times are not complied with, therefore the compressor is immediately switched off and on again.

if dF07 = 0 the compressor is not stopped and the inversion valve rotates immediately.

dF08 Waiting time after defrost (the compressor LED flashes during this phase)

at the end of the defrost cycle, the instrument stops the compressor for a time dF08.

With the compressor stopping after a time equal to half the set time dF08 the 4-way valve rotates.

This wait allows the pressures inside the cooling circuit to balance and any dripping from the external battery to take place.

Once the set dF08 time elapses the unit resumes its operation in heat pump mode.

With this procedure the compressor protection times are not complied with, therefore the compressor is immediately switched off and on again.

If dF08 = 0 the compressor is not stopped and the inversion valve rotates immediately.

DF09 defrost interval time

The count is decreased if the temperature/pressure detected by the condensation / evaporation probe is lower than set point dF02

The dF09 counter is reloaded if there is a power cut or after the defrost cycle or when the operating mode is changed.

The dF09 counter stops if the compressor is switched off or if the temperature / pressure measured by the probe is higher than dF02

dF10 Start temperature set point of the defrost cycle 1.

It allows a temperature set point to be set below which the defrost cycle is carried out.

Once the time dF09 elapses, the tool checks the temperature of the combined defrost NTC probe of circuit 1 and if the temperature is below set point dF10 it carries out the defrost, otherwise it continues to run in hp mode and as soon as the temperature drops below the set point it carries out the defrost.

dF11 End temperature set point of the defrost cycle.

It allows a temperature set point to be set above which the defrost cycle ends.

the defrost cycle ends when the temperature measured by combined defrost NTC sensor reaches the set point

dF12 Start temperature set point of the defrost cycle 2.

It allows a temperature set point to be set below which the defrost cycle is carried out.

Once the time dF09 elapses, the tool checks the temperature of the combined defrost NTC probe of circuit 2 and if the temperature is below set point dF12 it carries out the defrost, otherwise it continues to run in hp mode and as soon as the temperature drops below the set point it carries out the defrost.

dF13 End temperature set point of the defrost cycle.

It allows a temperature set point to be set above which the defrost cycle ends.

the defrost cycle ends when the temperature measured by the combined defrost NTC sensor reaches the set point

dF14 forcing all resources available in circuit 1 in ON

0 = disabled

1 = enabled

dF15 forcing all resources available in circuit 2 in ON

0 = disabled

1 = enabled

dF16 switch-on delay between defrost steps

dF17 Enabling in ON of the condensation ventilation during defrost / dripping

0 = Disabled

1 = Enabled only in defrost

2 = enabled in defrost and dripping

During defrost the condensation ventilation is blocked.

If dF17 = 1 and the condensation pressure / temperature rises above the set point dF18 the fans are forced on.

The fans are adjusted in the same way as chiller mode.

If dF17 = 2 during the dripping time (dF08 if not set to 0) ventilation is forced to maximum for the time set in dF08.

dF18 Forcing pressure / temperature ON set point of the fans during defrost

It allows a temperature / pressure set point to be set above which the fans are switched on.

dF19 minimum stand by time before a forced defrost

it allows you to set a delay for the forced defrost function

dF20 forced defrost temperature / pressure set point

Allows you to set a temperature / pressure set point below which the count dF19 begins and once this elapses, if the measured temperature / pressure remains below set point dF20, a defrost cycle is forced.

ATTENTION If during the dF19 time the temperature / pressure rises above the value set in par. dF20 + differential dF21, the function is cancelled and the dF19 time is reloaded.

dF21 forced defrost differential

dF22 determines the start of the defrost cycle in a unit with two circuits

defrost mode

0 = independent

1 = if both have reached the start defrost request

2 = if at least one has reached the start defrost request

dF23 determines the end of the defrost cycle in a unit with two circuits and the single condensation ventilation

defrost mode

0 = independent

1 = if both have reached the end of defrost request

2 = if at least one has reached the end of defrost request

27.3 END OF DEFROST DUE TO MAXIMUM TIME

If the defrost ends due to maximum time and not due to the end of defrost conditions having been fulfilled, alarm b1dF or b2dF is emitted.

Parameter AL88 allows you to set the maximum number of end of defrost alarms due to maximum time:

- if the number of alarms is lower than AL88, the alarm reset is automatic and does not affect the normal regulation
- if the number of alarms reaches AL88, the alarm reset is manual and the relevant circuit is blocked

27.4 DEFROST WITH CONDENSATION FANS

If dF01 = 4 the defrost is enabled via the condensation fans.
If the temperature measured by the probe configured as an outdoor air temperature is higher than the value set in Par. dF26, instead of inverting the cycle inversion valve, the compressor is stopped and the condensation ventilation is activated at maximum and the defrost ends:

- if combined defrost is enabled, due to temperature or max time
- if only NTC probes are configured, due to temperature or max time
- if only pressure probes are configured due to max time

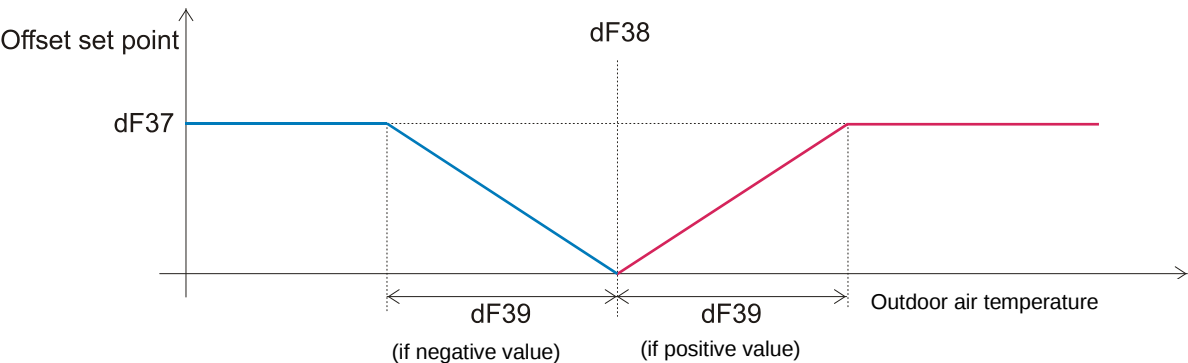
CAUTION:
even if the defrost is enabled via condensation ventilation if the outdoor air temperature is < dF26 the defrost takes place by hot gas (compressor on).
If dF17 = 2 during the dripping time (dF08 if not set to 0) ventilation is forced to maximum for the time set in dF08 only if the temperature measured by the probe configured as an outdoor air temperature is > the value set in Par. dF26
CAUTION:
With defrosting with ventilation only enabled the forced defrost is always with hot gas.

dF26	Defrost enabling set point with condensation fans	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
------	---	--------------------------	-----------------------------	------------------------	--------------------------

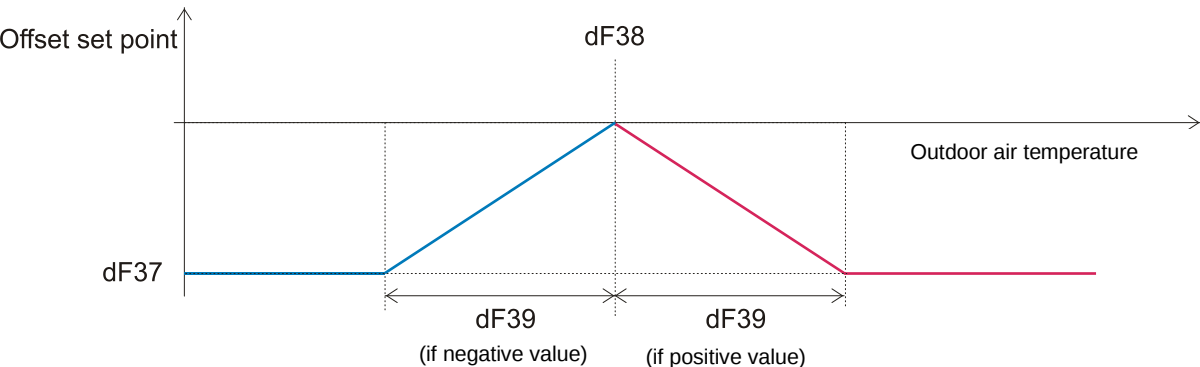
27.5 DYNAMIC SET POINT IN DEFROST

You can change the defrost starting set point (defrost starting set point only, not combined defrost set point) according to the temperature of the outdoor air as shown in the figures below.

Defrost set point modification curve with positive OFFSET (dF37>0)



Defrost set point modification curve with negative OFFSET (dF37<0)



28. RECOVERY FUNCTION

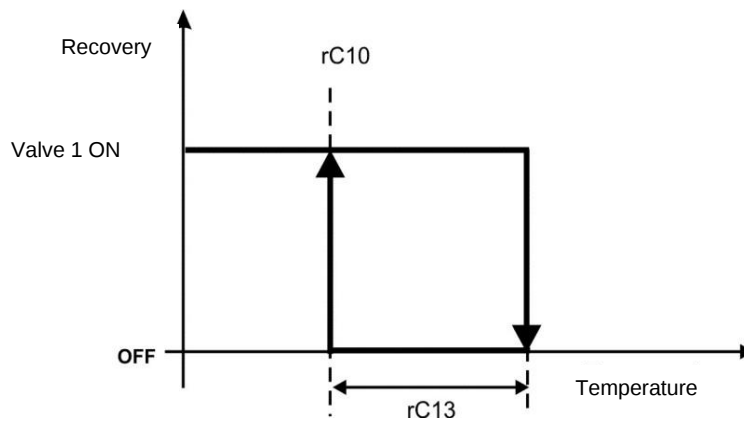
THE RECOVERY FUNCTION IS ENABLED IF:

- 1) Parameter **rC01**>0
- 2) The machine is on in chiller mode
- 3) A digital input must be configured as a recovery request (circuit 1 / circuit 2 / common)
- 4) A relay must be configured as a recovery request in circuit 1 (circuit 1 / circuit 2)
- 5) A probe can be configured as a "Recovery probe"

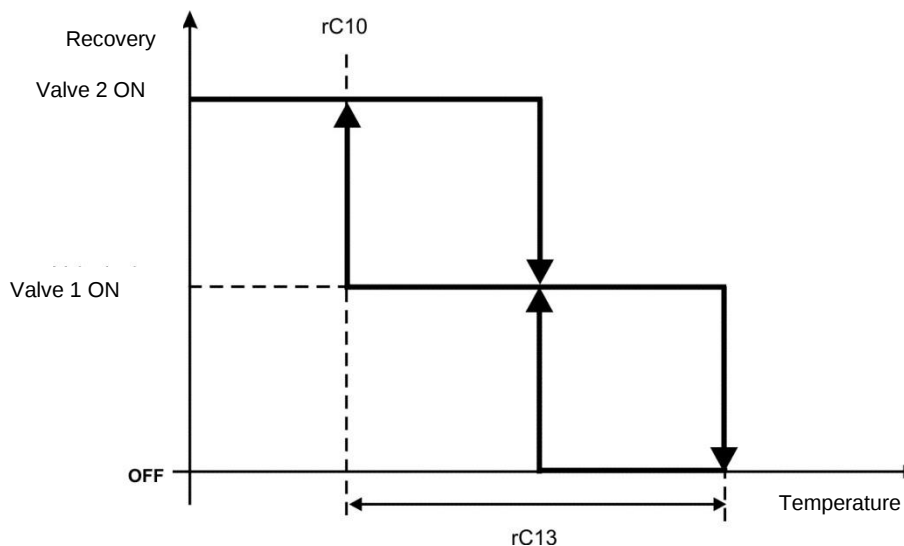
If the recovery is configured, the functions menu contains the REC item that still allows you to disable and enable the function.

28.1 RECOVERY CONSENT VIA PROBE

In the case of a single valve being used:



In the case of two valves being used:



In case of an active recovery request digital input and temperature value of the recovery being less than the activation threshold of the first valve, the recovery will be activated on the circuit switched on.

If 2 circuits are on, therefore the recovery valve of circuit 1 is first activated and then the recovery valve of circuit 2.

28.2 UNIT WITH TWO SEPARATE HYDRAULIC CIRCUITS (RC01=1)

INPUT/OUTPUT FROM RECOVERY MODE OF CIRCUIT 1 or 2 IF CONFIGURED WITH ONLY ONE POWER STEP

With the unit switched on in chiller mode, in adjustment (compressor/s ON) and if the condensation temperature / pressure conditions allow it, recovery mode is started in circuit 1 or circuit 2 if the digital input configured as a recovery request of circuit 1 or 2 is active and, if the recovery probe is used, if the temperature is below set point RC10 (both conditions must be fulfilled); in this condition the relay output configured as a recovery valve of circuit 1 or 2 is activated.

When the recovery request is no longer active, the relay output configured as a recovery valve of circuit 1 or 2 will be deactivated.

When the unit is started in recovery mode, the recovery state (although the request from a digital input lapses) is maintained for a minimum time set in parameter rC04.

When the recovery request lapses, due to the digital input being disabled or if the recovery temperature rises above the threshold RC10 + RC13, the next request will not be fulfilled until the time set in parameter rC05 elapses (counted from the moment the recovery mode is exited).

In the cases where a compressor should be switched on during the recovery phases, the safety times set with parameters CO02 and CO91 remain active.

INPUT/OUTPUT FROM RECOVERY MODE OF CIRCUIT 1 or 2 IF CONFIGURED WITH MORE THAN ONE POWER STEP

Recovery input:

with unit switched on in chiller mode, in adjustment (compressor/s ON) and if the condensation temperature / pressure conditions allow it, recovery mode is started in circuit 1 or circuit 2 if the digital input configured as a recovery request of circuit 1 or 2 is active and, if the recovery probe is used, if the temperature is below set point rC10 (both conditions must be fulfilled);

- if the recovery request comes when fewer compressors than the maximum number available for the circuit are on, the recovery valve is activated with delay rC02 seconds; during this delay no more compressors of the circuit can be switched on, if required by regulation.

Once the valve is switched on, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery comes when the maximum number of compressors available for the circuit is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is activated and the condensation ventilation will be switched off if rC09=1, therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

Recovery output

- if the request for recovery elapses, from disabling the digital input or if the recovery temperature rises above the threshold RC10 + RC13 when less than the maximum number of compressors available for that circuit is on, the recovery valve of circuit 1 or 2 is disabled with a delay of rC02 seconds; during this delay no additional compressors can be switched on if required by regulation.

Once the valve is disabled, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery elapses, from disabling the digital input or if the recovery temperature rises above the threshold RC10 + RC13 when the maximum number of compressors available for that circuit is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is disabled therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

28.3 UNIT WITH TWO HYDRAULIC CIRCUITS IN PARALLEL (RC01=2)

The principle of operation is similar to the unit with separate circuits; in particular, the condition in which only one of the two circuits is active, the digital inputs of recovery request are not specific for circuit 1 and circuit 2 but are generic.

Therefore, if the unit is on in chiller mode with a single regulation circuit (compressor/s ON), if the condensation temperature / pressure conditions of the circuit allow it, the recovery mode is started if one of the digital inputs configured as recovery request of circuit 1 or 2 is active and, if the recovery probe is used, if the temperature is below set point rC10 (both conditions must be fulfilled).

The activated recovery valve will belong to the circuit switched on at that time.

When the recovery request is no longer active, therefore the digital input or both recovery call digital inputs are not active or if the recovery temperature rises above the threshold RC10 + RC13, then the relay output configured as a recovery valve of circuit 1 or 2 will be disabled in the same way as described in the paragraph of the unit with separate circuits.

INPUT/OUTPUT FROM RECOVERY MODE OF CIRCUIT 1 OR 2 IF ONLY ONE CIRCUIT IS ON

Recovery input:

if the unit is switched on in chiller mode with only one adjustment circuit (compressor/s ON) and if the condensation temperature / pressure conditions of the circuit allow it, recovery mode is started if one of the digital inputs is configured as a recovery request of circuit 1 or 2 is active and, if the recovery probe is used, if the temperature is below set point rC10 (both conditions must be fulfilled);

- if the machine has only one compressor per circuit, in this condition the relay output configured as a recovery valve of circuit 1 or 2 will be activated according to the circuit itself.
- if the machine has more than one compressor per circuit:

- if the recovery request comes when fewer compressors than the maximum number available for the circuit are on, the recovery valve is activated with delay rC02 seconds; during this delay no more compressors, if required by regulation, is possible.

Once the valve is switched on, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery comes when the maximum number of compressors available is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is activated and the condensation ventilation will be switched off if rC09=1, therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

Recovery output

- if the machine has only one compressor per circuit, when the recovery request is no longer active, the relay output configured as a recovery valve of circuit 1 or 2 will be deactivated
- if the machine has more than one compressor per circuit:
 - if the recovery request lapses when fewer compressors than the maximum number for that circuit are on, the recovery valve of circuit 1 or 2 is disabled with delay rC02 seconds; during this delay no more compressors can be switched on, if required by regulation.

Once the valve is disabled, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery elapses when the maximum number of compressors available for that circuit is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is disabled therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

PUT/OUTPUT FROM RECOVERY MODE OF CIRCUIT 1 OR 2 IF BOTH CIRCUITS ARE ON

The principle of operation is similar to the unit with separate circuit; with the unit switched on in chiller mode, in adjustment on both circuits (compressor/s ON) and if the condensation temperature / pressure conditions allow it, recovery mode is started in circuit 1 or circuit 2 if the digital input configured as a recovery request of circuit 1 or 2 is active and, if the recovery probe is used, if the temperature is below set point rC10 (both conditions must be fulfilled);

- if the machine has only one compressor per circuit, in this condition the relay output configured as a recovery valve of circuit 1 or 2
- if the machine has more than one compressor per circuit:
 - if the recovery request comes when fewer compressors than the maximum number available for the circuit are on, the recovery valve is activated with delay rC02 seconds; during this delay no more compressors can be switched on, if required by regulation.

Once the valve is switched on, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery comes when the maximum number of compressors available is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is activated and the condensation ventilation will be switched off if rC09=1, therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

When the unit is started in recovery mode, the recovery state (although the request from a digital input lapses) is maintained for a minimum time set in parameter rC04.

Recovery output

- if the machine has only one compressor per circuit, when the recovery request is no longer active, the relay output configured as a recovery valve of circuit 1 or 2 will be deactivated
- if the machine has more than one compressor per circuit:
 - if the recovery request lapses when fewer compressors than the maximum number for that circuit are on, the recovery valve of circuit 1 or 2 is disabled with delay rC02 seconds; during this delay no more compressors can be switched on, if required by regulation.

Once the valve is disabled, any additional compressors being switched on required by the chiller regulation will be delayed by rC03 seconds after valve activation.

- if the request for recovery elapses when the maximum number of compressors available for that circuit is on, a compressor will be switched off, the rC02 time will be counted after which the recovery valve is disabled therefore, with a delay of rC03 seconds and the compressor switched back on (if the request remains and the safety switch-off time has already elapsed, otherwise this time must elapse first).

When the recovery request lapses and the unit exits the recovery mode, the next request will not be fulfilled until the time set in parameter rC05 elapses (counted from the moment the recovery mode is exited).

28.4 DISABLING ENABLE RECOVERY OPERATION VIA CONDENSATION PRESSURE - TEMPERATURE

If the condensation pressure/temperature of the circuit (dependent on the presence of the pressure transducer or temperature sensor of the condenser) exceeds the value of parameter rC06, the recovery function is disabled.

If the recovery is disabled, the message **b1rC** = disabled recovery of circuit 1 or **b2rC** = disabled recovery of circuit 2 appears on the display.

The recovery is re-enabled if the pressure/temperature drops below value rC06-rC07.

Disabling the recovery lasts for a maximum time of rC08 (maximum recovery disabling due to condensation pressure/temperature), after which the recovery will still be re-enabled.

28.5 DISABLING THE RECOVERY CONDENSATION FANS

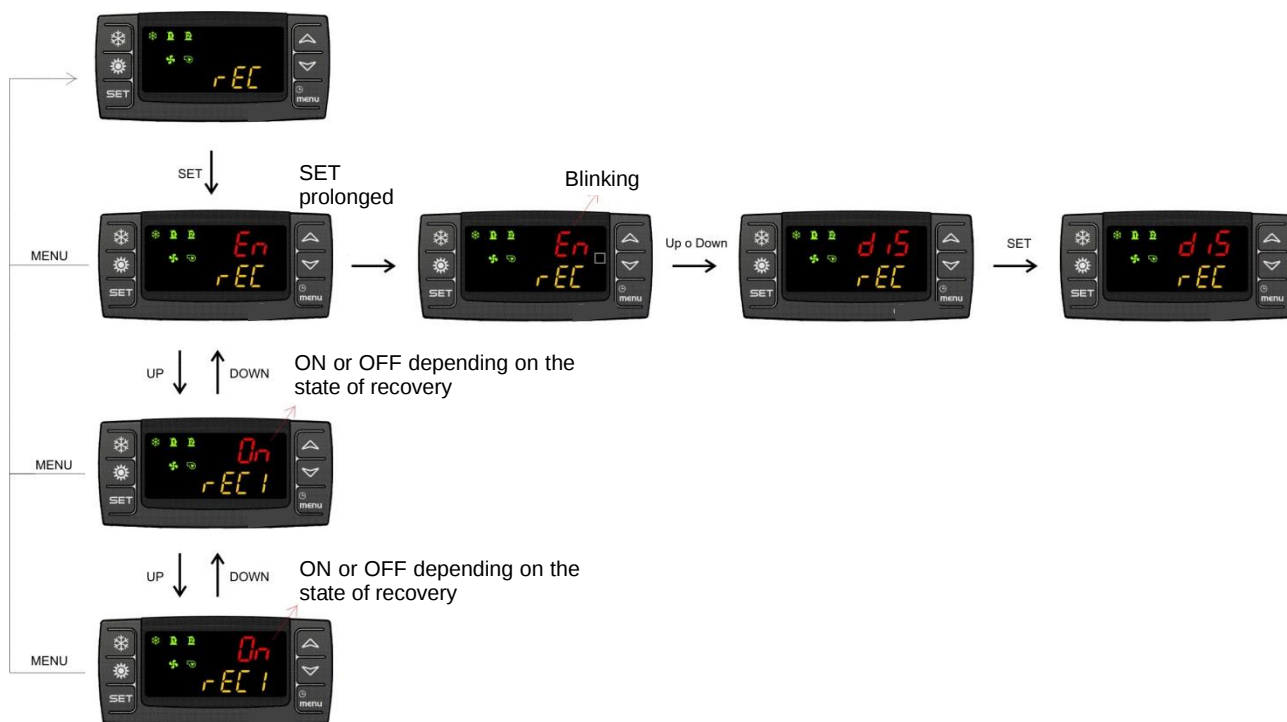
Parameter rC09 allows you to disable the condensation fans when recovery is active.

The fans are disabled when the recovery valve is active.

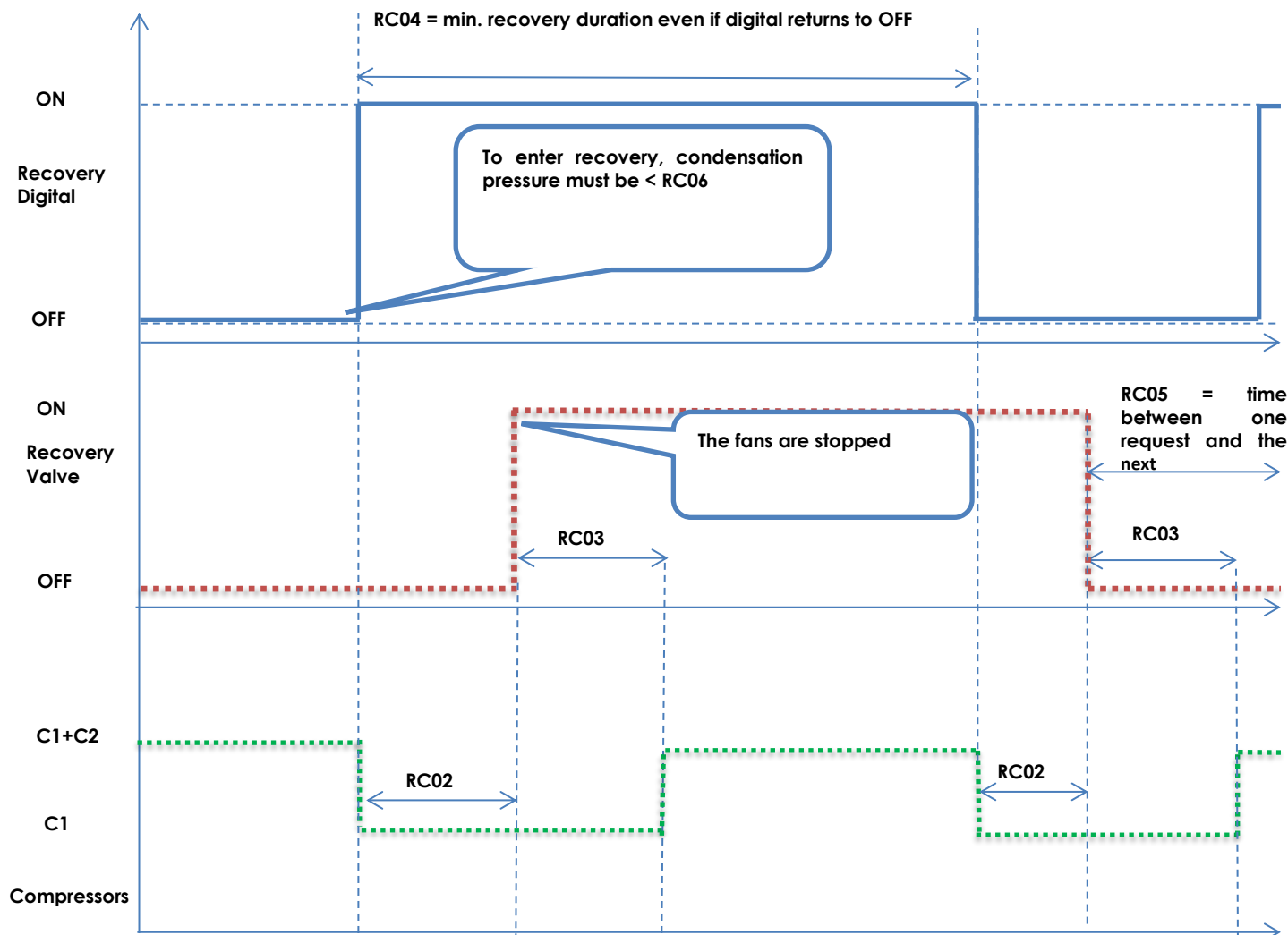
28.6 DISABLING THE RECOVERY FROM THE FUNCTIONS MENU

You can disable and then re-enable the recovery from the functions menu:

- Press the MENU key
- Use the arrow keys to select the rEC menu
- Press the SET key
- The display shows the status of the recovery (En = enabled, diS = disabled)
 - If necessary, press the SET key for a few seconds to disable or re-enable the recovery
 - The En or diS status flashes
 - Use the arrow keys to modify the status
 - Confirm the selection by pressing the SET key
- Press the arrow keys to view the current status of the recovery of circuit1
- Press the arrow keys to view the current status of the recovery of circuit2



The graph below shows a recovery input/output from a digital input:



29. OPERATIONS RELATED TO RTC

29.1 OPERATION WITH A CLOCK DISABLING DIGITAL INPUT

If a digital input is configured as "Time band RTC enabling automatic operation digital input) / manual (keyboard)" and is active, the operation via the internal clock is not enabled.

If a digital input is configured as "Time band RTC enabling automatic operation digital input) / manual (keyboard)" and is not active, the operation via the internal clock remains enabled.

29.2 OPERATION WITH UNIT IN OFF VIA RTC IF FORCED ON VIA A KEY

If the controller is switched off by a time band (see parameters ES), pressing the "chiller" or "heat pump" key allows you to switch the controller on and off for time ES18; once time ES18 elapses the controller will be automatically switched off.

ES18	Maximum unit operating time in OFF via RTC if forced to ON via a key	0	250	10 min	min
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30. PASSWORD MANAGEMENT

List of passwords managed by the instrument:

- AL46 Password to reset alarms and access the AlRM menu

If the compressor circuit breaker alarm, the antifreeze alarm, access to the alarms menu have been password protected, parameter AL46 determines the value

- Password Pr1 Password to access the view/edit of parameters of level 1
- Password Pr2 Password to access the view/edit of parameters of level 2
- Password Pr3 Password to access the view/edit of parameters of level 3

31. MODBUS COMMUNICATION

With regards to the Modbus communication refer to the specific document.

The modbus address of the controller must be set in the "CF64" parameter by means of the display keyboard;

The communication parameters are fixed: Baud Rate = 9600 bps; Data Length = 8 bits; Parity = None; Stop Bit = 1.

31.1 COMPRESOR SWITCH-ON REQUEST VIA MODBUS FUNCTION

The function must be enabled with parameter CF85=1; if enabled, the compressor is not switched on by the normal setting but by the writing of the variable at the address 4096 DEC with the following calculation:

Request number x Number of compressors configured / 1000

Example:

$350 \times 4 = 1400/1000 = 1.4$ only the whole number is considered, therefore 1 compressor is on

$550 \times 4 = 2200/1000 = 2.2$ only the whole number is considered, therefore 2 compressors are on

If compressors with capacity control are used the following formula is used:

(Number of compressors) x (number of capacity control +1) x Request number / 1000

Upon start-up the controller enters the status defined by parameter CF87 that determines how the machine operates if there is no communication; upon the first valid writing the controller adjusts accordingly.

If the serial connection fails or if no reading or writing is executed to variable 4094 DEC, the controller operates according to the value of parameter CF87 that defines the following options:

CF87= 0 The controller works according to the normal setting

CF87=1 The controller suspends the adjustment, remains on in the selected mode (chiller / heat pump) but with adjustment blocked; for adjustment to be restarted, the number of compressors must be written.

The protection times of compressor CO01, CO02, CO91 are also active with the active request of the number of compressors via Modbus. The execution of the defrost is delegated to IC208CX, therefore if there are the conditions for the defrost, the power request via Modbus is ignored.

If the serial communication lapses or if no reading or writing has been implemented within the time CF86 and parameter CF87=1, the controller blocks the adjustment even during the defrost phase.

If the chiller / heat pump status is written in serial, this is a priority on the keyboard selection.

Until the serial communication is active the operating mode is determined by the request for cooling or heating performed via serial; you can switch the controller off and on again via the local keyboard in the state defined via serial.

Once the time out CF86 elapses the controller goes into the state defined by parameter CF87 and you can change the operating mode via the keyboard or digital input.

Once the operating status has been changed in serial (for example from chiller to std-by and then to heat pump) the request for the number of compressors is reset and must be written again.
Once the instrument is switched off via serial you can switch it on again via serial; restarting via the keyboard will only be possible if the serial communication lapses or if no reading or writing has been implemented within time CF86.
If the instrument is powered via serial, the remote OFF is priority and if active, it can be switched off.
If you have configured the change of chiller / heat pump operation mode from a digital input, this is priority on the mode change via serial.
If 2 compressors are required via Modbus and one goes into alarm, this is replaced in the adjustment by a compressor switched off (if there is a compressor available).

Note:

the compressor switch-on function request via Modbus has been developed to be used in chiller and heat pump units (with/without defrost) and with ON/OFF compressors.

The unloading function is active and may reduce, if necessary, the number of compressors switched on.

The required compressor switch-on via Modbus cannot be used on machines with:

- domestic hot water function:
- free cooling
- screw compressors, capacity control and inverter
- limiting function of the maximum number of steps to be used in chiller, heat pump and DHW mode (parameters CO76, CO77, CO78)

32. NO POWER

when the power supply is restored:

1. The instrument goes back to the state prior to the power cut
2. If a defrost cycle is running, the procedure is cancelled
3. All ongoing timers are cancelled and restarted
4. If there is an alarm with manual reset the alarm status is maintained and must be reset from the functions menu

33. ALARMS

The alarm messages and codes consist of letters and numbers that identify the different types.

Alarm types:

- Letter **A** = machine alarm
- Letter **b** = circuit alarm
- Letter **C** = compressor alarm

33.1 EVAPORATOR ANTIFREEZE ALARM

The temperature is detected via the probe set by parameters Ar21 (chiller) and Ar22 (heat pump).

With the machine in STD-BY or OFF the antifreeze alarm warnings are emitted with reference to the thresholds both in chiller as well as heat pump mode (therefore the highest set point triggers the alarm).

Ar21= Antifreeze alarm adjustment probe in chiller mode

0= disabled

1= controls on evaporator input

2= controls on evaporator 1 / 2 output

3= controls on evaporator 1 / 2 output and common output

4= controls on external air temperature

Ar22= Antifreeze alarm adjustment probe in heat pump mode

0= disabled

1= controls on evaporator input

2= controls on evaporator 1 / 2 output

3= controls on evaporator 1 / 2 output and common output

4= controls on external air temperature

The threshold of the antifreeze alarm can be set in parameter AL26 (chiller) and AL33 (heat pump); the alarm detection can be delayed by AL28 in chiller mode and AL35 times (compressor start-up delay) and AL36 (regular operation delay) in heat pump mode.

You can decide whether:

- the alarm is reset automatically or manually (parameter AL29) or manually with password-protection (AL74)
- in case of alarm only the compressors can be switched off or if the alarm warning is also emitted (active buzzer and relays); the reference parameters are AL30 (chiller) and AL38 (heat pump)

33.2 CONDENSER ANTIFREEZE ALARM

The temperature is detected via the probe set in parameter Ar23.

With the machine on STD-BY or OFF the antifreeze alarm warning is emitted with reference to the threshold of the active mode prior to being set on STD-BY or OFF.

Par. Ar23= Condenser antifreeze alarm adjustment probe

0= disabled

1= adjusts the common condenser water input probe

2= adjusts the common condenser water input probe and condenser input 1/2

3= adjusts the condenser water output probe 1/2

4= adjusts the condenser output 1/2 and common output

5= adjusts the outdoor air temperature

The threshold of the antifreeze alarm can be set in parameter AL91 (chiller) and AL95 (heat pump); the alarm detection is delayed by Ar38 from the start-up of the compressors and Ar39 time in chiller mode and Ar41 time in heat pump mode.

You can decide whether the alarm is reset automatically, manually (parameter Ar40 for chiller mode and Ar42 for heat pump mode).

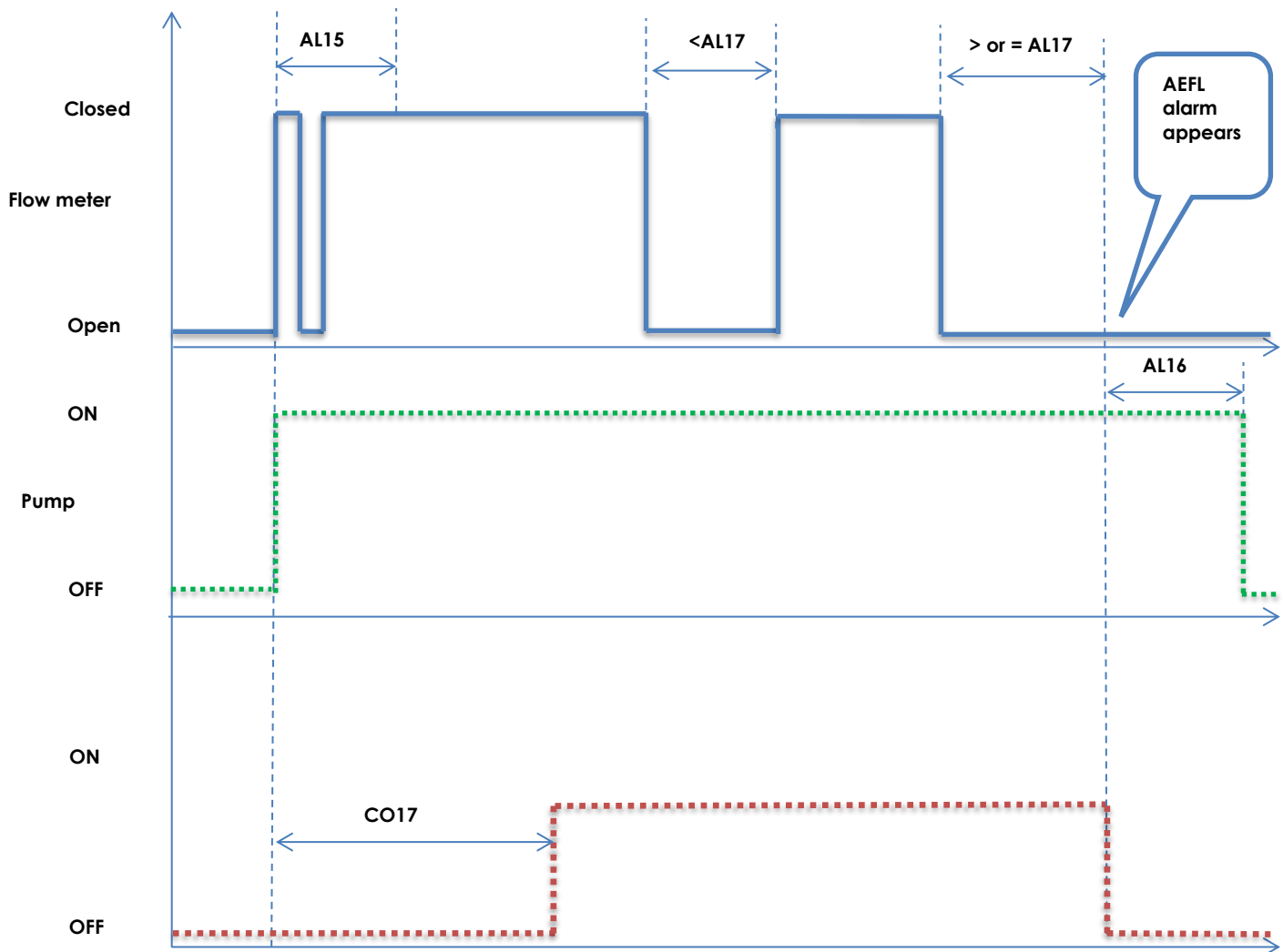
33.3 FLOW SWITCH ALARM

Evaporator side pump flow switch alarm

With each start-up of the water pump the flow switch alarm is ignored for the AL15 time to allow the hydraulic circuit to reach regular operation.

In normal working conditions if the flow switch is active for a time equal to AL17 the compressor is switched off and the label AEFL is displayed; the water pump remains on for another time AL16 after which, if the flow switch is still active, the pump is switched off.

Operation is summarised in the following chart:



At this point:

- if parameter AL86=0, the alarm remains with manual reset and you will need to reset it manually
- if parameter AL86>0, the water pump will remain off for the time set in this parameter (in minutes) after which the alarm will be reset automatically and the pump, if it is required to switch on, will be switched on and will resume normal operation (including checking the status of the flow switch).

Parameter AL18 represents the time for which the flow switch must remain disabled to allow the alarm to be reset.

Condenser side pump flow switch alarm

With each start-up of the water pump the flow switch alarm is ignored for the AL55 time to allow the hydraulic circuit to reach regular operation.

In normal working conditions if the flow switch is active for a time equal to AL57 the compressor is switched off and the label ACFL is displayed; the water pump remains on for another time AL56 after which, if the flow switch is still active, the pump is switched off.

At this point:

1. if parameter AL86=0, the alarm remains with manual reset and you will need to reset it manually
2. if parameter AL86>0, the water pump will remain off for the time set in this parameter (in minutes) after which the alarm will be reset automatically and the pump, if it is required to switch on, will be switched on and will resume normal operation (including checking the status of the flow switch).

Parameter AL58 represents the time for which the flow switch must remain disabled to allow the alarm to be reset.

33.4 COMPRESSOR BLOCK ALARM

With the switch-off request via processed thermoregulation and with the compressor OFF by:

- Thermo regulation
- Stand by
- OFF remotely

It overrides the acquisition of the following alarms:

Compressor circuit breaker 1

Compressor circuit breaker 2

Compressor circuit breaker 3

Compressor circuit breaker 4

Compressor circuit breaker 5

Compressor circuit breaker 6

Compressor oil float / pressure switch 1

Compressor oil float / pressure switch 2

Compressor oil float / pressure switch 3

Compressor oil float / pressure switch 4

Compressor oil float / pressure switch 5

Compressor oil float / pressure switch 6

AL48	Compressor circuit breaker alarm with compressor in OFF 0 = detection alarm not enabled 1 = detection alarm enabled	0	1		
AL49	Oil pressure switch / float alarm with compressor OFF 0 = detection alarm not enabled 1 = detection alarm enabled	0	1		

33.5 MACHINE ALARMS

33.5.1 FAULTY PROBE

Meaning of display label	AP1 controller probe alarm PB1... AP06 controller probe alarm PB6 APt1 remote terminal probe alarm 1... APt2 remote terminal probe alarm 2 APE1 expansion probe alarm PB1... APE8 expansion probe alarm PB8 APU1 electronic expansion probe alarm 1 ... APU4 electronic expansion probe alarm 4
Cause of activation	Configured probe and value converted out-of-range
Reset	Probe not configured or value converted within range
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
	Depending on the probe in error, the regulators linked to the probe itself will be disabled. An error by the adjustment probe will block the machine, whereas an error by the outdoor air probe will disable the functions related to the probe itself (for example: dynamic set point)

33.5.2 ANTIFREEZE ALARM LOW TEMPERATURE AIR OUTPUT WITH AIR AIR UNIT EVAPORATOR / CONDENSER CHILLER OPERATION

Meaning of label display	b1AC (anti-freeze alarm in chiller mode operation, circuit 1) b2AC (anti-freeze alarm in chiller mode operation, circuit 2) b1Ac (anti-freeze alarm message in chiller mode operation, circuit 1) b2Ac (anti-freeze alarm message in chiller mode operation, circuit 2) Note When the alarm is triggered by the evaporator input probe or by the evaporator output probe shared by the two circuits, the alarm message refers to both circuits (e.g. b1Ac and b2Ac).
Cause of alarm activation	Temperature sensor: in normal operation, in Standby or in remotely controlled OFF, whenever the temperature detected by the reference probe for the anti-freeze alarm (defined in parameter Ar21) is below the threshold stored in parameter AL26 for at least the number of seconds stored in AL28. Digital input: whenever the digital input configured as circuit anti-freeze alarm is active.
Reset	Temperature sensor: whenever the temperature detected by the reference probe for the anti-freeze alarm (defined by parameter Ar21) exceeds the threshold value resulting from AL26+AL27. Digital input: whenever the digital input configured as circuit anti-freeze alarm is not active.
Reset	The reset is always manual if AL29 = 0. The reset is always automatic if AL29 = 16. The reset is: - automatic if the number of alarms in the last hour of operation is smaller than the value stored in AL29; - manual if the number of alarms in the last hour of operation achieves the value stored in AL29. If AL74=1, alarm resetting requires entry of a password (the password is set in parameter AL46).
Icon	 flashing
Action	If AL30=0: the compressors are off, alarm b1Ac/b2Ac is displayed, and the alarm relay and the buzzer are not enabled. If AL30=1: the compressors are off, alarm b1AC/b2AC is displayed, and the alarm relay and the buzzer are enabled.
Controllers	
Alarm	If AL30=0: the relay and buzzer are not enabled. If AL30=1: the relay and buzzer are enabled.
Reversing valve	follows its setpoint(s)
Recovery valve	follows its setpoint(s)
Freecooling ON/OFF valve	follows its setpoint(s)
Auxiliary relay	follow(s) its/their setpoint(s)
Valve for loadless starting	follows its setpoint(s)
Ventilation in delivery line	If air/air unit is off
Condensation ventilation	follows its setpoint(s)
Support /boiler /anti-freeze	If air/air unit is off If the unit is either air/water or water/water type: the anti-freeze heaters are controlled by their respective controller (the reference probe is configured with parameter Ar06 and setpoint Ar01). If the alarm is triggered by the digital input, the anti-freeze heaters are active only if they are enabled and controlled by their respective controller (the reference probe is configured with parameter Ar06 and setpoint Ar01).
Water pump(s) in evaporator/condenser mode	follows its setpoint(s)
Compressors	Switched off
Pump down solenoid	Switched off

33.5.3 EVAPORATOR ANTI-FREEZE ALARM IN HEAT PUMP MODE OPERATION or LOW OUTPUT AIR TEMPERATURE WITH AIR/AIR UNIT

Meaning of label display	b1AH (anti-freeze alarm in heat pump operation, circuit 1) b2AH (anti-freeze alarm in heat pump operation, circuit 2) b1Ah (anti-freeze alarm message in heat pump operation, circuit 1) b2Ah (anti-freeze alarm message in heat pump operation, circuit 2) Note When the alarm is triggered by the evaporator input probe or by the evaporator output probe shared by the two circuits, the alarm message refers to both circuits (e.g. b1AH and b2AH).
Cause of alarm activation	Temperature sensor: in normal operation, in Standby or in remotely controlled OFF, whenever the temperature detected by the reference probe for the anti-freeze alarm (defined in parameter Ar22) is below the threshold stored in parameter AL33 for at least the number of seconds stored in AL36. Digital input: whenever the digital input configured as circuit anti-freeze alarm is active. As soon as the unit is switched on in heat pump mode, the alarm is bypassed for as long as specified in AL35 in order for the compressor(s) to get started.
Reset	Temperature sensor: whenever the temperature detected by reference probe for the anti-freeze alarm (defined by parameter Ar22) exceeds the threshold value resulting from AL33+AL34. Digital input: whenever the digital input configured as circuit anti-freeze alarm is not active.
Reset	The reset is always manual if AL37 = 0. The reset is always automatic if AL37 = 16. The reset is: - automatic if the number of alarms in the last hour of operation is smaller than the value stored in AL37; - manual if the number of alarms in the last hour of operation equals the value stored in AL37. If AL74=1, alarm resetting requires entry of a password (the password is set in parameter AL46).
Icon	 flashing
Action	If AL38=0: the compressors are off, alarm b1Ah/b2Ah is displayed, and the alarm relay and the buzzer are not enabled. If AL38=1: the compressors are off, alarm b1AH/b2AH is displayed, and the alarm relay and the buzzer are enabled.
Controllers	
Alarm	If AL30=0: the relay and buzzer are not enabled. If AL30=1: the relay and buzzer are enabled.
Reversing valve	follows its setpoint(s)
Recovery valve	follows its setpoint(s)
Freecooling ON/OFF valve	follows its setpoint(s)
Auxiliary relay	follow(s) its/their setpoint(s)
Valve for loadless starting	follows its setpoint(s)
Ventilation in delivery line	If air/air unit is off
Condensation ventilation	follows its setpoint(s)
Support /boiler /ant-freeze	If air/air unit is off If the unit is either air/water or water/water type: the anti-freeze heaters are controlled by their respective controller (the reference probe is configured with parameter Ar07 and setpoint Ar03). If the alarm is triggered by the digital input, the anti-freeze heaters are active only if they are enabled and controlled by their respective controller (the reference probe is configured with parameter Ar07 and setpoint Ar03).
Water pump(s) in evaporator/condenser mode	follows its setpoint(s)
Compressors	Switched off
Pump down solenoid	Switched off

33.5.4 CONDENSER ANTI-FREEZE ALARM or LOW OUTPUT TEMPERATURE IN CHILLER MODE OPERATION WITH WATER/WATER UNIT

Meaning of label display	b1CC (condenser anti-freeze alarm in chiller mode operation, circuit 1) b2CC (condenser anti-freeze alarm in chiller mode operation, circuit 2) Note When the alarm is triggered by the condenser output probe shared by the two circuits or by the evaporator input probe, the alarm message refers to both circuits (e.g. b1CC and b2CC).
Cause of alarm activation	Temperature sensor: in normal operation, in Standby or in remotely controlled OFF, whenever the temperature detected by the reference probe for the anti-freeze alarm (defined in parameter Ar23) is below the threshold stored in parameter AL91 for at least the number of seconds stored in Ar39. Digital input: whenever the digital input configured as circuit anti-freeze alarm is active. As soon as the unit is switched on in heat pump mode, the alarm is bypassed for as long as specified in Ar38.
Reset	Temperature sensor: whenever the temperature detected by reference probe for the anti-freeze alarm (defined by parameter Ar23) exceeds the threshold value resulting from AL91+AL92. Digital input: whenever the digital input configured as circuit anti-freeze alarm is not active.
Reset	The reset is always manual if Ar40 = 0. The reset is always automatic if Ar40 = 16. The reset is: - automatic if the number of alarms in the last hour of operation is smaller than the value stored in Ar40; - manual if the number of alarms in the last hour of operation equals the value stored in Ar40. If AL74=1, alarm resetting requires entry of a password (the password is set in parameter AL46).
Icon	 flashing
Action	If AL30=0: alarm detection is disabled. If AL30=1: the compressors are off, alarm b1CC/b2CC is displayed, and the alarm relay and the buzzer are enabled.
Controllers	
Alarm	If AL30=0: alarm detection is disabled. If AL30=1: the relay and the buzzer are enabled.
Compressors	Switched off
Other loads	follow their setpoint(s)

33.5.5 CONDENSER ANTI-FREEZE ALARM IN HEAT PUMP MODE

Meaning of label display	b1CH (anti-freeze alarm in chiller mode operation, circuit 1) b2CH (anti-freeze alarm in chiller mode operation, circuit 2) Note When the alarm is triggered by the condenser output probe shared by the two circuits or by the evaporator input probe, the alarm message refers to both circuits (e.g. b1CC and b2CC).
Cause of alarm activation	Temperature sensor: in normal operation, in Standby or in remotely controlled OFF, whenever the temperature detected by the reference probe for the anti-freeze alarm (defined in parameter Ar23) is below the threshold stored in parameter AL95 for at least the number of seconds stored in Ar41. Digital input: whenever the digital input configured as circuit anti-freeze alarm is active. When regulation is started, the alarm is bypassed for as long as the value stored in Ar38.
Reset	Temperature sensor: whenever the temperature detected by reference probe for the anti-freeze alarm (defined by parameter Ar23) exceeds the threshold value resulting from AL95+AL96. Digital input: whenever the digital input configured as circuit anti-freeze alarm is not active.
Reset	The reset is always manual if Ar42 = 0. The reset is always automatic if Ar42 = 16. The reset is: - automatic if the number of alarms in the last hour of operation is smaller than the value stored in Ar42; - manual if the number of alarms in the last hour of operation equals the value stored in Ar42. If AL74=1, alarm resetting requires entry of a password (the password is set in parameter AL46).
Icon	 flashing
Action	If AL30=0: alarm detection is disabled. If AL30=1: the compressors are off, alarm b1CC/b2CC is displayed, and the alarm relay and the buzzer are enabled.

Controllers	
Alarm	If AL30=0: alarm detection is disabled. If AL30=1: the relay and the buzzer are enabled.
Compressors	Switched off
Other loads	follow their setpoint(s)

33.5.6 COLD SIDE FLOW SWITCH ALARM (DIFFERENTIAL PRESSURE SWITCH)

Meaning of display label	AEFL (evaporator side flow switch alarm)
Cause of activation	The alarm is not detected for time AL15 from water pump start-up. Alarm is emitted if ID is active for time AL17.
Reset	ID not active for time AL18
Reset	Automatic - switches to manual if ID is active for time AL16 counted from when AL17 elapses (reset procedure in functions menu)
Icon	Flow! flashing
Action	Alarm relay + buzzer enabled only if the flow switch alarm is active in a normal operating phase
Regulators	
Alarm	Alarm relay + buzzer enabled only if the flow switch alarm is active in a normal operating phase
Inversion valve	Then its adjustment
Recovery valve	Then its adjustment
Free cooling on/off valve	Then its adjustment
Antifreeze / Support / boiler	Off
Auxiliary relay	Then its adjustment
Supply ventilation	Off
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator water pump	With CO15 = 1 always on; off when the alarm becomes manual reset (only in chiller or hp mode)
Evaporator water pump	With CO15 = 2 it must be adjusted; off when the alarm becomes manual reset (only in chiller or hp mode)
Condenser water pump	Then its adjustment
Compressors	Off
Solenoid pump down	Off

33.5.7 HOT SIDE FLOW SWITCH ALARM (DIFFERENTIAL PRESSURE SWITCH)

Meaning of display label	ACFL (condenser side flow switch alarm)
Cause of activation	The alarm is not detected for time AL55 from water pump start-up (alarm by-pass time). Alarm is emitted if ID is active for time AL57. Alarm disabled if AL14=0 Alarm enabled only in chiller mode if AL14=1 Alarm enabled only in heat pump mode if AL14=2 Alarm enabled in chiller and heat pump mode if AL14=3
Reset	ID not active for time AL58
Reset	Automatic - switches to manual if ID remains active for time AL56 counted from when AL57 elapses (reset procedure in functions menu)
Icon	Flow! flashing
Action	Alarm relay + buzzer enabled only if the flow switch alarm is active in a normal operating phase
Regulators	
Alarm	Alarm relay + buzzer enabled only if the flow switch alarm is active in a normal operating phase
Inversion valve	Then its adjustment
Recovery valve	Then its adjustment
Free cooling on/off valve	Then its adjustment
Antifreeze / Support / boiler	Off
Auxiliary relay	Then its adjustment
Supply ventilation	Off
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Condenser water pump	With CO20 = 1 always on; off when the alarm becomes manual reset (only in chiller or hp mode)
Condenser water pump	With CO20 = 2 it must be adjusted; off when the alarm becomes manual reset (only in chiller or hp mode)
Evaporator water pump	Then its adjustment
Compressors	Off
Solenoid pump down	Off

CAUTION

Alarm relay + buzzer are activated only if the flow switch alarm is active in a normal operating phase. Otherwise if only a light warning is emitted (icon **Flow!** flashing) E.G. the machine stops because it has reached the working set point and Par. CO16 / CO21= 2

NOTE: FLOW SWITCH ALARM

CO16 / CO21=0 No water pump

The alarm is only controlled if a digital input is configured as a flow switch, **is always automatically reset.**

CO16 / CO21=1 Water pump with continuous operation.

The alarm is only controlled if a digital input is configured as a flow switch, **is always automatically reset with units on stand by or remote OFF (pump off)**

FLOW SWITCH ALARM MANUAL RESET

If the alarm is manually reset, the reset is required to enter the functions menu (reset procedure in functions menu).

AL15 Flow switch alarm delay by pump activation

It allows you to set a delay in the recognition of the flow switch alarm from the start-up of the water pump to allow the flow rate to reach its regular value.

AL16 Alarm duration to block the water pump.

Determines the flow switch alarm duration (active digital input) after which the alarm switches from automatic reset to manual reset and the water pump is blocked.

AL17 Active flow switch input duration

Allows you to set a time during which the flow switch alarm must remain active, after which the alarm is emitted. The count begins after time **AL15** and allows you to filter any drop in flow rate or the presence of air bubbles in the water circuit.

AL18 Non-active flow switch input duration

Allows you to set a time during which the flow switch alarm must remain not active, after which, if the alarm is reset automatically it is reset and if reset manually it can be reset.

33.5.8 SUPPLY FAN CIRCUIT BREAKER ALARM

Meaning of display label	AtSF (supply fan circuit breaker alarm)
Cause of activation	CF01 =0 upon every fan start-up the ID is active for time AL15 from when the water pump starts and then the ID is active for AL17
Reset	ID not active for AL18
Reset	Automatic - switches to manual if ID is active for time AL16 counted from when AL17 elapses (reset procedure in functions menu)
Icon	Flow! flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	then its adjustment
Empty start-up valve	then its adjustment
Supply ventilation	off
Condens. ventilation	off
Support / boiler / antifreeze	off
Evaporator and condenser pump / and water	off
Compressors	Off
Solenoid pump down	off

SUPPLY FAN ALARM MANUAL RESET

If the alarm is manually reset, the reset is required to enter the functions menu (reset procedure in functions menu).

33.5.9 AMBIENT AIR TO BE CONDITIONED (AIR / AIR) LOW TEMPERATURE NTC PROBE

Meaning of display label	ALti (evaporator input low air temperature)
Cause of activation	If CF01=0 if the NTC probe configured as an evaporator input measures a temperature < set point AL26 for AL28 seconds in chiller mode If CF01=0 if the NTC probe configured as an evaporator input measures a temperature < set point AL33 for AL36 seconds in heat pump mode On stand by or remote OFF the reference probe remains that of the evaporator input and the bypass time before the alarm is that with the least time set between AL28 and AL36
Reset	If the probe is configured > set point AL26 + differential AL27 in chiller mode or the sensor is configured > set point AL33 + differential AL34 in heat pump mode On stand by or remote OFF, if the probe is configured > set AL26 + differential AL27 or > set AL33 + differential AL34
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	Then its adjustment
Solenoid pump down	Then its adjustment

33.5.10 EVAPORATOR WATER INPUT HIGH TEMPERATURE ALARM

Meaning of display label	AEht (evaporator water input high temperature alarm)
Cause of activation	The temperature measured by the probe configured in AL63 is > set point AL61
Reset	The temperature measured by the probe configured in AL63 is < set point AL61 - differential AL62
Reset	Reset is always manual if AL59 = 0 Reset is always automatic if AL59 = 16 Reset switches from automatic to manual if AL59 ranges from 1 to 15
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Compressors	Off
Other loads	Then their adjustment

CAUTION:

The alarm appears only if the unit is running with the compressor on after time AL60

The alarm remains on stand by, remote OFF or with the compressor off by thermoregulation only if it was present before and with MANUAL reset.

33.5.11 EVAPORATOR WATER PUMPING UNIT CIRCUIT BREAKER ALARM

Meaning of display label	AtE1 (evaporator water pump circuit breaker 1) AtE2 (evaporator water pump circuit breaker 2)
Cause of activation	ID configured as an active evaporator water pump circuit breaker ID configured as an active evaporator support water pump circuit breaker
Reset	With ID not active
Reset	Manual. (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Off if no pump is available
Condens. ventilation	Off if no pump is available
Support / boiler / antifreeze	Then its adjustment
Condenser evaporator water pump	Off if no pump is available
Condenser water pump	Then its adjustment

Compressors	Off if no pump is available
Solenoid pump down	Off if no pump is available

33.5.12 RECOVERY CONDENSER WATER PUMPING UNIT CIRCUIT BREAKER ALARM

Meaning of display label	AtC1 (condenser water pump circuit breaker 1) AtC2 (condenser water pump circuit breaker 2)
Cause of activation	ID configured as an active condenser water pump circuit breaker ID configured as an active condenser support water pump circuit breaker
Reset	With ID not active
Reset	Manual (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Off if no pump is available
Condens. ventilation	Off if no pump is available
Support / boiler / antifreeze	Then its adjustment
Evaporator water pump	Then its adjustment
Condenser water pump	Off if no pump is available
Compressors	Off if no pump is available
Solenoid pump down	Off if no pump is available

33.5.13 MACHINE BLOCK GENERAL ALARM 1

Meaning of display label	ALc1
Cause of activation	ID configured as machine block generic alarm 1 active after the time set in Par. AL43
Reset	ID configured as machine block generic alarm 1 not active after the time set in Par. AL44
Reset	If AL42 = 0 always manual If AL42 ≠ 0 automatic - becomes manual after AL42 events per hour (reset procedure in functions menu). It is recorded in the alarms log only with manual reset.
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Off

33.5.14 MACHINE BLOCK GENERAL ALARM 2

Meaning of display label	ALc2
Cause of activation	With AL50 = 0 ID configured as machine warning alarm 2 active after the time set in Par. AL52
Reset	ID configured as machine block warning alarm 2 not active after the time set in Par. AL53
Reset	always automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Then their adjustment

Meaning of display label	ALc2
Cause of activation	Con AL50 = 1 ID configured as machine block alarm 2 active after the time set in Par. AL52
Reset	ID configured as machine block generic alarm 2 not active after the time set in Par. AL53
Reset	If AL51 = 0 always manual If AL51 ≠ 0 automatic - becomes manual after AL51 events per hour (reset procedure in functions menu). It is recorded in the alarms log only with manual reset
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Off

33.5.15 Phase sequence ALARM

Meaning of display label	ALSF
Cause of activation	Active phase sequence ID
Reset	Non-active phase sequence ID
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Off

33.5.16 COMMUNICATION ALARM WITH I/O EXPANSION

Meaning of display label	ASLA
Cause of activation	No LAN communication between IChill and I/O expansion
Reset	Restoring the LAN communication
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Off

33.6 CIRCUIT ALARM

33.6.1 CIRCUIT HIGH PRESSURE SWITCH ALARM

Meaning of display label	b1HP (digital input high pressure of circuit 1) b2HP (digital input high pressure of circuit 2)
Cause of activation	With the unit ON and the circuit high pressure switch input active
Reset	Input not active
Reset	Reset is always manual if AL54 = 0 Reset is always automatic if AL54 = 16 Reset switches from automatic to manual if AL54 ranges from 1 to 15 (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling ON/OFF valve	then its adjustment
Auxiliary relay	Then its/their adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	If Par. FA02= 0 fan operating mode dependent on the compressor with active alarm the fans are forced to maximum speed for 60 seconds before switching off If Par. FA02= 1 fan operating mode independent from the compressor with active alarm the fans are forced to maximum speed for 60 seconds and then they must be adjusted
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Relevant circuit compressors	Off
Non-relevant circuit compressors	Then its adjustment
Non-relevant circuit solenoid pump down	Then its adjustment
Relevant circuit Solenoid pump down	off

33.6.2

33.6.3 COMPRESSOR HIGH PRESSURE SWITCH ALARM

Meaning of display label	C1HP (compressor high pressure switch alarm 1) -... C4HP (compressor high pressure switch alarm 4)
Cause of activation	With the unit ON and the compressor pressure switch input active
Reset	Disabling input
Reset	Manual reset (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling ON/OFF valve	then its adjustment
Auxiliary relay	Then its/their adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Relevant compressor	Off
Non-relevant compressor	Then its adjustment
Solenoid pump down	It switches off if there is only 1 compressor per circuit otherwise it must be adjusted

33.6.4 CIRCUIT LOW PRESSURE SWITCH ALARM

Meaning of display label	b1LP (digital input low pressure of circuit 1) b2LP (digital input low pressure of circuit 2)
Cause of activation	- With the circuit high pressure switch input active - If AL08=1, even with the unit on stand by or remote OFF, if the circuit low pressure switch input is active - If AL08=1, even with the unit on stand by or remote OFF, if the circuit low pressure switch input is active The alarm is not emitted: - In defrost for AL07 time upon activation of the cycle inversion valve - Upon compressor switch-on for time AL01 - If time AL64 has not elapsed from the activation of the Digital input
Reset	Disabling input
Reset	Automatic - becomes manual after AL05 events per hour (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its/their adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Off
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	Off
Solenoid pump down	off

33.6.5 CIRCUIT CONDENSATION HIGH PRESSURE / TEMPERATURE

Meaning of display label	b1hP (analogue input high pressure of circuit 1) b2hP (analogue input high pressure of circuit 2)
Cause of activation	With the unit in chiller or heat pump mode, if the condensation control probe measures a value > set point AL09
Reset	If the condensation control probe measures a value < set point AL09 – differential AL10
Reset	Reset is always manual if AL54 = 0 Reset is always automatic if AL54 = 16 Reset switches from automatic to manual if AL54 ranges from 1 to 15 (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment

Recovery valve	then its adjustment
Free cooling ON/OFF valve	then its adjustment
Auxiliary relay	Then its/their adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	If Par. FA02= 0 fan operating mode dependent on the compressor with active alarm the fans are forced to maximum speed for 60 seconds before switching off If Par. FA02= 1 fan operating mode independent from the compressor with active alarm the fans are forced to maximum speed for 60 seconds and then they must be adjusted
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Relevant circuit compressors	Off
Non-relevant circuit compressors	Then its adjustment
Non-relevant circuit solenoid pump down	Then its adjustment
Relevant circuit Solenoid pump down	off

33.6.6 CIRCUIT CONDENSATION LOW TEMPERATURE / PRESSURE

Meaning of display label	b1lP (analogue input low pressure of circuit 1) b2lP (analogue input low pressure of circuit 2)
Cause of activation	The alarm is activated when the probe configured as condensation control measures a temperature < set point AL03 in the following conditions: - chiller or heat pump mode - stand by or remote OFF if AL08 = 1 - in defrost if AL06=1 The alarm is not emitted: - in defrost for AL07 time upon valve inversion - upon compressor switch-on for time AL01
Reset	If the condensation control probe measures a temperature of set point > AL03 + differential AL04
Reset	Automatic - becomes manual after AL05 events per hour (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its/their adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Off
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	Off
Solenoid pump down	off

33.6.7 CONDENSATION FAN CIRCUIT BREAKER ALARM

Meaning of display label	b1tF (condensation ventilation thermal alarm of circuit 1) b2tF (condensation ventilation thermal alarm of circuit 2)
Cause of activation	With active configured circuit ID Attention: if you set an ID as a common condensation circuit breaker the identification labels are displayed together)
Reset	With ID not active
Reset	Manual. (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	off
Condens. ventilation	off
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment

Compressors	Off
Solenoid pump down	off

33.6.8 DEFROST ALARM

Meaning of display label	b1dF (defrost alarm warning of circuit 1) b2dF (defrost alarm warning of circuit 2)
Cause of activation	Only in defrost, if DF01=1 or DF01=3 and the defrost ends due to the maximum time DF05
Reset	▪ If stand by or remote ON-OFF ▪ Upon the next defrost cycle if the output occurs due to temperature / pressure
Reset	Automatic if upon the next defrost cycle the output occurs due to temperature /pressure, otherwise manual (with reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer NOT activated
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	Then its adjustment
Solenoid pump down	Then its adjustment

33.7 COMPRESSOR ALARMS

33.7.1 COMPRESSOR CIRCUIT BREAKER ALARM

Meaning of display label	C1tr (compressor circuit breaker alarm 1) -... C4tr (compressor circuit breaker alarm 4)
Cause of activation	With ID active. The alarm is not detected for time AL19 from compressor start-up.
Reset	If ID not active
Reset	AL77=0: - Manual from Alm menu if AL20=1÷16 - Manual from the cOtr menu with password prompt AL46 if AL20=0 or if the number of alarms/hour is reached set in AL20 AL77=1: - Automatic if less than AL20 compressor events per hour occur or if AL20=16 - Manual from the Alm menu if AL20 compressor alarms/hour is reached
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its/their adjustment
Evaporator and condenser pump / and water	Then its adjustment
Relevant compressor	If Par. AL47 = 0 or 1 Off
Non-relevant compressor	If Par. AL47 = 0 it must be adjusted - If Par. AL47 = 1 Off
Solenoid pump down	It switches off if there is only 1 compressor per circuit otherwise it must be adjusted

AL19 Circuit breaker alarm delay compressor 1 - 6 upon start-up

It allows you to set a delay to recognise the circuit breaker alarm upon compressor start-up.

AL20 Maximum number of events per hour of the compressors 1 - 6 circuit breaker

Determines the maximum number of compressor circuit breaker events per hour which once exceeded the alarm switches from automatic reset to manual reset.

Parameter AL47 operation

AL47 compressor circuit breaker alarm operation

1 = the compressor circuit breaker alarm only blocks the relevant compressor

1 = the compressor circuit breaker alarm blocks the relevant compressor and all the compressors in that circuit

SEE THE RESET PROCEDURE IN THE COMPRESSOR CIRCUIT BREAKER ALARM 1-6 FUNCTIONS MENU AFTER AL20 EVENTS PER HOUR

33.7.2 COMPRESSOR SUPPLY HIGH TEMPERATURE ALARM

Meaning of display label	C1dt (compressor supply high pressure alarm 1) - C4dt (compressor high pressure alarm 4)
Cause of activation	The temperature measured by the probe configured as supply high pressure is > set point AL39
Reset	The temperature measured by the probe configured as supply high pressure is < set point AL39 - differential AL40
Reset	Manual Automatic. If more than AL41 events occur per hour, reset the alarm by entering the functions menu
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Inversion valve	then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its/their adjustment
Evaporator and condenser pump / and water	Then its adjustment
Relevant compressor	Off
Non-relevant compressor	Then its adjustment
Solenoid pump down	It switches off if there is only 1 compressor per circuit otherwise it must be adjusted
Liquid injection solenoid valve	Off with compressor in OFF

33.8 WARNINGS

33.8.1 UNLOADING WARNING DUE TO CONDENSATION HIGH TEMPERATURE /PRESSURE IN CHILLER MODE

Meaning of display label	b1Cu (condenser battery unloading warning of circuit 1) b2Cu (condenser battery unloading warning of circuit 2)
Cause of activation	Depending whether the probe is configured as condensation temperature or pressure control measures a value > set point CO44
Reset	- if the condensation pressure or temperature measures a value < CO44 – differential CO45 - with unloading active, after the time set in Par. CO48
Reset	Automatic
Action	No action on the alarm relay and buzzer
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	The number of compressors switched on is forced to the maximum to the value set in parameter CO49
Solenoid pump down	Then its adjustment

33.8.2 RECOVERY DISABLING WARNING DUE TO CONDENSATION HIGH TEMPERATURE /PRESSURE IN CHILLER MODE

Meaning of display label	b1rC (recovery disabling warning of circuit 1) b2rC (recovery disabling warning of circuit 2)
Cause of activation	Depending whether the probe is configured as condensation temperature or pressure control measures a value > set point rC06
Reset	- if the condensation pressure or temperature measures a value < set point rC06 – differential rC07 - From recovery disabling function engaged after the time set in Par. rC08
Reset	Automatic
Icon	 flashing
Action	No action on the alarm relay and buzzer
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment
Recovery valve	Off
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	Then its adjustment
Solenoid pump down	Then its adjustment

33.8.3 UNLOADING WARNING DUE TO EVAPORATION LOW PRESSURE IN HP MODE

Meaning of display label	b1Cu (condenser battery unloading warning of circuit 1) b2Cu (condenser battery unloading warning of circuit 2)
Cause of activation	In normal operation if the probe is configured as condensation temperature or pressure control or as evaporation pressure measures a value < set point CO46
Reset	- if the condensation pressure / temperature or evaporation pressure measures a value > CO46 + CO47 - With unloading function engaged, after the time set in Par. CO48
Reset	Automatic
Action	No action on the alarm relay and buzzer
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment

Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	The number of compressors switched on is forced to the maximum to the value set in parameter CO49
Solenoid pump down	Then its adjustment

33.8.4 UNLOADING WARNING DUE TO EVAPORATOR WATER INPUT HIGH TEMPERATURE

Meaning of display label	AEun (unloading warning from evaporator)
Cause of activation	Depending whether the measured evaporator water input temperature is > set point CO40 for the time set in Par. CO42
Reset	- if the measured water temperature is < set point CO40 – differential CO41 - From unloading function engaged, after the time set in Par. CO43
Reset	Automatic
Action	No action on the alarm relay and buzzer
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	The number of compressors switched on is forced to the maximum to the value set in parameter CO49
Solenoid pump down	Then its adjustment

33.8.5 UNLOADING WARNING DUE TO unloading digital input

Meaning of display label	b1cu (digital input unloading warning of unloading circuit 1) b2cu (digital input unloading warning of unloading circuit 2)
Cause of activation	Activation from a digital input
Reset	By the digital input being disabled
Reset	Automatic
Action	No action on the alarm relay and buzzer
Regulators	
Alarm	Relay + buzzer NOT activated
Inversion valve	Then its adjustment
Recovery valve	then its adjustment
Free cooling on/off valve	then its adjustment
Auxiliary relay	Then its adjustment
Empty start-up valve	Then its adjustment
Supply ventilation	Then its adjustment
Condens. ventilation	Then its adjustment
Support / boiler / antifreeze	Then its adjustment
Evaporator and condenser pump / and water	Then its adjustment
Compressors	The number of compressors switched on is forced to the maximum to the value set in parameter CO49
Solenoid pump down	Then its adjustment

33.8.6 COMPRESSOR MAINTENANCE REQUEST WARNING

Meaning of display label	C1Mn (compressor maintenance request 1) -... C4Mn (compressor maintenance request 4)
Cause of activation	Compressor operating hours > counter set point
Reset	Resetting operating hours (in functions menu, Hour function, keep the "set" button pressed for a few seconds)
Reset	Manual
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Then their adjustment

33.8.7 SUPPLY FAN PUMP MAINTENANCE REQUEST WARNING

Meaning of display label	AEP1 (evaporator water pump maintenance request) AEP2 (evaporator support water pump maintenance request)
Cause of activation	Compressor operating hours > counter set point
Reset	Resetting operating hours (in functions menu, Hour function, keep the "set" button pressed for a few seconds)
Reset	Manual
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Then their adjustment

33.8.8 CONDENSER PUMP MAINTENANCE REQUEST WARNING

Meaning of display label	ACP1 (condenser water pump maintenance request 1) ACP2 (condenser water pump maintenance request 2)
Cause of activation	Compressor operating hours > counter set point
Reset	Resetting operating hours (in functions menu, Hour function, keep the "set" button pressed for a few seconds)
Reset	Manual
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Then their adjustment

33.9 VARIOUS ALARMS

33.9.1 CLOCK ALARM

Meaning of display label	ArtC (clock alarm)
Cause of activation	Clock to be set
Reset	Adjusted clock
Reset	Manual (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Loads	Then their adjustment
Energy saving function	Disabled if it depends on time bands
Automatic switch-on and off function	disabled

33.9.2 CLOCK ALARM

Meaning of display label	ArtF (clock alarm)
Cause of activation	Faulty clock
Reset	Clock replacement
Reset	Manual (reset procedure in functions menu)
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Loads	Then their adjustment
Energy saving function	Disabled if it depends on time bands
Automatic switch-on and off function	disabled

33.9.3 EEPROM ALARM

Meaning of display label	AEE
Cause of activation	Writing in EEPROM failed
Reset	-----
Reset	Manual
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Loads	Off

33.9.4 REMOTE TERMINAL ALARM

Meaning of display label	noL (no link warning)
Cause of activation	Incorrect connection between the remote terminal and the controller or two remote terminals configured as present and both with the same HW address (see the position of the address assignment switch of the keyboards)
Reset	Correct connection - two different HW addresses
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated
Regulators	
Alarm	Relay + buzzer activated
Other loads	Then their adjustment

33.9.5 REMOTE TERMINAL ALARM

Meaning of display label	Atr1 / Atr2
Cause of activation	Remote terminal configured by parameter but not connected electrically
Reset	Correct connection - remote terminal declared missing from parameter
Reset	Automatic
Icon	 flashing
Action	Alarm relay + buzzer activated

33.10 NOTES ALARM RELAY / OPEN - COLLECTOR / BUZZER

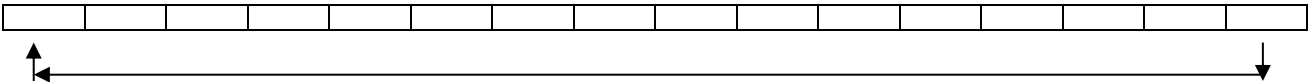
The alarm relay operation is enabled with at least one relay configured as an alarm
Alarm / buzzer relay output

ON if...	1. In the presence of an alarm that has not been eliminated 2. In the presence of alarms that are not reset
OFF if..	1. With no alarms 2. On stand by or remote ON-OFF if AL45=1 3. (buzzer) pressing one of the keys even when if an alarm that cannot be reset has been triggered

34. DIAGNOSTICS ALARMS THAT SWITCH FROM AUTOMATIC TO MANUAL

No. OF EVENTS PER HOUR

Every hour is divided into 16 intervals, each of $3600 / 16 = 225$ seconds (3 minutes and 45 seconds).



When the instrument is switched on, each observation interval is marked as "inactive".
Each observation interval is first marked "inactive" and until its conclusion (i.e. 225 seconds) it is marked "active" if at least one alarm event occurs.
One observation interval goes on to the next when it is completed, considering it is continuous and once the first 16 observation intervals are completed, the 17th overwrites the first, the 18th overwrites the 2nd and so on.
Therefore, the last hour of work is always monitored and the "active" intervals can be counted. When the number of active intervals exceeds the set threshold, the alarm switches to manual.
If the threshold is set to 0, the alarm will already be manual upon its first event, whereas if the threshold is set to 16, the alarm will always remain automatic because there are not 17 observation intervals.

34.1 OUTPUT BLOCK TABLE

The alarm messages and codes consist of letters and numbers that identify the different types.

34.2 MACHINE ALARM OUTPUT BLOCK TABLE: “A”

Cod. Alarm	Alarm description	Comp.	Support Anti-freeze Electric Heaters	Support Electric Heaters	Supply fan Evap. pump	Cond. pump	Cir1 Cir2 cond. Fan	Auxiliary relay
ACFL	Condenser water pump flow switch alarm	Off	/	/		Off (3)	Off	/
AEE	EEPROM Alarm	Off	/	/	Off	Off	Off	Off
AEFL	Evaporator water pump flow switch alarm	Off	Off (boiler)	/	Off (3)	/	Off	/
ALc1	Main unit alarm	Off	/	/	Off	Off	Off	Off
ALc2	Main unit alarm	Off	/	/	Off	Off	Off	Off
ALSF	Phase sequence alarm	Off	Off	Off	Off	Off	Off	Off
ALti	Low air/air unit evaporator input air temperature	/	/	/	/	/	/	/
AP1 AP6	PB1 probe.. Probe Pb6 of the controller	(7)	Off (1)	(7)	(7)	(7)	(7)	Off (2)
APE1 APE8	PB1 probe.. Probe Pb8 of the I/O expansion	(7)	(7)	(7)	(7)	(7)	(7)	(7)
APt1 APt2	Remote terminal probes	(7)	(7)	(7)	(7)	(7)	(7)	(7)
ASLA	LAN communication alarm with I/O expansion	Off	Off	Off	Off	Off	Off	Off
AtC1	Condenser water pump 1 circuit breaker	Off (4)	/	/	/	Off	Off	/
AtC2	Support condenser water pump 2 circuit breaker	Off (4)	/	/	/	Off	Off	/
AtE1	Evaporator water pump 1 circuit breaker	Off (4)	Off (boiler) (5)	/	Off	/	Off	/
AtE2	Support evaporator water pump 2 circuit breaker	Off (4)	Yes (boiler) (5)	/	Off		Off	/
AtSF	Supply fan circuit breaker alarm	Off	/	Off	Off	/	Off	/
Err	Simultaneous cooling and heating activation request in condensing units	Off	Off	Off	Off	Off	Off	Off

1= If the probe is configured to control the antifreeze - boiler and Ar10 = 0

2= If the probe is configured to control the auxiliary relay output

3= With the alarm with manual reset

4= Compressors off with only 1 water pump configured or with 2 water pumps configured and both in circuit breaker alarm

5= boiler electric heaters off with only 1 water pump configured or with 2 water pumps configured and both in circuit breaker alarm (in this case the boiler electric heaters are activated only by the antifreeze set point that protects the evaporator)

7= the switching off of the loads depends on the faulty probe; the adjustment probe in error switches off the main loads, the outdoor air probe disables only the dynamic set point

34.3 CIRCUIT ALARM OUTPUT BLOCK TABLE: “B”

Cod. Alarm	Alarm description	Compressors compressors (n)	Other circuit compressors	Other circuit condensation ventilation circuit (n)	Other circuit condensation ventilation
b(n)AC	Antifreeze in chiller circuit (n)	Off	/	Off	/
b(n)Ac	Antifreeze warning in chiller circuit (n)	/	/	/	/
b(n)AH	Antifreeze in heat pump circuit (n)	Off	/	Yes	/
b(n)Ah	Antifreeze warning in heat pump circuit (n)	/	/	/	/
b(n)Cu	Unloading warning from circuit condensation press. temp. (n)	/	/	/	/
b(n)dF	Circuit defrosting alarm warning (n)	/	/	/	/
b(n)Eu	Unloading warning from circuit evaporator low temp. (n)	/	/	/	/
b(n)HP	Circuit high pressure switch (n)	Off	/	Off after 60 sec.	/
b(n)hP	Circuit transducer condensation high pressure (n)	Off	/	Off after 60 sec.	/
b(n)hP	Circuit NTC probe condensation high temperature (n)	Off	/	Off after 60 sec.	/
b(n)LP	Circuit low pressure switch (n)	Off	/	Off	/
b(n)LP	Condensation low pressure - (evaporation with low pressure transducer) circuit transducer (n)	Off	/	Off	/
b(n)IP	Circuit NTC probe condensation low temperature (n)	Off	/	Off	/
b(n)rC	Circuit recovery disabling warning (n)	/	/	/	/
b(n)tF	Circuit ventilation circuit breaker alarm (n)	Off	/	Off	/

Where the letter **(n)** identifies circuit 1 or 2

34.4 COMPRESSOR ALARM OUTPUT BLOCK TABLE: “C”

Cod. Alarm	Alarm description	Compressor (n)	Non-relevant circuit compressors
C(n)dt	Compressor supply high temperature	Off	/
C(n)HP	Compressor high pressure switch (n)	Off	/
C(n)tr	Compressor circuit breaker alarm (n) with AL47 = 0 – 1	Off	/
C(n)tr	Compressor circuit breaker alarm (n) with AL47 ≠ from 0	Off	Off

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

34.5 TABLE OF WARNINGS

Cod. Alarm	Alarm description
C(n)Mn	Compressor maintenance (n)
ACP1	Condenser water pump 1 maintenance
ACP2	Condenser water pump 2 maintenance
AEP1	Evaporator water pump 1 maintenance
AEP2	Support evaporator water pump 2 maintenance
AEUn	Evaporator unloading warning
b(n)Cu	Unloading warning from circuit condensation press. temp. (n)
b(n)Eu	Unloading warning from circuit evaporator low temp. (n)
ArtC	Clock adjustment
ArtF	Clock alarm
noL	No communication warning between the keyboard or remote terminal control 2 configured with the same address

35. PARAMETERS

35.1 TERMOREGOLATION

Parameter	Description	min.	max.	u.d.m.	Risolution
ST1	Chiller set point Allows you to set the working set point in chiller mode	ST02	ST03	°C/°F	dec/int
ST2	Minimum chiller set point Defines the lowest limit that can be used for setting the working set point in chiller mode	-50.0 -58	ST01	°C °F	Dec int
ST3	Maximum chiller set point Defines the highest limit that can be used for setting the working set point in chiller mode	ST01	110 230	°C °F	Dec int
ST4	Heat pump set point Allows you to set the working set point in heat pump mode	ST05	ST06	°C/°F	dec/int
ST5	Minimum heat pump set point Defines the lowest limit that can be used for setting the working set point in heat pump mode	-50.0 -58	ST04	°C °F	Dec int
ST6	Maximum heat pump set point Defines the highest limit that can be used for setting the working set point in heat pump mode	ST04	110 230	°C °F	Dec int
ST7	Intervention band of control steps in chiller mode	0.1 0	25.0 45	°C °F	Dec int
ST8	Intervention band of control steps in heat pump mode	0.1 0	25.0 45	°C °F	Dec int

35.2 DISPLAY ON THE DISPLAY

Parameter	Description	min.	max.	u.d.m.	Risolution
dP1	Default - display on the upper display	0	17		
dP2	Default - display on the lower display	0	21		

35.2.1 Forced display on the display

dP3	Default - forced display on the upper / lower display 0= configurable display 1= upper display IN evaporator / lower display OUT evaporator 2= upper display IN condenser / lower display OUT condenser 3= upper display of condensing temperature / pressure / lower display of evaporating pressure	0	3		
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35.2.2 Forced display on the display of the remote terminals

dP4	Default - display on the upper display of remote terminal n° 1 0= the display depends on the value of parameters dP01 – dP02 – dP03 1= the upper display displays the temperature measured by the NTC probe installed on remote terminal n° 1	0	1		
dP5	Default - display on the upper display of remote terminal n° 2 0= the display depends on the value of parameters dP01 – dP02 – dP03 1= the upper display displays the temperature measured by the NTC probe installed on remote terminal n° 2	0	1		

35.3 UNIT

35.3.1 Offset of probes

Parameter	Description	min.	max.	u.d.m.	Risolution
CF16	Offset of PB1	-12.0 -21	12.0 21	°C °F	Dec int
CF17	Offset of PB2	-12.0 -21	12.0 21	°C °F	Dec int
CF18	Offset of PB3	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int

CF19	Offset of PB4	-12.0	12.0	°C	Dec
		-21	21	°F	int
		-5.0	5.0	bar	dec
		-72	72	psi	int
CF20	Offset of PB5	-12.0	12.0	°C	Dec
		-21	21	°F	int
		-5.0	5.0	bar	dec
		-72	72	psi	int
CF21	Offset PB6	-12.0	12.0	°C	Dec
		-21	21	°F	int
		-5.0	5.0	bar	dec
		-72	72	psi	int

35.3.2 Digital inputs

CF40	Configuration of ID11	0 -o1	c94		
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35.3.3 Remote terminal

CF54	Configuration of remote terminal n° 1 0= absent 1= on-board NTC probe 2= without on-board NTC probe	0	2		
CF55	Configuration of remote terminal n° 2 0= absent 1= on-board NTC probe 2= without on-board NTC probe	0	2		
CF56	Offset of NTC probe on remote terminal n° 1	- 12.0 -21	12.0 21	°C °F	Dec Int
CF57	Offset of NTC probe on remote terminal n° 2	- 12.0 -21	12.0 21	°C °F	Dec Int

35.3.4 Selection of chiller/heat pump operation

CF59	Selection of chiller / heat pump operation 0= from keypad 1= from digital input 2= from analogue input	0	2		
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35.3.5 Selection of unit of measurement

CF62	Selection of °C or °F 0= °C / BAR 1= °F / psi	0	1		
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35.3.6 Serial address

CF64	Serial address	1	247		
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35.3.7 Enabling of buzzer

CF76	Enabling of buzzer (0=disabled, 1=enabled)	0	1		
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35.3.8 Offset of I/O expansion probes

Parameter	Description	min.	max.	u.d.m.	Risolution
EI10	Offset PB1	-12.0 -21	12.0 21	°C °F	Dec int
EI11	Offset PB2	-12.0 -21	12.0 21	°C °F	Dec int
EI12	Offset PB3	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI13	Offset PB4	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int

EI14	Offset PB5	-12.0 -21 -5.0 -72	12.0 21 5.0 72	EI14	Dec int dec int
EI15	Offset PB6	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
EI16	Offset PB7	-12.0 -21	12.0 21	°C °F	Dec int
EI17	Offset PB8	-12.0 -21	12.0 21	°C °F	Dec int

35.3.9 Dynamic set point

Parameter	Description	min.	max.	u.d.m.	Risolution
Sd1	Max. dynamic set point increase in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd2	Max. dynamic set point increase in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd3	Set point of outside air temp. for dynamic set point management in chiller mode	-50.0 -58	110.0 230	°C °F	Dec int
Sd4	Set point of outside air temp. for dynamic set point management in heat pump mode	-50.0 -58	110.0 230	°C °F	Dec int
Sd5	Differential of outside air temp. for dynamic set point management in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd6	Differential of outside air temp. for dynamic set point management in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int

35.3.10 Energy saving

Parameter	Description	min.	max.	u.d.m.	Risolution
ES1	Start of operating time band n° 1 (0 to 24)	0	24.00	Hr	10 Min
ES2	End of operating time band n° 1 (0 to 24)	0	24.00	Hr	10 Min
ES3	Start of operating time band n° 2 (0 to 24)	0	24.00	Hr	10 Min
ES4	End of operating time band n° 2 (0 to 24)	0	24.00	Hr	10 Min
ES5	Start of operating time band n° 3 (0 to 24)	0	24.00	Hr	10 Min
ES6	End of operating time band n° 3 (0 to 24)	0	24.00	Hr	10 Min
ES7	Monday - operation with time band in energy saving mode Monday - operation with automatic switch on/off	0 - 0	7 - 7		
ES8	Tuesday - operation with time band in energy saving mode Tuesday - operation with automatic switch on/off	0 - 0	7 - 7		
ES9	Wednesday - operation with time band in energy saving mode Wednesday - operation with automatic switch on/off	0 - 0	7 - 7		
ES10	Thursday - operation with time band in energy saving mode Thursday - operation with automatic switch on/off	0 - 0	7 - 7		
ES11	Friday - operation with time band in energy saving mode Friday - operation with automatic switch on/off	0 - 0	7 - 7		
ES12	Saturday - operation with time band in energy saving mode Saturday - operation with automatic switch on/off	0 - 0	7 - 7		
ES13	Sunday - operation with time band in energy saving mode Sunday - operation with automatic switch on/off	0 - 0	7 - 7		
ES14	Energy saving set point increase in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
ES15	Differential of energy saving in chiller mode	0.1 0	25.0 45	°C °F	Dec int
ES16	Energy saving set point increase in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
ES17	Differential of energy saving in heat pump mode	0.1 0	25.0 45	°C °F	Dec int
ES18	Maximum operating time of unit in OFF mode from RTC if forced to ON from button	1	250	10 min	min

35.4 COMPRESSOR

Parameter	Description	min.	max.	u.d.m.	Resolution
CO1	Minimum compressor switched-on time Determines the time during which the compressor must remain active after being switched on, even if the request for it ceases.	0	250	10 sec	10 sec
CO2	Minimum compressor switched-off time Determines the time during which the compressor must remain inactive even if it is required to be switched on again. During this stage the compressor LED flashes.	0	250	10 sec	10 sec
CO3	Switch-on delay between 2 compressors / steps With two compressors, this defines the switch-on delay between the two, to reduce the starting current draws. During this stage the compressor LED flashes. (only for the compressor) With unit with one compressor at reduced capacity. Determines the switched-on time of the capacity reduction solenoid for a start at minimum capacity (see starting the compressors)	1	250	Sec	
CO4	Switch-off delay between 2 compressors / steps Defines the switch-off delay between the two compressors / two capacity reduction steps	0	250	Sec	
CO5	Delay to switch-on of compressors from power ON Switch-on understood as physical power supply to the control. Delays activation of all the outputs to distribute the mains current draws and to protect the compressor(s) from repeated switch-ons in case of frequent power failures	0	250	10 Sec	10 sec

35.4.1 Rotation – balancing – thermoregulation of compressors

CO14	Rotation of compressors (see rotation of compressors) 0 = Fixed sequence 1 = Rotation enabled with thermoregulation of compressors according to hours of operation 2 = Rotation enabled with thermoregulation of compressors according to starts per hour (starts)	0	2		
CO15	Balancing of the circuits (see balancing of the circuits) 0= saturation of the circuits 1= balancing of the circuits	0	1		

35.4.2 Evaporator water pump

CO17	Compressor ON delay from starting of the supply pump/fan (see evaporator/condenser water pump operation)	1	250	sec	10sec
CO18	Supply evaporator/fan water pump OFF delay from compressor switch-off. This time is complied with even when the unit is put in standby mode (see evaporator water pump operation)	0	250	Min	
CO19	N° of hours for forced rotation of evaporator pumps (see evaporator pumping unit operation)	0	999	10Hr	10Hr
CO20	Time for simultaneous operation of pumps after forced rotation of pumps (see evaporator pumping unit operation)	0	250	Sec	

35.4.3 Condenser water pump

CO23	Condenser pump OFF delay from compressor switch-off. This time is complied with even when the unit is put in standby mode (see condenser water pump operation)	0	250	Min	
CO24	N° of hours for forced rotation of condenser pumps (see evaporator pumping unit operation)	0	999	10Hr	10Hr
CO25	Time for simultaneous operation of pumps after forced rotation of condenser pumps (see evaporator pumping unit operation)	0	250	Sec	

35.4.4 Maintenance of loads

CO26	Set point for compressor 1 hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO27	Set point for compressor 2 hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO28	Set point for compressor 3 hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO29	Set point for compressor 4 hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO30	Not used	0	0		
CO31	Not used	0	0		

CO32	Set point for pump / supply fan hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO33	Set point for evaporator n° 2 pump hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO24	Set point for condenser pump hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr
CO35	Set point for condenser n° 2 pump hour counter (see maintenance request function chapter)	0	999	10 Hr	10 Hr

35.4.5 Evaporator unloading

CO40	Set point for compressor unloading function in chiller mode from high evaporator water inlet temperature (see unloading function)	-50.0 -58	110.0 230	°C °F	Dec int
CO41	Relay differential for comp. unloading from high evaporator water inlet temperature (see unloading function)	0.1 0	25.0 45	°C °F	Dec int
CO42	Delay time to enabling of comp. unloading function from high evaporator water inlet temperature (see unloading function)	1	250	10 Sec	10 sec
CO43	MAX residence time in comp. unloading mode from high evaporator water inlet temperature	1	250	Min	

35.4.6 Chiller – heat pump condenser unloading

CO44	Set point of temperature/pressure for comp. unloading in chiller mode (see unloading function)	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
CO45	Differential of temperature/pressure for comp. unloading in chiller mode (see unloading function)	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO46	Set point of temperature/pressure for comp. unloading in heat pump mode (see unloading function)	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
CO47	Differential of temperature/pressure for comp. unloading in heat pump mode (see unloading function)	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO48	MAX residence time in compressor unloading mode from temperature/pressure	1	250	Min	
CO49	Choice of steps per circuit to be enabled during unloading 1= 1 step 2= 2 steps 3= 3 steps	1	3		
CO50	Minimum time of operation in ON mode of capacity reduction step after entering unloading mode (only for compressor with capacity reductions)	0	250	Sec	

35.4.7 Compressor liquid injection function

CO51	Set point for activation of liquid injection solenoid valve	0 32	150 302	°C °F	Dec / int int
CO52	Differential for deactivation of liquid injection solenoid valve	0.1 0	25.0 45	°C °F	Dec int

35.4.8 Low evaporator water temperature unloading

CO55	Set point for compressor unloading from low evaporator water temperature	-50.0 -58	110.0 230	°C °F	Dec int
CO56	Differential for compressor unloading from low evaporator water temperature	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO57	MAX residence time in compressor unloading mode from low evaporator water temperature	0	250	Min	

35.4.9 Machine capacity reduction

CO76	Limitation of the number of steps in Chiller mode	1	15		
CO77	Limitation of the number of steps in Heat Pump mode	1	15		
CO85	Evaporator water pump deactivation time with machine at set point	0	250	10 min	
CO86	Evaporator water pump deactivation time with machine switched off (standby or OFF)	0	250	10 Ore	
CO87	Evaporator water pump activation time	0	250	Sec	10sec
CO88	Condenser water pump deactivation time with machine at set point	0	250	10 min	
CO89	Condenser water pump deactivation time with machine switched off (standby or OFF)	0	250	10 Ore	
CO90	Condenser water pump activation time	0	250	Sec	10sec
CO91	Minimum time between two switch-ons of the same compressor	0	250	sec	

35.5 AUXILIARY RELAY MENU

35.5.1 Auxiliary relay n° 1

Parameter	Description	min.	max.	u.d.m.	Risolution
US6	Minimum winter set point for auxiliary relay 1 output	-50.0 -58 0.0 0	US8	°C °F Bar Psi	Dec int Dec Int
US7	Maximum winter set point for auxiliary relay 1 output	US8	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
US8	Winter set point for auxiliary relay 1 output	US6	US7	°C °F Bar Psi	Dec int Dec int
US10	Winter differential for auxiliary relay 1	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int

35.5.2 Condensation ventilation

Parameter	Description	min.	max.	u.d.m.	Risolution
FA3	Start time of fans at MAX speed after ON (TRIAC). Irrespective of the condensing temperature/pressure, at each start, the fan is powered at the maximum voltage for time FA03, at the end of which the fan continues at the speed set by the controller.	0	250	Sec	

35.5.3 Operation in chiller mode

FA9	Proportional control Temperature/pressure set point of minimum fan speed in chiller mode - allows you to set the condensing temperature/pressure value in chiller mode to which the minimum speed of the fan corresponds. Stepped control 1st STEP SET POINT Allows you to set the condensing temperature/pressure value in chiller mode to which corresponds the operation in ON mode of the relay output configured as 1st step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA10	Proportional control Temperature/pressure set point of maximum fan speed in chiller mode - allows you to set the condensing temperature/pressure value in chiller mode to which the maximum speed of the fan corresponds. Stepped control 2nd STEP SET POINT Allows you to set the condensing temperature/pressure value in chiller mode to which corresponds the operation in ON mode of the relay output configured as 2nd step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA11	Proportional control Proportional band for control of fans in chiller mode Allows you to set a temperature/pressure differential to which a fan speed change from minimum to maximum corresponds. Stepped control With Par. FA01 = 2 / 3 this becomes the differential on the step of circuit n° 1 in chiller mode (see fan control graph).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA12	Proportional control CUT-OFF differential in chiller mode - Allows you to set a temperature/pressure differential in chiller mode for switching off the fan. Stepped control With Par. FA01 = 2 / 3 this becomes the differential on the step of circuit n° 2 in chiller mode (see fan control graph).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA13	CUT-OFF override in chiller mode - Allows you to set a temperature/pressure differential in chiller mode in which the fan stays at minimum speed.	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA14	CUT-OFF delay time - Allows you to set a delay time for activation of the CUT-OFF function when the fans start. If, when the compressor starts, the proportional controller requires the fan to be switched off (cut-off) and FA14≠0 for the set time, the fan will be forced to minimum speed. If FA14=0 the function is not enabled.	0	250	Sec	

35.5.4 Operation in heat pump mode

FA18	Proportional control Temperature/pressure set point of maximum fan speed in heat pump mode - Allows you to set the condensing temperature/pressure value in heat pump mode to which the maximum speed of the fan corresponds. Stepped control 1st STEP SET POINT Allows you to set the condensing temperature/pressure value in heat pump mode to which corresponds the operation in ON mode of the relay output configured as 1st step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA19	Proportional control Temperature/pressure set point of minimum fan speed in heat pump mode - Allows you to set the condensing temperature/pressure value in heat pump mode to which the minimum speed of the fan corresponds. Stepped control 2nd STEP SET POINT Allows you to set the condensing temperature/pressure value in heat pump mode to which corresponds the operation in ON mode of the relay output configured as 2nd step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA20	Proportional control Proportional band for control of fans in heat pump mode Allows you to set a temperature/pressure differential to which a fan speed change from minimum to maximum corresponds. Stepped control With Par. FA01 = 2 / 3 this becomes the differential on the step of circuit n° 1 in heat pump mode (see fan control graph).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA21	Proportional control CUT-OFF differential in heat pump mode - allows you to set a temperature/pressure differential in heat pump mode for switching off the fan. Stepped control With Par. FA01 = 2 / 3 this becomes the differential on the step of circuit n° 2 in heat pump mode (see fan control graph).	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA22	CUT-OFF override in heat pump mode - Allows you to set a temperature/pressure differential in heat pump mode in which the fan stays at minimum speed.	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int

35.5.5 3 / 4 Condensation ventilation step in chiller mode

FA26	Stepped control 3rd STEP SET POINT Allows you to set the condensing temperature/pressure value in chiller mode to which corresponds the operation in ON mode of the relay output configured as 3rd step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA27	Stepped control 4th STEP SET POINT Allows you to set the condensing temperature/pressure value in chiller mode to which corresponds the operation in ON mode of the relay output configured as 4th step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int

35.5.6 3 / 4 Condensation ventilation step in heat pump mode

FA28	Stepped control 3rd STEP SET POINT Allows you to set the condensing temperature/pressure value in heat pump mode to which corresponds the operation in ON mode of the relay output configured as 3rd step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int
FA29	Stepped control 4th STEP SET POINT Allows you to set the condensing temperature/pressure value in heat pump mode to which corresponds the operation in ON mode of the relay output configured as 4th step of condensation ventilation speed.	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F Bar Psi	Dec int Dec int

35.5.7 Anti-freeze heaters – support – boiler

Ar1	Set point for anti-freeze heaters / support (air/air unit) in chiller mode Allows you to set a temperature value below which the anti-freeze heaters are activated	-50.0 -58	110.0 230	°C °F	Dec int
Ar2	Control band for anti-freeze heaters / support in chiller mode	0.1 0	25.0 45	°C °F	Dec Int
Ar3	Set point for anti-freeze heaters / support (air/air unit) in heat pump mode Allows you to set a temperature value below which the anti-freeze heaters are activated	-50.0 -58	110.0 230	°C °F	Dec int
Ar4	Control band for anti-freeze heaters / support in heat pump mode	0.1 0	25.0 45	°C °F	Dec int

35.5.8 Boiler function

Ar12	Outside air set point for activation of boiler heaters	-50.0 -58	110.0 230	°C °F	Dec int
Ar13	Outside air differential for deactivation of boiler heaters	0.1 0	25.0 45	°C °F	Dec int
Ar14	Delay time for activation of boiler heaters	0	250		Min

35.5.9 Boiler operation in chiller mode

Ar15	Set point for boiler heaters in chiller mode	-50.0 -58	110.0 230	°C °F	Dec int
Ar16	Proportional band for boiler heaters in chiller mode	0.1 0	25.0 45	°C °F	Dec int

35.5.10 Boiler operation in heat pump mode

Ar17	Set point for boiler heaters in heat pump mode	-50.0 -58	110.0 230	°C °F	Dec int
Ar18	Proportional band for boiler heaters in heat pump mode	0.1 0	25.0 45	°C °F	Dec int
Ar19	Outside air set point for deactivation of compressors in supplement mode	-50.0 -58	110.0 230	°C °F	Dec int
Ar20	Outside air differential for activation of compressors in supplement mode	0.1 0	25.0 45	°C °F	Dec int

35.5.11 Operation of evaporator water pump with anti-freeze alarm

Ar26	Set point for activation of evaporator water pump in anti-freeze mode on thermoregulation probe	-50.0 -58	110.0 230	°C °F	Dec int
Ar27	Differential for deactivation of evaporator water pump in anti-freeze mode on thermoregulation probe	0.1 0	25.0 45	°C °F	Dec int

35.5.12 Condenser heaters

Ar28	Set point for condenser anti-freeze heaters in chiller mode	-50.0 -58	110.0 230	°C °F	Dec int
Ar29	Differential for condenser anti-freeze heaters in chiller mode	0.1 0	25.0 45	°C °F	Dec int
Ar30	Set point for condenser anti-freeze heaters in heating mode	-50.0 -58	110.0 230	°C °F	Dec int
Ar31	Differential for condenser anti-freeze heaters in heating mode	0.1 0	25.0 45	°C °F	Dec int

35.5.13 Defrosting

dF2	Temperature and pressure at start of defrost	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int
dF3	Temperature and pressure at end of defrost	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int
dF6	Delay time between the defrost of two circuits	0	250	Min	
dF9	Defrost interval in the same circuit	1	99	Min	
dF18	Pressure/temperature set point for forcing ventilation ON in defrost mode	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec Int

35.5.14 Forced defrost

dF19	Minimum waiting time before a forced defrost	0	250	sec	
dF20	Temperature/pressure set point for forced defrost	-50.0	110.0	°C	Dec
		-58	230	°F	int
		0.0	50.0	bar	Dec
		0	725	psi	int
dF21	Forced defrost differential	0.1	25.0	°C	Dec
		0	45	°F	int
		0.1	14.0	Bar	Dec
		1	203	Psi	int

35.5.15 Defrost with condensation fans

dF26	Set point for enabling defrost with condensation fans	-50.0	110.0	°C	Dec
		-58	230	°F	int
		0.0	50.0	bar	Dec
		0	725	psi	int

35.5.16 Dynamic set point in defrost mode

dF37	Maximum dynamic set point increase in defrost mode	-30.0	30.0	°C	Dec
		-54	54	°F	int
		-14.0	14.0	Bar	Dec
		-203	203	Psi	int
dF38	Outside air temperature set point for defrost management with dynamic set point	-50.0	110.0	°C	Dec
		-58	230	°F	int
dF39	Outside air temperature differential for defrost management with dynamic set point	-30.0	30.0	°C	Dec
		-54	54	°F	int

35.5.17 Recovery

Parameter	Description	min.	max.	u.d.m.	Risolution
rC2	Step forcing deactivation time	0	250	Sec	
rC3	Step forcing deactivation time after rotation of the recovery valve	0	250	Sec	
rC4	Minimum operating time in recovery mode	0	250	Min	
rC5	Minimum delay between end of recovery and next recovery	0	250	Min	
rC6	Set point for disabling recovery function	-50.0	110.0	°C	Dec
		-58	230	°F	int
		0.0	50.0	Bar	Dec
		0	725	Psi	int
rC7	Differential for disabling recovery function	0.1	25.0	°C	Dec
		0	45	°F	int
		0.1	14.0	Bar	Dec
		1	203	Psi	int
rC8	Maximum time for disabling recovery from condensing pressure/temperature	0	250	Min	
rC10	Recovery request set point	rC11	rC12	°C	Dec
				°F	int
				Bar	Dec
				Psi	int
rC11	Lowest limit of recovery request set point	-50.0		°C	Dec
		-58		°F	int
		0.0	rC10	Bar	Dec
		0		Psi	int
rC12	Highest limit of recovery request set point		110.0	°C	Dec
			230	°F	int
			50.0	Bar	Dec
			725	Psi	int
rC13	Recovery exit differential	0.1	25.0	°C	Dec
		0	45	°F	int
		0.1	14.0	Bar	Dec
		1	203	Psi	int

35.6 ALLARM

35.6.1 Low alarm

Parameter	Description	min.	max.	u.d.m.	Risolution
AL1	Delay for low pressure alarm from digital/analogue input	0	250	Sec	
AL3	Set point for low pressure alarm from analogue input	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
AL4	Differential for low pressure alarm from analogue input	0.1 0 0.1 1	25.0 45 14.0 203	°C °F bar psi	Dec int Dec Int
AL5	Maximum number of low pressure alarm occurrences per hour from digital/analogue input The reset is always manual if AL05 = 0 The reset is always automatic if AL05 = 16 The reset changes from automatic to manual if AL05 ranges from 1 to 15	0	16		
AL6	Low temperature/pressure alarm during defrost 0= not enabled 1= enabled	0	1		
AL7	Low temperature/pressure alarm delay during defrost	0	250	Sec	
AL8	Low temperature/pressure alarm with unit in remote OFF or standby mode 0 = alarm detection not enabled 1 = alarm detection enabled	0	1		

35.6.2 High alarm

AL9	Set point for high condensing temperature/pressure alarm from analogue input	-50.0 -58 0.0 0	110.0 230 50.0 725	°C °F bar psi	Dec int Dec int
AL10	Differential for high condensing temperature/pressure alarm from analogue input	0.1 0 0.1 1	25.0 45 14.0 203	°C °F bar psi	Dec int Dec int

35.6.3 Evaporator flow switch alarm

AL15	Evaporator flow switch / supply fan thermal overload protection alarm delay from activation of evaporator water pump / supply fan	0	250	Sec	
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35.6.4 Compressor Thermal Overload Protection Alarm

AL19	Compressor thermal overload protection alarm delay when the compressor starts	0	250	Sec	
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35.6.5 Evaporator anti-freeze alarm in chiller mode

AL24	Set point for minimum limit of evaporator anti-freeze in chiller mode (ranges from -30°C to AL24)	-50.0 -58	AL26	°C °F	Dec int
AL25	Set point for maximum limit of evaporator anti-freeze in chiller mode (ranges from AL24 to 70°C)	AL26	110.0 230	°C °F	Dec int
AL26	Set point for evaporator anti-freeze alarm in chiller mode - allows you to set a temperature value below which the anti-freeze alarm, low ambient air temperature alarm (air/air unit), low outgoing air temperature alarm (air/air unit), is activated. (ranges from AL24 to AL25)	AL24	AL25	°C/°F	Dec/int
AL27	Differential for evaporator anti-freeze alarm in chiller mode, low ambient air temperature alarm, low outgoing air temperature alarm. Allows you to set a temperature differential that causes a reset of the alarm	0.1 0	25.0 45	°C °F	Dec int

35.6.6 Anti-freeze alarm in heat pump mode

AL31	Set point for minimum limit of evaporator anti-freeze in heat pump mode (ranges from -30°C to AL32)	-50.0 -58	AL33	°C °F	Dec int
AL32	Set point for maximum limit of evaporator anti-freeze in heat pump mode (ranges from AL31 to 70°C)	AL33	110.0 230	°C °F	Dec int
AL33	Set point for evaporator anti-freeze alarm in heat pump mode Allows you to set a temperature value below which the anti-freeze alarm, low ambient air temperature alarm (air/air unit), low outgoing air temperature alarm (air/air unit), is activated. (ranges from AL31 to AL32)	AL31	AL32	°C/°F	Dec/int
AL34	Differential for evaporator anti-freeze alarm in heat pump mode, low ambient air temperature alarm, low outgoing air temperature alarm. Allows you to set a temperature differential that causes a reset of the alarm.	0.1 0	25.0 45	°C °F	Dec int

35.6.7 High compressor delivery temperature

AL39	Set point for high compressor delivery temperature alarm	0 32	150 302	°C °F	Dec int
AL40	Differential for high compressor delivery temperature alarm	0.1 0	25.0 45	°C °F	Dec int

35.6.8 High evaporator water inlet temperature alarm

AL60	High system inlet water temperature probe alarm delay from ON of compressor	0	250	sec	10 sec
AL61	Set point for high system inlet water temperature probe alarm	-50.0 -58	110 230	°C °F	Dec int
AL62	Differential for high system inlet water temperature probe alarm	0.1 0	25.0 45	°C °F	Dec int

36. CONNECTION LAYOUT

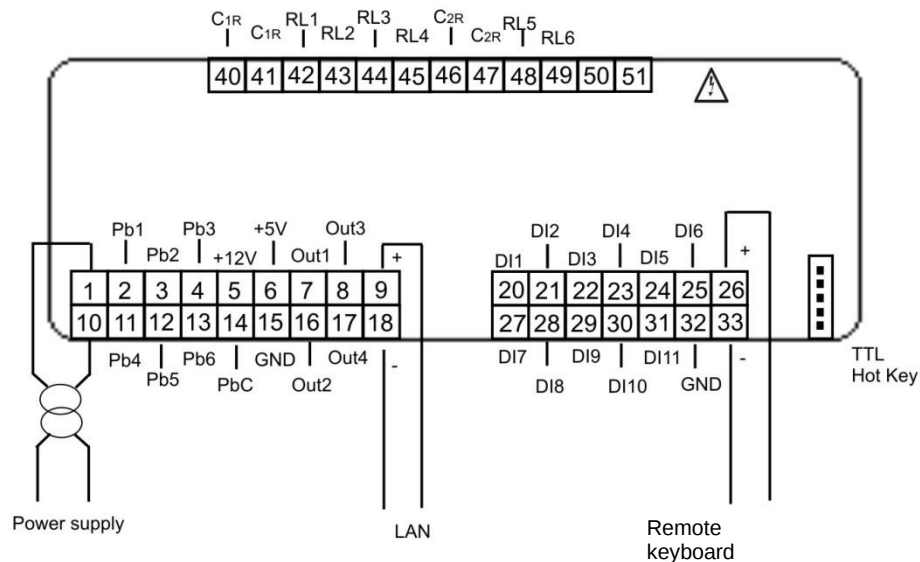
36.1 MODEL IC206CX HARDWARE RESOURCES

- 6 digital outputs (relay)
- 11 digital inputs (potential-free contact)
- 6 analogue inputs:
 - 4 configurable as an NTC / PTC probe or as a digital input
 - 2 configurable as an NTC / PTC / probe for a 4÷20mA pressure transducer / for a 0 ÷ 5 Volt ratiometric pressure transducer or as a digital input
- 4 modulating outputs:
 - 2 configurables 0 ÷ 10.0 Volt or output for external relay
 - 2 configurables 0 ÷ 10.0 Volt, or phase cut (to control the condensation fans with an external fan module) or output for external relay
- 1 LAN output for connection to an I/O expansion and/or to an IEV electronic expansion driver
- 1 output to connect the LED remote terminal (up to 2 terminals)
- 1 TTL output to connect Hot Key 64 (parameter programming key) or to connect to the Personal Computer to program parameters or to a monitoring system with Mod_BUS communication protocol (in this case, the XJ485 Dixell interface module is required to convert the TTL signal to RS485).

MAX current applicable to the relay contacts 5(2)A 250V - MAX current applicable to the common contacts 10A 250V

C_{1R} = common RL1, RL2, RL3, RL4

C_{2R} = common RL5, RL6

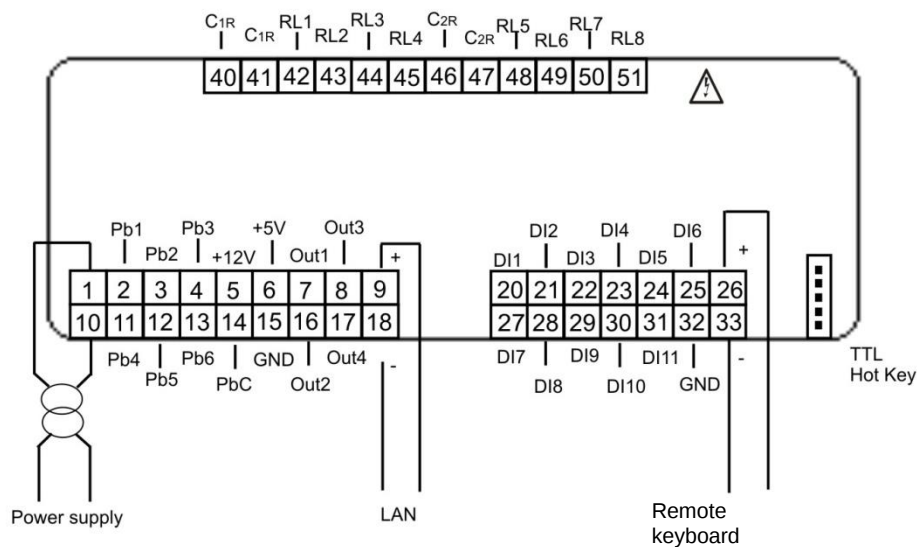


36.2 MODEL IC208CX HARDWARE RESOURCES

- 8 digital outputs (relay)
- 11 digital inputs (potential-free contact)
- 6 analogue inputs:
 - 4 configurable as an NTC / PTC probe or as a digital input
 - 2 configurable as an NTC / PTC / probe for a 4÷20mA pressure transducer / for a 0 ÷ 5 Volt ratiometric pressure transducer or as a digital input
- 4 modulating outputs:
 - 2 configurables 0 ÷ 10.0 Volt or output for external relay
 - 2 configurables 0 ÷ 10.0 Volt, or phase cut (to control the condensation fans with an external fan module) or output for external relay
- 1 LAN output for connection to an I/O expansion and/or to an IEV electronic expansion driver
- 1 output to connect the LED remote terminal (up to 2 terminals)
- 1 TTL output to connect Hot Key 64 (parameter programming key) or to connect to the Personal Computer to program parameters or to a monitoring system with Mod_BUS communication protocol (in this case, the XJ485 Dixell interface module is required to convert the TTL signal to RS485).
- MAX current applicable to the relay contacts 5(2)A 250V - MAX current applicable to the common contacts 10A 250V

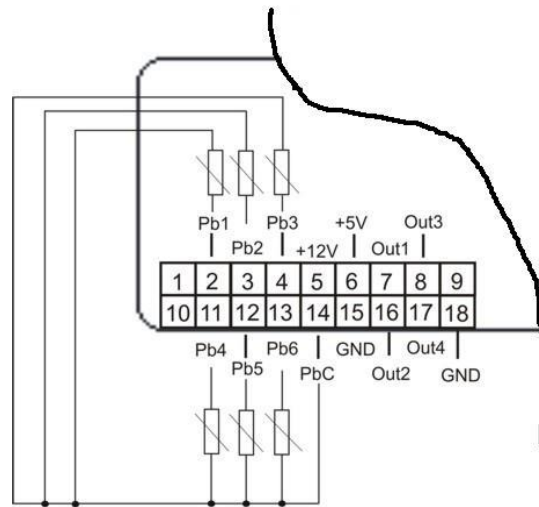
C_{1R} = common RL1, RL2, RL3, RL4

C_{2R} = common RL5, RL6, RL7, RL8



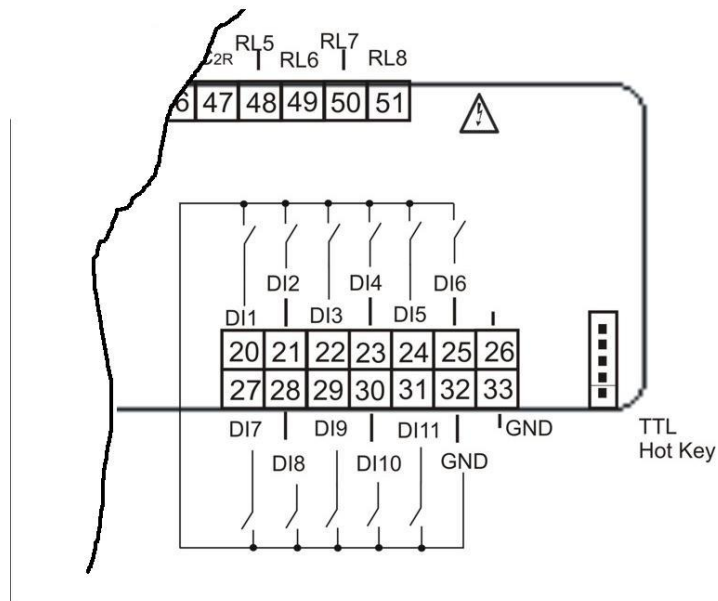
36.3 NTC / PTC PROBE ANALOGUE INPUTS

PbC = common probe
PbC = common probe
Pb1...Pb6 = probe inputs



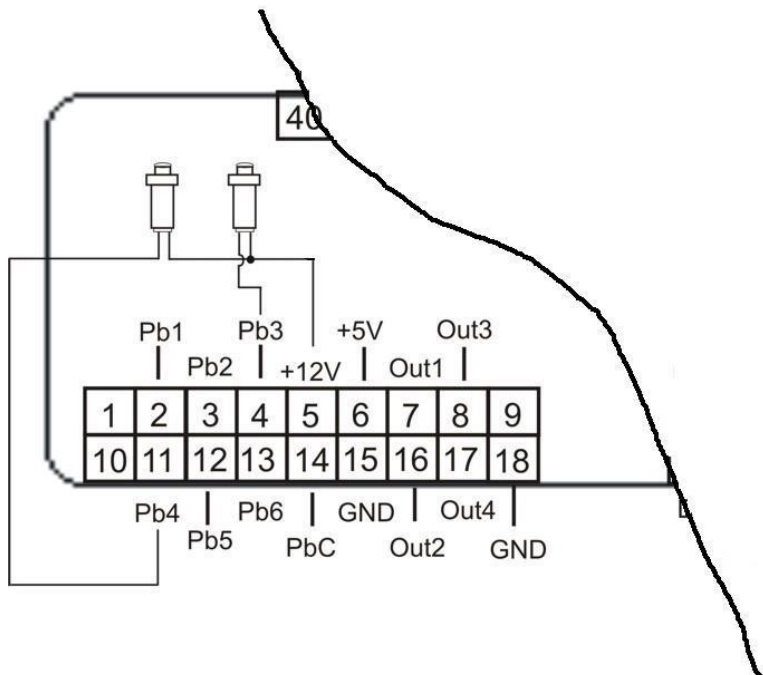
36.4 DIGITAL INPUTS

GND = common inputs
ID1..ID11 = digital inputs



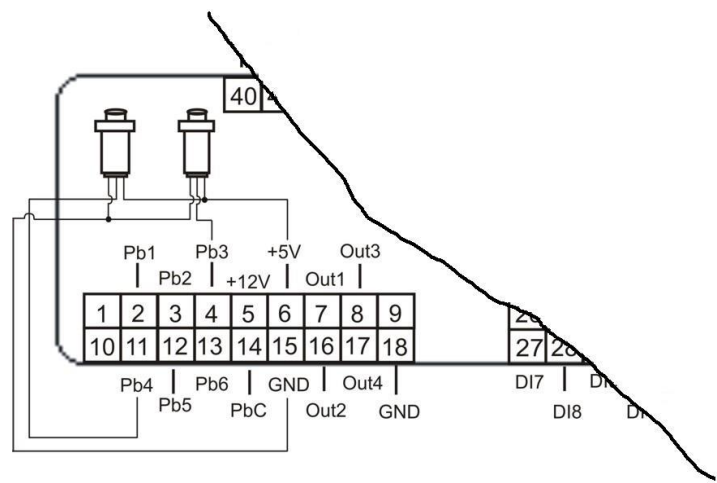
36.5 PRESSURE TRANSDUCERS ANALOGUE INPUTS 4÷20MA

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



36.6 RATIOMETRIC PRESSURE TRANSDUCERS ANALOGUE INPUTS 0-5V

+5V = transducers power supply
Pb3 and Pb4 = analogue inputs for pressure transducers
+12V = transducers power supply earth



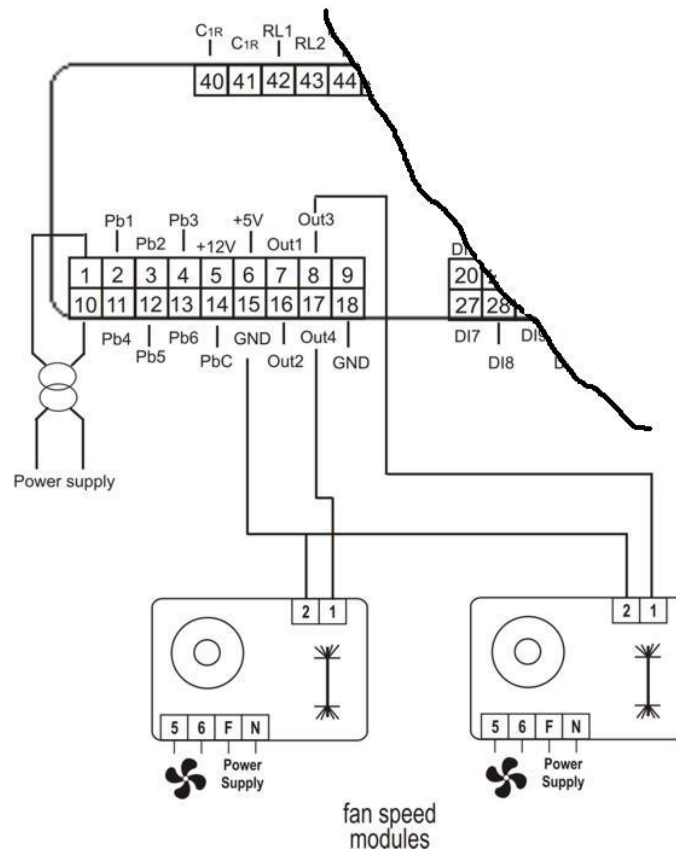
36.7 CONDENSATION CONTROL PHASE CUT OUTPUTS (ONLY FOR OUTPUTS OUT3 AND OUT4)

If a single condensation ventilation circuit is configured the OUT2 / OUT3 outputs run in parallel.
The phase cut signal must only be connected to the manufacturer modules:

XV05PK 500 Watt (**2A**) single phase cut module

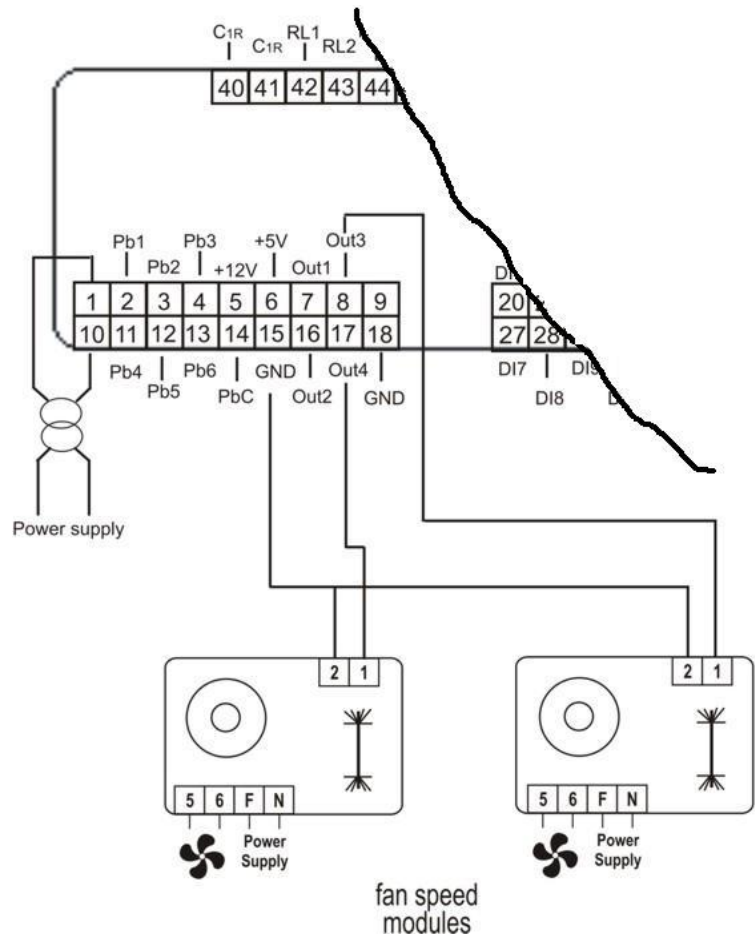
XV10PK 1000 Watt (**4A**) single phase cut module

XV22PK 2200 Watt (**9A**) single phase cut module



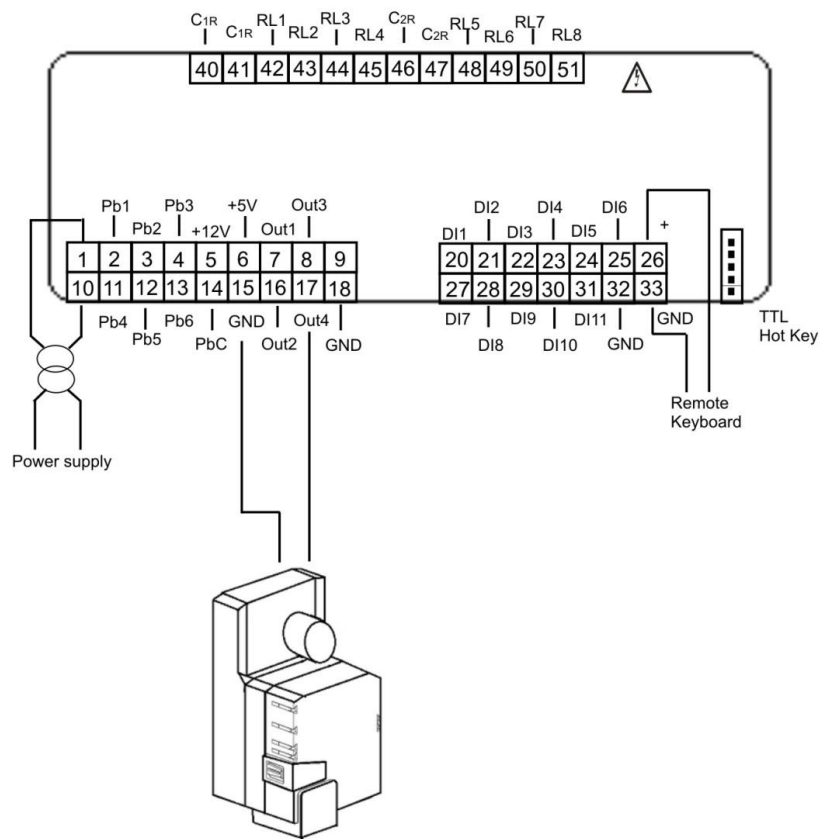
36.8 0 ÷ 10V PROPORTIONAL OUTPUTS FOR CONDENSATION CONTROL / MODULATING COMPRESSOR CONTROL / AUXILIARY OUTPUT CONTROL

GND = common
OUT1..OUT4 = analogue outputs

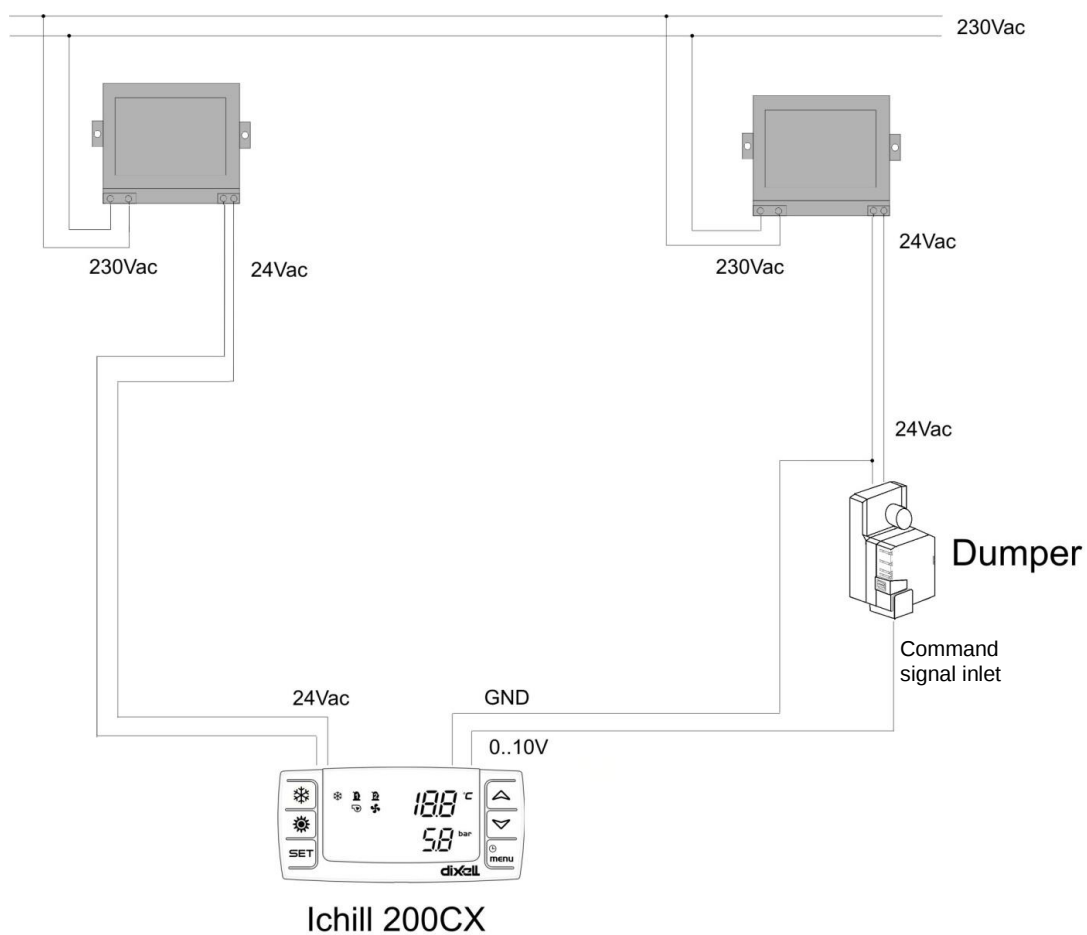


36.9 SERVO-MOTOR CONTROL 0-10V PROPORTIONAL OUTPUTS

GND = common



If the GND of the 0..10V modulating signal in the servo-motor is in common with a power supply pole, the power supplies of the Ichill and the servo-motor must be separated as shown in the image below.

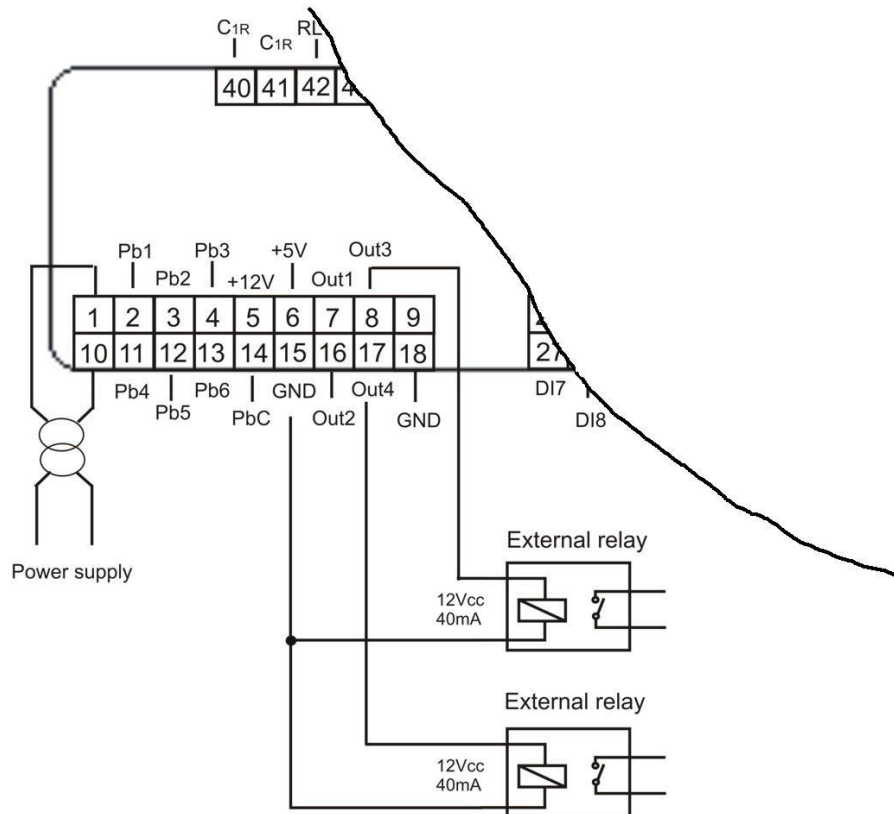


36.10 PROPORTIONAL OUTPUTS CONFIGURED TO PILOT AN EXTERNAL RELAY

GND = common

OUT1..OUT4 = outputs for external relays

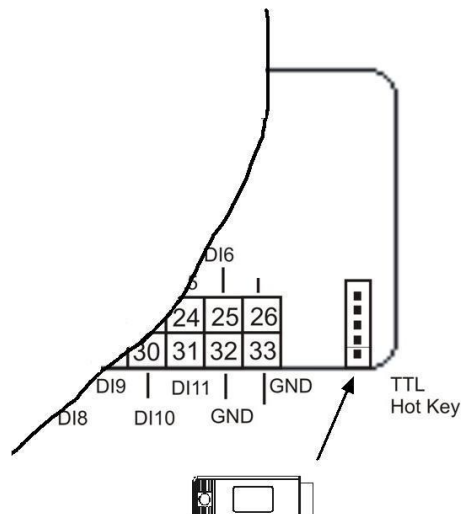
You can connect a relay with a coil at 12 volts in DC with a maximum absorption of 40mA.



36.11 CONNECTION HOT KEY 64 - INSTRUMENT

The HOT KEY 64 programming key allows you to:

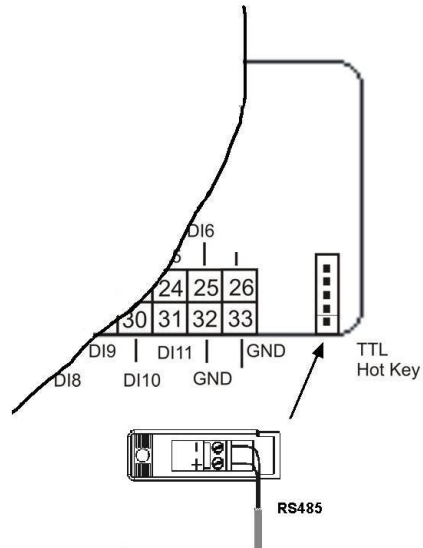
- copy the map of parameters of the controller to the key
- copy the map of parameters of the key to the controller



36.12 CONNECTION OF THE XJ485CX MODULE

The XJ485CX module converts the "TTL" 5-wire serial output into RS 485 (2 wires with polarity) and allows the instrument to be connected to an XWEB monitoring system.

The CAB/RS02 serial wire be used to connect the XJ485CX module.



37. CONNECTION TO REMOTE TERMINALS VI620CX

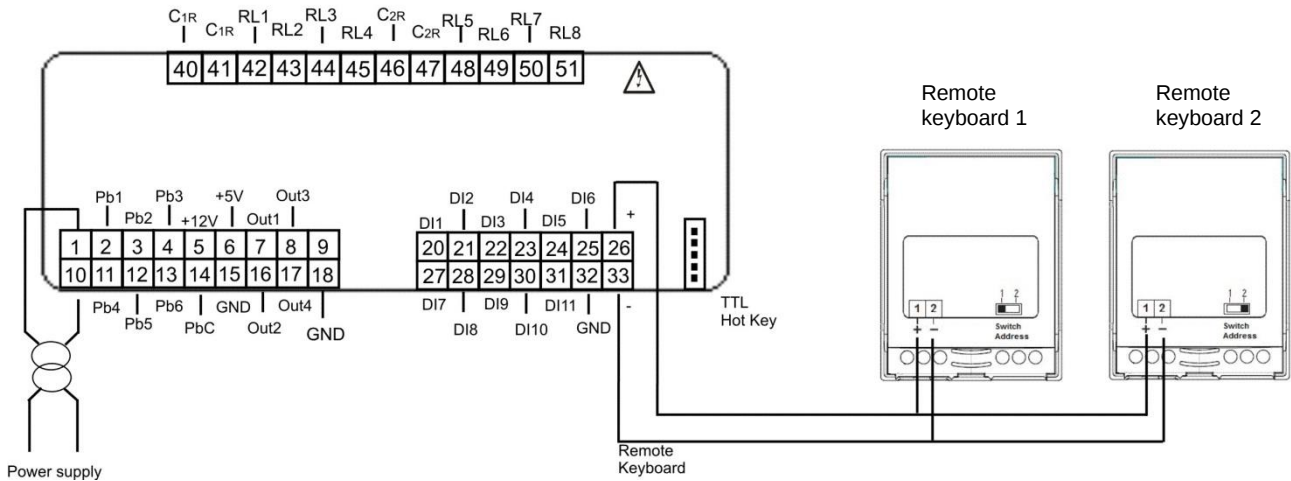
You can connect up to two remote terminals VICX620 to the instrument, available with or without the temperature probe on board. If the VICX620 remote terminal is used with a probe on board, the temperature can be adjusted with the terminal probe. Terminal operation is enabled by the following parameters:

- CF54 Enable remote terminal 1 (VICX620)
- CF55 Enable remote terminal 2 (VICX620)

The remote terminals must be connected using a shielded/stranded cable (for example Belden 8772 with a 1 mm² cross-section) unless the distance between the keyboard and controller is limited (a few meters) and the wiring is far from sources of interference (such as power cables); the maximum overall distance of the connection (both for connections to one or two terminals) is 150 m.

If communication is missing between the device and keyboard (incorrect connection, incorrect parameter configuration) the display views the message "noL" (no link).

When using two VICX620 keyboards, the dip switch at the back must be configured, assigning the first keyboard with address 1 and the second with address 2.



38. I/O EXPANSION CONNECTION

By means of the I/O expansion board, it is possible to increase the number of probes, digital inputs, relays and analogue outputs. The I/O expansion board does not control automatically but is only an actuator; the inputs and outputs must be set by means of the EI parameters in the IC208CX EVO map.

The connection layouts of the I/O expansion are shown in the manual of the expansion itself.

Connection is implemented by LAN.

To configure the expansion board, you must:

- enable operation by means of the parameter CF78 "I/O expansion board presence"
- configure the communication address with Ichill by means of the parameter EI01
- Configure the communication address in the expansion board ICX207D by means of the dip-switch, which must match that set in the parameter EI01 of Ichill
- configure the inputs and outputs by means of the parameters EI02...EI43 of Ichill
- connect the Ichill and the expansion according to the diagram below

Should LAN communication be missing or lost, Ichill control is blocked immediately.

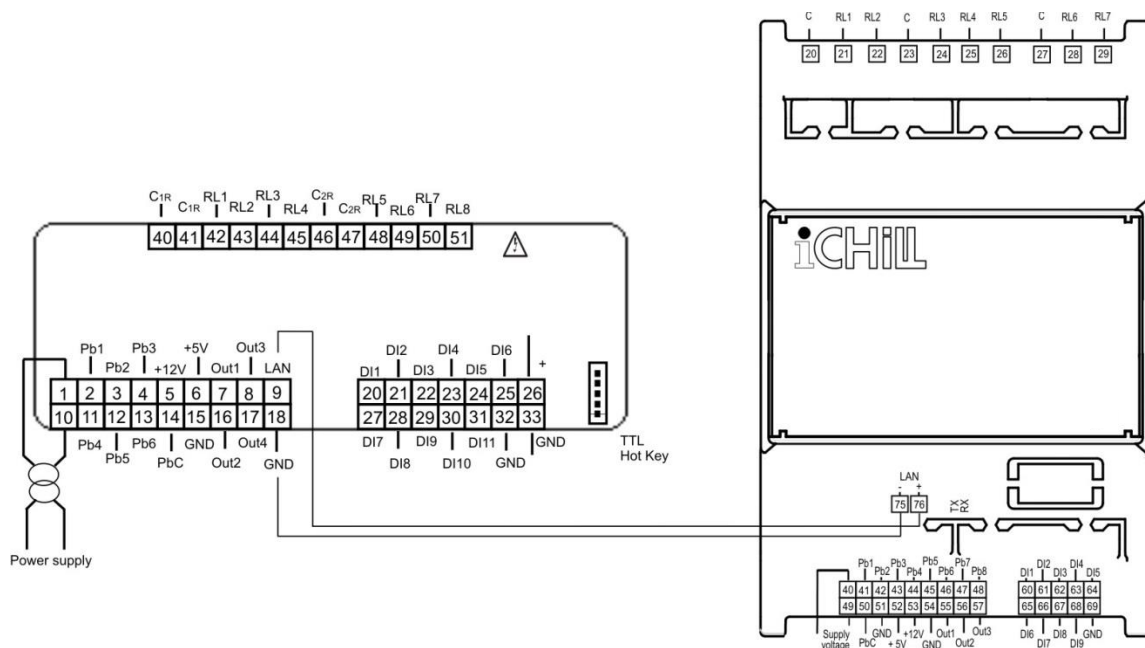
The maximum length of the LAN connection is 30 m.

The communication address via LAN with the EVO series Ichill controller must be set by means of the dip-switch:



	1	2	3	4
Adr. 0	OFF	OFF	OFF	OFF
Adr. 1	ON	OFF	OFF	OFF
Adr. 2	OFF	ON	OFF	OFF
Adr. 3	ON	ON	OFF	OFF
Adr. 4	OFF	OFF	ON	OFF
Adr. 5	ON	OFF	ON	OFF
Adr. 6	OFF	ON	ON	OFF
Adr. 7	ON	ON	ON	OFF
Adr. 8	OFF	OFF	OFF	ON
Adr. 9	ON	OFF	OFF	ON
Adr. 10	OFF	ON	OFF	ON
Adr. 11	ON	ON	OFF	ON
Adr. 12	OFF	OFF	ON	ON
Adr. 13	ON	OFF	ON	ON
Adr. 14	OFF	ON	ON	ON
Adr. 15	ON	ON	ON	ON

Not used

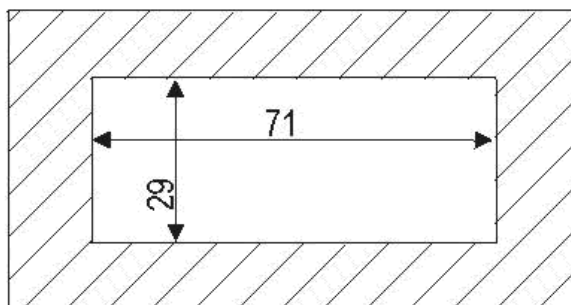


39. INSTALLATION AND ASSEMBLY

39.1 DRILLING TEMPLATE

The instruments are assembled on a vertical panel, on a 71x29 mm hole.

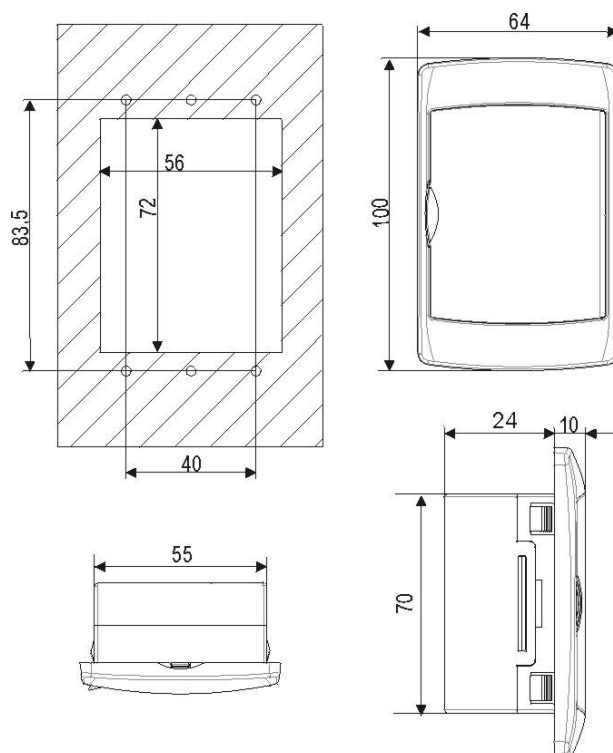
Avoid places subject to strong vibration, corrosive gas, excessive dirt or humidity. The same recommendations apply to the probes. Ventilate the area near the cooling holes.



39.2 VICX620 ICHILL REMOTE TERMINAL DRILLING TEMPLATES

The remote terminal can be panel mounted, on a 72x56 mm hole, and secured with screws or embedded inside a normal wall box (domestic or commercial light switch) embedded in the upright wall.

Obtain a front protection of IP65 use the front protection rubber mod. RG - V (optional).



An adapter for vertical keyboards V-KIT is available for external wall mounting as shown in **fig.1**. Colours available: White – grey – black

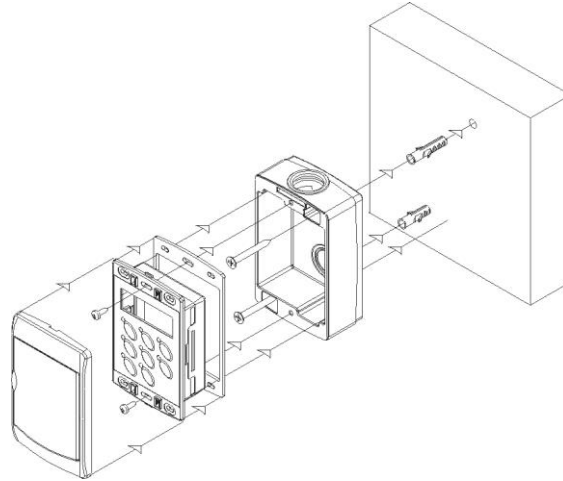


Fig. 1

40. ELECTRICAL CONNECTIONS

18 and 14-way removable terminal blocks for power supply, the connection of the digital inputs, of the analogue inputs, of the analogue outputs and of the remote keyboard.

The section of the connection cables of the 18 and 14-way terminal blocks (MOLEX) is AWG 24 and the power cables are AWG 22.

12-way removable terminal block to connect relay outputs.

The section of the connection cables of the 12-way terminal blocks (AMP) is AWG 17.

5-pin connector (TTL output) to connect to the Prog Tool, or Hot Key 64 to program parameters or a TTL/RS485 converter to connect to the RS485 network.

The remote terminal is fitted with a 2-way terminal block with a screw to connect cables with a maximum cross section of 2.5 mm²

The following wiring kits are available:

- IC206CX: CWCXA15 and CWCXA30 1.5 m or 3 m long; the cables bear the screen printed number of the terminal they are connected to;
- IC208CX: CWCXB15 and CWCXB30 1.5 m or 3 m long; the cables bear the screen printed number of the terminal they are connected to;

Before connecting the cables make sure the supply voltage complies with that of the instrument. During the installation, separate the connection cables of the probes from those of the power supply, from the outputs and the power connections; coupling electromagnetic interference generated by the power cables can generate malfunctions.

Do not exceed the maximum current allowed on each relay (see the technical data); in case of heavier loads, use a suitable remote control switch.

41. ACCESSORIES

XJ485CX

The TTL/RS485 converter is required to connect the Ichill to an RS485 network of the monitoring system.



RT314 KIT

The analogue outputs can be configured as an output for external relays; the RT314KIT is available with a DIN guide socket.



HOT KEY64

A hardware device that allows:

- programming parameters from the instrument to HotKey64, then transferring them to another equivalent device (it must be the same model and it must have the same firmware version)
- programming parameters of the Ichill with the previously programmed HotKey64.



42. TECHNICAL DATA

Container:
self-extinguishing ABS
Format:
Front 32x74mm; depth 60mm
Mounting:
On a panel on a 29x71 mm hole
Front protection:
IP65 (with front rear gasket)
Display:
4-digit d.p. upper display
4-digit d.p. upper display
Connections:
Removable connectors
Power supply:
12Vac -10% ÷ +15% 50/60 HZ
24 Vac/dc±10%. 50/60 HZ (optional)
Absorbed power:
10VA max.
Probe inputs:
6 configurable analogue inputs (4 NTC / PTC / Digital input, 2 NTC / PTC / 4 ÷ 20ma / 0 ÷ 5Volt / Digital Input)
Digital inputs:
11 (potential-free contacts)
Relay outputs:
IC206CX: 6 SPDT 5(2) A, 250Vac
IC208CX: 8 SPDT 5(2) A, 250Vac
Max current in the common contacts 10A
Data storage:
To a non-volatile memory (EEPROM)
Operating temperature: -10÷55 °C
Storage temperature: -30÷85 °C
Relative humidity: 20÷85% (without condensation).
Measurement and adjustment field:
- 50÷110 °C (- 58 ÷ 230 °F) NTC / -50.0÷150 °C (-58÷302 °F) PTC or 0÷ 50 bar (0÷725 psi)
Resolution: 0.1 °C or 1°F (selected via parameter)
Precision (at 25 °C Ambient temp.): ± 0.7 °C ± 1 digit

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