iCHiLL

User Manual
Ichill 290D/291D
(Firmware version 1.8)

INDEX

General advice

PLEASE READ BEFORE USING THIS MANUAL

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

SAFETY PRECAUTIONS

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

1. GENERAL FEATURES

IC290D/291D is an electronic controller for chiller unit applications having one or two circuits:
- Air/air
- Air/water
- Water/water
- Condensing unit

Additional features :
- Heat pump with gas reversibility

1.1 MAIN FUNCTION

Chiller management:
- One circuit up to 4 compressors
- Double circuit up to 6 compressors
- Screw compressors

Compressor start up:
- Direct
- Part winding
- Star - delta

Capacity step control:
- Continuous control
- Step control
- Modulation control (screw compressors)

Regulation of the compressors
- Working hour trade-off
- Start-up trade-off

Management of two pump groups
- 2 pumps evaporator side
- 2 pumps condenser side

Pump down management
- With dedicated pressure switch
- Low pressure switch
- Low pressure transducer

Unloading circuit
- High temperature of the evaporator inlet water
- High temperature of the condenser inlet water (unit with recovery)
- High condensing pressure
- Low evaporating pressure

Maintenance messages
- Compressors
- Evaporator pumps
- Condenser pumps

Auxiliary relays
- It is possible to configure two relays with indipendent regulation

Weekly Energy saving
- Three different time bands per day (only if RTC onboard)
- Energy saving enabled by digital input

Weekly ON/OFF:
- Three different time bands per day (only if RTC onboard)

Dynamic setpoint:
- It is possible to modify the set point according to outside temperature or a dedicated 4..20mA probe

Change over :
- Automatic operative mode selection (chiller / heat pump) maccording to outside temperature

Defrost management:
- Combined control temperature / pressure

- Forced defrost
- Different way to enable the defrost (temperature / pressure / digital input)

Boiler:

- For heating integration

Two proportional outputs for condensing fan speed control (inverter or phase cut) with configurable signal:

- PWM
- 0÷10Volt
- 4÷20mA

Four proportional control outputs 0÷10V or ON/OFF

- To control the dumper
- To control an external relay

Complete alarm management

- Internal Data logger up to 100 events

Supervisor / monitoring

- TTL output for XJ485 interface (ModBus protocol) for XWEB Dixell monitoring system

2. ICHILL 290D/291D FEATURES

FEATURES	IC290D	IC291D
OUTPUT RELAYS		
10	●	
14		●
DIGITAL INPUTS		
18	configurable	configurable
PROBE INPUTS		
10	configurable	configurable
PROPORTIONAL OUTPUTS		
2 PWM outputs for condensing fan	●	●
2 0÷10V or 4÷20mA for condensing fan	configurable	configurable
4 0÷10V	configurable	configurable
OTHER OUTPUTS		
TTL	●	●
Output for remote keyboard VGI890	●	●
POWER SUPPLY		
12 Vac/dc (+15%;-10%)	●	●
24 Vac/dc (± 10%)	opt	opt
OTHERS		
Internal RTC	opt	opt
Buzzer	opt	opt

- configurable = configurable by parameter
- opt = optional
- ● = default

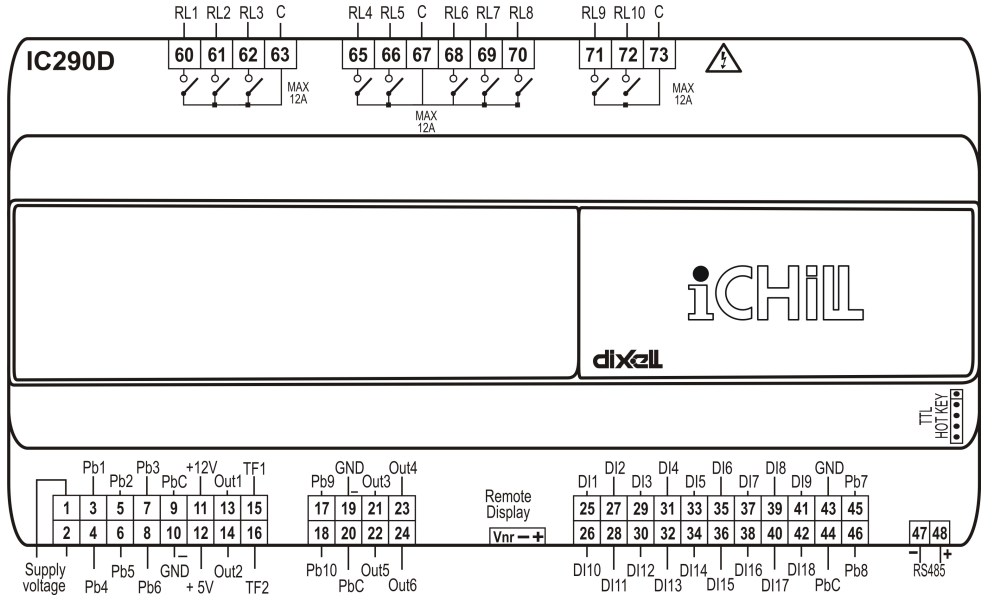
3. WIRING CONNECTIONS

Ichill 290D

10 digital outputs (relays)
18 digital inputs (free of voltage)
10 analogue inputs:

- 6 configurable NTC or PTC or digital input
- 4 configurable NTC or PTC or 4÷20mA or 0÷ 5Volt or digital input

4 0..10 V output (OUT 3..OUT6)
2 0..10V or 4..20mA or PWM output (OUT1..OUT2)
2 PWM output (TF1..TF2)
1 output for remote keyboard Visograph VGI890
1 TTL output for “Hot Key 64” connection
1 RS485 output with modbus RTU protocol (for monitoring system)
MAX current on the relay contacts relè 5(2)A 250V - MAX common current 12A 250V

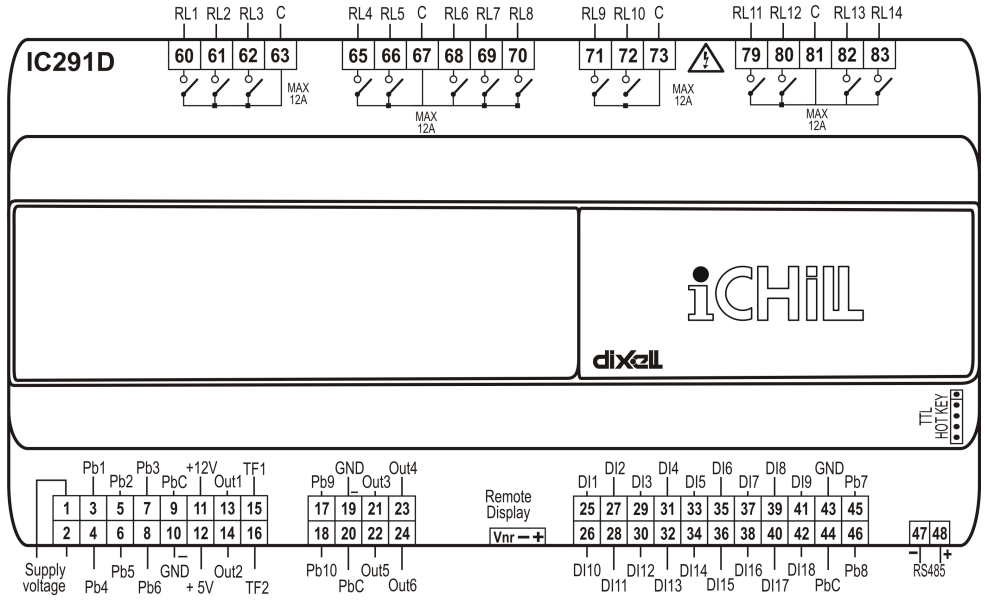


Ichill 291D

14 digital outputs (relays)
18 digital inputs (free of voltage)
10 analogue inputs:

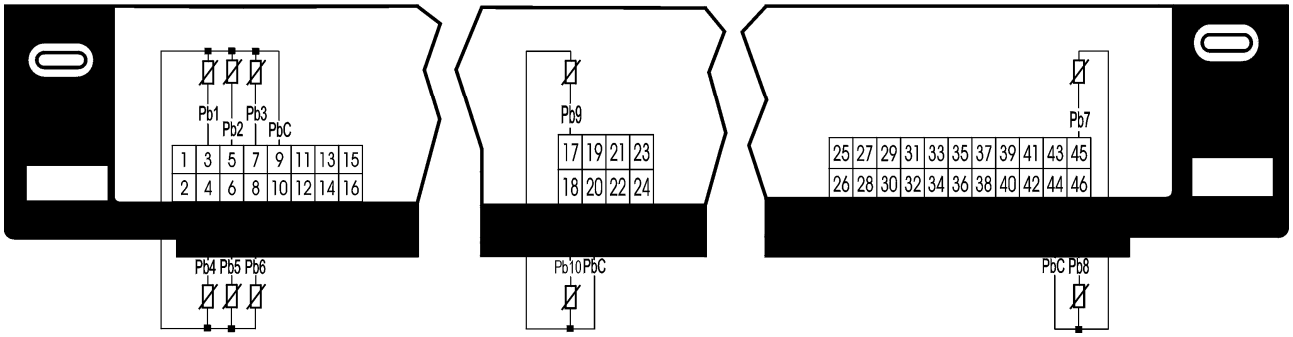
- 6 configurable: NTC or PTC or digital input
- 4 configurable: NTC or PTC or 4÷20mA or 0÷ 5Volt or digital input

4 0..10 V output (OUT 3..OUT6)
2 0..10V or 4..20mA or PWM output (OUT1..OUT2)
2 PWM output (TF1..TF2)
1 output for remote keyboard Visograph VGI890
1 TTL output for “Hot Key 64” connection
1 RS485 output with modbus RTU protocol (for monitoring system)
MAX current on the relay contacts relè 5(2)A 250V - MAX common current 12A 250V



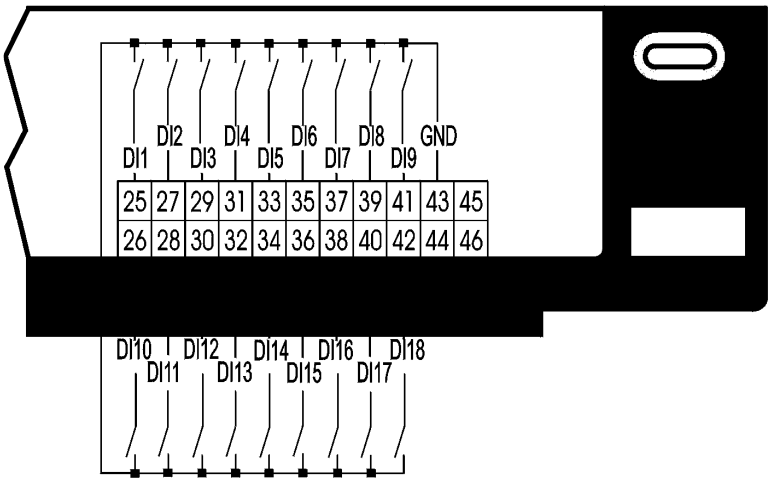
Temperature probes connection (NTC – PTC Probes)

PbC = Probes common terminal



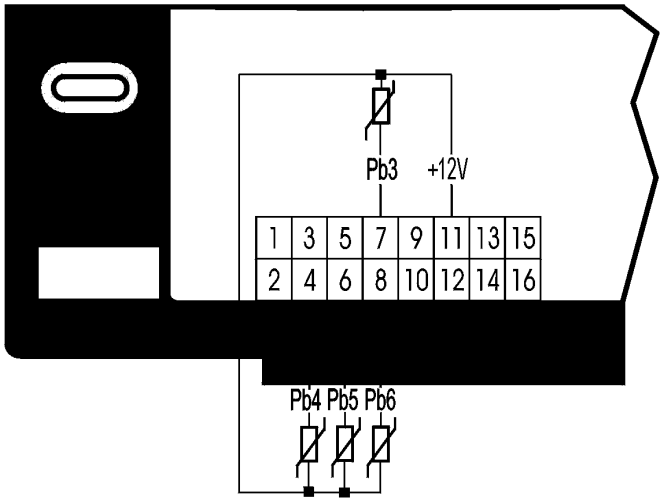
Digital Inputs

GND = Digital inputs common terminal

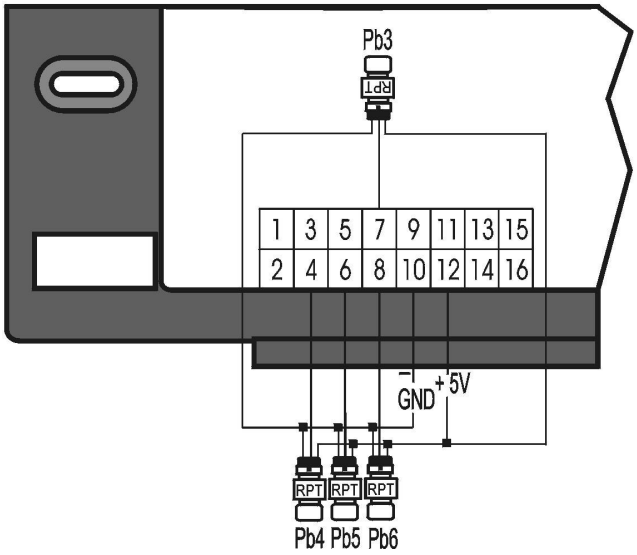


Pressure Transducer connection (4 ÷ 20mA signal)

12V = Pressure trasducers common terminal

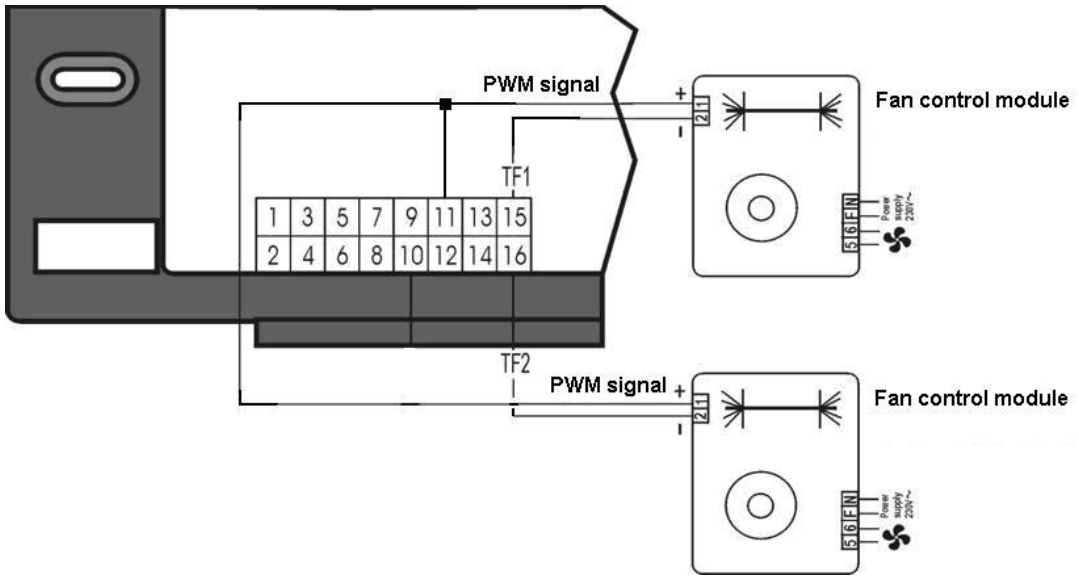


Ratiometric Transducer connection (0 ÷ 5V signal)



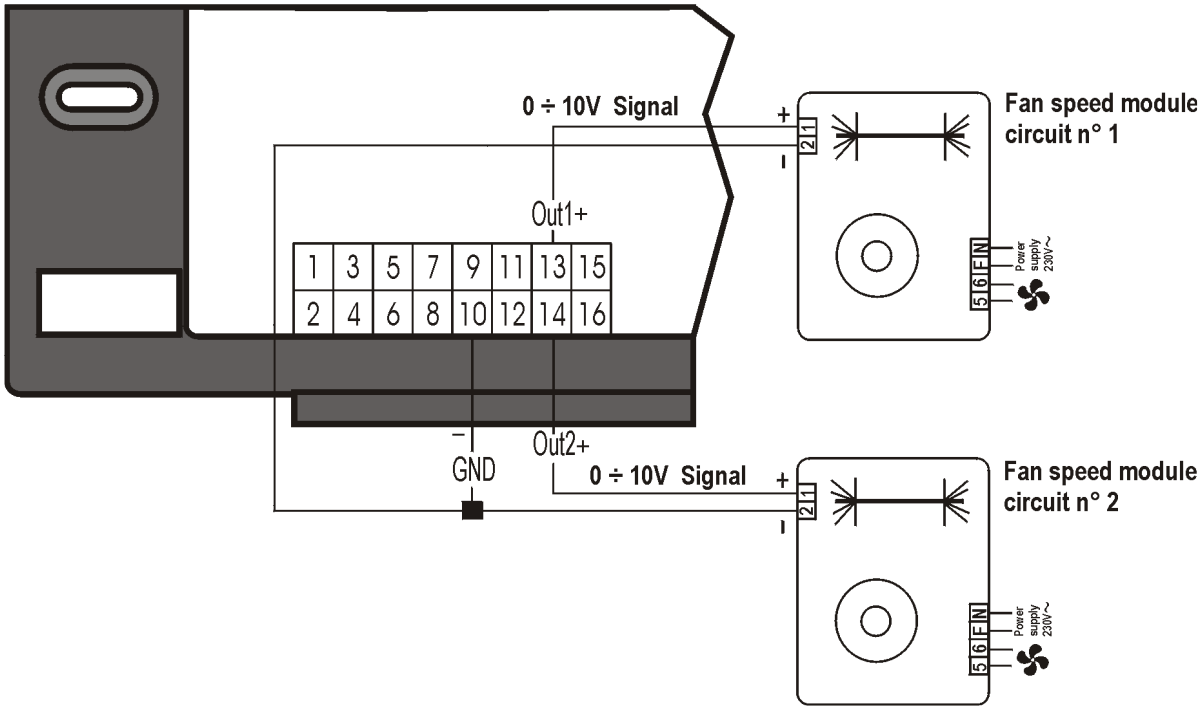
PWM Output for Condensing Fan Speed Control

The PWM signal has to be connected to the cut of phase controller:
Mod. XV05PK mono-phase, cut phase control 500 Watt (2A)
Mod. XV10PK mono-phase, cut phase control 1000 Watt (4A)
Mod. XV22PK mono-phase, cut phase control 2200 Watt (9A)



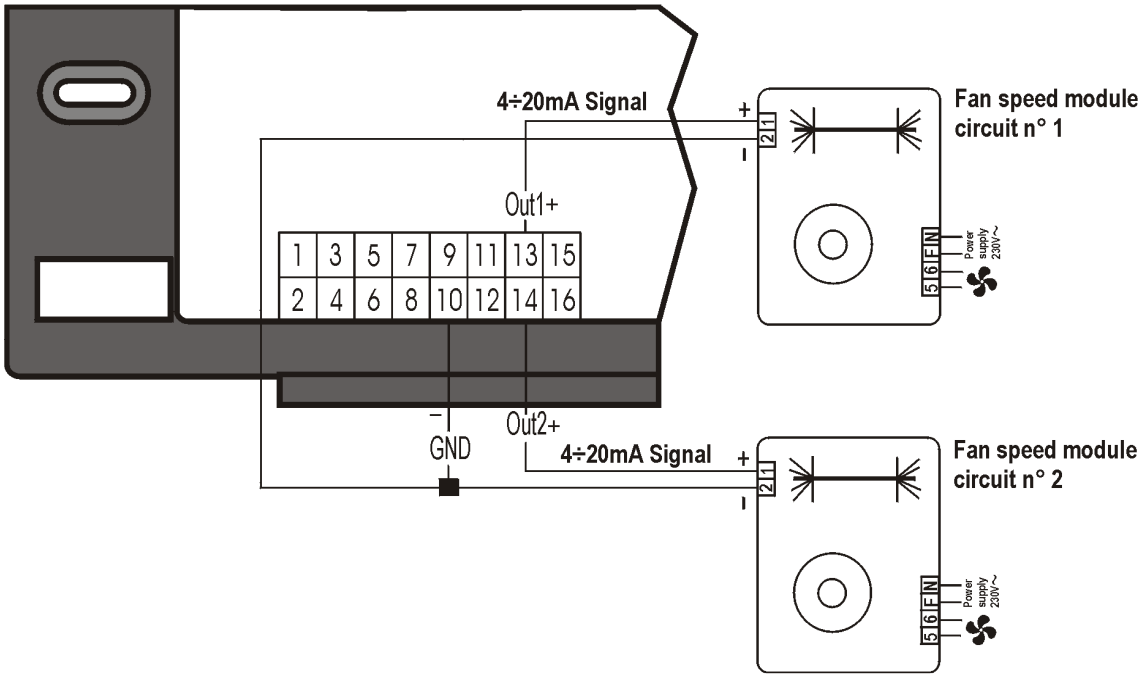
Condensing Fan control: 0 ÷ 10Vdc signal

In case of only one condensing circuit configured, the Out1 / Out2 outputs work together giving the same signal.

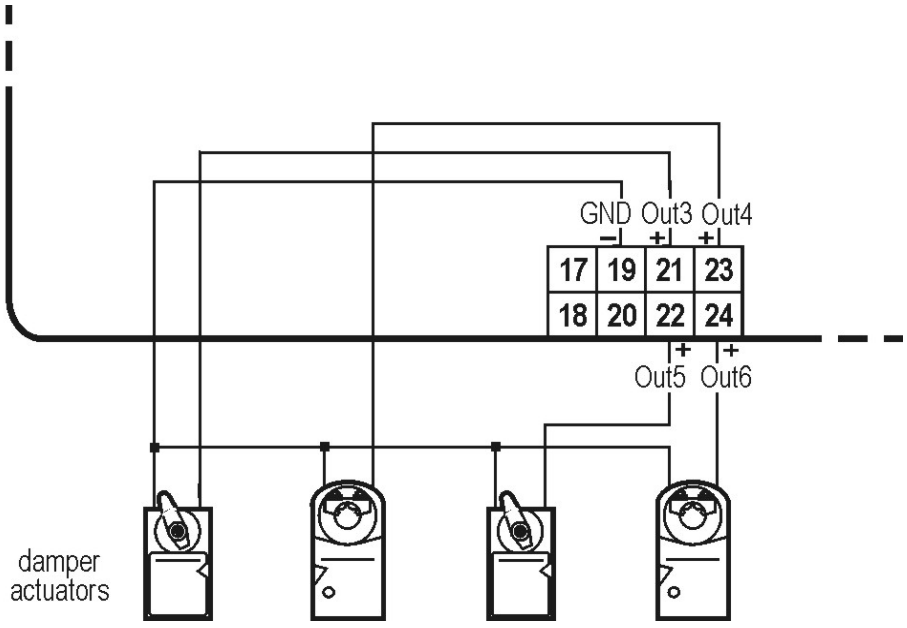


Condensing Fan Control: 4÷20mA signal

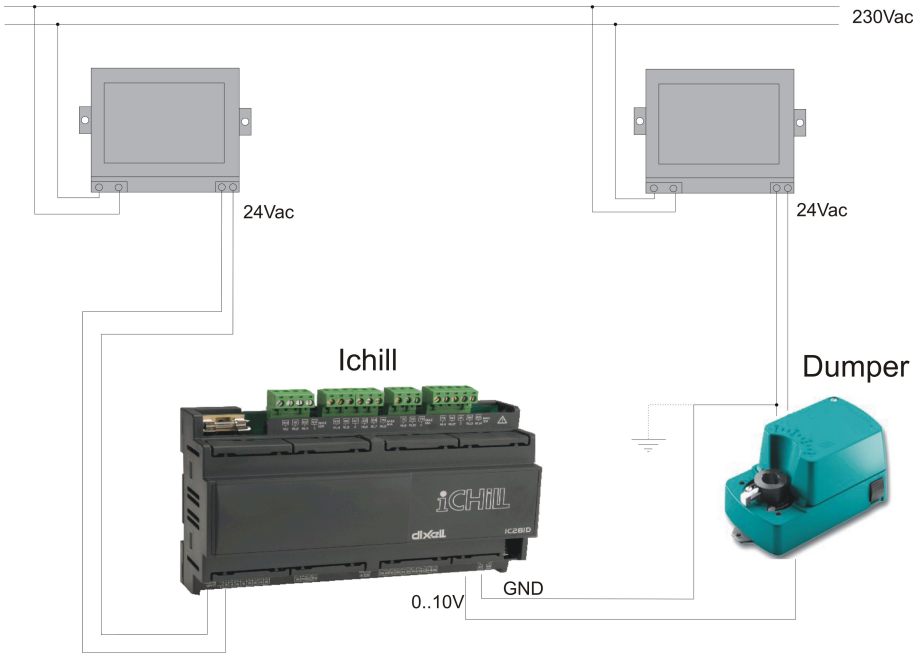
In case of only one condensing circuit configured, the Out1 / Out2 outputs work together giving the same signal.



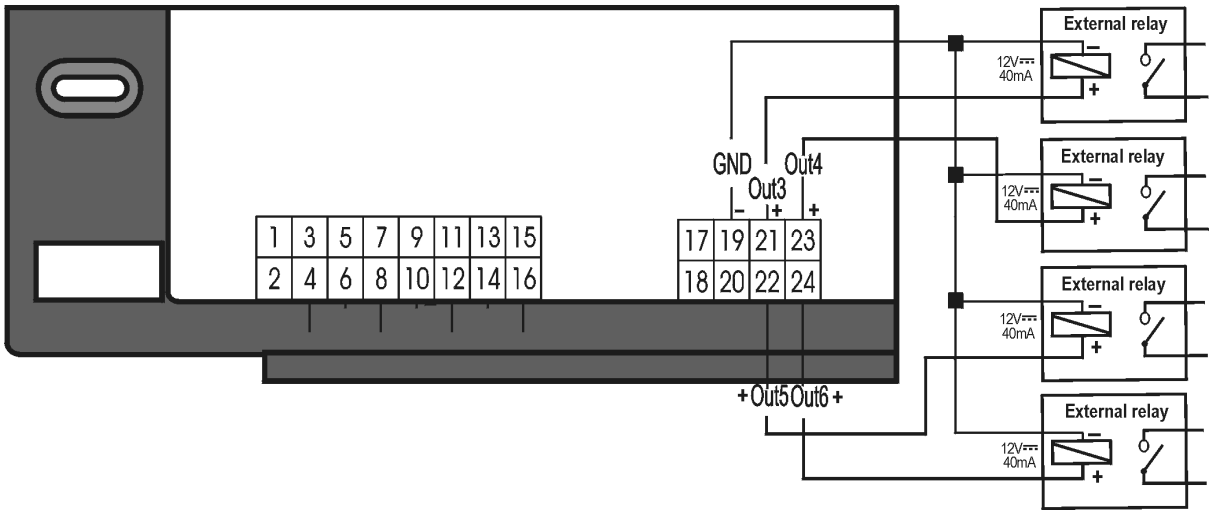
Proportional outputs 0 ÷ 10V



If the dumper motor has a common pole for the 0..10V and the power supply, the connection has to be done as showed below.
Ground connection has to be evaluated case per case.



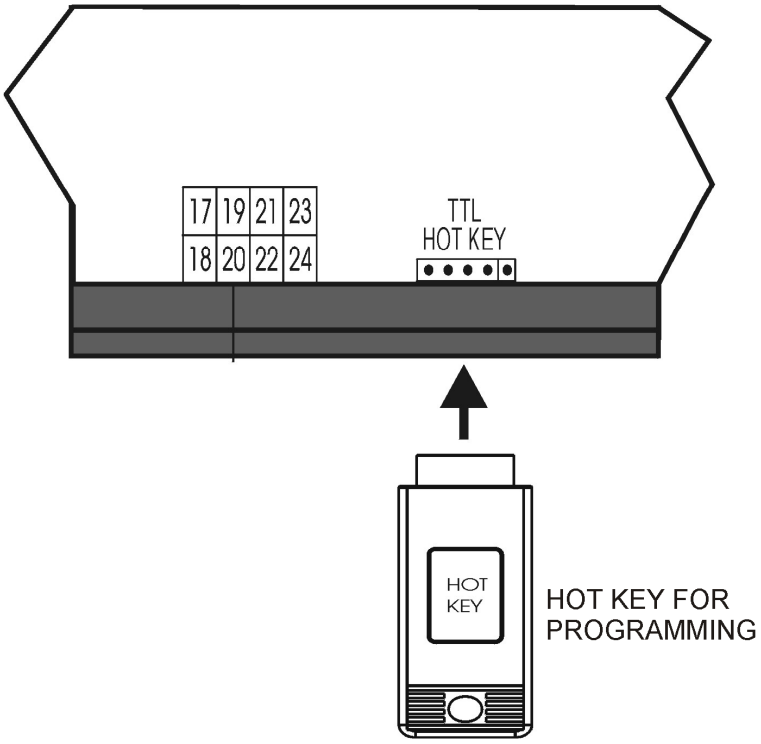
Proportional outputs when used to manage an external relay



Hot Key 64 Connection

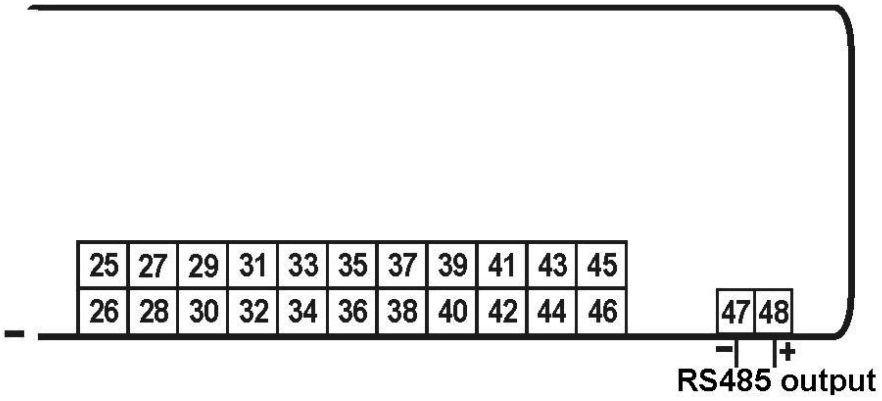
HOT KEY 64 allows to:

- upload the parameter map from the Hot key to the Ichill
- download the parameter map from the Ichill to the Hot key



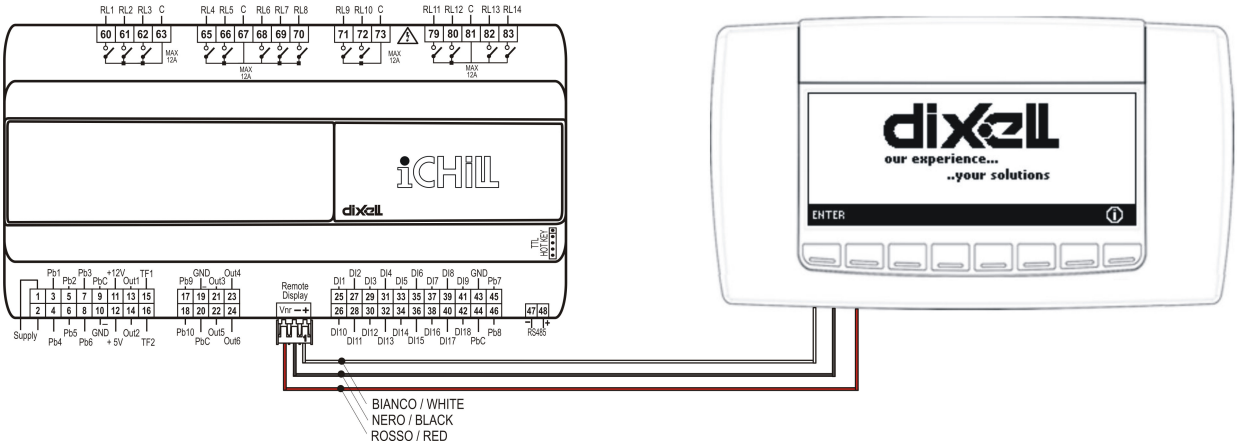
RS485 connection (IC290D / IC291D)

The Ichill 290D and Ichill 291D have a RS 485 output to connect the controller to the Wizmate (software for parameters programming) or a XWEB (to monitoring the system).
Make attention to the polarity of the RS 485 signal.

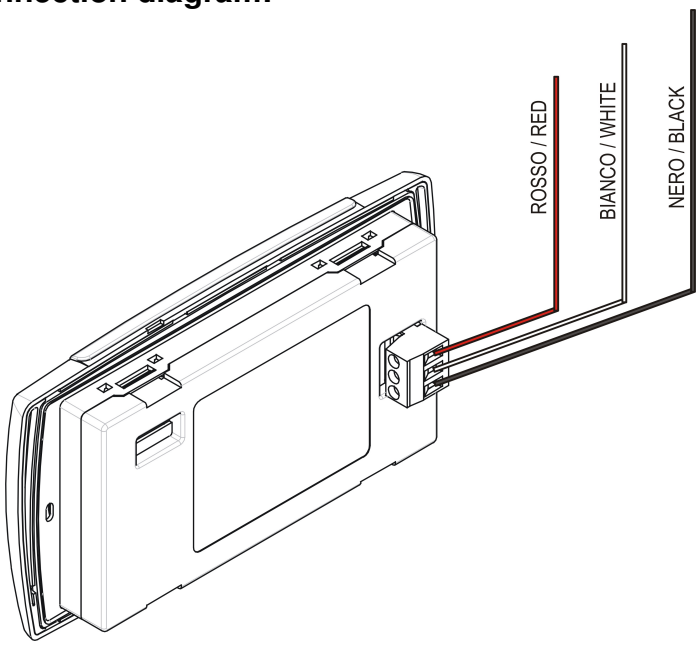


Remote keyboard VGI890 connection

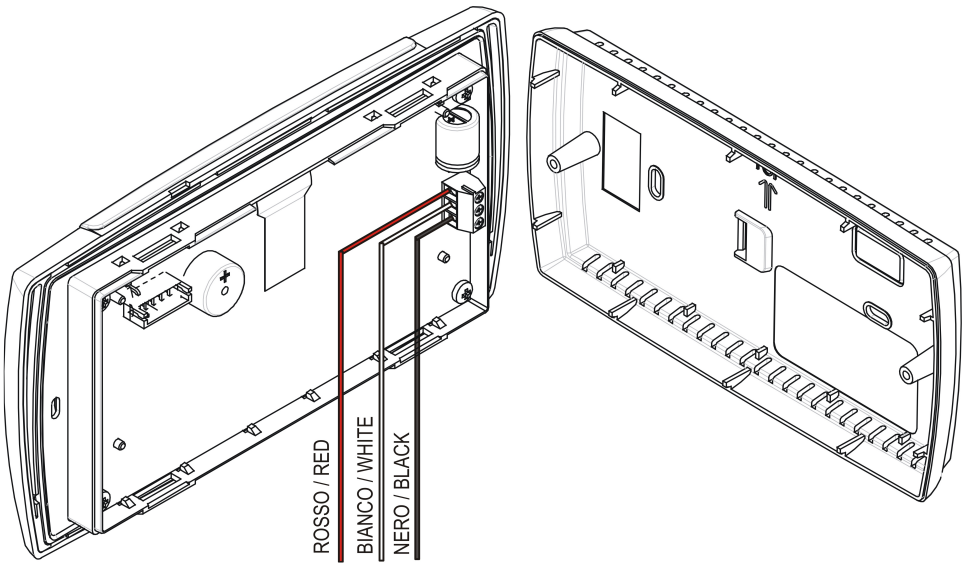
⚠ Special care must be taken when connecting the keyboard to the Ichill200D, to avoid irreparable damage to the controller or/and keyboard.
In case of power supply failure (wire black or red), the keyboard doesn't work.
In case of comunication problems, the display shows "noL" message.
At the moment the keyboard is available without internal temperature sensor.



Panel mounting connection diagram:



Wall mounting connection diagram:



4. ANALOG AND DIGITAL OUTPUT CONFIGURATION

Analog input Pb1 - Pb2 - Pb7 - Pb8 - Pb9 - Pb10

Parameters involved:
CF08 = Configuration PB1
CF09 = Configuration PB2
CF14 = Configuration PB7
CF15 = Configuration PB8
CF16 = Configuration PB9
CF17 = Configuration PB10
0. Not enabled
1. Temperature probe **PTC** for compressor 1 discharge
2. Temperature probe **PTC** for compressor 2 discharge
3. Temperature probe **PTC** for compressor 3 discharge
4. Temperature probe **PTC** for compressor 4 discharge
5. Temperature probe **PTC** for compressor 5 discharge
6. Temperature probe **PTC** for compressor 6 discharge
7. Temperature probe **NTC** for evaporator inlet
8. Temperature probe **NTC** for evaporator 1 outlet
9. Temperature probe **NTC** for evaporator 2 outlet
10. Temperature probe **NTC** for common evaporator outlet
11. Temperature probe **NTC** for common hot water condenser / recovery inlet
12. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 inlet
13. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 inlet
14. Temperature probe **NTC** for hot water of the condenser / recovery circuit 1 outlet
15. Temperature probe **NTC** for hot water of the condenser / recovery circuit 2 outlet
16. Temperature probe **NTC** for hot water of the condenser / recovery common outlet
17. Temperature probe **NTC** for free cooling water inlet circuit
18. Not Used
19. Temperature probe **NTC** for dynamic setpoint external air / boiler / change over
20. Temperature probe **NTC** for combined defrost circuit 1
21. Temperature probe **NTC** for combined defrost circuit 2
22. Temperature probe **NTC** for auxiliary output 1
23. Temperature probe **NTC** for auxiliary output 2
24. Temperature probe **NTC** sanitary water 1
25. Temperature probe **NTC** sanitary water 1
26. Temperature probe **NTC** solar panel
27. Temperature probe **NTC** for condensing circuit 1
28. Temperature probe **NTC** for condensing circuit 2

After the number 28 the display configuration can be selected from **o 1** to **c67** to set an analogue input as digital input (see polarity of the digital input/outputs).

Analog input Configuration Pb3 - Pb4 - Pb5 - Pb6

Parameter involved:
CF10 = Configuration PB3
CF11 = Configuration PB4
CF12 = Configuration PB5
CF13 = Configuration PB6
0 Not enabled
1 Temperature probe **PTC** for compressor 1 discharge
2 Temperature probe **PTC** for compressor 2 discharge
3 Temperature probe **PTC** for compressor 3 discharge
4 Temperature probe **PTC** for compressor 4 discharge
5 Temperature probe **PTC** for compressor 5 discharge
6 Temperature probe **PTC** for compressor 6 discharge
7 Temperature probe **NTC** for evaporator inlet
8 Temperature probe **NTC** for evaporator outlet 1
9 Temperature probe **NTC** for evaporator outlet 2
10 Temperature probe **NTC** for common evaporator outlet
11 Temperature probe **NTC** for common hot water condenser / recovery inlet

12 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 1
13 Temperature probe **NTC** for hot water condenser / recovery inlet circuit 2
14 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 1
15 Temperature probe **NTC** for hot water condenser / recovery outlet circuit 2
16 Temperature probe **NTC** for hot water condenser / recovery common outlet circuit
17 Temperature probe **NTC** for free cooling water inlet
18 Not Used
19 Temperature probe **NTC** for external air dynamic setpoint/ boiler / change over
20 Temperature probe **NTC** for combined defrost circuit 1
21 Temperature probe **NTC** for free cooling water inlet 2
22 Temperature probe **NTC** for auxiliary output 1
23 Temperature probe **NTC** for auxiliary output 2
24 Temperature probe **NTC** sanitary water 1
25 Temperature probe **NTC** sanitary water 2
26 Temperature probe **NTC** solar panel
27 Condenser probe circuit 1 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
28 Condenser probe circuit 2 (temperature **NTC** / pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
29 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
30 Evaporator pressure probe circuit 1 (pressure **4÷20 mA** / ratio-metric **0÷ 5Volt**)
31 Auxiliary output 1 pressure probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
32 Auxiliary output 2 pressure probe control (**4÷20 mA** / ratio-metric **0÷ 5Volt)**
33 Dynamic setpoint pressure probe (**4÷20 mA)**

After the number 33 the display read-out goes from "**o 1"** to "**c67"** to set an analogue input as digital input (see polarity input of digital inputs).

Digital Input Configuration Id1 – Id18

Parameters involved:

CF36 = Configuration ID1…**CF53 =** Configuration ID18

0. Not enabled
1. Remote ON / OFF
2. Remote chiller / heat pump
3. Flow switch/ Supply fan overload
4. Flow switch of heated side
5. Antifreeze heater circuit 1
6. Antifreeze heater circuit 2
7. High pressure switch circuit 1
8. High pressure switch circuit 2
9. Low pressure switch circuit 1
10. Low pressure switch circuit 2
11. Compressor 1 high pressure
12. Compressor 2 high pressure
13. Compressor 3 high pressure
14. Compressor 4 high pressure
15. Compressor 5 high pressure
16. Compressor 6 high pressure
17. Compressor 1 overload
18. Compressor 2 overload
19. Compressor 3 overload
20. Compressor 4 overload
21. Compressor 5 overload
22. Compressor 6 overload
23. Condenser fan overload of circuit 1
24. Condenser fan overload of circuit 2
25. Condenser fan overload of circuit 1 and 2 (comun)
26. Water pump overload of evaporator 1
27. Water support pump overload of evaporator
28. Water pump overload of condenser 1
29. Water support pump overload of condenser
30. Not Used
31. Not Used
32. End defrost circuit 1
33. End defrost circuit 2

34. Energy Saving
35. Pressure switch / compressor 1 oil
36. Pressure switch / compressor 2 oil
37. Pressure switch / compressor 3 oil
38. Pressure switch / compressor 4 oil
39. Pressure switch / compressor 5 oil
40. Pressure switch / compressor 6 oil
41. Pump down pressure switch of circuit 1
42. Pump down pressure switch of circuit 2
43. Generic alarm from digital input with stop regulation n° 1
44. Generic alarm from digital input with stop or signal regulation n° 2
45. Operation working mode: by RTC or keyboard
46. Operation mode with supplay fan only
47. Digital input of thermoregulation request (condensing unit)
48. Digital input of cooling request (condensing unit)
49. Digital input of heating request (condensing unit)
50. Request step 2 (condensing unit)
51. Request step 3 (condensing unit)
52. Request step 4 (condensing unit)
53. Request step 5 (condensing unit)
54. Request step 6 (condensing unit)
55. Request step 7 (condensing unit)
56. Request step 8 (condensing unit)
57. Request step 9 (condensing unit)
58. Request step 10 (condensing unit)
59. Request step 11 (condensing unit)
60. Request step 12 (condensing unit)
61. Request step 13 (condensing unit)
62. Request step 14 (condensing unit)
63. Request step 15 (condensing unit)
64. Request step 16 (condensing unit)
65. Sanitary water flow switch
66. Solar panel flow switch
67. Only sanitary water

Digital Output (relay) Configuration RL1- RL14

Parameter involved:

CF54= Configuration RL1…**CF67=** Configuration RL14

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

24. Auxiliary output circuit 2
25. Solenoid valve Intermittent for screw compressor 1
26. Solenoid valve Intermittent for screw compressor 2
27. Solenoid valve of the liquid injection for compressor 1
28. Solenoid valve of the liquid injection for compressor 2
29. Sanitary valve 1
30. Sanitary valve 2
31. Sanitary heater 1
32. Sanitary heater 2
33. Sanitary heater 3
34. Solar panel water pump
35. Solar panel valve
36. Sanitary water pump
37. Hybrid exchanger 1
38. Hybrid exchanger 2
39. Direct start-up : compressor 1 relay
    PW start: relay PW 1 of the compressor 1
    Star-delta start: relay line 1 of the compressor 1
40. PW start: relay PW 2 of the compressor 1
    Star-delta start: relay linea 2 compressor 1
41. Star centre of the Star-delta start of the compressor 1
42. Capacity step valve 1 compressor 1
43. Capacity step valve 2 compressor 1
44. Capacity step valve 3 compressor 1
45. By-pass gas valve compressor 1start
46. Direct start: compressor 2 start
    PW start: relay 1 of the compressor 2
    Star-delta start: relay line 1 of the compressor 2
47. PW start: relay PW 2 of the compressor 2
    Star-delta start: relay line 2 of the compressor 2
48. Star centre of the Star-delta start of the compressor 2
49. Capacity step valve 1 compressor 2
50. Capacity step valve 2 compressor 2
51. Capacity step valve 3 compressor 2
52. By-pass gas valve compressor 2 start
53. Direct start: compressor 3 relay
    PW start: relay PW 1 of the compressor 3
    Star-delta start: relay line 1 of the compressor 3
54. PW start: relay PW 2 of the compressor 3
    Star-delta start: relay line 1 of the compressor 3
55. Star centre of the Star-delta start of the compressor 3
56. Capacity step valve 1 compressor 3
57. Capacity step valve 2 compressor 3
58. Capacity step valve 3 compressor 3
59. By-pass gas valve compressor 3 start
60. Direct start: compressor 4 relay
    PW start: PW 1 of the compressor 4
    Star-delta start: relay line 1 of the compressor 4
61. PW start: relay PW 2 of the compressor 4
    Star-delta start: relay line 1 of the compressor 4
62. Star centre of the Star-delta start of the compressor 4
63. Capacity step valve 1 of the compressor 4
64. Capacity step valve 2 of the compressor 4
65. Capacity step valve 3 of the compressor 4
66. By-pass gas valve compressor 4 start
67. Compressor 5 relay
68. Compressor 6 relay

Condenser proportional control configuration (2 outputs)

Proportional outputs used to configure a proportional output signal to condenser fan control

Parameters involved:

CF68 = Condenser control configuration for circuit 1

CF69 = Condenser control configuration for circuit 2
0= 0 ÷ 10Vdc (for external mono or three-phase fan control board)
1= 4÷20mA (for external mono or three-phase fan control board)
2= PWM (only for external mono-phase fan control board with cut phase control)

Proportional output configuration 0 ÷ 10 Vdc (4 outputs)

Parameters involved:
CF70 = Proportional output 1 configuration
CF71 = Proportional output 2 configuration
CF72 = Proportional output 3 configuration
CF73 = Proportional output 4 configuration
0 Not enabled
1 not used
2 not used
3 not used
4 Auxiliary output 0÷10V n° 1
5 Auxiliary output 0÷10V n° 2
6 Proportional output for modulating compressor 1
7 Proportional output for modulating compressor 2
After the number 4 it is possible to set "**o 1**" to "**c38**" to configure the output as digital output to control an external relay.

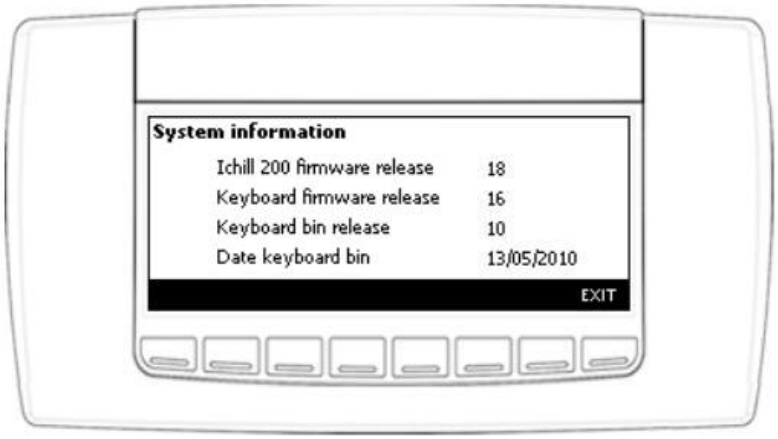
5. DISPLAY VISUALIZATION

5.1 VISUALIZATION AFTER THE POWER ON

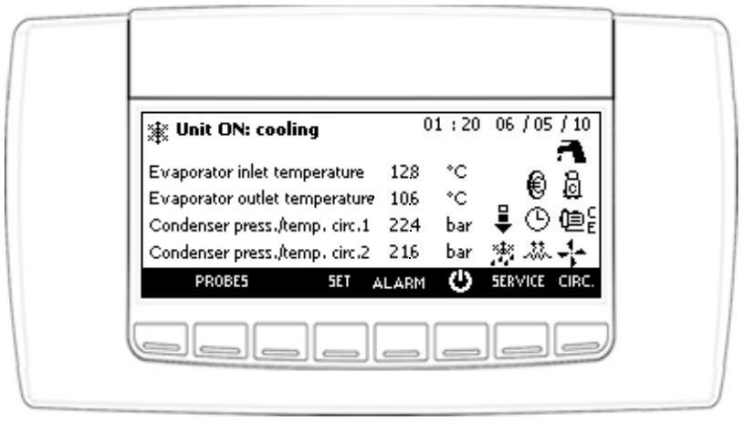
The display visualizes the logo Dixell as showed below.
To enter the main visualization press ENTER.

It is possible to read the main information about the firmware version and bin version by pressing ⓘ:

- release firmware of the Ichill 200D
- release firmware of the Visograph VGI890
- BIN version of the Visograph VGI890
- date of the BIN of the Visograph



5.2 MAIN VISUALIZATION



In the main visualization it is possible to read:

- status of the unit: cooling, heating, remote OFF or STD-BY
- date and time, available if the Ichill is provided by internal clock
- 4 probes value; it is possible to manage 4 lines to visualize the probe temperature / pressure (parameters dP06..dP09)
- load / function status as showed below:

	Compressor/s (blinking during the start up delay)		Economy function
/	Water pump / Supply fan		Unloading function
	Condenser fan		Economy or ON/OFF by timetable
	Electric heater		Defrost
	Sanitary water		Alarm

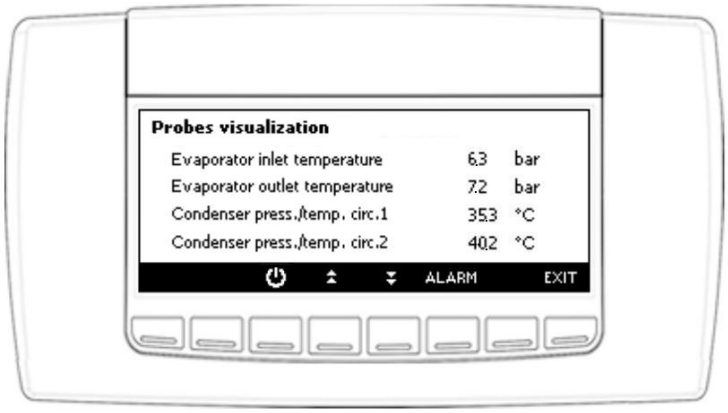
Meaning of the keys:

PROBES	Allows to read the value of the probes configured in the Ichill	**SET**	Allows to read/modify the set point
	Allows to switch on the Ichill in heating or cooling mode (see parameter CF78)	**ALARM**	Allows to read the alarms
	Allows to switch on the Ichill in heating or cooling mode (see parameter CF78)	**SERVICE**	Allows to enter the SERVICE menù
	Allows to put the Ichill in STD-BY	**CIRC.**	Allows to read the main information of the circuits (compressor status, water pump status, pressure probe value,…)

Note:
in case of alarm, press any key to silence the buzzer

5.3 PROBES VISUALIZATION

Press PROBES key to visualize the value of the probes configured in the Ichill (press ▲ or ▼ to visualize all the probes).

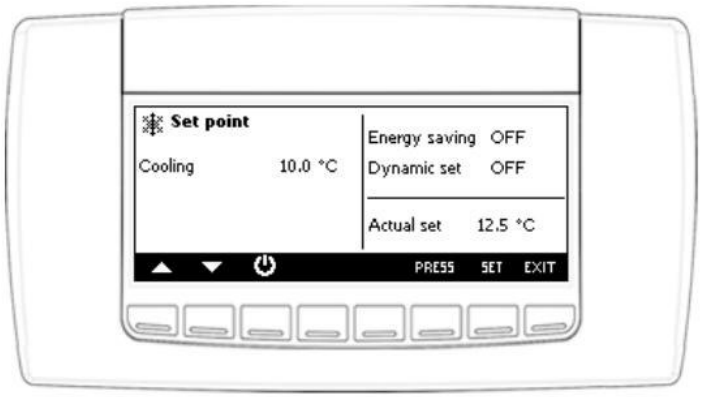


5.4 VISUALIZATION / MODIFICATION OF THE SET POINT

Press SET key to read the value of the set point (cooling set point if the Ichill is in cooling mode, heating set point if the Ichill is in heating mode, cooling and hating set point if the Ichill is in STD_BY or remote OFF, Sanitary water when enabled).
It is also possible to read the status of the Energy saving, the status of the Dynamic set point and the real value of the set point if the Energy saving or Dinamic set point are active.

To modify the set point (Cooling, Heating or Sanitary water):

- press ▲ or ▼ to select the value of the set point
- press SET
- press ▲ o ▼ to modify the value
- press SET to confirm the operation



5.5 ALARM VISUALIZATION

Press ALARM key to read the alarm status; the alarm status can be:

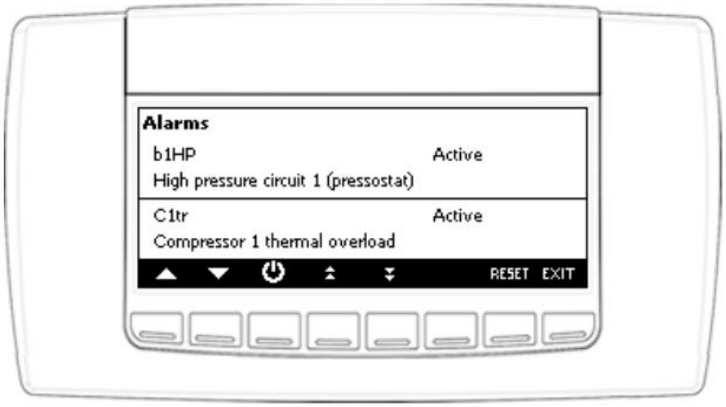
- **Active**: the alarm is still active and it is not possible to reset it
- **Reset**: the alarm is not active and it is possible to reset it

Manual reset procedure:

- press ▲ or ▼ to select the alarm;
- press RESET to reset the alarm

In case of compressor overload alarm when the password is requested, follow this step:

- press ▲ o ▼ to select the compressor overload alarm
- press RESET
- press SET
- press ▲ or ▼ to insert the password value (parameter AL46)
- press SET to confirm the operation

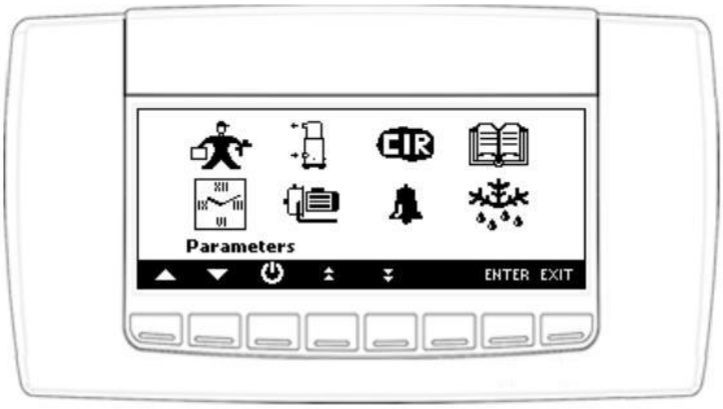


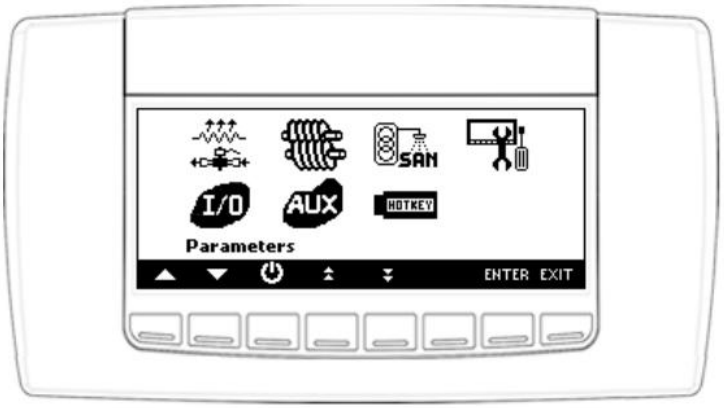
5.6 MENU SERVICE

Pressing SERVICE it is possible to read the following information:

	**Parameter programming**
	**Programming clock** **Energy saving and ON/OFF scheduling**
	**Compressor maintenance** It is possible to disable the compressor for maintenance, read the working hours and number of start up (and reset them)
	**Water pump maintenance** It is possible to read / reset the working hours
	**Circuit maintenance**
	**Visualization and reset of the alarms**
	**Visualization and reset of the alarm log**
	**Defrost status**

	Electrical heater and pump down valve status
	I/O status
	Screw compressor information It is possible to read the discharge temperature, the liquid injection valve status and the minimum load valve status
	Auxiliary output status
	Upload and download parameter map with Hot Key
	Sanitary water status, sanitary water temperature, antilegionella status, etc.
	Visograph configuration It is possible to read the Ichill firmware version (for the compatibility with the keyboard), the keyboard firmware release and keyboard bin release. It is possible to change the language, to set the contrast and the backlight**.**



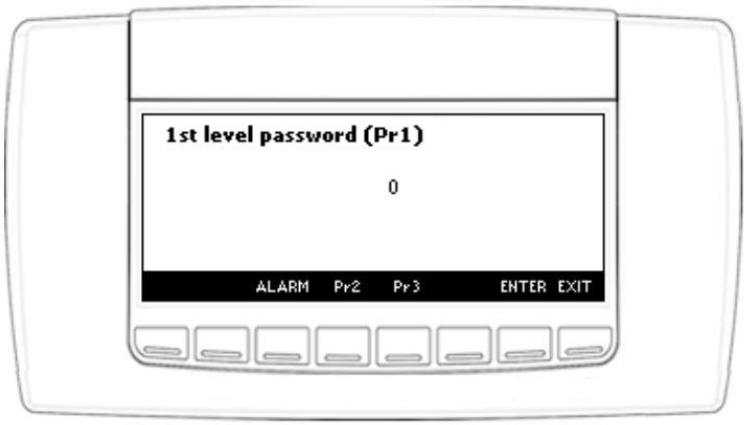


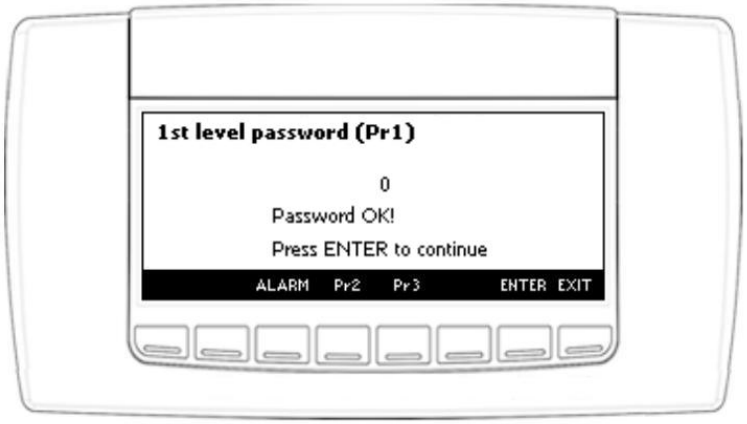
	Parameters programming

Pressing ENTER it is possible to read/modify the parameters value:

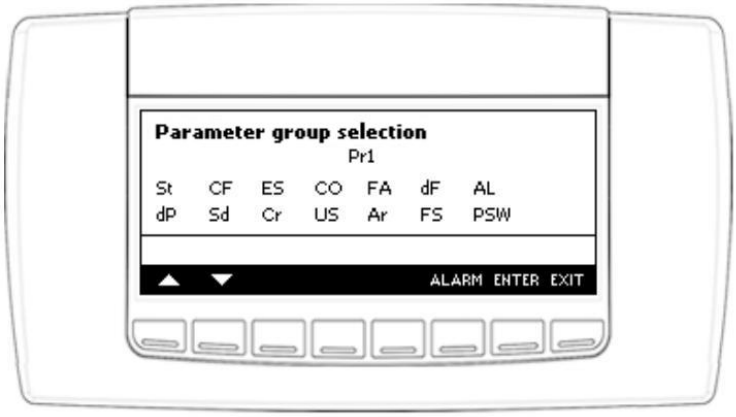
- select the level 1 (default) or level 2 or level (by pressing Pr2 or Pr3 key)
- press SET

- press ▲ or ▼ to enter the password
- press SET to confirm
- the display shows “Password OK!” (otherwise repeat the procedure)
- press ENTER to visualize the parameters





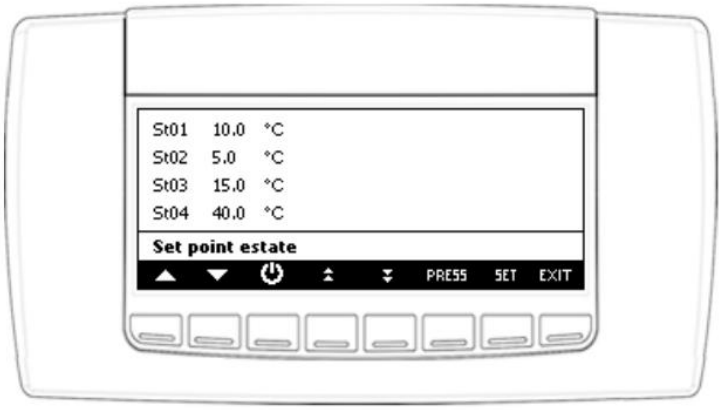
Pressing ▲ or ▼ it is possible to select the group of parameters to modify, then press ENTER.



How to modify the value of the parameter:

- press ▲ or ▼ to select the parameter to modify

- press ENTER
- press ▲ or ▼ to modify the value
- press ENTER to confirm

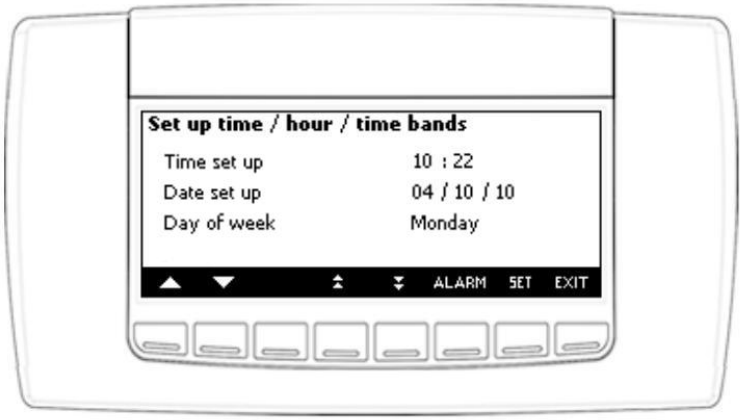


Press ▲▲ or ▼▼ to scroll the parameters.

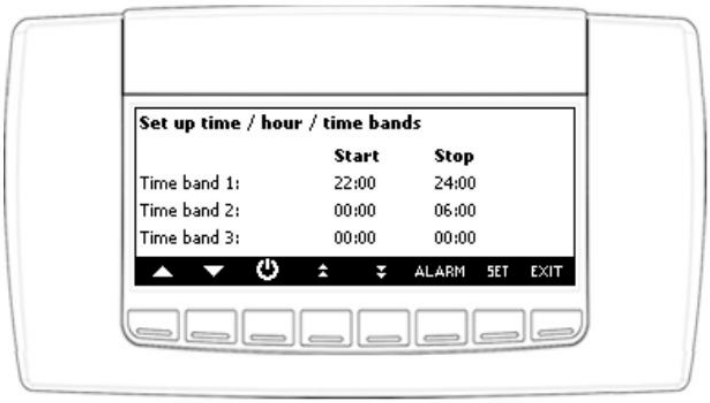
	Clock programming and Energy saving / ON_OFF scheduling visualization

It is possible to set the clock and read the Energy saving and the ON/OFF scheduler.
How to set the clock:

- press ▲ or ▼ to select the date to modify (hour, minutes, date);
- press SET
- press ▲ or ▼ to modify the value
- press SET to confirm

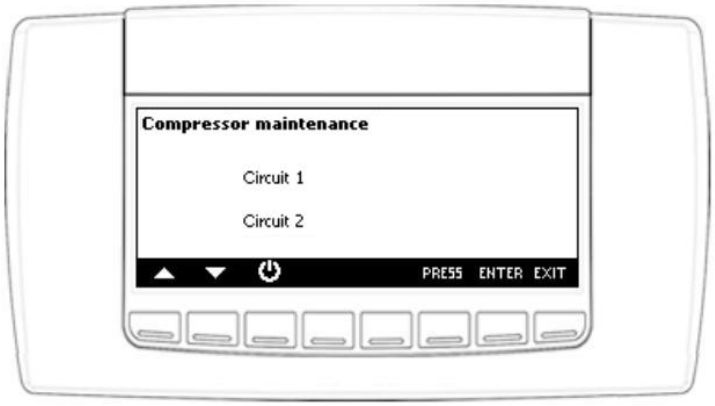


Pressing ▲▲ or ▼▼ it is possible to read the information about the Energy saving and ON/OFF scheduling.
To modify the hour of the time band and to enable the function is necessary to enter the parameter programming (ES parameters).

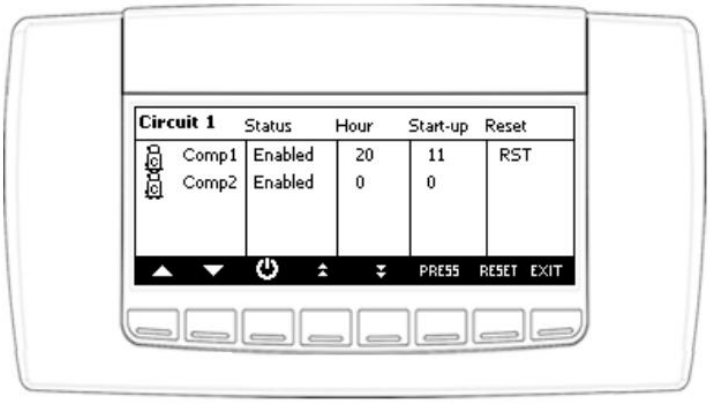


	Compressor maintenance

Pressing it is possible to visualize the compressor working hour and the number of activations. It is also possible to disable the compressor for maintenance.



Pressing ENTER it is possible to enter on the visualization of the working hour and number of start up of each compressor.



How to reset the working hours and number of start up:

- press ▲ or ▼ to select the label RST;

- press RESET for 5 seconds to reset hour and start up

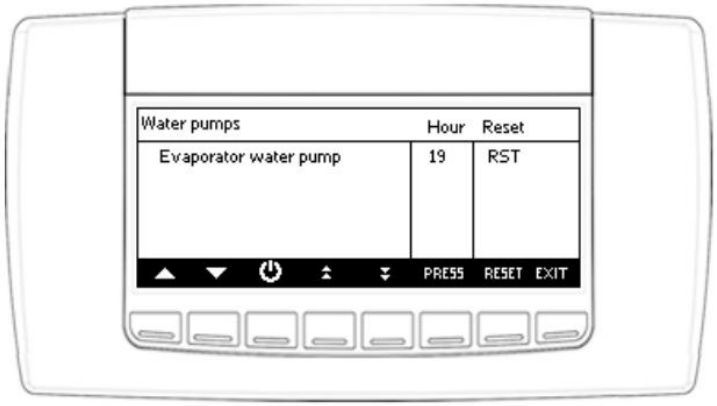
How to disable a compressor:

- press ▲ or ▼ to select the status of the compressor (Enabled in the “Status” column);
- press ENB/DIS for 5 seconds
- press ▲ or ▼ to select the status “Disabled”
- press ENB/DIS for 5 seconds to confirm the operation

	Water pump maintenance

How to reset the working hours:

- press ▲ or ▼ to select the label RST;
- press RESET for 5 seconds to reset hour and start up

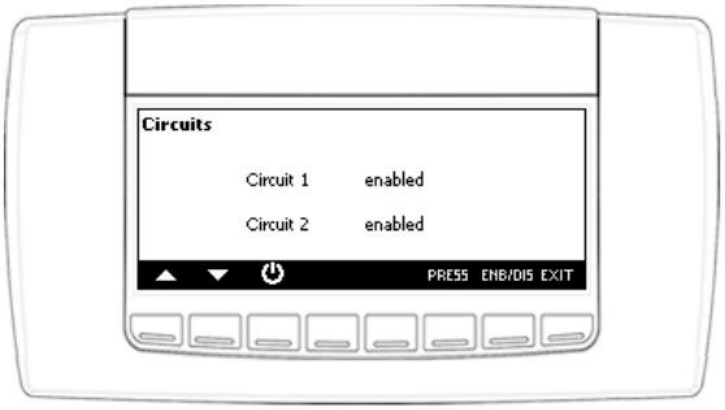


	Circuit maintenance

Press CIR to disable the circuit for maintenance; all the compressor will be switched off after disabling the circuit.

How to disable a circuit:

- press ▲ or ▼ to select the circuit to disable
- press ENB/DIS for 5 seconds
- press ▲ or ▼ to select the status “Disabled”
- press ENB/DIS for 5 seconds to confirm the operation



	Alarm visualization and reset

Pressing ▲▲ o ▼▼ it is possible to visualize the alarms; the alarm status can be:

- **Active**: the alarm is still active and it is not possible to reset it
- **Reset**: the alarm is not active and it is possible to reset it

Manual reset of all alarms:

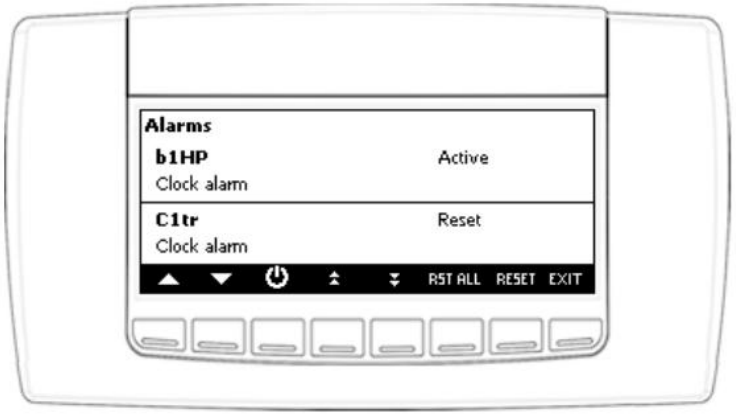
press RST ALL to reset all the alarms (only the alarms that are not active)

Manual reset procedure:

- press ▲ or ▼ to select the alarm;
- press RESET to reset the alarm

In case of compressor overload alarm when the password is requested, operate in this way:

- press ▲ o ▼ to select the compressor overload alarm
- press RESET
- press SET
- press ▲ or ▼ to insert the password value (parameter AL46)
- press SET to confirm the operation

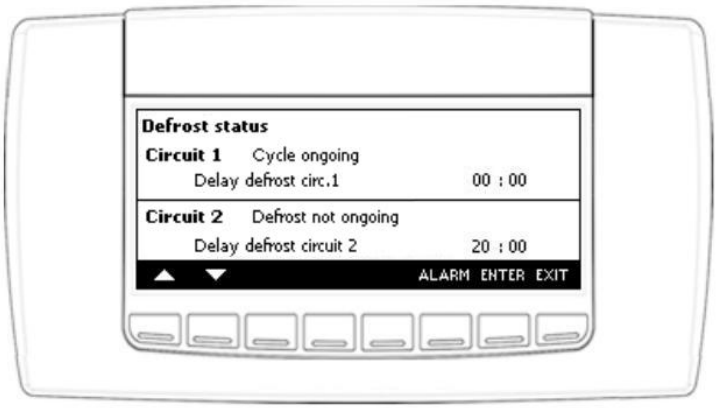


	Alarm log

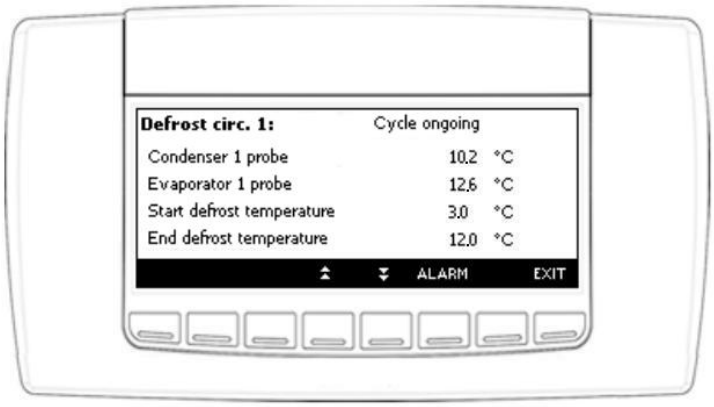
Pressing ▲▲ or ▼▼ it is possible to read the last 99 alarms.

	Defrost

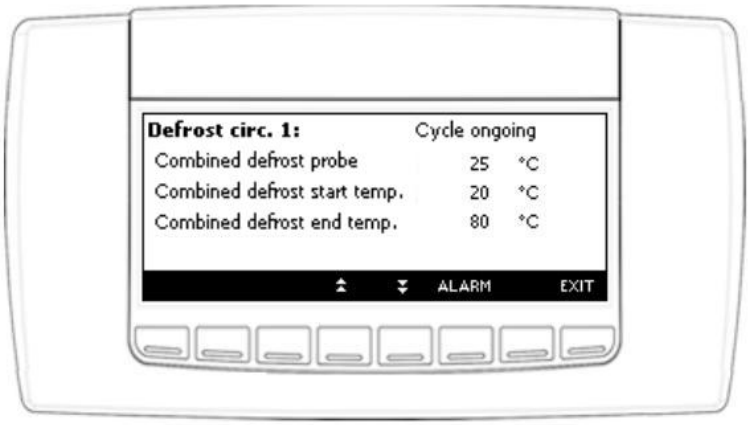
For each circuit it is possible to read the status of the defrost, the condenser pressure, the suction pressure, the defrost start temperature / pressure and the defrost end temperature / pressure.



Press ▲ or ▼ to select the circuit 1 or circuit 2, then press ENTER.

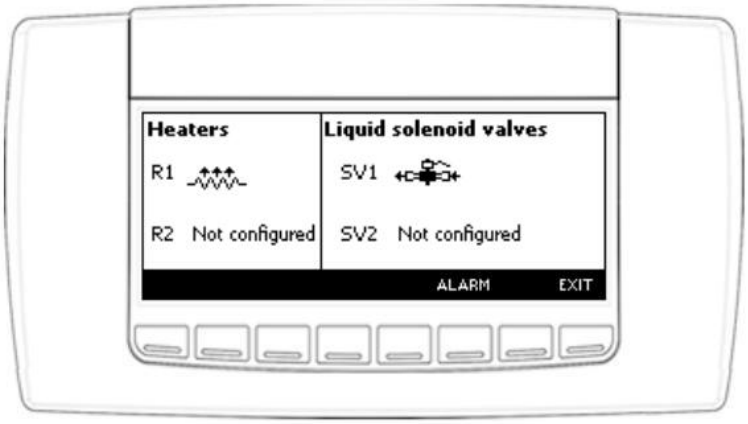


If the combined defrost is enabled, press ▲ or ▼ to read the probe value and the set point.



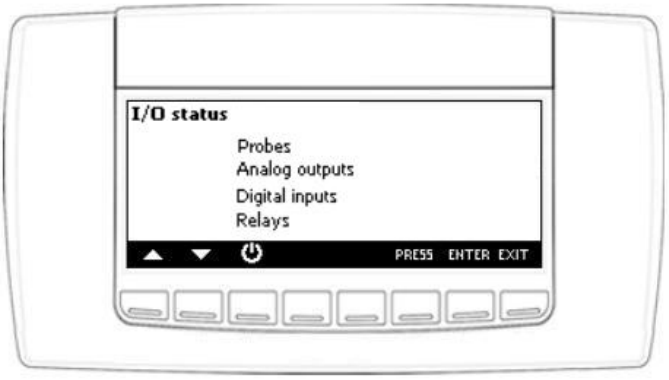
	Eletrical heater and pump down valve

It is possible to read the status of the electrical heaters and the pump down valve.

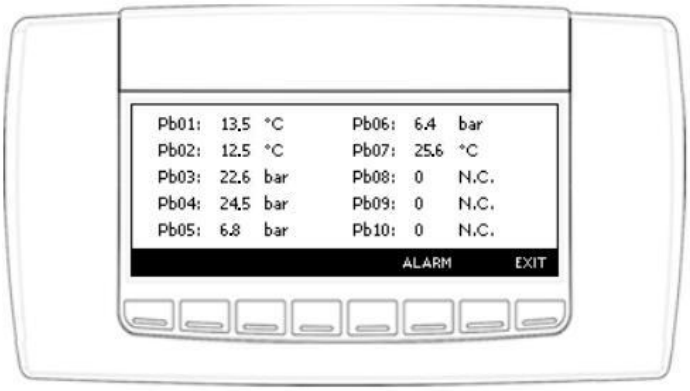


	I/O status

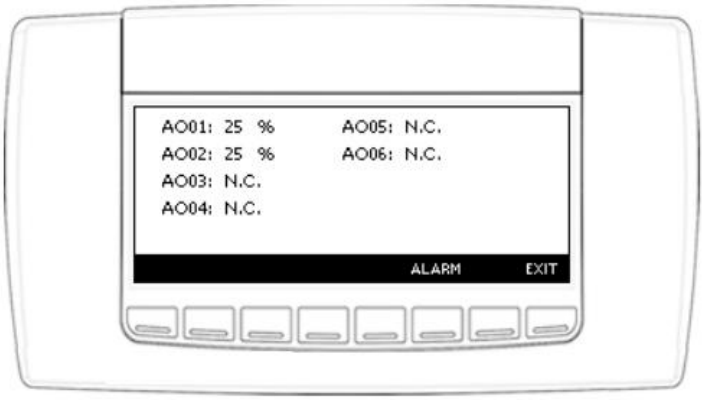
Press  or  to select the digital input, analog output, analog input or relays, then press ENTER.



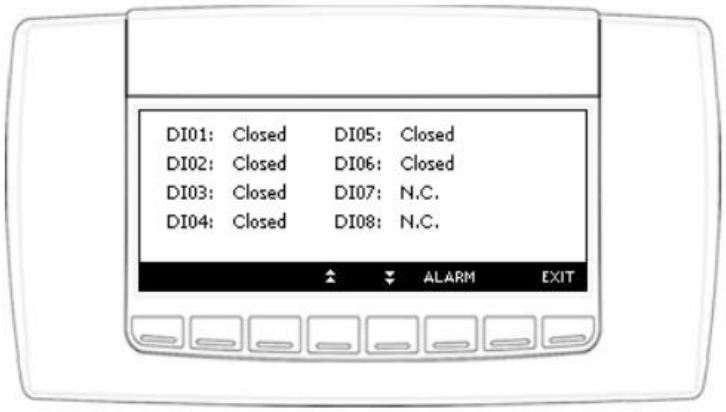
Probes visualization.



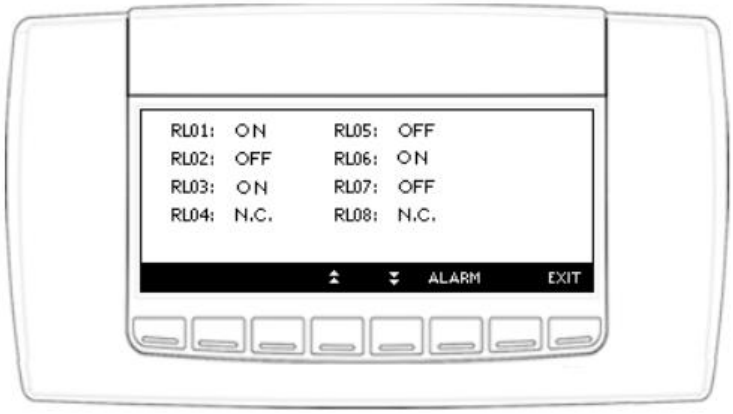
Analog output status.



Digital input status.

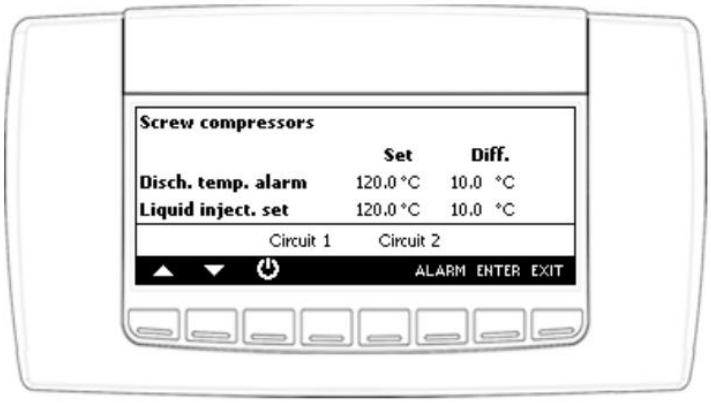


Relay status visualization.



	Screw compressor

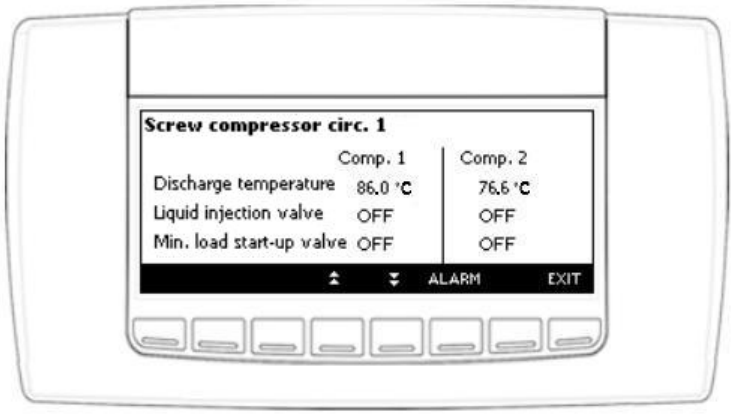
It is possible to read the information related to the screw compressor.
In the first visualization it is possible to read the set point of the discharge temperature and the liquid injection set point.



To read the discharge temperature, the status of the liquid injection valve and the status of the minimum load start up valve:

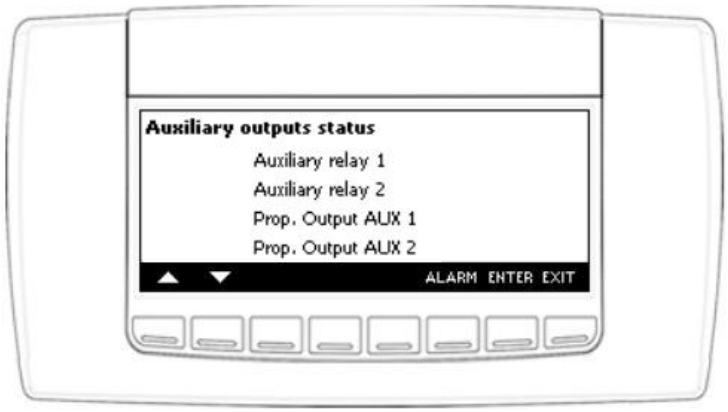
- press  or  to select the circuit 1 or circuit 2

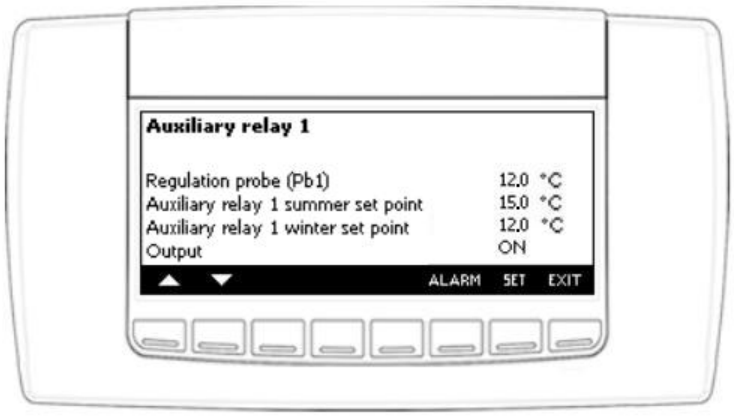
- press ENTER to visualize the discharge temperature, the status of the liquid injection valve and the status of the minimum load start up valve of the compressor 1
- press ▲ or ▼ to visualize the information of the next compressor (if configured)



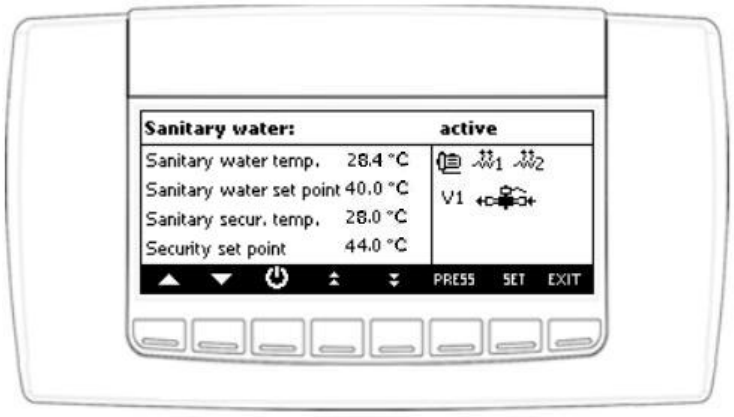
AUX	Auxiliary output

Press ▲ or ▼ to select the auxiliary relay or analog output and press ENTER to read the information (probe value, status of the output).

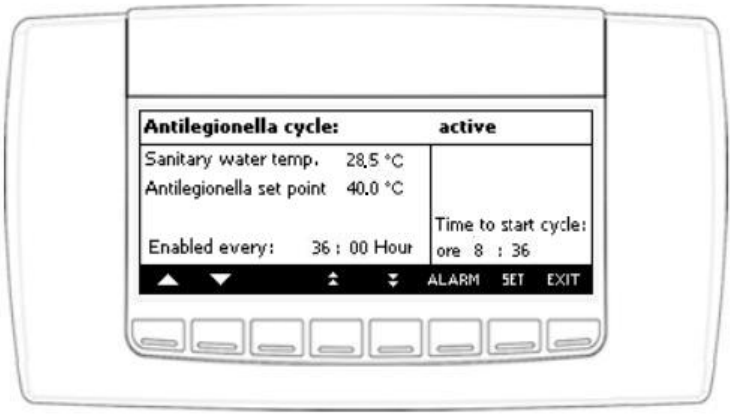


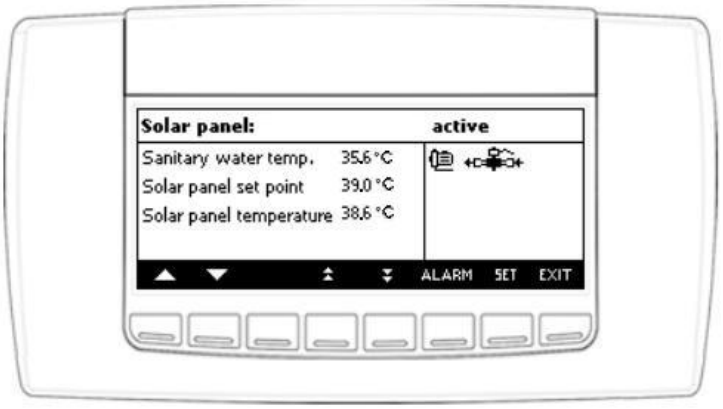


SAN	Sanitary water



Press ▲▲ or ▼▼ to read the information of the sanitary water regulation, antilegionella and solar panel.





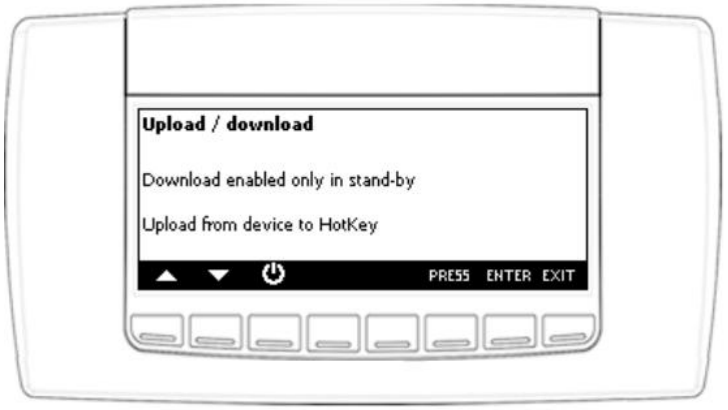
HOTKEY	Parameters programming with Hot Key 64

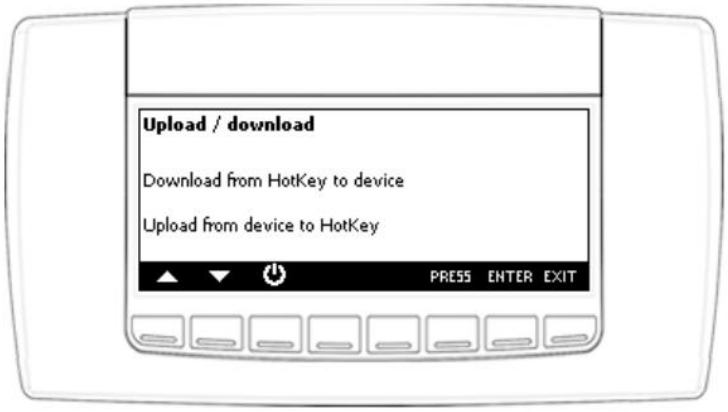
It is possible to use the HotKey 64 for:
- copy the parameter map from the HotKey 64 to the Ichill (Download)
- copy the parameter map from the Ichill to HotKey 64 (Upload)

Download from HotKey 64 to Ichill:
this operation is enabled only if the Ichill is in STD-BY or remote OFF, otherwise the display shows the message “Download enabled only in stand-by”.
Download procedure:
- Insert the Hot Key 64 into the 5 ways connector through the hole at the top of the Ichill (see image below)
- Select “Download from HotKey to device”
- Press ENTER
- if the operation was successful the display shows “OK”, otherwise shows “ERR”

Upload from Ichill to Hot Key 64:
Upload procedure:
- Insert the Hot Key 64 into the 5 ways connector through the hole at the top of the Ichill (see image below)
- Select “Upload from device to HotKey”
- Press ENTER
- if the operation was successful the display shows “OK”, otherwise shows “ERR”

In case of Upload / Download failure:
- Hot Key 64 not properly inserted in the 5 ways connector
- Hot Key model different to Hot Key 64

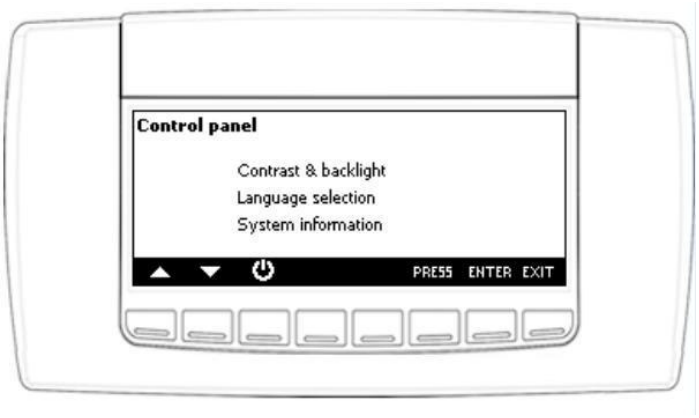




	Keyboard configuration

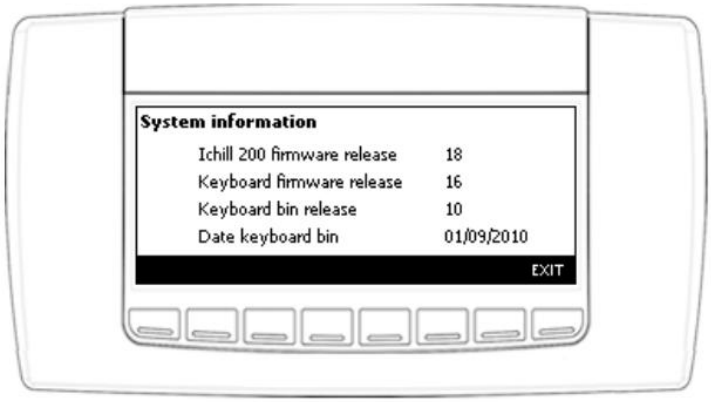
It is possible to set:

- contrast and backlight (it is strongly recommended to reduce as possible the activation time of the backlight)
- language selection
- information about:
  - Ichill firmware release (to verify the compatibility Ichill ←→ Visograph keyboard)
  - Visograph keyboard firmware release
  - Visograph keyboard bin release



How to modify the configuration:

- press ▲ or ▼ to select the configuration to change
- press SET
- press ▲ or ▼ to change the configuration
- press SET to confirm



5.7 CIRCUIT INFORMATION

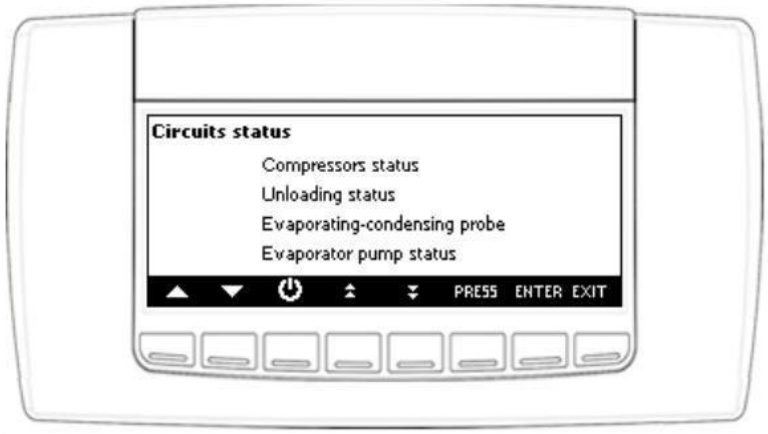
Press **CIRC.** to read the main information about the circuit:

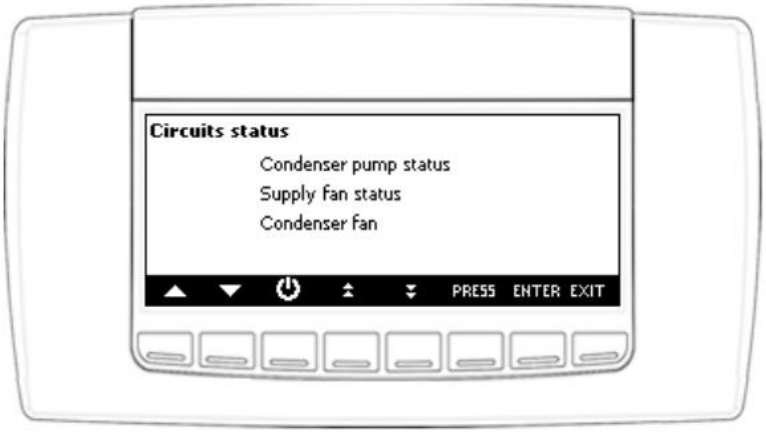
- compressor status
- unloading status
- evaporating – condensing probes
- water pump / supply fan status
- condenser fan status

Load status visualization:

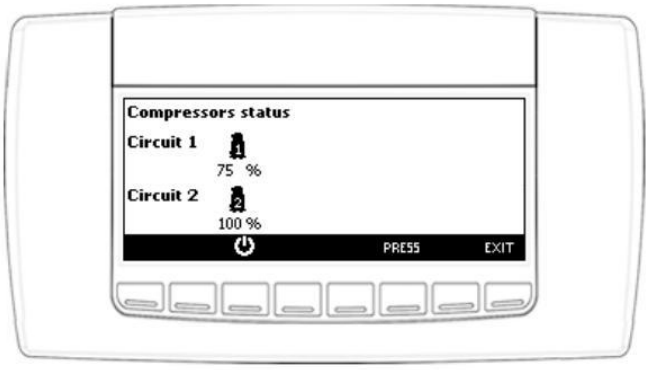
	Compressor OFF		Compressor ON
	Condenser fan OFF (step regulation)		Condenser fan ON (step regulation)
	Condenser fan OFF (proportional regulation)		Condenser fan ON (proportional regulation)
OFF	Water pump OFF		Water pump ON
SF OFF	Supply fan OFF	SF	Supply fan ON

Press ▲ or ▼ to select the information to read then press SET.

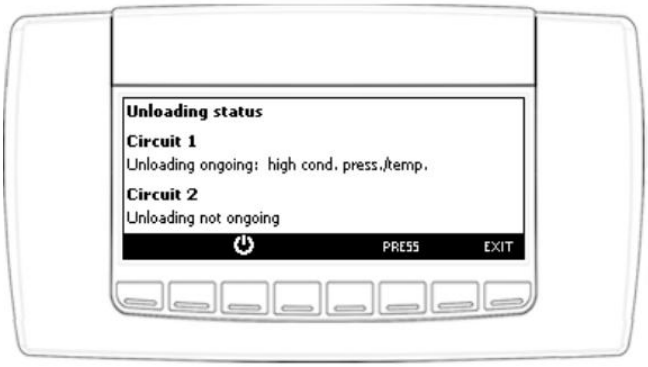




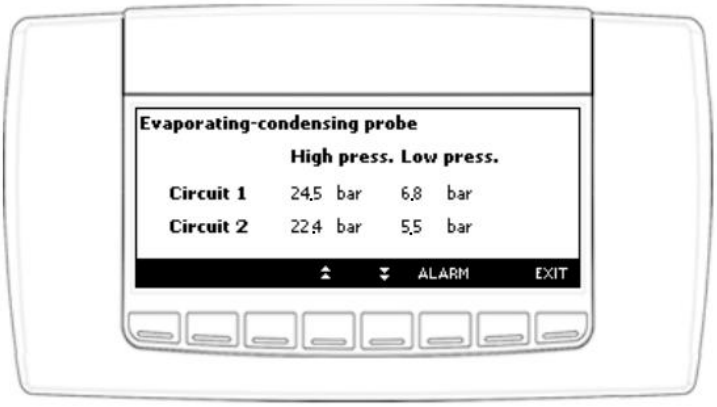
- **Compressors status**



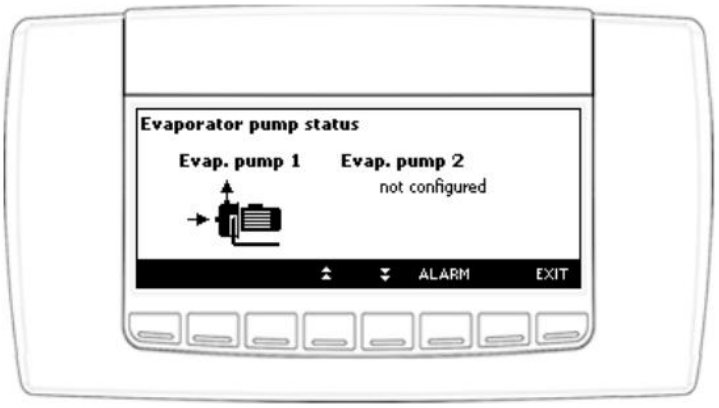
- **Unloading status**

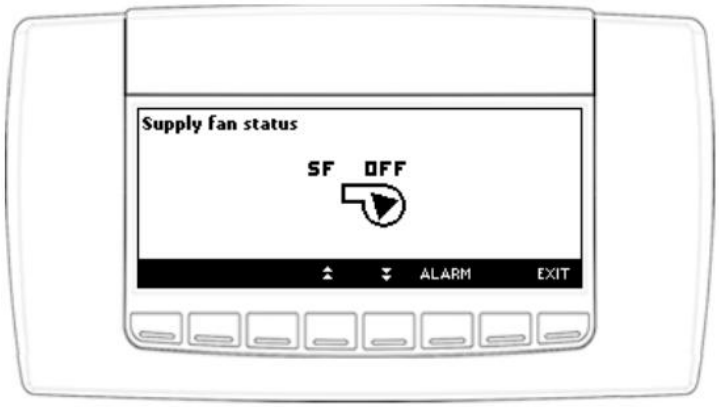


- **Evaporating-condensing probe**

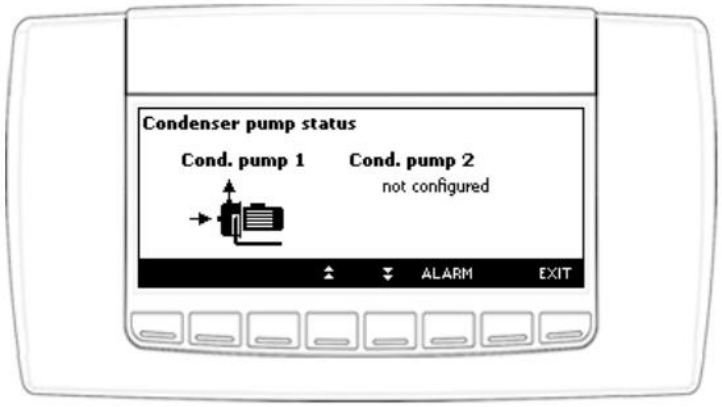


- **Evaporator pump / Supply fan status**

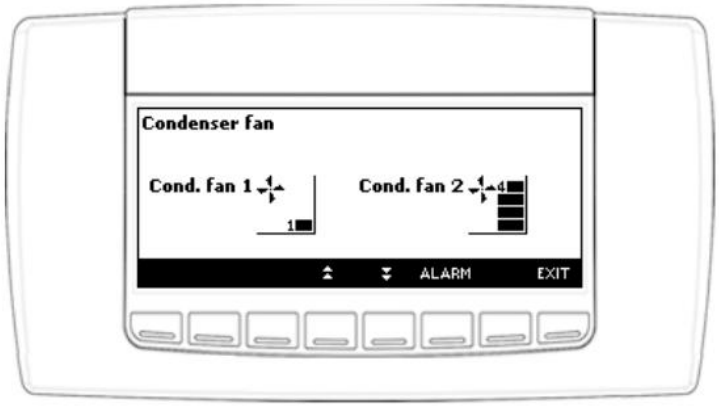




- **Condenser pump status**



Condenser fan status



6. CHILLER / HEAT PUMP SELECTION

The parameter CF02 allows to configure the machine:

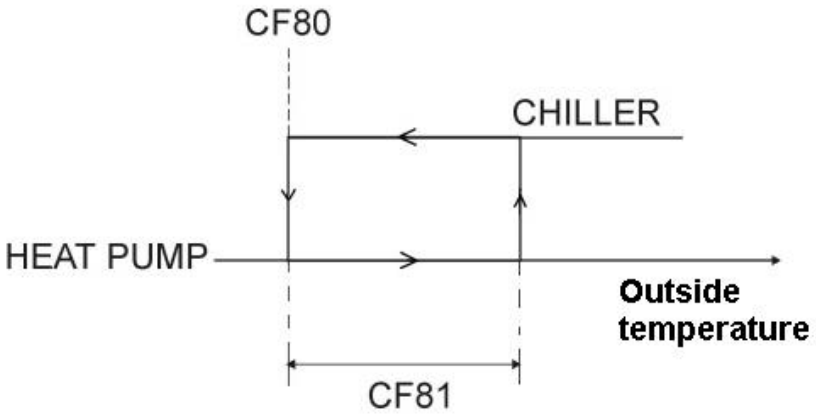
CF02	Unit configuration 1= only chiller 2= only heat pump 3= chiller and heat pump 4= heat pump + freecooling 5= heat pump + chiller + freecooling

The parameter CF79 determines the chiller / heat pump selection mode.

Par. CF79 = 0: Chiller / Heat pump selection from keyboard VGI890

Par. CF79 = 1: Chiller / Heat pump selection from digital input
One digital input has to be configured as “remote Chiller / Heat Pump”.
Using the keyboard is possible to put the Ichill in STD-BY or switch on the machine in the mode selected by digital input.

Par. CF79 =2: Chiller / Heat pump selection according to outside temperature
One probe has to be configured as outside temperature; the parameters involved with the change over function are:
CF80 Change over Setpoint. If the outside temperature is lower than CF80, the Ichill works in Heat Pump mode.
CF81 Change over Differential. If the outside temperature is higher than CF80 + CF81, the Ichill works in Chiller mode.



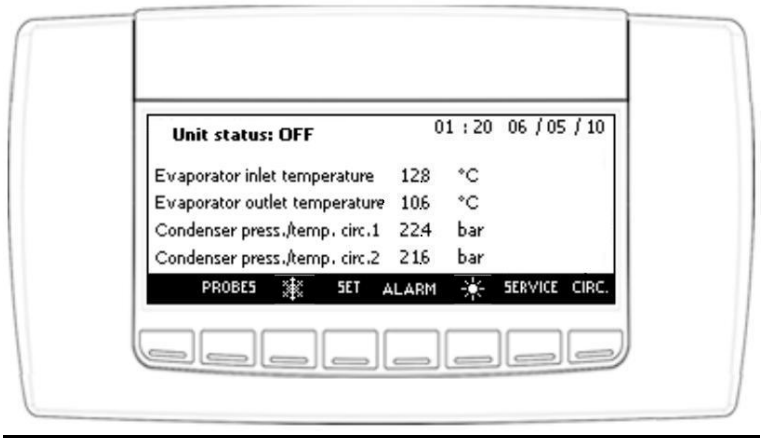
Keyboard selection

If the Ichill is in STD-BY press ❄ o ☀ to switch on the machine.

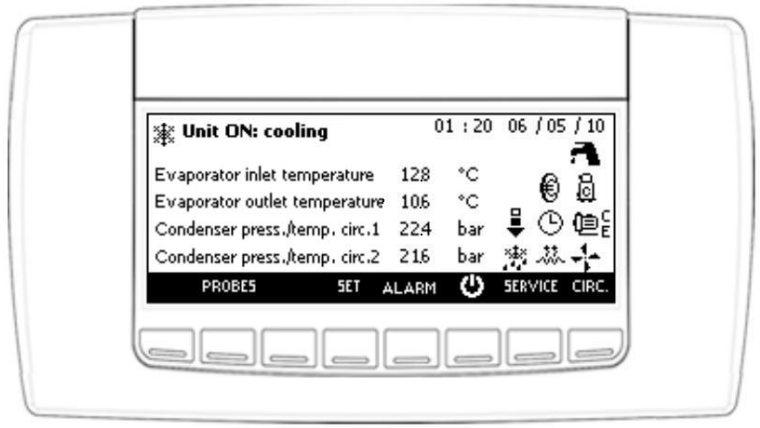
Meaning of the simbols:

CF78 = 0: pushing ❄ key the unit starts in chiller, pushing ☀ key the unit starts in heat pump

CF78 = 1: pushing ❄ key the unit starts in heat pump, pushing ☀ key the unit starts in chiller



When the Ichill is ON, press ⏻ to put the machine in STD-BY.



CONDENSING UNIT: CHILLER / HEAT PUMP SELECTION FROM KEYBOARD

Unit configured as condensing unit CF03 = 1.
One digital input has to be configured as request of regulation (o47 or c47, see digital input configuration).
The chiller/heat pump selection has to be done by keyboard; when the digital input is active, one compressor is automatically switched on.
In unit with more than one compressor, every step (compressor) is activated when the corresponding digital input is activated; this means that is necessary to configure a digital input for each compressor.

CONDENSING UNIT: CHILLER REQUEST BY DIGITAL INPUT

Unit configured as condensing unit CF03 = 1
One digital input has to be configured as chiller request (o48 or c48, see digital input configuration); when the digital input is activated the unit start to work in chiller and one compressor is automatically switched on.
In unit with more than one compressor, every step (compressor) is activated when the corresponding digital input is activated; this means that is necessary to configure a digital input for each compressor.

CONDENSING UNIT: HEAT PUMP REQUEST BY DIGITAL INPUT

Unit configured as condensing unit CF03 = 1
One digital input has to be configured as heat pump request (o49 or c49, see digital input configuration); when the digital input is activated the unit start to work in heat pump and one compressor is automatically switched on.
In unit with more than one compressor, every step (compressor) is activated when the corresponding digital input is activated; this means that is necessary to configure a digital input for each compressor.

7. ENERGY SAVING

7.1 ENERGY SAVING ACTIVATION BY DIGITAL INPUT

The energy saving is activated when one digital input is configured as energy saving is active.

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

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

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

7.2 ENERGY SAVING TIME TABLE WITH RTC

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

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

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

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

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

Enter the parameter programming:
1. Select the ES parameter family.

2. Select the parameters ES07 (Monday)…ES13 (Sunday).

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

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

Example of a daily programming:

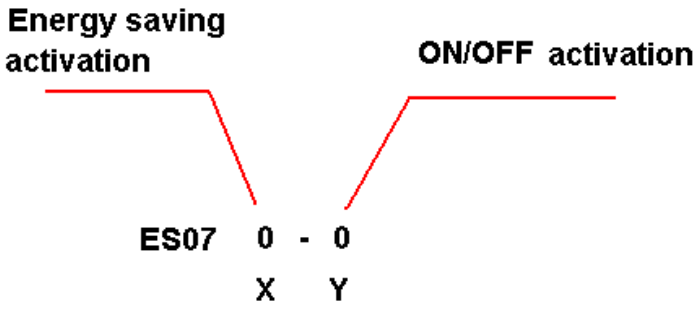
Monday

Enter parameter programming:

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

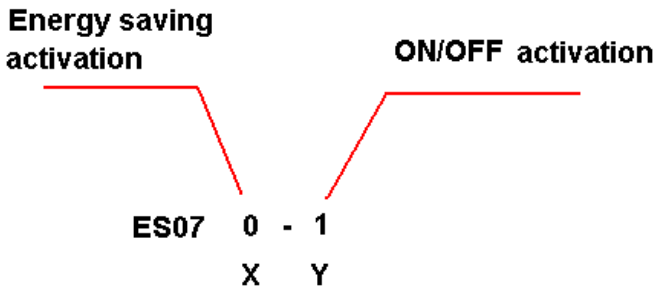
MONDAY

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



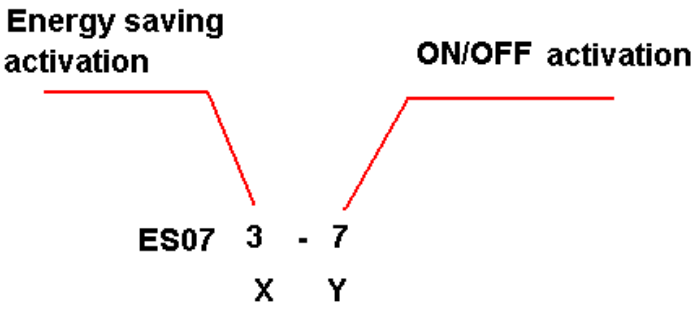
MONDAY

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



MONDAY

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



WEEKLY PROGRAMMING

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

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

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

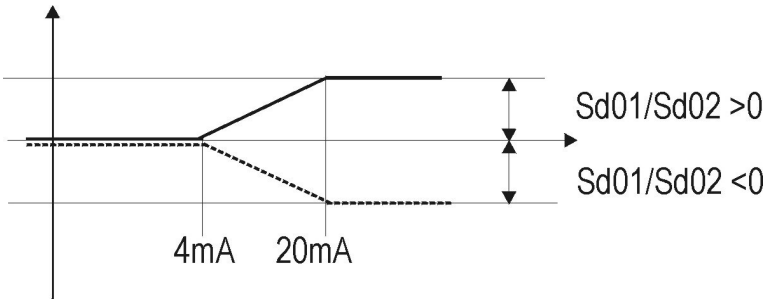
8. DYNAMIC SETPOINT

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

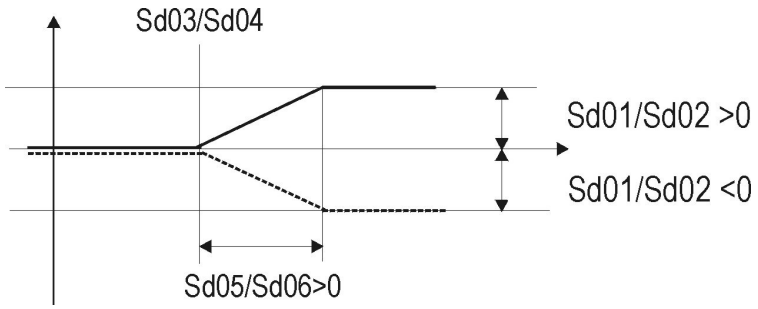
- In chiller mode the parameter Sd01 is not equal to 0.
- In heat pump mode the parameter Sd02 is not equal to 0.
- A analog input is configured as 4÷20mA for dynamic setpoint control or outside temperature

Dynamic setpoint diagram

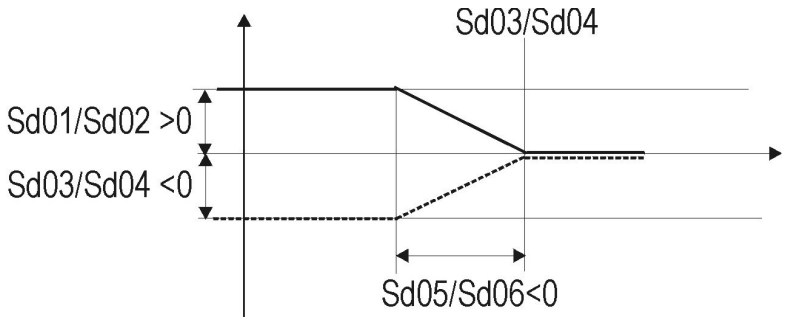
Analog input configured as 4..20mA for dynamic setpoint:



Analog input configured as outside temperature and positive differential:



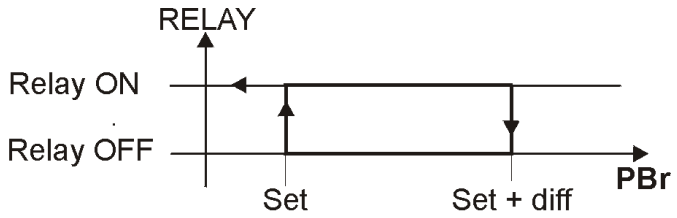
Analog input configured as outside temperature and negative differential:



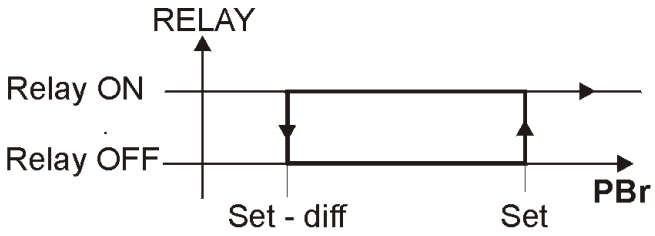
9. AUXILIARY RELAYS

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

Auxiliary relay with direct action



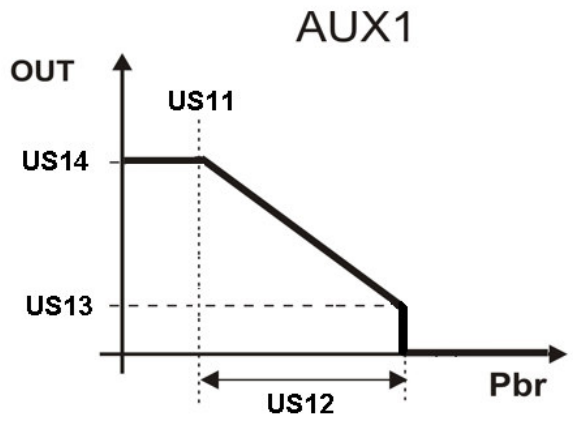
Auxiliary relay with inverse action

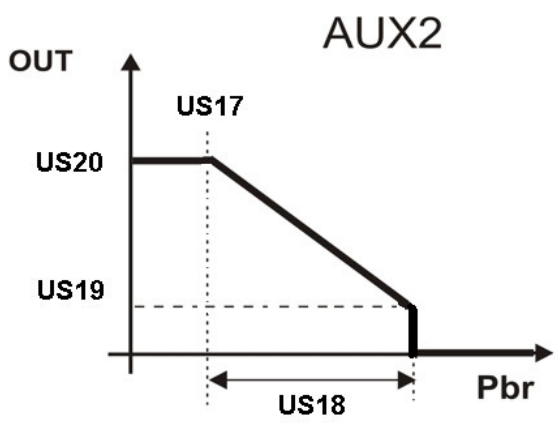


10. AUXILIARY PROPORTIONAL OUTPUTS

The outputs OUT 3 .. OUT 6 can be configured as proportional output.
Each output is managed with a dedicated temperature or pressure probe; the parameters involved in the probe selection are uS23 for the output 1 and uS35 for the output 2.
The function is enabled when the parameter uS22>0 for the output 1 and the parameter uS34>0 for the output 2 and at least one output is configured as auxiliary output.
Par. **uS22** configuration auxiliary output 1
Par. **uS34** configuration auxiliary output 2
Value and function
0 = Not enabled
1 = Function enabled, direct action, enabled also in stand-by and remote off
2 = Function enabled, direct action, enabled only if the Ichill is working in chiller or heat pump
3 = Function enabled, inverse action, enabled also in stand-by and remote off
4 = Function enabled, inverse action, enabled only if the Ichill is working in chiller or heat pump

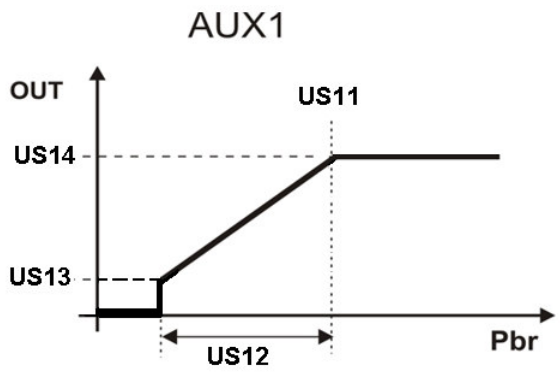
Auxiliary Proportional output: Direct action

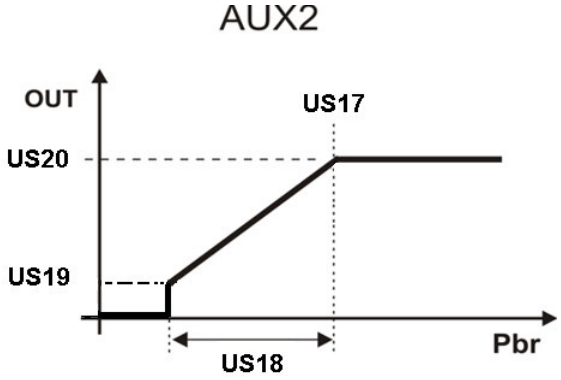




PBr = probe or transducer selected with uS23 / uS35 parameters

Auxiliary Proportional output: Inverse action





PBr = probe or transducer selected with uS23/ uS35 parameters

11. COMPRESSOR REGULATION

11.1 PARAMETER DESCRIPTION

Par. **ST01** Chiller Setpoint
It allows to set the chiller working temperature within the range ST02..ST03.
Par. **ST02** Minimum setpoint limit in chiller.
The user can not program a setpoint value lower than ST02, the range is –30 °C..ST01.
Par. **ST03** Maximum setpoint limit in chiller.
The user can not program a setpoint value higher than ST02, the range is ST01..70°C.
Par. **ST04** Heat pump setpoint
It allows to set the Heat pump working temperature within the range ST05..ST06.
Par. **ST05** Minimum setpoint limit in heat pump.
The user can not program a setpoint value lower than ST05, the range is –30 °C..ST04.
Par. **ST06** Maximum setpoint limit in heat pump
The user can not program a setpoint value higher than ST06, the range is ST01..70°C.
Par. **ST07** Regulation band width in chiller mode.
Par. **ST08** Regulation band in heat pump mode
Par. **ST09** Defines the thermoregulation probe in chiller.
0= NTC Temperature probe of the evaporator inlet
1= NTC Temperature probe of the evaporator circuit 1
2= NTC Temperature probe of the evaporator circuit 2

3= NTC Temperature probe of the common evaporator
4= Remote keyboard 1 probe
5= Remote keyboard 2 probe
The **ST10** parameter defines the thermoregulation probe of the unit with heat pump control
0= NTC probe temperature of the evaporator inlet
1= NTC probe temperature of the evaporator 1 outlet
2= NTC probe temperature of the evaporator 2 outlet
3= NTC probe temperature of the evaporator common outlet
4= Remote keyboard 1 probe
5= Remote keyboard 2 probe
6= NTC probe temperature of the condenser common inlet
7= NTC probe temperature of the condenser 1 inlet
8= NTC probe temperature of the condenser 2 inlet
9= NTC probe temperature of the condenser 1 outlet
10= NTC probe temperature of the condenser 2 outlet
11= NTC probe temperature of the condenser common outlet

12. CHILLER / HEAT PUMP REGULATION

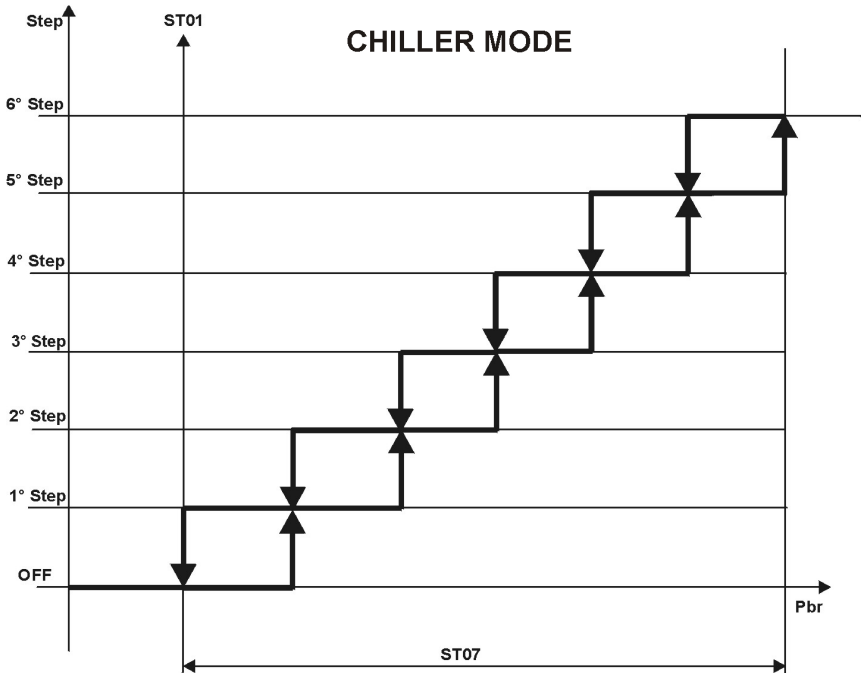
The parameter CF94 allows to enable/disable the management of the compressors on chiller or heat pump.

Abilitazione funzionamento compressori					
CF94	Enabling compressors 0= chiller and heat pump 1= only chiller 2= only heat pump	0	2		

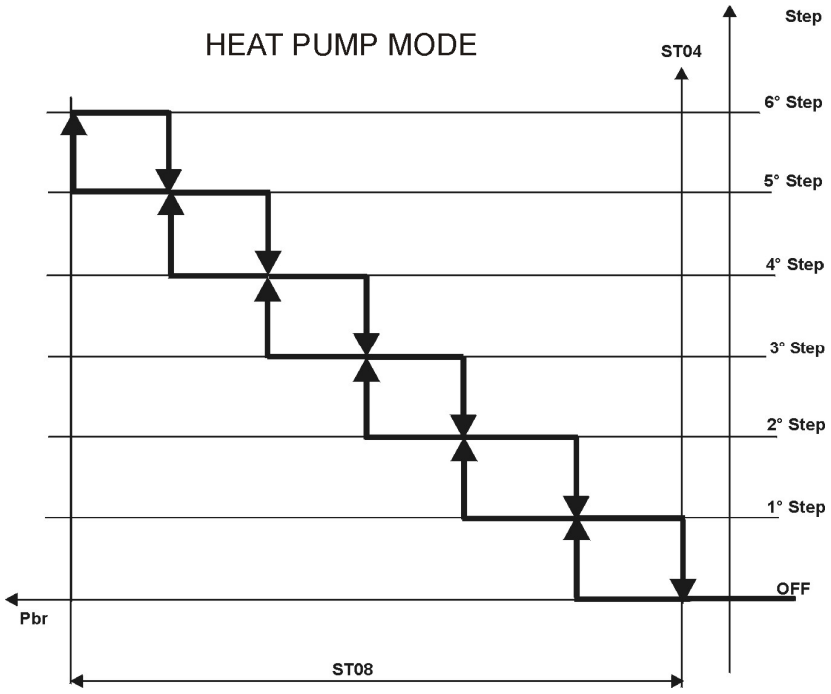
The parameter **ST11** determines the type of regulation
St11 = 0 Proportional regulation
St11 = 1 Neutral zone regulation

12.1 PROPORTIONAL REGULATION

Chiller regulation

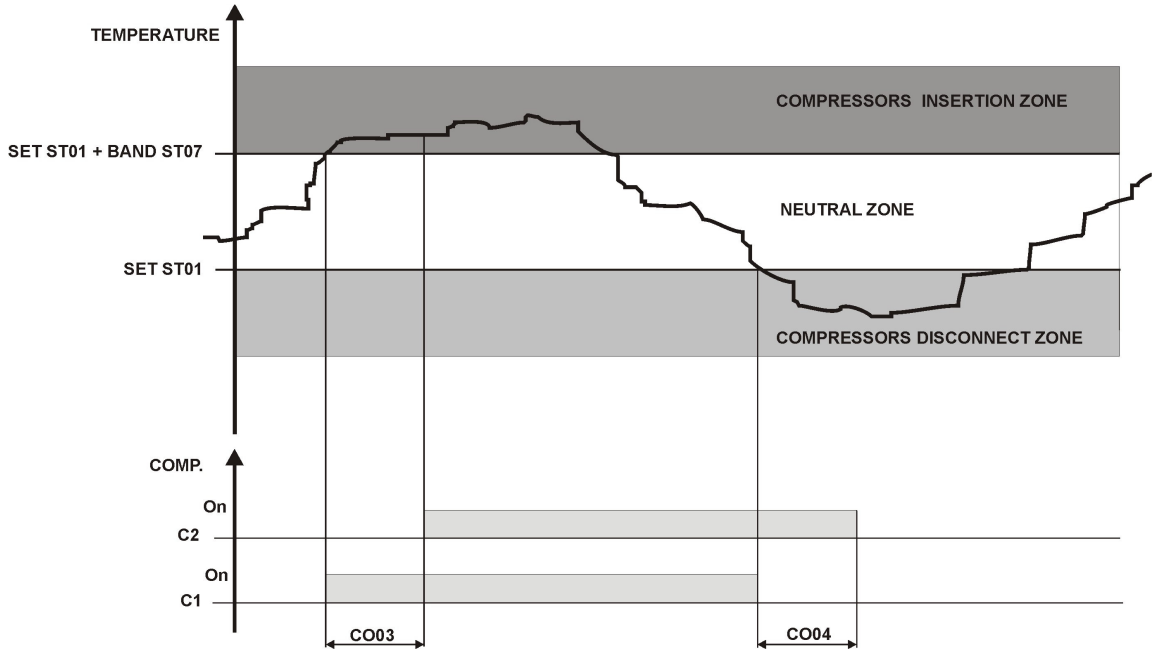


Heat pump regulation

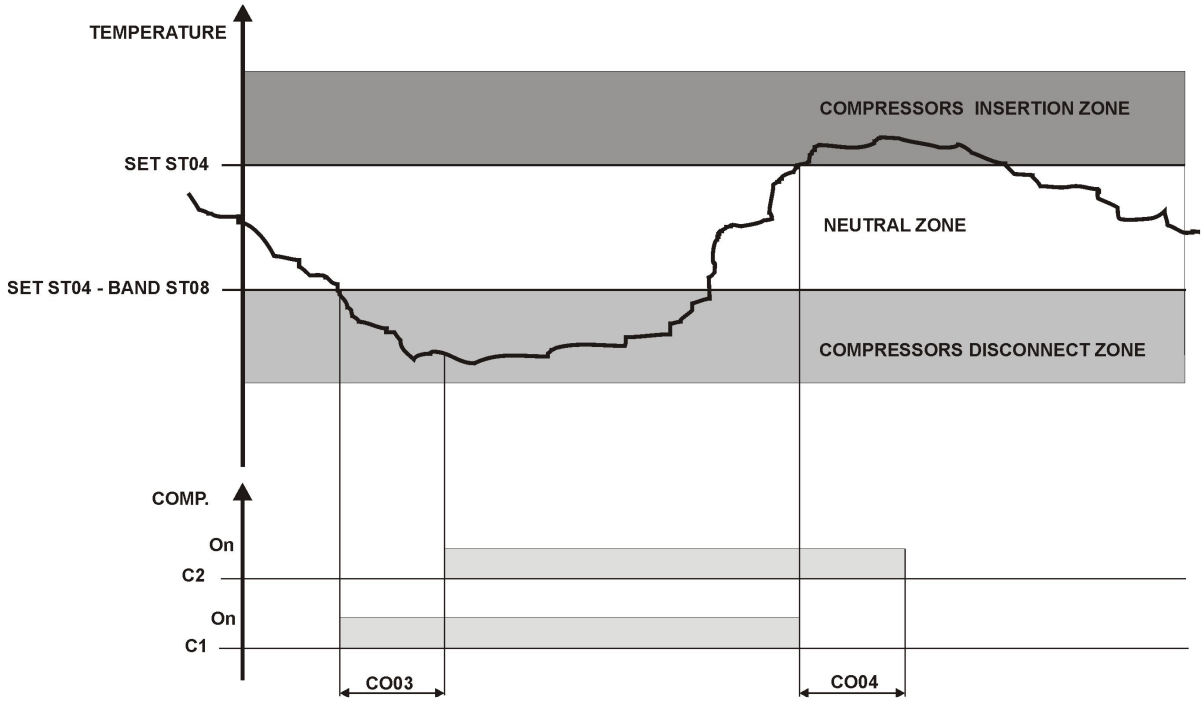


12.2 NEUTRAL ZONE REGULATION

Compressor regulation in chiller



Compressor regulation in heat pump



Compressor in neutral zone

Par. CO53 Maximum time of work in neutral zone without insert resource
When the temperature is inside the neutral zone, a timer is activated (parameter CO53); when this time is elapsed, the Ichill switch on all the compressor to avoid an stationary situation.
If the parameter value is 0 the function is non activated.

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

13. REGULATION OF THE COMPRESSOR WITH DIFFERENT CAPACITY

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

Parameters involved:

CF87	Compressor 1 capacity	0	100%
CF88	Compressor 2 capacity	0	100%
CF89	Compressor 3 capacity	0	100%
CF90	Compressor 4 capacity	0	100%
CF91	Compressor 5 capacity	0	100%
CF92	Compressor 6 capacity	0	100%

CF93	Maximum number of start of the compressor 0= Not enabled	0	15

Example: circuit 1 with 2 compressors:

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

The regulation is a steps; if two compressors with different weight are configured, are available 3 steps activated in regulation band ST07 or ST08.

ATTENTION:
It is possible to protect the compressor setting a maximum number of activation per hour.

14. REGULATION OF THE COMPRESSOR INVERTER CONTROLLED

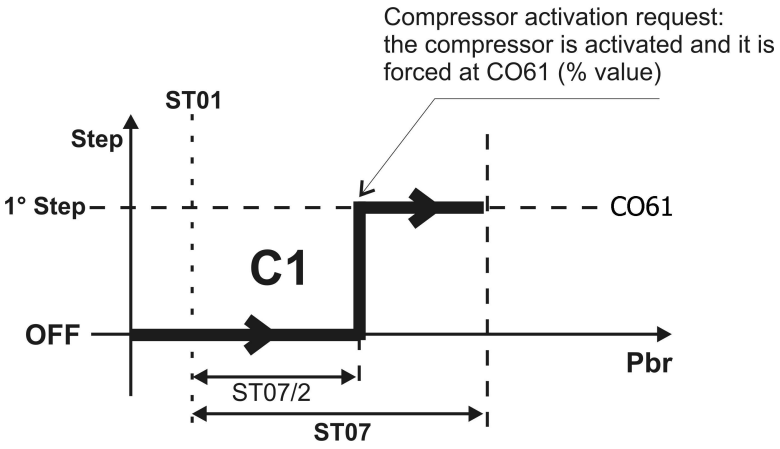
The signal 0÷10V is given by one of 4 configurable ouputs of the Ichill (OUT3—OUT6).
The compressor inverter controlled can be used only with proportional regulation (parameter St11=0).
Possible unit configuration:

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

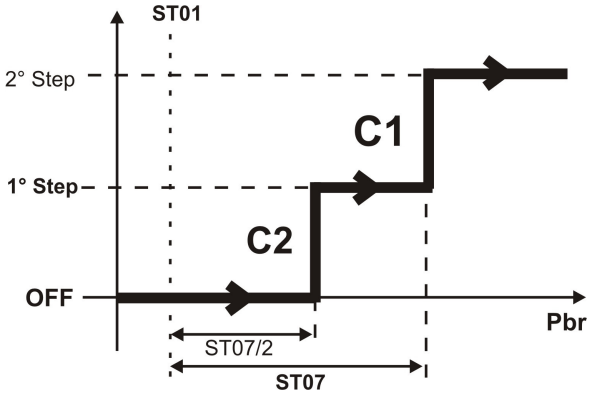
First step to be activated is always the compressor inverter controlled; it will be swiched on when the regulation requests 100% of the compressor power.
To increase / decrease the power the compressor works by step of 1% of the power; every step is delayed by CO62 at the start-up of the compressor and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

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

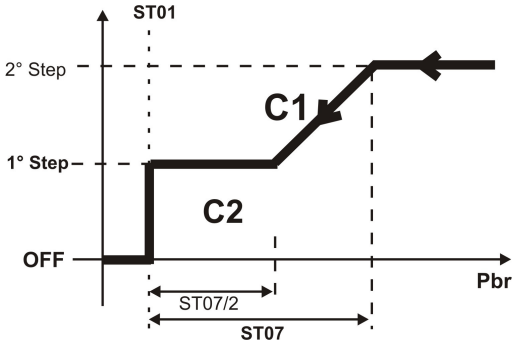
COMPRESSOR INVERTER CONTROLLED OPERATING MODE: CHILLER
At the start up the compressor is forced to work at CO61 speed for CO60 seconds.



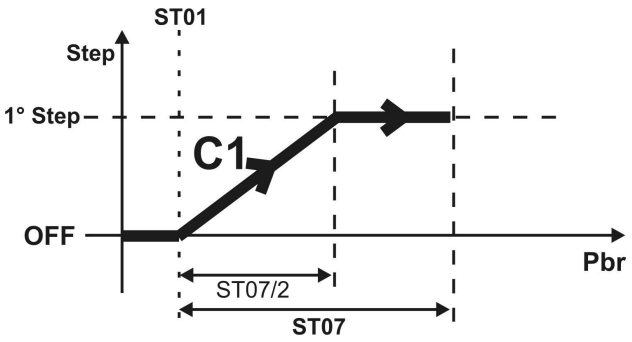
When the regulation temperature is > ST01 + ST07 the second compressor is activated.



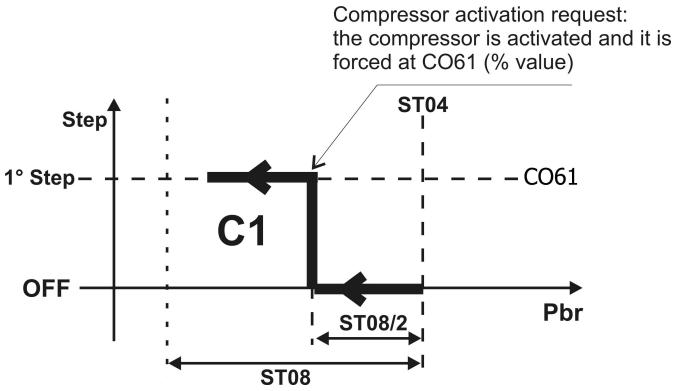
The termoregulation is done by the modulation of the compressor inverter controlled.



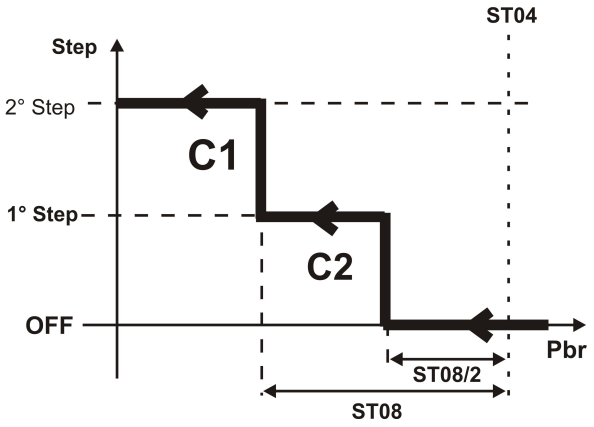
If the temperature descreases under ST01+ST07/2 the compressor ON/OFF controlled is switched off and the compressor inverter controlled modulates the power according to the thermoregulation request.



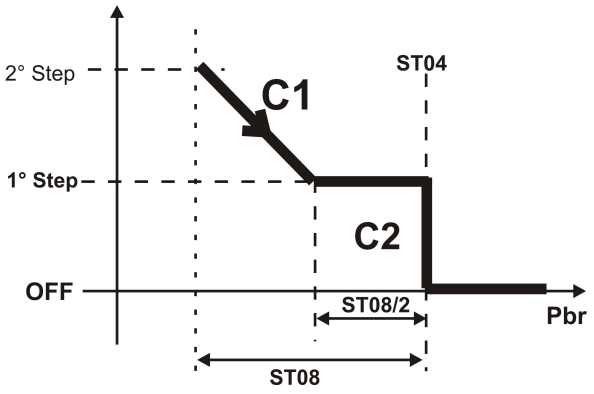
COMPRESSOR INVERTER CONTROLLED OPERATING MODE: HEAT PUMP
At the start up the compressor is forced to work at CO61 speed for CO60 seconds.



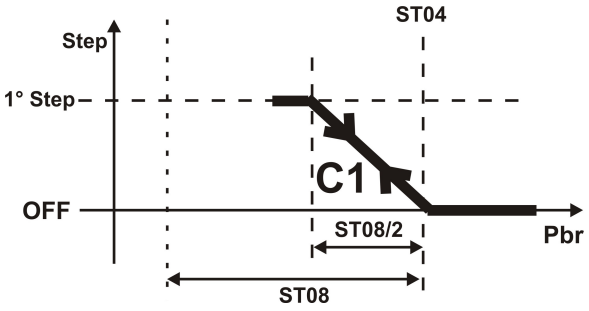
When the regulation temperature is < ST04 + ST08 the second compressor is activated.



The termoregulation is done by the modulation of the compressor inverter controlled.



If the temperature increases over ST04-ST08/2 the compressor ON/OFF controlled is switched off and the compressor inverter controlled modulates the power following the thermoregulation request.



Parameters involved:

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

15. COMPRESSOR RACK

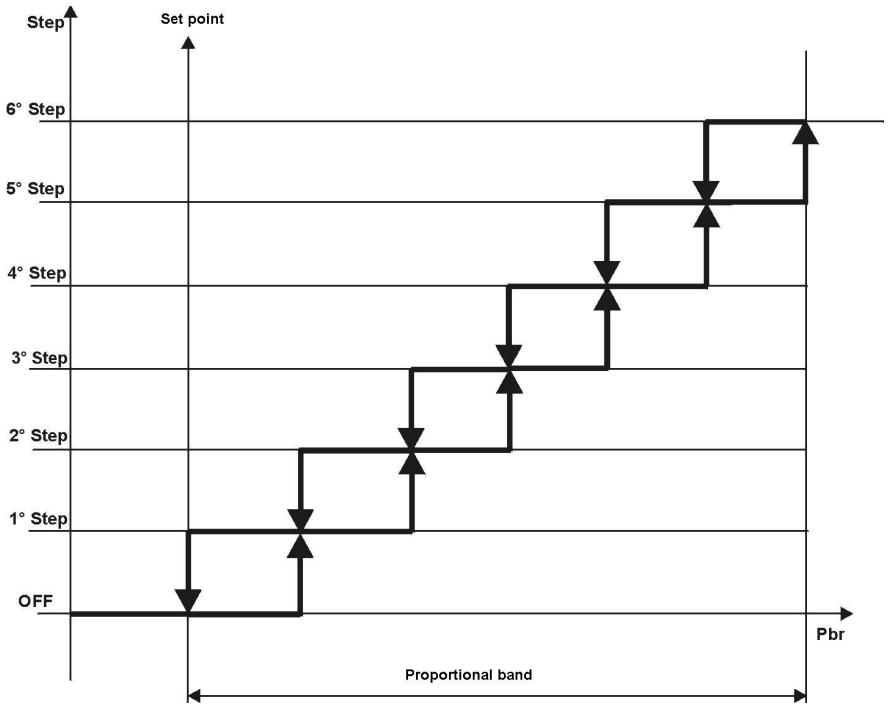
The IC200L can manage a compressor rack; the configuration parameters are Cr01…Cr09.
In this operation mode the controller can manage maximum 6 compressors in one circuit and only the chiller mode is enabled.
The parameter Cr01 allows to enable the compressor rack regulation:
Cr01 = 0 Compressor rack regulation disabled
Cr01 = 1 Compressor rack enabled and regulation on the probe defined by parameter ST09
Cr01 = 2 Compressor rack enabled and regulation on the evaporator trasducer

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

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

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

Graph of the compressors thermoregulation



16. ANTI FREEZE HEATERS, INTEGRATION HEATING OR BOILER

Regulation of the heaters in chiller

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

Regulation of the heaters in heat pump

The **Par. Ar07** selects the probe/s control for the anti-freeze alarm and the relay outputs configured as anti-freeze / support / boiler heaters for the circuits 1 and 2 in heat pump mode.
Par. **Ar07 = 0:** the function is disabled
Par. **Ar07 = 1:** function enabled; the regulation probe is evaporator water inlet.
Par. **Ar07 = 2**: function enabled; the regulation probe are evaporator water outlet circuit 1 and evaporator water outlet circuit 2.

ATTENTION: It is not possible to control the heaters of the circuit #1 with the probe of the circuit #2 and viceversa.

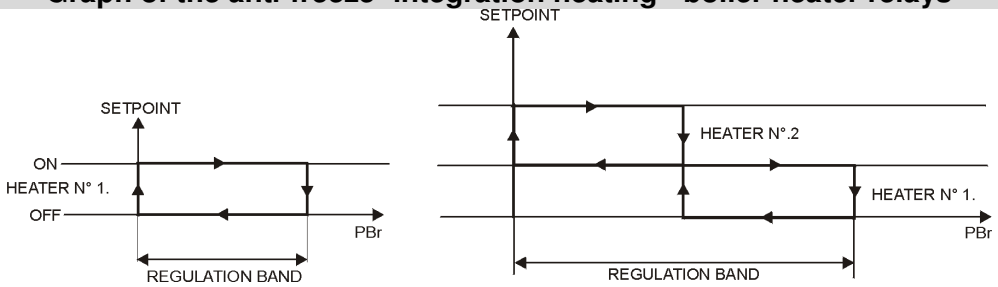
Par. **Ar07 = 3:** function enabled; the regulation probe are evaporator water outlet circuit 1, evaporator water outlet circuit 2 or evaporator common probe.
Par. **Ar07 = 4**: function enabled; the regulation probe is outside temperature.

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

Condenser Anti-freeze heaters regulation

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

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



Boiler function

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

Ar11=1 Boiler in integration mode
When outside temperature decreases under the Ar12 setpoint, the Ar14 delay starts counting. If during the Ar14 counting the external air increases above the Ar12 + Ar13 (differential) the function is aborted and the Ar14 time is reloaded.
When the time Ar14 is elapsed and the external air temperature is still under the Ar12 setpoint, if the water temperature detected by the evaporator probe is lower than Ar15 in chiller mode or Ar17 in heat pump mode, the heaters are turned on.
When the temperature rises over Ar15 + Ar16 in chiller mode or Ar17+Ar18 in heat pump the heaters are turned off.
If the heaters are on, when the outside temperature increases over Ar12 + Ar13, they are turned off and the Ar14 delay is reloaded.

Attention
If outside temperature falls blow Ar19 setpoint, the compressors are switched off; they can restart if the outside temperature increase over Ar19+Ar20.

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

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

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

17. COMPRESSORS MANAGEMENT

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

18. SATURATION - CIRCUIT BALANCING

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

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

19. COMPRESSORS MANAGEMENT

19.1 COMPRESSORS START- UP

The parameter CO10 defines the compressor start-up:
CO10=0 direct
CO10=1 part winding
CO10=2 star-delta

Direct Start- Up

It is necessary to configure one relay to drive the contactor of the compressor.

EXAMPLE

Direct start up configuration for one compressor
Set the parameter CF54 = c39 → direct start-up RL1 compressor 1

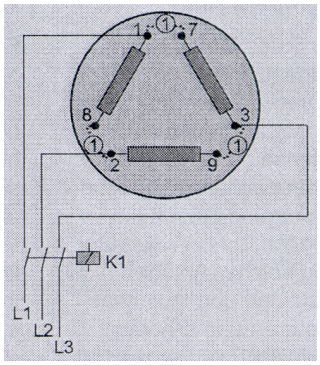


Fig. 1

Part Winding

Each compressor needs two relay outputs:

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

The time delay between coil 1 and coil 2 activation is CO11 (decimal of second, in a range 0..5 seconds).
The maximum number of relay outputs is 8, this means 4 compressors managed with Part Winding start-up.

EXAMPLE

Part Winding configuration of the compressor relay outputs
Set the Par CF54 = c39 Part Winding coil 1 the compressor 1;
Set the Par CF55 = c40 Part Winding coil 2 of the compressor 1.

Compressor Start- up With Part Winding

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

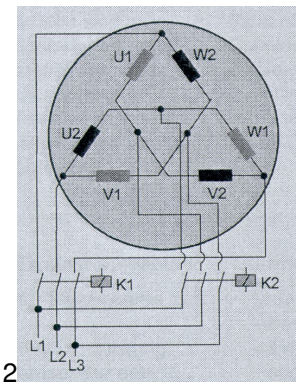


Fig 2

Part Winding start- up of Compressors or capacity compressors

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

Star - Delta Start up

The Ichill manages maximum 2 compressor with star-delta start-up; each compressor needs three relay outputs:

- Line 1 of the compressor 1 (Relay K1 of the Fig.3).
- Line 2 of the compressor 1 (Relay K3 of the Fig.3).
- Centre of the star (Relay K2 of the Fig.3)

Compressor switching on:
the centre of the star relay is turned on (Relay K2 of the Fig.3), after 1 second the Line #1 relay is turned on (relay K1 Fig.3). The two relays work together for the time set in CO11, then the relay of centre of the star is switched off (relay K2 Fig.2). Then after the CO12 delay time the relay of the line #2 is turned on (relay K3 Fig.3).
Compressor switching off:
the output relay of the line #1 and line #2 are switched off together.

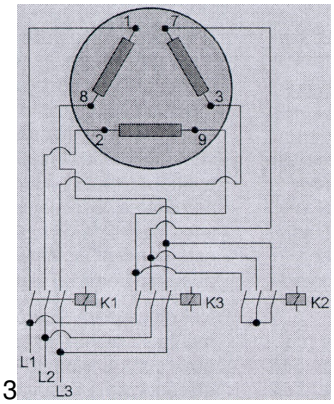


Fig. 3

Star - Delta Start- Up Of A Capacity Compressor
If one or more capacity compressors are configured and the thermoregulation requires the full load control, the controller turns the solenoid valve on, then after 1 second the centre of the star relay is turned on (relay K2 Fig. 3). Then the star-delta procedure will be completed with the other two contactors. Durning the CO13 time delay the step valve is forced on: minimum power. When the C013 is expired if the thermoregulation requires more power the valve will be switched off (maximum power).

20. CAPACITY STEP CONTROL

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

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

Eg: compressor with 3 capacity step.

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

Step control process

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

Power
0 %
25 %
50 %
75 %
100 %

- **CO06 = 1 direct action**

Eg: compressor with 3 capacity step.

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

Direct action with sequential step

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

Power
0 %
25 %
50 %
75 %
100 %

- **CO06 = 2 inverse action**

Eg: compressor with 3 capacity step.

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

Inverse action with sequential step

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

Power
0 %
25 %
50 %
75 %
100 %

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

Eg: compressor with 3 capacity step.

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

Direct action with sequential step

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

Power
0 %
25 %
50 %
75 %
100 %

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

20.1 MINIMUM LOAD START- UP

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

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

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

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

20.2 INTERMITTENT SOLENOID VALVE FOR SCREW COMPRESSOR

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

21. PUMP DOWN

PUMP DOWN with low pressure switch or pump down pressure switch

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

CO36 = 2 Pump down enabled during the switching off and switching on (low pressure switch or pump down switch)
Before turning off the last compressor, the solenoid valve is closed; the compressor works until the pressure switch is activated or after a maximum time CO39; in this case an alarm is displayed (b1PH or b2PH) but the machine continuous to work as normal.
If the alarm occurs more than AL21 times per hour, the Ichill generate a manual alarm.
Low pressure alarm (when the low pressure switch is used) is disabled for AL02 time after valve activation (AL02=0 the alarm is disabled when the compressor is OFF).

When the first compressor of the circuit is switched on, the solenoid valve is switched on 1 seconds before it if the pressure switch is not active.
If the pump down pressure switch remains activeated, the compressors does not restart and after CO39 time a pump-down alarm is displayed.
The parameter AL23 allows to choose if the pump down alarm (during the switching on) is automatic or manual reset:

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

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

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

PUMP DOWN with low pressure probe

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

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

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

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

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

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

Pump Down by TIME

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

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

22. UNLOADING

22.1 HIGH TEMPERATURE OF THE EVAPORATOR WATER INLET

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

UNLOADING ACTIVATION
When the evaporator water inlet temperature is higher than CO40 for CO42 time, the display shows ⇩ and the unit works with the number of compressors selected in CO49 parameter.

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

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

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

22.2 CONDENSER HIGH PRESSURE, CONDENSER HIGH TEMPERATURE OR EVAPORATOR LOW PRESSURE

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

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

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

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

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

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

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

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

22.3 LOW TEMPERATURE OF THE EVAPORATOR WATER OUTLET

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

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

23. SOLENOID VALVE FOR LIQUID INJECTION

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

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

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

Water pump / supply fan operation mode:

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

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

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

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

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

24.1 EVAPORATOR PUMP GROUP

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

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

25. WATER PUMP OF THE CONDENSER

Condenser Water pump control

Water pump operation mode:

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

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

CO21 = 2: on compressor demand
The water pump is ON only if at least a compressor is ON; in case of compressor activation, the water pump is switched on CO17 before the compressor.
When the last compressor is switched off, the water pump is switched off after CO23 delay from compressor.

When the unit is in stand-by or remote off and the Ar09 =1, if the regulation requires the antifreeze heaters also the water pump is turned on.

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

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

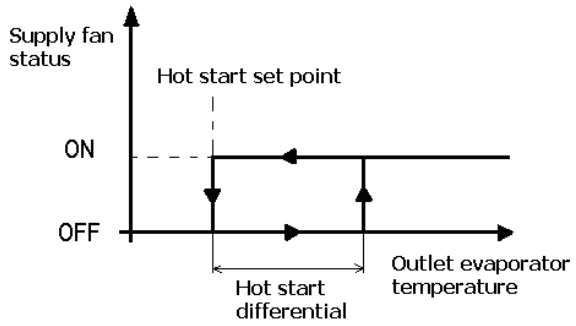
25.1 CONDENSER PUMP GROUP

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

26. HOT START

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

FA24 Hot start Setpoint
FA25 Hot start differential



27. LOAD MAINTENANCE

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

Parameters **CO26..CO31:** number of working hour of the compressors.
Parameters **CO32..CO33:** number of working hour of the evaporator water pump.
Parameters **CO34..CO35:** number of working hour of the condenser water pump.
Parameters **CO73:** number of working hour of the sanitary water pump.
Parameters **CO74:** number of working hour of the solar panel water pump.

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

28. CONDENSER FAN REGULATION

The signal to drive the modulating condenser fan is available in the PWM outputs (TF1 and TF2 in the connection diagram) or in the Out 1 and Out2; for these output the parameters that allows to choose the signal are:

CF68 Condenser fan circuit 1
CF68=0 0..10V
CF68=1 4..20mA
CF68=2 PWM

CF69 Condenser fan circuit 2
CF69=0 0..10V
CF69=1 4..20mA
CF69=2 PWM

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

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

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

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

Par. **FA01** = **2** / Par. **FA02** = **1**
Fans on, with ON/OFF regulation and with temperature/pressure transducer control, only when the compressor is on (at least one relay is configured as fan control). When the compressor turns off the fans are thermoregulated depending on the condensing temperature/pressure.

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

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

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

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

When the compressor turns off the fans are thermoregulated depending on the condensing temperature/pressure.

28.1 OUTPUT STEP RELE' CONDENSER FAN

Par FA01 = 2 ON/OFF step regulation

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

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

Par FA01 = 3 ON/OFF continuous step regulation

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

Continuous step regulation

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

28.2 PWM OUTPUT FOR FAN CONTROL

When the condenser fan is switched on it works at maximum speed for FA03 time, then it modulate according to condenser pressure/temperature or evaporator pressure (heat pump mode).
F04 parameter allows to adapt the signal to the motor (current-voltage phase displacement of a line-powered ac load).
If FA01=3, when the compressor starts-up and the proportional regulation requires to turn off the fan (cut-off), if FA14≠0 the fan is forced at the minimum speed for the time set in FA14 itself (if FA14=0 the function is disabled).

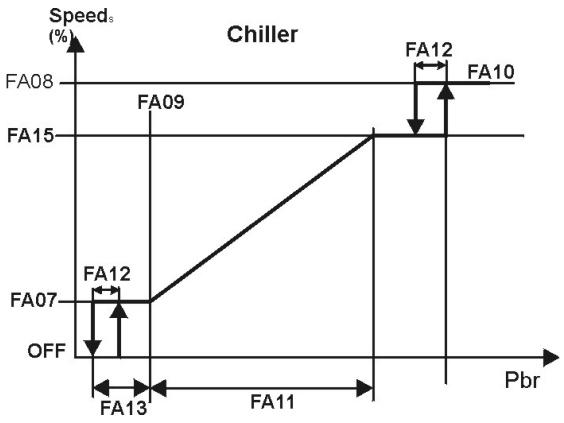
28.3 CONDENSING UNIT: COMMON OR SEPARATE CONDENSER

FA05 defines the condenser unit
Par. **FA05** type of condenser
FA05=0 Common condenser unit
FA05=1 Separate condenser units
If FA05= 0 the condenser fan of the circuit 1 and circuit 2 works in parallel:

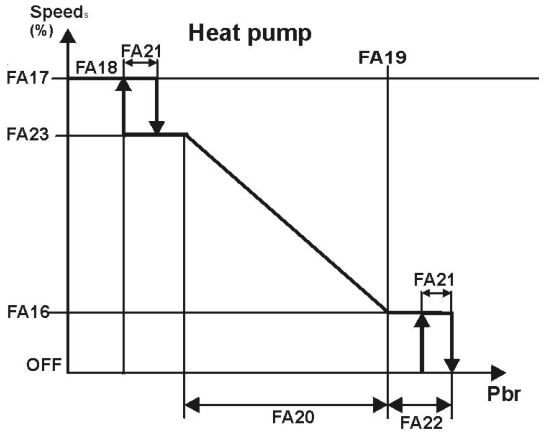
- **CHILLER mode:** the regulation probe is the probe that has the higher value
- **HEAT PUMP mode:** the regulation probe is the probe that has the lower value

28.4 PROPORTIONAL REGULATION OF CONDENSER FANS

Condenser fan in Chiller mode.

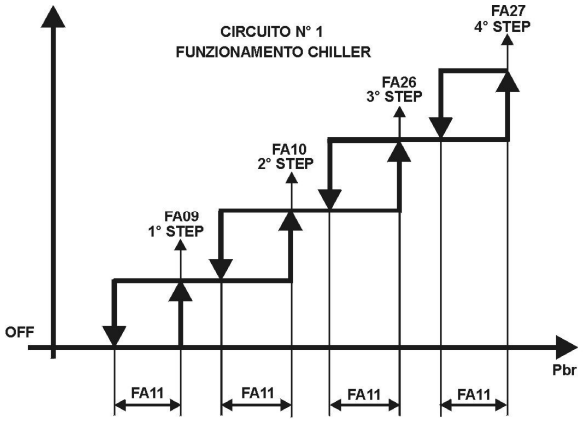


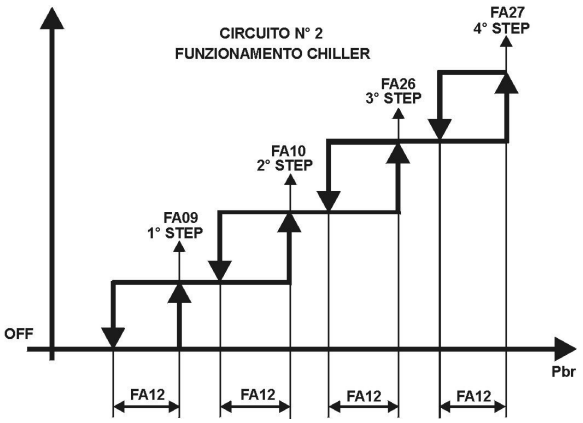
Condenser fan in Heat pump mode.



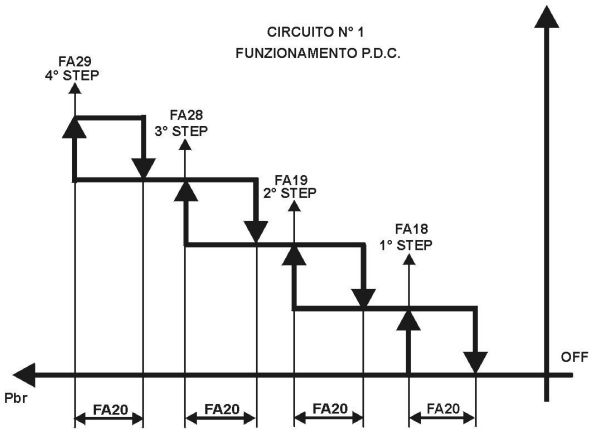
28.5 ON/OFF REGULATION OF CONDENSER FANS

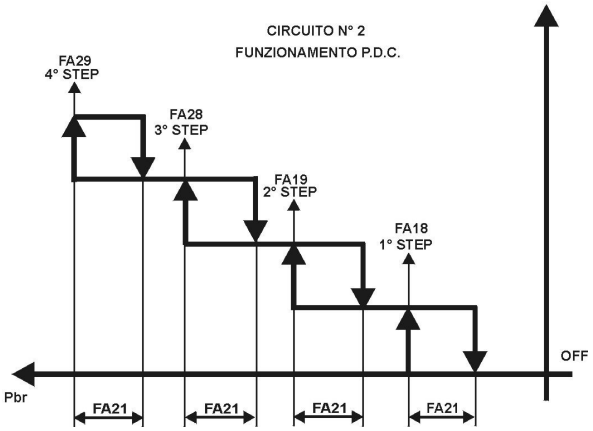
Condenser fan in Chiller mode.





Condenser fan in Heat pump mode.





29. DEFROST CYCLE

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

29.1 AUTOMATIC DEFROST PROCEDURE

Phase 1
When the condenser temperature/pressure or evaporating pressure falls below dF02 and at least one compressor is ON, the delay between two defrost dF09 starts counting.
The display of the keyboard shows the symbol ❄ blinkking.
dF09 counter is reloaded in case of power down, after a defrost cycle, when the Ichill change the operation mode (from heat pump to chiller) or when the Ichill is in STD-BY or remote OFF.
dF09 counter is stopped if the last compressor of the circuit is turned off or if the pressure-temperature of the condensing-evaporating probe increase over dF02.

Phase 2
When dF09 counter is elapsed the defrost procedure starts.
If one digital input is configured as “end defrost” is active, the unit waits until the contact is de-activated.
If one probe is configured as combined defrost:
- If the combined defrost probe of the 1st circuit is lower than dF10 and/or the combined defrost probe of the circuit 2 is lower than dF12, the process proceeds to phase 3.
- If the combined defrost probe of the 1st circuit is higher than dF10 and/or the combined defrost probe of the circuit 2 is higher than dF12, the process doesn’t proceed to phase 3

Phase 3
If dF07=0 the reversiong valve is activated without stopping any conmpressor and the defrost cycle is immediately activated.
If df07>0:
1. Compressors are turned off
2. After dF07 / 2 the reversing valve is activated;
3. After dF07 / 2 the compressor is activated; if dF14=1 and / or dF15=1 all the compressor are activated (with a delay of dF16).

Phase 4
Defrost ON
Condenser fan management:
- If dF17=0: condenser fan are always off;
- If dF17=1: condenser fans start if the condensing temperature-pressure value is higher than dF18 and the regulation is the standard chiller regulation.

ATTENTION

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

The phase 4 lasts at least dF04 time; phase 4 ends:
1. If dF01=1:
   - the combined probe is higher than dF11 of the 1st circuit;
   - the combined probe is higher than dF13 of the 2nd circuit;
   - when the condensing temperature/pressure is higher than dF03
2. If dF01=2: when dF05 counter is elapsed
3. If dF01=3: when the digital input configured as end defrost is deactivated

PHASE 5
If dF08 = 0 the reversing valve is switched without stopping the compressors and the defrost ends.
If dF08 > 0:
1. All the compressors are switched off
2. After dF08 / 2 reversing valve is de-activated
3. After dF08 / 2 the heat pump regulation can restart

29.2 OTHER INFORMATION ABOUT THE DEFROST

If the unit is configured with one condenser FA05=0, the defrost of the two circuits starts at the same time.
ATTENTION
Before starting the 3rd phase, the dF06 counting, time delay between two circuits defrost, must be expired.
If the defrost ends because of the dF05 counting (Maximum defrost time) and the dF02 configuration or with the end defrost contact, the bottom display will show, alternated with the normal measurement value, the label **b1dF** (circuit #1) or **b2dF** (circuit #2) labels to indicate the defrost end alarms.

29.3 FORCED DEFROST

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

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

29.4 COMBINED DEFROST

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

29.5 MANUAL DEFROST

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

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

29.6 DEFROST IN UNIT WITH TWO CIRCUITS

29.6.1 Start defrost in unit with common condenser

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

29.6.2 End defrost in unit with two condenser

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

Configuration of the parametrs dF22 and dF23:

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

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

29.7 DEFROST WITH CONDENSER FAN PROCEDURE

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

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

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

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

29.8 DEFROST PARAMETER DESCRIPTION

ATTENTION IT IS NOT POSSIBLE TO DO MODIFY THE dF PARAMETERS WHEN THE DEROST CYCLE IS RUNNING.
dF01 Defrost mode
0 = Defrost not enabled;
1 = Temperature/pressure defrost. The dF09, time delay to the defrost, starts when the temperature decreases under the dF02 setpoint. The Defrost cycle end is determined by temperature/pressure.
2 = Time duration defrost. The dF09, time delay to the defrost, starts when the temperature decreases under the dF02 setpoint. (see start probe par. dF24). The Defrost cycle end is determined by the maximum duration dF05.

3 = Defrost from digital input. The dF09, time delay to the defrost, starts when the temperature decreases under the dF02 setpoint. (see start probe par. dF24) The Defrost cycle end is determined by the active digital input.
4 = Defrost with condeser fan
dF02 Temperature / pressure to begin the time counting to next defrost.
It allows to program a setpoint under which the dF09 starts counting.
dF03 Temperature / pressure to end the defrost.
It allows to program a temperature/pressure setpoint value to determines the end of the defrost when the probe value is rising.
dF04 Minimum duration of the defrost
It determines the minimum defrost time duration after starting the defrost itself even if the conditions are not more satisfied.
dF05 Maximum duration of the defrost
If dF01=2, it determines the maximum duration of the defrost and even if, for the other cases, the end defrost condition are still to be satisfied.
dF06 defrost delay time between the 1st and the 2nd circuit.
After the interval dF09 determined by the defrost request of one of the circuits the other 2nd circuits must wait also the time dF06 before defrosting.
dF07 Compressor off time before the defrost (the led of the compressor is blinking)
After the dF09 delay and before activating the defrost, the compressors are stopped for the dF07 time.
Exactly in the middle of the dF07 time the 4-way valve is activated to equalise the pressure of the unit and when dF07 is completely expired the compressors and the defrost can start.
This procedure does not respect the compressor on delay protection therefore the compressor is immediately turned off and then on. If dF07 = 0 the compressor is not stopped and the 4-way valve is immediately turned.
dF08 Compressor off time after the defrost (the led of the compressor is blinking)
After the defrost cycle the compressors are stopped for the dF08 time.
Exactly in the middle of the dF07 time the 4-way valve is activated to equalise the pressure of the unit and to drain the external exchange unit, when dF08 is completely expired the unit restart in heat pump mode.
This procedure does not respect the compressor on delay protection therefore the compressor is immediately turned off and then on. If dF08 = 0 the compressor is not stopped and the 4-way valve is immediately turned.
DF09 Delay time to next defrost
It starts when the condensing/evaporating temperature/pressure probe value is lower than dF02 setpoint.
This time is reloaded if the power supply fails, after a defrost cycle or from a digital input request of defrost.
The time counting is interrupted if the compressor is turned off or if the temperature/pressure is higher then dF02.
dF10 Temperature setpoint to start a combined defrost of the circuit #1.
It allows to set a temperature value to determines the beginning of a combined defrost.
After the dF09 counting the NTC probe of the combined defrost of the circuit #1 is compared to the dF10 setpoint, if the value is lower the defrost starts otherwise the unit runs in heat pump mode and when the temperature decreases under dF10 the defrost immediately starts.
dF11 Temperature setpoint to end a combined defrost of the circuit #1.
It allows to set a temperature value to determine the end of a combined defrost.
When the NTC probe of the combined defrost of the circuit #1 becomes higher than dF10 setpoint the defrost cycle stops.
dF12 Temperature setpoint to start a combined defrost of the circuit #2.
It allows to set a temperature value to determine the beginning of a combined defrost.
After the dF09 counting the NTC probe of the combined defrost of the circuit #2 is compared to the dF12 setpoint, if the value is lower the defrost starts otherwise the unit runs in heat pump mode and when the temperature decreases under dF12 the defrost immediately starts.
dF13 Temperature setpoint to end a combined defrost of the circuit #2.
It allows to set a temperature value to determine the end of a combined defrost.
When the NTC probe of the combined defrost of the circuit #2 becomes higher than dF13 setpoint the defrost cycle stops.
dF14 All the resources on during the defrost of the circuit #1
0= Not enabled
1= Enabled
dF15 All the resources on during the defrost of the circuit #2
0= Not enabled
1= Enabled
dF16 Compressor step delay time in defrost.
dF17 Condensing fan control during defrost and dripping cycle

0= Not enabled
1 = Enabled in defrost
2= Enabled in defrost and in dripping time
If dF17 = 0: During the defrost the fan control is not active.
If dF17 = 1: when the condensing temperature/pressure value increases over dF18 the fans are turned on. the fan control is determined by the same algorithm used in chiller mode.
If dF17 = 2: during the dripping time (dF08 <>0) the fan are turned on for the time duration set in dF08 .
dF18 Pressure / temperature setpoint to force the fans on during the defrost
When the temperature/pressure rises over this value the fan are turned on at the maximum speed.
dF19 Time delay before starting a forced defrost
It determines a delay time before starting the defrost cycle
dF20 Temperature / pressure setpoint to force a defrost
It determines a temperature/pressure setpoint under which the dF19 starts counting, when dF19 is expired if the temperature/pressure is still lower than dF20 the defrost is immediately executed.
ATTENTION If during the dF19 counting the temperature rises over df20+dF21(differential) the process is aborted and the dF19 time reloaded.
dF21 Forced defrost differential
dF22 defrost mode for unit with two circuits
Operative mode:
0= Independent
1= The condition are satisfied in both circuits
2= At least one circuit has reached the start condition
dF23 It determines the end of the defrost for unit having two circuit and common condensing ventilation
Operative mode:
0= Independent
1= The end defrost condition are satisfied In both circuits
2= At least one circuit has reached the end defrost condition
dF24 Start / stop defrost probe
Start / stop defrost from analog input
0= start and stop with condenser temperatur / pressure probe
1= start with evaporator pressure probe / stop with condenser temperatur / pressure probe
2= start with condenser temperatur / pressure probe / stop with evaporator pressure probe
3= start and stop with evaporator pressure probe

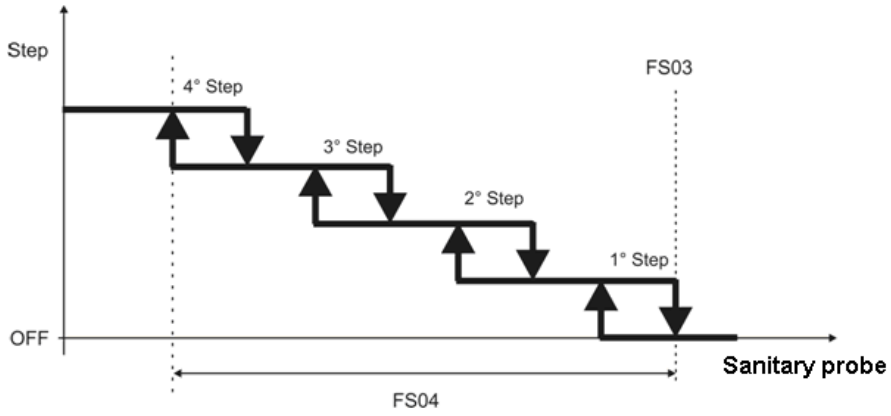
30. PRODUCTION OF SANITARY HOT WATER

The sanitary hot water production is enabled when the machine is switched on and disabled when the machine is OFF or in STANDBY.
The Ichill has to be configured for the proportional regulation (St11=0) and not in neutral zone.
Two temperature probes need to be configured when the function is enabled:
- Probe 1: it is used to determine the temperature of the sanitary water
- Probe 2: it is used exclusively for display purposes

Configurable proportional band and set-point are used to regulate the production of sanitary water; when the sanitary water function is enabled, you will see symbol lighted on the display.
The production of sanitary water can only be requested when the temperature detected by Probe n°1 is below the FS03 set-point – band FS04; all the compressors are called into action when the function is enabled.
The sanitary water set-point can be viewed and modified on the display by pressing the SET button.

Notes on operation:
1. When the compressors are switched off for switching the reversing valve, the time for protecting the compressors (parameter CO02) is cancelled.

An example of water regulation is illustrated below.



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

When the sanitary heaters are enabled, the symbol is lighted on the display.

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

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

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

Management of the sanitary water pump
The sanitary water pump is managed during the production of sanitary water or during the anti-legionella cycle as described below.
The times for managing the sanitary water pump are as follows:
- The valve 1 and valve 2 are switched with the delay of FS27 seconds from start-up of the sanitary water pump
- The sanitary water pump is switched off with the delay of FS28 seconds from switching valve 1 and valve 2

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

1.1 ANTI-LEGIONELLA FUNCTION:

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

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

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

To disable the function you need to configure FS12=0 and FS13=0 or FS12=1 and FS18=0.

The function is enabled when the machine is ON. If the request for an anti-legionella cycle is made when the machine is switched off, the cycle will start immediately when the machine is next switched on and the priority is given to anti-legionella cycle.
If instead heat regulation is prioritized, the anti-legionella cycle will run when the chiller/heat pump set-point is reached.
The function must remain active for the minimum time configured with parameter FS19 (activated when the temperature of the sanitary water reaches the anti-legionella set-point) and can last a maximum of FS29 minutes.
When the anti-legionella cycle is active, all the compressors and heating elements configured for the sanitary water are switched on; once the set-point is reached, the compressors are switched off (delayed of CO04 time) while the heating elements are switched off when the the set-point (parameter FS14) + band (parameter FS20) is reached.
The anti-legionella cycle is enabled for FS19 time; during this time the machine works to maintain the anti-legionella set point.
When the anti-legionella cycle is active, the label "**LEG"** is showed at the bottom of the display.
At the end of this procedure, the controller returns to the production of sanitary water or normal heating/cooling regulation.
If the FS02 parameter (operating priority) gives priority to heating/cooliong regulation and the production of anti-legionella needs to be enabled, then the heat regulation set-point has to be reached beforehand.

The anti-legionella cycle has to end before heating/cooling regulation can start, even if the FS02 parameter gives the priority to heating/cooling regulation.

Management of priority (sanitary water or heating/cooling)

If parameter FS02=1, priority is given to the production of sanitary water (or anti-legionella). Chilled water or hot water can be produced once the need for sanitary hot water has been satisfied (if required).
If parameter FS02 is set at 0, priority is given to the production of chilled/hot water; sanitary hot water is produced once the chiller/heat pump requests has been satisfied.
The production of anti-legionella is stopped in case of chiller/heat pump requests.

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

30.1 WATER PUMPS MANAGEMENT

Evaporator water pump:

- if it is configured in continuously mode (CO16=1), during hot water production it is ON. in case of "Only sanitary hot water production" digital input activation, the evaporator water pump is OFF
- if it is configured in parallel with the compressor (CO16=2), the water pump is OFF in case of hot water production except the machine with FS01=2 in case of cold water production (chiller) and contemporary production of sanitary hot water production.

The evaporator water pump flow switch stop the unit.

1.2 SOLAR PANEL WATER PUMP

Management of the solar panel water pump
The solar panel water pump is enabled by setting up an appropriately configured relay.
The condition of the solar panel pump depends on the status of two probes:
- **NTC** sanitary water temperature probe 1
- **NTC** solar panel temperature probe

If the temperature detected by the solar panel probe is greater than sanitary water probe 1, management of the solar panel pump is enabled as follows:
- If the temperature detected by sanitary water pump 1 is less than FS23-FS24, the solar panel pump is ON
- If the temperature detected by sanitary water pump no. 1 is greater than FS23, the solar panel pump is OFF

The valve to disable the solar panel is enabled when the pump is OFF (the water stops flowing through the solar panel.

1.3 MANAGEMENT OF THE SANITARY WATER FLOW SWITCH AND SOLAR PANELS FLOW SWITCH

The times for signalling and stopping the flow switch alarm are the same as evaporator pump flow switch (parameter AL15, AL16, AL17 and AL18).

1.4 SANITARY HOT WATER PRODUCTION: VALVES IN WATER CIRCUIT ___ FS01=1 (AIR/WATER, WATER/WATER UNIT)

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

When sanitary hot water production is required (and it has priority), the sequence of operation is the following:
- the sanitary water pump is switched on
- after a delay of FS27 seconds, sanitary valve 1 is swithed on
- after a delay of FS10 seconds the sanitary valve 2 is switched off

Sanitary hot water is produced until the FS03 set-point is reached.
Once the sanitary water set-point is reached, the sequence of operation is the following:
- sanitary valve 2 is switched on
- after a delay of FS10 seconds the sanitary water valve 1 is switched off
- after a delay of FS28 seconds the sanitary water circulation pump is switched off

Condenser fans are managed normally.

The defrost takes priority over the production of sanitary water.
If the controller determines the need for a defrosting cycle during the production of sanitary water, the Ichill stops the sanitary hot water operation to activate the defrost procedure:
- all compressors and heaters are stopped
- the sanitary valve 2 is switched on
- after the FS10 delay sanitary water valve 1 is switched off
- after a delay of FS28 seconds the sanitary water pump is switched off

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

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

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

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

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

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

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

1.5 SANITARY HOT WATER PRODUCTION: VALVES IN GAS CIRCUIT ___FS01=2 (AIR/WATER, WATER/WATER UNIT)

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

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

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

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

Once the sanitary water set-point is reached:

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

Condenser fans are managed normally.

The defrost takes priority over the production of sanitary water.

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

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

The defrost can now start as per the normal procedure.

At the end of the defrosting cycle:

- If there is a need to produce sanitary water, the compressors and any heating elements will be switched on. After the FS11 delay from the end of the dripping phase, sanitary water valve 1 is enabled and, after the FS10 delay, sanitary water valve 2 is switched off.

- If there is no need to produce sanitary water, the controller continues with normal heat regulation.

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

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

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

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

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

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

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

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

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

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

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

When the sanitary water set-point is reached:

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

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

In this case, the cycle is reversed as follows:

- the 4-way valve status is reversed
- after dF07/2 the compressors are switched on

- the sanitary water pump switches on after the FS11 delay from start-up of the compressors
- after a delay of FS27 seconds the sanitary water valve 1 is switched on
- after the FS10 delay the sanitary water valve 2 is switched off.

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

- the sanitary valve 2 is switched on
- after the FS10 delay the sanitary water valve 1 and the compressors are switched off
- after a delay of FS28 seconds the sanitary water circulation pump is switched off
- after the DF07/2 delay the 4-way valve status is reversed and normal regulation is restored.

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

1.6 SANITARY HOT WATER PRODUCTION: VALVES IN WATER CIRCUIT ___ FREE COOLING VALVE (CF02=4 OR 5) ___ FS01=1 (AIR/WATER, WATER/WATER UNIT)

There are two free cooling operation modes:

- **CF02=4**: the free cooling is the only source of cooling; the mode can be selected using the keypad.
- **CF02=5**: the free cooling is used as integration to chiller mode. In this case, the chiller mode and free cooling operate according to their regulators.

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

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

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

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

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

Condenser fans are managed normally.

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

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

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

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

In this mode the digital output configured as the ON/OFF free cooling valve will remain switched off.

1.6.2 - Sanitary hot water operation when the unit is producing cold water (only units with CF02 =4 or 5)

The free cooling valve is always off when the controller is producing sanitary hot water.

CF02=5
The sequence of the operation is the following:
- the compressors are switched off
- after the DF07/2 delay the 4-way valve status is reversed
- after dF07/2 the compressors are switched on
- after the FS11 time the sanitary water pump is switched on
- after a delay of FS27 seconds the sanitary water valve 1 is switched on
- after the FS10 delay the sanitary water valve 2 is switched off

CF02=4
The sequence of the operation is the following:
- the compressors are switched on
- the sanitary water pump is switched on
- after a delay of FS27 seconds the sanitary valve 1 is switched on
- after a delay of FS10 seconds the sanitary valve 2 is switched off

Heat regulation continues until the FS03 set-point is reached.
Once the set-point is reached:

CF02=5
- the sanitary water valve 2 is switched on
- after the FS10 delay the sanitary valve 1 and the compressors are switched off
- after the FS28 delay the sanitary circulation pump is switched off
- after the FS11 delay the 4-way valve status is reversed

CF02=4
- the sanitary water valve 2 is switched on
- after the FS10 delay the sanitary valve 1 is switched off
- after the FS28 delay, the sanitary pump is switched off

From now, the free cooling valve is managed as described below:
- If “evaporator water temperature” – “inlet water temperature” (free cooling) ≥ FS21**,** the free cooling valve is switched on
- If “evaporator water temperature” – “inlet water temperature” (free cooling) < (FS21 – FS22)**,** the free cooling valve is off

1.7 SANITARY HOT WATER PRODUCTION: VALVES IN GAS CIRCUIT ___ FREE COOLING VALVE (CF02=4 OR 5) ___ FS01=2 (AIR/WATER, WATER/WATER UNIT)

There are two free cooling operation modes:
- **CF02=4**: the free cooling is the only source of cooling; the mode can be selected using the keypad.
- **CF02=5**: the free cooling is used as integration to chiller mode. In this case, the chiller mode and free cooling operate according to their regulators.

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

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

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

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

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

Condenser fans are managed normally.

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

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

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

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

During the defrost the free cooling valve is always off.

1.7.2 - Sanitary hot water operation when the unit is producing cold water (only units with CF02 =4 or 5)

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

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

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

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

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

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

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

  Once the sanitary water set-point is reached:
  - the sanitary valve 2 is switched on

- after the FS10 delay sanitary water valve 1 is switched off
- after FS28 seconds the sanitary water circulation pump and the compressors are switched off
- after the dF08/2 delay the status of the 4-way valve is reversed

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

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

When the sanitary water set-point is reached:

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

The free cooling valve is managed as described below:

- If “evaporator water temperature” – “inlet water temperature” (free cooling) ≥ FS21**,** the free cooling valve is switched on
- If “evaporator water temperature” – “inlet water temperature” (free cooling) < (FS21 – FS22)**,** the free cooling valve is off

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

CF02=5

The sequence of the operation is the following:

- the 4-way valve status is reversed
- after dF07/2 the compressors are switched on
- after the FS11 time the sanitary water pump is switched on
- after a delay of FS27 seconds the sanitary water valve 1 is switched on
- after the FS10 delay the sanitary water valve 2 is switched off

CF02=4

The sequence of the operation is the following:

- the compressors are switched on
- the sanitary water circulation pump is switched on
- after a delay of FS27 seconds the sanitary water valve 1 is switched on
- after a delay of FS10 seconds the sanitary water valve 2 is switched off

Heat regulation continues until the FS03 set-point is reached.
Once the set-point is reached:

CF02=5

- the sanitary water valve 2 is switched on
- after the FS10 delay, the sanitary water valve 1 and the compressors are switched off
- after the FS28 delay, the sanitary water circulation pump is switched off
- after the FS11 delay, the 4-way valve status is reversed

CF02=4

- the sanitary water valve 2 is switched on
- after the FS10 delay the sanitary water valve 1 is switched off
- after the FS28 delay, the sanitary water pump is switched off

At this point the Ichill return to cooling regulation:

- If “evaporator water temperature” – “inlet water temperature” (free cooling) ≥ FS21**,** the free cooling valve is switched on
- If “evaporator water temperature” – “inlet water temperature” (free cooling) < (FS21 – FS22)**,** the free cooling valve is off

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

The parameter CF95=1 enables this function.
This unit manages two exchangers by relay:

- Hybrid exchanger 1
- Hybrid exchanger 2

These set point and differential has to be configured:

- Hybrid eschangers summer set point (dF27)
- Hybrid eschangers summer differential (dF28)

- Hybrid eschangers winter set point (dF29)
- Hybrid eschangers winter differential (dF30)

The regulation probe is outside temperature.

Operation in summer mode:
If the temperature increases over dF27:

- Hybrid exchanger 1 ON
- Hybrid exchanger 2 OFF

If the temperature falls below dF27-dF28:

- Hybrid exchanger 2 ON
- Hybrid exchanger 1 OFF

Operation in winter mode:
If the temperature falls below dF29:

- Hybrid exchanger 1 ON
- Hybrid exchanger 2 OFF

If the temperature increases over dF29+dF30:

- Hybrid exchanger 2 ON
- Hybrid exchanger 1 OFF

If the unit is switched on when outside temperature is inside the differential, the hybrid exchangers are:

- Hybrid exchanger 1 OFF
- Hybrid exchanger 2 ON

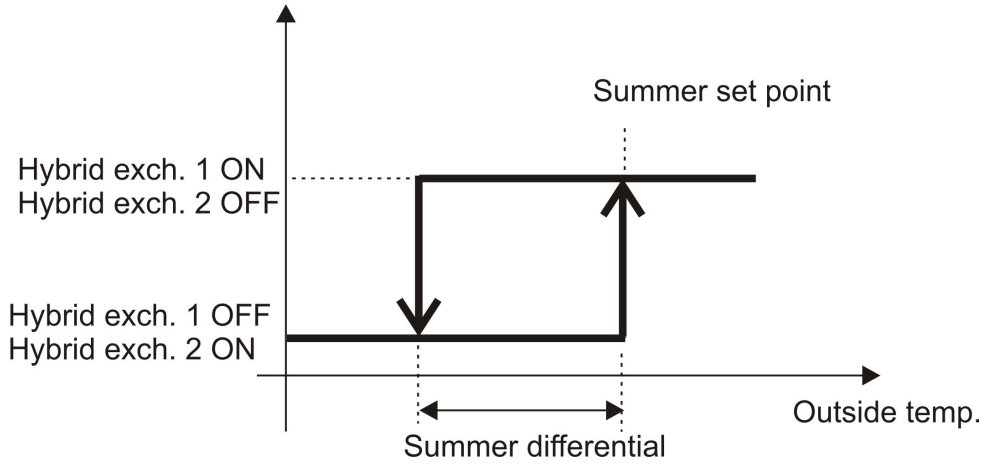
The hybrid exchangers change their status on in chiller and heat pump operation mode but not during the defrost.

The working set point of the hybrid exchangers depends on the operation status of the machine:
E.g.:

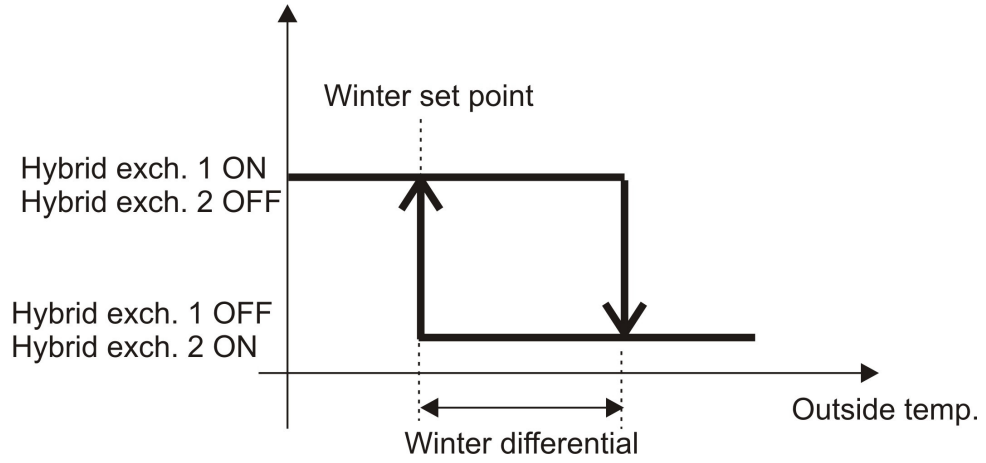
- if the machine is producing cold water (chiller) and sanitary hot water, the hybrid exchangers work in summer mode

- if the machine is producing sanitary hot water and the previous state was cold water production (chiller) the the hybrid exchangers work in winter mode; when the saitary hot water reach the set point, the machine works in summer mode and also the the hybrid exchangers work in summer mode

Summer mode



Winter mode



32. OPERATION RELATED TO THE REAL TIME CLOCK

32.1 REAL TIME CLOCK DISABLED BY DIGITAL INPUT

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

32.2 “ONLY SUPPLY FAN” WORKING MODE”

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

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

33. MESSAGES - ALARM CODES

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

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

33.1 AUTOMATIC / MANUAL ALARM DESCRIPTION

The menù ALARM allows to read the alarms.
An alarm can be:

- automatic reset: the reset is automatic when the cause of the alarm is not present
- manual reset: to reset the alarm see Cap. 39.2

Alarms managed by number of events per hour
Some alarms are managed by number of events per hour; when the alarm happens more times per hour the alarm become a manual reset.
Following an example of low pressure alarm:

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

Compressor overload alarm is always manual reset:

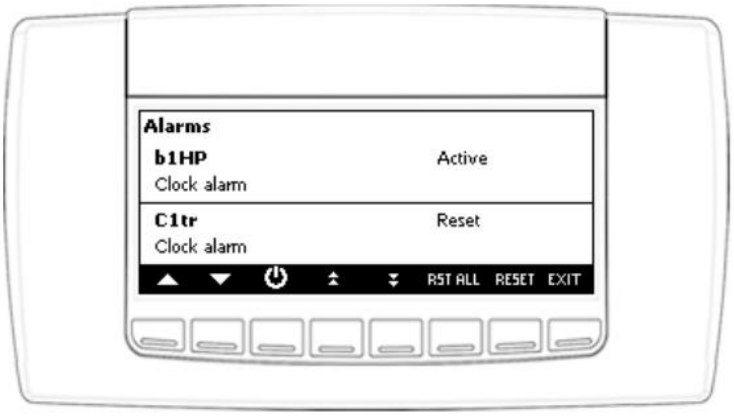
- when the number of the event is < AL20 to reset the alarm follow the procedure described in Cap. 39.2
- when the number of the event is = AL20 to reset the alarm follow the procedure described in Cap. 39.3 (a password is necessary to reset the alarm)

If the cause of alarm is already present, the display shows “Active” and it is not possible to reset the alarm.
If the cause of alarm is not present, the display shows “Reset” and it is possible to reset the alarm.

33.2 MANUAL RESET PROCEDURE

To reset the alarm:

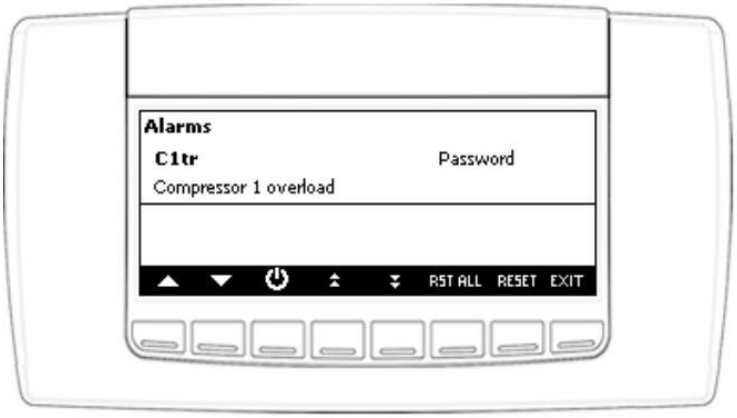
- push  o  and select the alarm
- push  to reset the alarm



33.3 MANUAL RESET PROCEDURE WITH PASSWORD

If the compressor overload alarm reach AL20events per hour:

- push ▲ o ▼ to select the alarm
- push RESET
- push SET
- push ▲ or ▼ to enter the password
- push SET



AP1 - AP2 - AP3 - AP4 - AP5 - AP6 - AP7 - AP8 - AP9 - AP10 PROBE FAILURE	
Label on alarm visualization menu	**AP1** = PB1 probe alarm…**AP10** = PB10 regulator probe alarm
Reason	Probe configured but the read-out is not in the range
Reset	Probe not configured or probe in the right range
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Loads	The behaviour of the load depend on witch probe is on error (regulation probe = all loads OFF; external temperature probe = only loads involved on this probe)

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

ATTENTION

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

NOTE ABOUT THE FLOW ALARM

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

MANUAL RESTART OF THE FLOW ALARM

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

ATTENTION

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

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

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

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

AtE1 - AtE2 Evaporator pump overload alarm	
Label on alarm visualization menu	**AtE1** (overload pump alarm of evaporator 1) **AtE2** (overload pump alarm of support evaporator 2)
Origin	Active ID when it is configured as overload pump of evaporator 1 Active ID when it is configured as overload pump of support evaporator 2.
Reset	With active digital input
Restart	Manual (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

AtC1 - AtC2 Condenser/recovery pump overload alarm	
Label on alarm visualization menu	**AtC1** (overload pump alarm of condenser 1) **AtC2** (overload pump alarm of support condenser 2)
Origin	Active ID when it is configured as overload pump of condenser 1 Active ID when it is configured as overload pump of condenser 2.
Reset	With active digital input
Restart	Manual (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking

Action	Alarm relay + buzzer ON
Loads	OFF

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

AFr: Power supply frequency alarm	
Label on alarm visualization menu	**AFr** (Line frequency alarm)
Origin	The power supply frequency is not equal to the Par. CF83
Reset	Ferquency control parameter adjusted, disabled CF83 = 2, frequency within the tolerance
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Loads	OFF

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

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

ALC2: Generic Signal alarm	
Label on alarm visualization menu	**ALC1:** generic signal alarm from digital input if AL50 = 0
Origin	Digital input configured as generic alarm with stop regulation active after the delay in Par. AL52
Reset	Digital input configured as generic alarm with stop regulation not active after the delay in Par. AL53
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON

REGULATION	
Alarm	Alarm relay + buzzer ON

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

ALC2: Generic alarm with stop regulation

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

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

ACF1 - ACF2 - ACF3 - ACF4 - ACF5 - ACF6 - ACF7 - ACF8 - ACF9	
Label on alarm visualization menu	**ACF1** • Heat pump unit without 4-way valve not configured • Wrong configuration of defrost parameters dF22 and dF23) **ACF2** • Condensing control without probe configuration. (one probe per circuit with 2 separate circuits, at least 1 probe for common cond.) • Fan proportional control algorithm not respected: FA09 + FA11 + FA12 < FA10 FA12 < FA13 FA07 < FA15 < FA08 • Fan proportional control algorithm not respected and pump enabled: FA18 + FA21 + FA20 < FA19 FA21 < FA22 FA16 < FA23 < FA17 • Fan ON - OFF regulation algorithm not respected: FA09 < FA10 • Fan ON - OFF regulation algorithm not respected and pump enabled: FA18 < FA19 • With pump and defrost enabled there are no evaporating/condensing probes. • With triac regulation (CF68, CF69 = 2) the power supply configuration is Vcc (CF83 = 0) **ACF3** • Two digital / analogue inputs configured with the same function or without the necessary resources (es. compressor 3 overload but compressor 3 relay not configured) **ACF4** • CF79 = 1 and none digital input configured as Chiller request or Heat Pump request • CF79 = 2 and none probe configured as external temperature probe • Unit configured as Heat pump and rack compressorr unit enabled (Cr01≠0) • CF03 = 1 and wrong configuration of the digital input or digital output for condensing unit unit **ACF5** Circuito # 2 not configured but at least one of its resources are present (relay: solenoid pump-down, heaters, inversion valve, fan condensing ON - OFF, recovery, auxilairy)

ACF6

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

√ > 6

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

√ > 2 and the intermittent valve is configurated with ON (CO08) and OFF (CO09) ≠ 0

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

    Or
    - ❑ No low pressure switch configurated.
- The compressor configuration with CF04 and CF05 but not the relay outputs:
  - √ Main
  - √ Intermittent valve when enabled with the ON / OFF time, CO08 / CO09 ≠ 0
  - √ When the by-pass time ≠ 0 and there is no partialization or by-pass valve configured
  - √ Motor part_2 / centre of the star with part-winding or star-delta
  - √ The necessary step valve configurated
- One relay is configured
  - √ Too much compressors
  - √ Intermittent valve when ON / OFF time CO08 / CO09 ≠ 0
  - √ By-pass gas when the by-pass = 0
  - √ Compressor Motor coil 2 / center of the star with direct compressor start-up
- Wrong configuration of the capacity step valve

ACF7

Evaporator pump

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

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

Condenser pump

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

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

Allarm configuration water pump in antifizee alarm

- if Ar24=1 and Ar25=0

or

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

or

- Ar29=1 and wrong configuration of the probes

ACF8

- Thermoregulation probe
  - ✓ The thermoregulation probe (in chiller with ST09, in heat pump when enabled with ST10) is not properly configurated (it does not exist or it is not a NTC)
  - ✓ Compressor rack is configurated with termoregulation like pressure probe and not exist a pressure probe

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

ArtF Clock failure

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

ArtC Clock alarm

Label on alarm visualization menu	**ArtC** (clock alarm)
Origin	Wrong setting
Reset	Clock adjusted
Restart	Manual in function menu

Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Loads	Not changed
Energy saving	Disabled if based on RTC
Unit ON/OFF	Disabled if based on RTC

AEun: Unloading from high temperature of the evaporator water inlet

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

AEht: alarm from high temperature of the evaporator water inlet

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

ALti: low air ambient temperature (Air / Air unit only)	
Label on alarm visualization menu	**ALti** (low temperature value of the evaporator air inlet)
Origin	Chiller mode: CF01=0 and evaporator inlet NTC probe lower than AL26 for AL28 seconds. Heat pump: CF01=0 and evaporator inlet NTC probe lower than lower than AL33 forAL36 seconds In stand-by or remote OFF: the evaporator inlet NTC probe lower than the lowest value compared between AL28 and AL36.
Reset	Chiller: evaporator inlet NTC probe higher than AL26 + AL27(differential). Heat pump: evaporator inlet NTC probe higher than AL33 + AL34 (differential). n stand-by or remote OFF: the evaporator inlet NTC probe higher than AL26+AL27 or AL33+AL34.
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

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

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

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

B1HP - B2HP High Pressure switch circuit 1 and 2	
Label on alarm visualization menu	**b1HP** (high pressure switch circuit #1) **b2HP** (high pressure switch circuit #2)
Reason	The unit is running and the digital input of the high pressure switch is active
Reset	Digital input not active

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

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

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

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

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

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

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

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

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

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

b1LP - b2LP low pressure switch circuit #1 or 2

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

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

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

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

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

b1tF- b2tf Condenser fan overload alarm

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

AEun: Unloading from low temperature of the evaporator water outlet

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

Regulation	
Compressor	OFF
Other loads	Not modified

C1HP - C2HP - C3HP - C4HP - C5HP - C6HP compressor high pressure alarms

Label on alarm visualization menu	**C1HP** (compressor high pressure alarm 1) – … **C6HP** (compressor high pressure alarm 6)
Origin	The unit is running and the digital input of the compressor high pressure switch is active
Reset	Digital input not active
Restart	Reset procedure in Menu function Reset procedure in Menu function Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on
Regulation	
Condensing fan	If FA02=0 the fan is forced at maximum speed for 60 seconds then switched off If FA02=1 the fan is forced at maximum speed for 60 seconds then regulate according to normal fan regulation

C1oP - C2oP - C3oP - C4oP - C5oP - C6oP - Pressure switch alarm / compressor oil

Label on alarm visualization menu	**C1oP** (Compressor pressure switch #1) … **C6oP** (Compressor pressure switch #6)
Origin	The alarm is not signalled: during the AL01 delay after turning on the compressor, during the AL12 delay that starts after the AL11 delay when the unit is properly running
Reset	Digital input not active
Restart	Automatic - Manual after AL013 events per hour (Reset procedure in Menu function)
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

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

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

C1dt - C2dt - C3dt - C4dt - C5dt - C6dt High compressor discharge temperature alarm

Label on alarm visualization menu	**C1dt** (High discharge temperature of the compressor #1) -…**C6dt** (High discharge temperature of the compressor #6)
Origin	The compressor discharge temperature is higher than AL39 setpoint. **ATTENTION** The display resolution is 0.1°C until the read-out is 99.9, over 100°C it is 1°C.

Reset	If the probe value of the high discharge temperature is lower than "AL39 - AL40 (differential)"
Restart	Automatic. Manual when there are AL41 per hour (Reset procedure in Menu function).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm Relay + and buzzer on

C1tr - C2tr - C3tr - C4tr - C5tr - C6tr Compressor overload alarm

Label on alarm visualization menu	C1tr (Compressor 1 overload alarm) -…C6tr (Compressor 1 overload alarm 6)
Origin	With active digital input. The alarm is not detected within the AL19 time delay after the on compressor
Reset	When the digital input is not active
Restart	Manual. After AL20 events/hour, to reset the alarm enter the function menu under cOtr.
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Compressor involved	If AL47=0 or 1: OFF
Compressor not involved	If AL47=0: it follows its regulation. If AL47=1: OFF

ATTENTION
The parameter AL47 determines the functioning of the overload alarm of the compressors.
If AL47 = 0 single compressor locked when its digital input protection is active, on the display the corresponding alarm message.
If AL47 = 1 all the circuit of the compressor is locked when one digital input protection is active, on the display the corresponding alarm message.

b1dF – b2dF Defrost alarm

Label on alarm visualization menu	**b1dF** (Defrost alarm of the circuit #1) **b2dF** (Defrost alarm of the circuit #2)
Origin	Only in defrost if DF01 = 1,3 (defrost en temperature/pressure or external contact): when the defrost ends after the DF05 timeout.
Reset	▪ Stand - by or remote ON-OFF. ▪ Next defrost ends for temperature/pressure.
Restart	Automatic if next defrost ends for temperature/pressure, otherwise manual.
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

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

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

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

Label on alarm visualization menu	**b1CU** (unloading message from condenser #1) **b2CU** (unloading message from condenser #2)

Origin	During normal running condition when the temperature/pressure of evaporator/condenser probe is lower than < CO46 setpoint
Reset	▪ when the temperature/pressure of evaporator/condenser probe value is higher than CO46 + CO47 ▪ After unloading is activated and after Par. CO48
Restart	Automatic
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer OFF

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

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

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

Label on alarm visualization menu	**b1PH** (Pump down stop alarm of the circuit 1) **b2PH** (Pump down stop alarm of the circuit 2)
Origin	Pressure switch: if CO36 = 1,2,3,4 and ID not active, the pump down stops because of the timeout CO39. Transducer: if CO36 = 1,2,3,4 and the set CO37 is not reached: the pump stops because of the timeout CO39.
Reset	From thermoregulation start-up and ID not active From thermoregulation start-up with evaporating pressure higher than CO37 + CO38 (differential)
Restart	Automatic – Manual and logged after AL21 events per hour (reset procedure in function menu).
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON when it becomes manual

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

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

C1Mn - C2Mn - C3Mn - C4Mn - C5Mn - C6Mn Compressor maintenance	
Label on alarm visualization menu	**C1Mn** (Compressor #1 maintenance) –…**C6Mn** (Compressor #6 maintenance)
Origin	Compressor running hours > Hour counter setpoint
Reset	Hour reset in function menu
Restart	Manual
Symbol	On the display the symbol ⚠ is blinking
Action	Alarm relay + buzzer ON
Regulation	
Action	Only display warning messages
Loads	Not changed

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

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

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

ASUn Solar panel water pump mintenance

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

Alarm relay and buzzer

Alarm relay / buzzer outputs

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

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

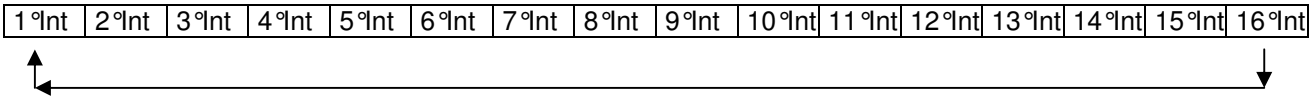
Keyaboard Alarm

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

34. AUTOMATIC TO MANUAL ALARM PROCEDURE

NUMBER OF EVENTS PER HOUR

Each hour counting is divided in 16 intervals, each made of 3600 / 16 = 225 seconds (3 minuts and 45 seconds).



After the unit start-up, each interval is marked as “not active”. During the interval counting, for 255seconds, if at least an alarm event appears, the interval itself is marked “Active”.
Starting from the first interval the instrument calculates the 16 intervals and, at the end, it restats overwriting from the first.
In this way the last hour is always monitored and counted the active intervals. when the number of active intervals reaches the threshold set with the corresponding parameter the alarm becomes manual.
By setting the threshold (parameter)=0 the alarm is manual from its first activation while if the threshold=16 the alarm is always automatic (In this case, to change in manual, the threshold should be 17).

34.1 ALARM

Alarm Code	Alarm description	Comp.	Anti freeze heaters Boiler	Support heaters	Evaporator Pump / Supply fan	Condenser Pump	Sanitary Water pump	Solar panel Water pump	Ventilaz. cond. Cir1 Cir2	Auxiliary relay
AP1..AP 10	Probe alarm	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**	Yes **(1)**
ALti	Low air temperature of the evaporator inlet (air / air unit) Alarm									
AEFL	Evaporator flow alarm	Yes	Yes (boiler)		Yes **(3)**				Yes	
ACFL	Condenser flow alarm	Yes				Yes **(3)**			Yes	
AHFL	Sanitary water flow switch alarm	Yes **(6)**				Yes	Yes			
APFL	Solar panel flow switch alarm	Yes **(6)**						Yes	Yes	
AtSF	Fan supply overload alarm	Yes		Yes	Yes				Yes	
AtE1	Evaporator 1 water pump overload alarm	Yes **(4)**	Yes (boiler) **(5)**		Yes				Yes	
AtE2	Evaporator 2 water pump overload alarm	Yes **(4)**	Yes (boiler) **(5)**		Yes				Yes	
AtC1	Condenser 1 water pump overload alarm	Yes **(4)**				Yes			Yes	
AtC2	Condenser 2 water pump overload alarm	Yes **(4)**				Yes			Yes	
AEP1	Evaporator 1 water pump maintenance									
AEP2	Evaporator 2 water pump maintenance support									
ACP1	Condenser 1 water pump maintenance									
ACP2	Condenser 2 water pump maintenance									
ASAn	Sanitary water pump maintenance									
ASUn	Solar panel water pump maintenance									
ArtC	Clock alarm									
ArtF	Clock failure									
ALOC	Generic alarm	Yes			Yes	Yes			Yes	Yes
AEE	Eeprom alarm	Yes			Yes	Yes			Yes	Yes
ACF1	Configuration alarm	Yes			Yes	Yes			Yes	Yes

ACF12										
ArtF	Faulty clock									
ArtC	Clock error									
AEUn	Unloading signalling from high temp. of evaporator water									
ALti	Low evaporator inlet temperature in air/air unit									
AEht	High water temperature inlat evaporator	Yes								
ALC1	General alarm	Yes			Yes	Yes	Yes	Yes	Yes	
ALC2	Genearl alarm type 2	Yes **(3)**			Yes **(3)**	Yes **(3)**	Yes **(3)**	Yes **(3)**	Yes **(3)**	

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

34.2 ALARM: CIRCUIT ALARM

Alarm Code	Alarm description	Compressors of the circuit (*n*)	Compressors of the other circuit	Fan condensing of the circuit (*n*)	Fan condensing of the other circuit
b(*n*)HP	High pressure switch of the circuit **(*n*)**	Yes		Yes after 60 seconds	
b(*n*)LP	Low pressure switch of the circuit **(*n*)**	Yes		Yes	
b(*n*)AC	Anti-freeze in chiller of the circuit **(*n*)**	Yes		Yes	
b(*n*)AH	Anti-freeze in heat pump of the circuit **(*n*)**	Yes		Yes	
b(*n*)hP	High condensing pressure of the circuit **(*n*)**	Yes		Yes after 60 seconds	
b(*n*)hP	High condensing temperature from NTC of the circuit **(*n*)**	Yes		Yes after 60 seconds	
b(*n*)LP	Low condensing pressure - (evaporating with low pressure transducer) with transducer of the circuit of the **(*n*)**	Yes		Yes	
b(*n*)lP	Low condensing temperature NTC circuit **(*n*)**	Yes		Yes	
b(*n*)tF	Fan overload circuit **(*n*)**	Yes		Yes	
b(*n*)PH	Pump down alarm in stop regulation of the circuit **(*n*)**	Yes		Yes	
b(*n*)PL	Pump down in regulation start-up of the circuit **(*n*)**	Yes		Yes	
b(*n*)dF	Bad defrost circuit **(*n*)**				

b(*n*)Cu	Unloading from condenser high temp/press of the circuit **(*n*)**				
b(*n*)Cu	Unloading from evaporator low temp/press of the circuit **(*n*)**	Yes		Yes	
b(*n*)rC	Recovery function disabled in circuit **(n)**				
b(*n*)ds	Circuit **(n)** disabled from keyboard	Yes		Yes	
b(*n*)Ac	Anti-freeze circuit **(n)** message in chiller				
b(*n*)Ah	Anti-freeze circuit **(n)** message in heat pump				

(*n*) identifies the circuit 1 or 2

34.3 ALARM: COMPRESSOR ALARM

Alarm Code	Alarm description	Compressor (*n*)	Compressors not involved
C(*n*)HP	Compressor(*n*) high pressure switch	Yes	
C(*n*)oP	Compressor(*n*) oil pressure switch / Oil level switch	Yes	
C(*n*)tr	Compressor(*n*) overload	Yes	
C(*n*)dt	Compressor high discharge temperature	Yes	
C(*n*)dS	Compressor (n) disabled from keyboard	Yes	
C(*n*)Mn	Compressor(*n*) maintenance		

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

Cod. Allarme	**Descrizione allarme**	**Comp.**	**Resistenze Antigelo boiler**	**Resistenze appoggio**	**Pompa Evap. Vent. mand.**	**Pompa cond.**	**Ventilaz. cond. Cir1 Cir2**	**Relè ausiliario**
noL	Link problem between the Ichill and the remote keyboard							

35. TABLE OF THE PARAMETERS

Label	Description
ALL	Shows all the parameters
ST	Shows only the Thermoregulation parameters
CF	Shows only the Configuration parameters
SD	Shows only the Dynamic Setpoint parameters
ES	Shows only the Energy Saving, RTC parameters
Cr	Shows only the compressor rack parameters
CO	Shows only the compressor parameters
US	Shows only the Auxiliary Output parameters
FA	Shows only the Fan Control parameters
Ar	Shows only the Antifreeze Control parameters
DF	Shows only the Defrost parameters
FS	Shows only the Sanitary Water parameters
AL	Shows only the Alarm parameters

Thermoregulation					
Parameter	Description	min	max	u.m.	Resolution
ST 1	Chiller Setpoint	ST02	ST03	°C/°F	dec/int
ST 2	Chiller minimum Setpoint	-30.0 -22	ST01	°C °F	dec/int
ST 3	Chiller maximum Setpoint	ST01	70.0 158	°C °F	dec/int
ST 4	Heat pump setpoint	ST05	ST06	°C/°F	dec/int
ST 5	Heat pump minimum Setpoint	-30.0 -22	ST04	°C °F	Dec int
ST 6	Heat pump maximum Setpoint	ST04	70.0 158	°C °F	Dec int
ST 7	Regulation band in chiller mode	0.0 0	25.0 45	°C °F	Dec int
ST 8	Regulation band in chiller heat pump	0.0 0	25.0 45	°C °F	Dec int
ST 9	Thermoregulation probe selection in chiller 0= Temperature probe NTC for evaporator inlet 1= Temperature probe NTC for evaporator outlet 1 2= Temperature probe NTC for evaporator outlet 2 3= Temperature probe NTC for common evaporator outlet 4= Temperature NTC probe from remote panel 1 5= Temperature NTC probe from remote panel 2	0	5		
ST 10	Thermoregulation probe selection in heat pump 0= Temperature probe NTC for evaporator inlet 1= Temperature probe NTC for evaporator outlet 1 2= Temperature probe NTC for evaporator outlet 2 3= Temperature probe NTC for common evaporator outlet 4= Temperature NTC probe from remote panel 1 5= Temperature NTC probe from remote panel 2 6= Temperature probe for water common inlet of the condenser 7= Temperature probe for water inlet of the circuit # 1 condenser 8= Temperature probe for water inlet of the circuit # 2 condenser 9= Temperature probe for water outlet of the circuit # 1 condenser 10= Temperature probe for water outlet of the circuit # 2 condenser 11= Temperature probe for water common otlet of the condenser ATTENTION To have the same thermoregulation for chiller and heat pump mode, set the parameters ST09 and ST10 with the same value	0	11		
ST 11	Type of thermoregulation 0= Proportional 1= Neutral zone	0	1		
Pr1	Password	0	999		
Pr2	Password	0	999		
Pr3	Password	0	999		
Display read-out					
Parameter	Description	min	max	M. u.	Resolution

dP 1	Not used				
dP 2	Not used				
dP 3	Not used				
dP4	Not used				
dP5	Not used				
	Display read-out of the VGI890				
dP6	First probe displayed on Visograph	0	33		
dP7	Second probe displayed on Visograph	0	33		
dP8	Third probe displayed on Visograph	0	33		
dP9	Fourth probe displayed on Visograph	0	33		
	Configuration				
Parameter	Description	min	max	M. u.	Resolution
	Unit Model				
CF 1	Type of unit 0= Air / air Chiller 1= Air / water Chiller 2= Water / water Chiller	0	2		
CF 2	Selection type rof unit 1= only chiller 2= only heat pump 3= chiller and heat pump 4= heat pump and free cooling 5= chiller, heat pump and free cooling	0	5		
CF 3	Condensing unit 0= no 1= si	0	1		
	Compressors				
CF 4	Compressors number for circuit 1 1= 1 2= 2 3= 3 4= 4	0	4		
CF 5	Compressors number for circuit 2 0= 0 1= 1 2= 2 3= 3	0	3		
CF 6	Number of compressor parzialization 0= none 1= 1 2= 2 3= 3	0	3		
	Analog Inputs				
CF 7	Pressure or temperature analogue input functioning 0 = Temperature / pressure NTC – 4÷20 mA : The condensing temperature is controlled with NTC probe while for the evaporating pressures of the circuits 1 and 2 and the pressure probe configured as auxiliary output 1 and 2 are controlled with 4÷20mA transducers. 1 = Pressure control with 4÷20 mA: To control the evaporating and condensing pressures it is necessary a 4÷20mA transducer. 2 = Temperature / pressure NTC – 0÷5Vdc: The condensing temperature is controlled with NTC probe while for the evaporating pressures of the circuits 1 and 2 and the pressure probe configured as auxiliary output 1 and 2 are controlled with 0÷5Vdc transducers. 3 = Pressure control with 0÷5Vdc: To control the evaporating and condensing pressures it is necessary a ratiometric 0÷5Vdc transducer.	0	3		
CF 8	PB1 Configuration If configured as digital input	0 o 1	28 c66		
CF 9	PB2 Configuration If configured as digital input	0 o 1	28 c66		
CF 10	PB3 Configuration If configured as digital input	0 o 1	33 c66		
CF 11	PB4 Configuration If configured as digital input	0 o 1	33 c66		
CF 12	PB5 Configuration If configured as digital input	0 o 1	33 c66		
CF 13	PB6 Configuration If configured as digital input	0 o 1	33 c66		
CF 14	PB7 Configuration If configured as digital input	0 o 1	28 c66		
CF 15	PB8 Configuration If configured as digital input	0 o 1	28 c66		

CF 16	PB9 Configuration If configured as digital input	0 o 1	28 c66		
CF 17	PB10 Configuration If configured as digital input	0 o 1	28 c66		
	Probe Offset				
CF 18	PB1 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 19	PB2 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 20	PB3 Offset	-12.0 -10 -5.0 -72	12.0 53 5.0 72	℃ ℉ bar psi	Dec int dec int
CF 21	PB4 Offset	-12.0 -10 -5.0 -72	12.0 53 5.0 72	℃ ℉ bar psi	Dec int dec int
CF 22	PB5 Offset	-12.0 -10 -5.0 -72	12.0 53 5.0 72	℃ ℉ bar psi	Dec int dec int
CF 23	PB6 Offset	-12.0 -10 -5.0 -72	12.0 53 5.0 72	℃ ℉ bar psi	Dec int dec int
CF 24	PB7 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 25	PB8 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 26	PB9 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 27	PB10 Offset	-12.0 -10	12.0 53	℃ ℉	Dec int
CF 28	Pressure value at 4mA or 0.5 Vdc of the PB3 transducer	0 0	50.0 725	Bar psi	Dec int
CF 29	Pressure value at 20mA or 5 Vdc of the PB3 transducer	0 0	50.0 725	Bar psi	Dec int
CF 30	Pressure value at 4mA or 0.5 Vdc of the PB4 transducer	0 0	50.0 725	Bar psi	Dec int
CF 31	Pressure value at 20mA or 5 Vdc of the PB4 transducer	0 0	50.0 725	Bar psi	Dec int
CF 32	Pressure value at 4mA or 0.5 Vdc of the PB5 transducer	0 0	50.0 725	Bar psi	Dec int
CF 33	Pressure value at 20mA or 5 Vdc of the PB5 transducer	0 0	50.0 725	Bar psi	Dec int
CF 34	Pressure value at 4mA or 0.5 Vdc of the PB6 transducer	0 0	50.0 725	Bar psi	Dec int
CF 35	Pressure value at 20mA or 5 Vdc of the PB6 transducer	0 0	50.0 725	Bar psi	Dec int
	Digital Inputs				
CF 36	Configuration of ID1	0	c66		
CF 37	Configuration of ID2	0	c66		
CF 38	Configuration of ID3	0	c66		
CF 39	Configuration of ID4	0	c66		
CF 40	Configuration of ID5	0	c66		
CF 41	Configuration of ID6	0	c66		
CF 42	Configuration of ID7	0	c66		
CF 43	Configuration of ID8	0	c66		
CF 44	Configuration of ID9	0	c66		
CF 45	Configuration of ID10	0	c66		
CF 46	Configuration of ID11	0	c66		
CF 47	Configuration of ID12	0	c66		
CF 48	Configuration of ID13	0	c66		
CF 49	Configuration of ID14	0	c66		
CF 50	Configuration of ID15	0	c66		
CF 51	Configuration of ID16	0	c66		
CF 52	Configuration of ID17	0	c66		
CF 53	Configuration of ID18	0	c66		
	Relay Outputs				
CF 54	Configuration of RL1	0 -o1	c66		
CF 55	Configuration of RL2	0 -o1	c66		
CF 56	Configuration of RL3	0 -o1	c66		
CF 57	Configuration of RL4	0 -o1	c66		
CF 58	Configuration of RL5	0 -o1	c66		

CF 59	Configuration of RL6	0 -o1	c66		
CF 60	Configuration of RL7	0 -o1	c66		
CF 61	Configuration of RL8	0 -o1	c66		
CF 62	Configuration of RL9	0 -o1	c66		
CF 63	Configuration of RL10	0 -o1	c66		
CF 64	Configuration of RL11	0 -o1	c66		
CF 65	Configuration of RL12	0 -o1	c66		
CF 66	Configuration of RL13	0 -o1	c66		
CF 67	Configuration of RL14	0 -o1	c66		
	Condensing proportional outputs				
CF 68	Circuit 1 output signal: 0= 0 – 10Vdc 1= 4 ÷ 20mA 2= PWM for mono phase fan control board	0	2		
CF 69	Circuit 2 output signal: 0= 0 – 10V 1= 4 ÷ 20Ma 2= PWM for mono phase fan control board	0	2		
	Proportional output				
CF 70	Proportional output “out 3” 0= Not enabled 1= Not used 2= Not used 3= Not used 4= Auxiliary output 0÷10V n° 1 5= Auxiliary output 0÷10V n° 2 6= Proportional output for inverter circuit 1 compressor n° 2 7= Proportional output for inverter circuit 2 compressor n° 2 Relay driver ON / OFF	0 o 1	7 C36		
CF 71	Proportional output “out 4” 0= Not enabled 1= Not used 2= Not used 3= Not used 4= Auxiliary output 0÷10V n° 1 5= Auxiliary output 0÷10V n° 2 6= Proportional output for inverter circuit 1 compressor n° 2 7= Proportional output for inverter circuit 2 compressor n° 2 Relay driver ON / OFF	0 o 1	7 C36		
CF 72	Proportional output “out 5” 0= Not enabled 1= Not used 2= Not used 3= Not used 4= Auxiliary output 0÷10V n° 1 5= Auxiliary output 0÷10V n° 2 6= Proportional output for inverter circuit 1 compressor n° 2 7= Proportional output for inverter circuit 2 compressor n° 2 Relay driver ON / OFF	0 o 1	7 C36		
CF 73	Proportional output “out 6” 0= Not enabled 1= Not used 2= Not used 3= Not used 4= Auxiliary output 0÷10V n° 1 5= Auxiliary output 0÷10V n° 2 6= Proportional output for inverter circuit 1 compressor n° 2 7= Proportional output for inverter circuit 2 compressor n° 2 Relay driver ON / OFF	0 o 1	7 C36		
	Remote keyboard				
CF 74	Remote keyboard 1 configuration 0= Not enabled 1= Enabled model with ambient temperature sensor 2= Enabled model without ambient temperature sensor	0	2		
CF 75	Remote Panel 2 configuration 0= Not enabled 1= Enabled model with ambient temperature sensor 2= Enabled model without ambient temperature sensor	0	2		
CF 76	Offset of the probe of the remote terminal 1	-12.0 -10	12.0 53	°C °F	Dec int
CF 77	Offset of the probe of the remote terminal 2	-12.0 -10	12.0 53	°C °F	Dec int
	Icon function				

CF 78	Icon function 0= ❄ chiller / ✹ heat pump 1= ✹ chiller / ❄ heat pump	0	1		
	Chiller / heat pump selection mode				
CF 79	0= Chiller / Heat pump selection by keyboard 1= Chiller / Heat pump selection by digital input 2= Chiller / Heat pump selection by analogue input	0	2		
	Automatic Change over				
CF 80	Automatic change over setpoint for chiller/ heat pump selection (CF79 = 2)	-30.0 -22	70.0 158	°C °F	Dec int
CF 81	Automatic change over differential (CF79 = 2)	0 0	25.0 45	°C °F	Dec int
	Unit of measurement				
CF 82	°C or °F selection 0= °C / °BAR 1= °F / °psi	0	1		
	Supply voltage frequency				
CF 83	Power supply frequency 0= 50 Hz 1= 60 Hz 2= cc voltage (ATTENTION When CF83 = 2 the proportional outputs for fan control are not enabled and the frequency alarm is inhibited)	0	2		
	Serial Address				
CF 84	Serial address	1	247		
CF 85	Firmware Release				
CF 86	Eeprom parameter map				
	Regulation of unbalanced compressors (different power)				
CF 87	Compressor 1 capacity	0	100%		
CF 88	Compressor 2 capacity	0	100%		
CF 89	Compressor 3 capacity	0	100%		
CF 90	Compressor 4 capacity	0	100%		
CF 91	Compressor 5 capacity	0	100%		
CF 92	Compressor 6 capacity	0	100%		
CF 93	Maximum number of start up of the compressor in 15 minutes 0= Not enabled	0	15		
	Working mode of the compressor				
CF 94	Working mode of the compressor 0 = chiller and heat pump 1 = only chiller 2 = only heat pump	0	2		
	Hybrid exchangers				
CF 95	Enable hybrid exchangers	0	1		
	Dynamic Setpoint				
Parameters	Description	min	max	M. u.	Resolution
Sd 1	Maximum dynamic Offset in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 2	Maximum dynamic Offset in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 3	External air setpoint in chiller mode	-30.0 -22	70.0 158	°C °F	Dec int
Sd 4	External air setpoint in heat pump mode	-30 -22	70.0 158	°C °F	Dec int
Sd 5	External air differential in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 6	External air differential in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
Sd 7	Dynamic set point: summer offset analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 8	Dynamic set point: winter offset analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 9	Summer outside temperature analog 1	-30 -22	70.0 158	°C °F	Dec int
Sd 10	Winter outside temperature analog 1	-30 -22	70.0 158	°C °F	Dec int
Sd 11	Summer outside temp. differential analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 12	Winter outside temp. differential analog 1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 13	Dynamic set point: summer offset analog 2	-30.0 -54	30.0 54	°C °F	Dec int

Sd 14	Dynamic set point: winter offset analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 15	Summer outside temperature analog 2	-30 -22	70.0 158	°C °F	Dec int
Sd 16	Winter outside temperature analog 2	-30 -22	70.0 158	°C °F	Dec int
Sd 17	Summer outside temp. differential analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 18	Winter outside temp. differential analog 2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 19	Dynamic set point: summer offset relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 20	Dynamic set point: winter offset relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 21	Summer outside temperature relay AUX1	-30 -22	70.0 158	°C °F	Dec int
Sd 22	Winter outside temperature relay AUX1	-30 -22	70.0 158	°C °F	Dec int
Sd 23	Summer temperature differential relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 24	Winter temperature differential relay AUX1	-30.0 -54	30.0 54	°C °F	Dec int
Sd 25	Dynamic set point: summer offset relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 26	Dynamic set point: winter offset relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 27	Summer outside temperature relay AUX2	-30 -22	70.0 158	°C °F	Dec int
Sd 28	Winter outside temperature relay AUX2	-30 -22	70.0 158	°C °F	Dec int
Sd 29	Summer temperature differential relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
Sd 30	Winter temperature differential relay AUX2	-30.0 -54	30.0 54	°C °F	Dec int
	Energy saving				
Parameters	Description	min	max	udm	Risoluzione
ES 1	Start of the Time band 1 (0÷24)	0	24.00	Hr	10 Min
ES 2	End of the Time Band 1 (0÷24)	0	24.00	Hr	10 Min
ES 3	Start of the Time band 2 (0÷24)	0	24.00	Hr	10 Min
ES 4	End of the Time Band 2 (0÷24)	0	24.00	Hr	10 Min
ES 5	Start of the Time band 3 (0÷24)	0	24.00	Hr	10 Min
ES 6	End of the Time Band 3 (0÷24)	0	24.00	Hr	10 Min
ES 7	Monday: energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 8	Tuesday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 9	Wednesday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 10	Thursday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 11	Friday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 12	Saturday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 13	Sunday energy saving activated Automatic unit on-off	0 - 0	7 - 7		
ES 14	Energy Saving setpoint offset in chiller mode	-30.0 -54	30.0 54	°C °F	Dec int
ES 15	Energy Saving differential in chiller mode	0.0 0	25.0 45	°C °F	Dec int
ES 16	Energy Saving setpoint offset in heat pump mode	-30.0 -54	30.0 54	°C °F	Dec int
ES 17	Energy Saving differential in heat pump mode	0.0 0	25.0 45	°C °F	Dec int
ES 18	Maximum ON time when the unit is switched on by keyboard starting from OFF state by RTC 0= Not enabled	0	250	Min	10 Min
	Compressors rack				
Cr1	Type of functioning compressor rack 0= Not enabled 1= regulation by ST09 probe 2 = regolation by pressure probe (Evaporator pressure probe)	0	2		
Cr2	Set point compressor suction probe	Cr03	Cr04	Bar Psi	Dec int

Cr3	Minimum set point compressor suction probe	0	Cr03	Bar Psi	Dec int
Cr4	Maximum set point compressor suction probe	Cr03	50 725	Bar Psi	Dec int
Cr5	Regulation band suction probe	0.1 1	14.0 203	Bar Psi	Dec int
Cr6	Set energy saving compressor rack	0.0 0	50.0 725	Bar psi	Dec int
Cr7	Differential energy savingcompressor rack	0.1 1	14.0 203	Bar Psi	Dec int
Cr8	Number of compressors enabled in case of failure probe 0 ÷ 6	0	6		
Cr9	Number od ventilation step in case of failure probe 0 ÷ 4	0	4		
	Compressors				
Parameters	Description	min	max	udm	Risoluzione
CO 1	Minimum compressor ON time after the start-up.	0	250	10 sec	10 sec
CO 2	Minimum compressor OFF time after the switching off.	0	250	10 sec	10 sec
CO 3	ON delay time between two compressors or compressor and valve. During this time the led of the next resource is blinking.	1	250	Sec	
CO 4	OFF delay time between two compressors or compressor and valve. During this time the led of the next resource is blinking.	0	250	Sec	
CO 5	Output time delay after the main power supply start-up to the unit. All the loads are delayed in case of frequently power failures.	0	250	10 Sec	10 sec
	Capacity Control				
CO 6	Functioning (see Capacity Control) 0= With on/off steps 1= Continuous with steps and direct action 2= Continuous with steps and reverse action 3= Continuous with steps and direct total action	0	3		
CO 7	Start-up with minimum compressor power / automatic start-unloading valve 0 = Only at the compressor start-up (Minimum power automatic start-unloading valve off) 1= At the compressor start-up and during the termoregulation (Minimum power / automatic start-unloading valve off) 2 = Only at the screw compressor start-up (Minimum power automatic start-unloading valve off) 3= At the compressor start-up and during the termoregulation (Minimum power / Unloading valve ON with compressor off)	0	3		
CO 8	Relay ON time of the Solenoid valve Intermittent for screw compressor, with 0 the function is not enabled.	0	250	Sec	
CO 9	Relay OFF time of the Solenoid valve Intermittent for screw compressor	0	250	Sec	
	Compressor start-up				
CO 10	Kind of compressor start-up 0= Direct (vedi avviamento compressors) 1= Part - winding 2= Star-delta	0	2		
CO 11	If CO10= 1 part - winding start-up time. To change the time delay between the two contactors of the two compressor circuits. Se CO10= 2 Star-delta start-up time. To change the time delay between the contactor of the line 1 and the contactor of the centre of the star. (see part – winding /start-triangle functioning)	0	100	Dec. di Sec	0.1 sec
CO 12	If CO10= 2 Time of Star-delta start. Time delay to turn off the centre star contactor and to turn on the line 2 contactor (see Star-delta functioning)	0	50	Dec. di Sec	0.1 sec
CO 13	By-pass gas valve start-up time / automatic start-unloading valve (capacity step control)	0	250	sec	
	Rotating – Balancing – Compressors Thermoregulation				
CO 14	Compressor rotation (See compressor rotation) 0 = Sequential 1 = Compressors rotation based on time running hours 2 = Compressors rotation based on number of starts-up	0	2		
CO 15	Circuit balancing (See Circuit balancing) 0= Circuit saturation 1= Circuit balancing	0	1		
	Evaporator water pump				
CO 16	Operative mode of the evaporator pump / supply fan (See Evaporator pump function) 0= Not enabled (evaporator pump or supply fan). 1= Continuous. When the unit is running in Chiller or HP the pump or the supply fan is running. 2= With compressor. When a compressor is running also the pump or the supply fan is running.	0	2		

CO 17	ON compressor delay after water pump / supply fan start-up (See water pump functioning).	1	250	Min	
CO 18	OFF delay evaporator water pump / supply fan after compressor switching OFF. This delay is also active when the unit is turned in stand-by (See evaporator water pump function).	0	250	Min	
CO 19	Number of time running hours for pump rotation (See water pump group function)	0	999	10Hr	10Hr
CO 20	Time to make run the pumps together before rotating from one to the other (See water pump group function)	0	250	Sec	
	Condenser water pump				
CO 21	Operative mode for condenser water pump (See condenser water pump function) 0= Not enabled. 1= Continuous. When the unit is running in Chiller or HP the is running. 2= With compressor. When a compressor is running also the pump is running.	0	2		
CO 22	Free				
CO 23	OFF delay condenser water pump after compressor switching OFF. This delay is also active when the unit is turned in stand-by (See evaporator water pump function).	0	250	Min	
CO 24	Number of time running hours for pump rotation (See water pump group function).	0	999	10Hr	10Hr
CO 25	Time to make run the pumps together before rotating from one to the other (See water pump group function).	0	250	Sec	
	Load maintenance				
CO 26	Compressor 1 hour counter set	0	999	10 Hr	10 Hr
CO 27	Compressor 2 hour counter set	0	999	10 Hr	10 Hr
CO 28	Compressor 3 hour counter set	0	999	10 Hr	10 Hr
CO 29	Compressor 4 hour counter set	0	999	10 Hr	10 Hr
CO 30	Compressor 5 hour counter set	0	999	10 Hr	10 Hr
CO 31	Compressor 6 hour counter set	0	999	10 Hr	10 Hr
CO 32	“Evaporator pump / Supply fan” hour counter set	0	999	10 Hr	10 Hr
CO 33	2nd Evaporator pump hour counter set	0	999	10 Hr	10 Hr
CO 34	Condenser pump hour counter set	0	999	10 Hr	10 Hr
CO 35	2nd Condenser pump hour counter set	0	999	10 Hr	10 Hr
	Pump down				
CO 36	Pump down operating mode (See pump down ON/OFF function) 0= Not enabled 1= Unit off with pump–down, unit on without pump–down 2= Unit off with pump–down, unit on with pump–down 3= Chiller mode off with pump–down, chiller mode on without pump–down 4= Chiller mode off with pump–down, chiller mode on with pump–down	0	4		
CO 37	Pump–down pressure setpoint (See pump down ON/OFF function)	0 0	50.0 725	Bar psi	Dec int
CO 38	Pump-down pressure differential (See pump down ON/OFF function)	0 0	14.0 203	Bar psi	Dec int
CO 39	Maximum pump–down time duration at start-up and stop (See pump down ON/OFF function)	0	250	Sec	
	Evaporator Unloading				
CO 40	Unloading compressor setpoint in chiller. From high temperature of the evaporator water inlet (See unloading function).	-30 0	70.0 725	°C °F	Dec int
CO 41	Unloading Differential. From high temperature of the evaporator water inlet (See unloading function).	0.0 0	25.0 45	°C °F	Dec int
CO 42	Delay time to engage the Unloading function from high temperature of the evaporator water inlet (See unloading function).	0	250	Sec	10sec
CO 43	Maximum unloading duration time to keep activated the Unloading function from high temperature of the evaporator water inlet (See unloading function).	0	250	Min	
	Condenser Unloading				
CO 44	Unloading compressor setpoint. From temperature / pressure in chiller mode (See unloading function).	0 0	50.0 725	Bar psi	Dec int
CO 45	Unloading Differential. From temperature / pressure in chiller mode (See unloading function).	0.0 0	14.0 203	Bar Psi	Dec int
CO 46	Unloading compressor setpoint. From temperature / pressure in HP mode (See unloading function).	0 0	50.0 725	Bar psi	Dec int
CO 47	Unloading Differential. From temperature / pressure in HP mode (See unloading function).	0.0 0	14.0 203	Bar Psi	Dec int
CO 48	Maximum unloading duration time from temperature/pressure control.	0	250	Min	
CO 49	Number of steps for circuit with active unloading 1= 1st step 2= 2nd step 3= 3rd step	1	3		
CO 50	Minimum ON time of the capacity step after the unloading function start (only for capacity compressor)	0	250	Sec	
	Compressor liquid injection				

CO 51	Setpoint of the solenoid valve (on) of the liquid injection	0 0	150 302	°C °F	Dec / int int
CO 52	Setpoint of the solenoid valve (off) of the liquid injection	0.0 0	25.0 45	°C °F	Dec int
	Management resource in neutral zone				
CO 53	Maximum time of work in neutral zone without insert resource	0	250	Min	10 Min
CO 54	Maximum time of work in neutral zone without rotation resource	0	999	Hr	1Hr
	Evaporator low water temperature Unloading				
CO 55	Set point unloading compressor from low evaporator water temperature	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
CO 56	Differential unloading compressor from low evaporator water temperature	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
CO 57	Maximum unloading duration time from low evaporator water temperature	0	250	Min	
	Pump down to time				
CO 58	maximum time pump-down in stopped CO58 = 0 Not enabled	0	250	Sec	
CO 59	maximum time pump-down in started CO59 = 0 Not enabled	0	250	Sec	
	Compressor inverter controlled				
CO 60	Maximum time start up compressor digital scroll	0	250	sec	
CO 61	Minimum value proportional output from stat up compressor	0	100	%	
CO 62	Minimum time capacity variation from start up compressor digital scroll	1	250	sec	
CO 63	Minimum percentage continuative of work of the compressor digital scroll before to start counting CO64 time	0	100	%	
CO 64	Maximum time continuative of work of the compressor with percentage less of CO63	0	250	Min	10 Min
CO 65	Time of forcing the compressor digital scroll to the maximum power	0	250	sec	10sec
CO 66	Maximum time continuative of work of the digital sroll compressor	0	999	Hr	1Hr
CO 67	Minimum value proportional output digital scroll 0÷10V compressor 1	0	CO65	%	
CO 68	Maximum value proportional output digital scroll 0÷10V compressor 1	CO64	100	%	
CO 69	Minimum value proportional output digital scroll 0÷10V compressor 2	0	CO67	%	
CO 70	Maximum value proportional output digital scroll 0÷10V compressor 2	CO66	100	%	
CO 71	Minimum time capacity variation compressor digital scroll	1	250	sec	
	Tamdem function				
CO 72	Maximum operating time of a single compressor	0	250	Min	
	Load maintenance				
CO 73	Sanitary water pump hour counter	0	999	10 Hr	10 Hr
CO 74	Solar panel water pump hour counter	0	999	10 Hr	10 Hr
	4 way valve				
CO 75	Forced time to reverse the 4 way valve when the compressor is switched off	0	250	sec	
	Auxiliary relay menu function				
Parameters	Description	min	max	M. U.	Resolution
	Auxiliary relay of the circuit 1				
US 1	Auxiliary relay 1 operating mode (See graph and auxiliary relay functions) 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 2	Analog input configuration for auxiliary relay 1 control. Allows to select which probe value Pb1..Pb10 controls the relay	1	10		
US 3	Auxiliary setpoint 1 (See graph and auxiliary relay functions)	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int

US 4	Auxiliary differential 1 (See graph and auxiliary relay functions)	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
	Auxiliary relay circuit 2				
US 5	Auxiliary relay 2 operating mode (See graph and auxiliary relay functions) 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 6	Analogue input configuration for auxiliary relay 2 control . Allows to select which probe value Pb1..Pb10 controls the relay	1	10		
US 7	Auxiliary setpoint 2 (See graph and auxiliary relay functions)	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 8	Auxiliary differential 1 (See graph and auxiliary relay functions)	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
	Auxiliary proportional output n°1				
US 9	Auxiliary proportional output n°1 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 10	Analogue input configuration for auxiliary control 1 Allows to select which probe value Pb1..Pb10 controls output	1	10		
US 11	Auxiliary setpoint proportional output 1	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 12	Differenzential proportional output 1	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 13	Minimum value proportional output 1	0	US14	%	
US 14	Maximum value proportional output 1	US13	100	%	
	Auxiliary proportional output n°2				
US 15	Auxiliary proportional output n°2 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 16	Analogue input configuration for auxiliary 2 control Allows to select which probe value Pb1..Pb10 controls output	1	10		
US 17	Auxiliary setpoint proportional output 2	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 18	Differenzential proportional output 2	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 19	Minimum value proportional output 2	0	US20	%	
US 20	Maximum value proportional output 2	US19	100	%	
US 21	Maximum operating time of auxiliary realys	0	250	Min	
US 22	Analog output 1 operating mode	0	4		
US 23	Analog output 1 probe selection	1	10		
US 24	Analog output 1 summer minimum set point	-30.0 -22 0.0 0	US26	°C °F Bar Psi	Dec int Dec int
US 25	Analog output 1 summer maximum set point	US26	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int

US 26	Analog output 1 summer set point	US24	US25	℃ ℉ Bar Psi	Dec int Dec int
US 27	Analog output 1 winter minimum set point	-30.0 -22 0.0 0	US29	℃ ℉ Bar Psi	Dec int Dec int
US 28	Analog output 1 winter maximum set point	US29	70.0 158 50.0 725	℃ ℉ Bar Psi	Dec int Dec int
US 29	Analog output 1 winter set point	US27	US28	℃ ℉ Bar Psi	Dec int Dec int
US 30	Analog output 1 summer differential	0.0 0 0.0 0	25.0 45 14.0 203	℃ ℉ Bar Psi	Dec int Dec int
US 31	Analog output 1 winter differential	0.0 0 0.0 0	25.0 45 14.0 203	℃ ℉ Bar Psi	Dec int Dec int
US 32	Analog output 1 minimum value	0	US33	%	
US 33	Analog output 1 maximum value	US32	100	%	
US 34	Analog output 2 operating mode	0	4		
US 35	Analog output 2 probe selection	1	10		
US 36	Analog output 2 summer minimum set point	-30.0 -22 0.0 0	US38	℃ ℉ Bar Psi	Dec int Dec int
US 37	Analog output 2 summer maximum set point	US38	70.0 158 50.0 725	℃ ℉ Bar Psi	Dec int Dec int
US 38	Analog output 2 summer set point	US36	US37	℃ ℉ Bar Psi	Dec int Dec int
US 39	Analog output 2 winter minimum set point	-30.0 -22 0.0 0	US41	℃ ℉ Bar Psi	Dec int Dec int
US 40	Analog output 2 winter maximum set point	US41	70.0 158 50.0 725	℃ ℉ Bar Psi	Dec int Dec int
US 41	Analog output 2 winter set point	US39	US40	℃ ℉ Bar Psi	Dec int Dec int
US 42	Analog output 2 summer differential	0.0 0 0.0 0	25.0 45 14.0 203	℃ ℉ Bar Psi	Dec int Dec int
US 43	Analog output 2 winter differential	0.0 0 0.0 0	25.0 45 14.0 203	℃ ℉ Bar Psi	Dec int Dec int
US 44	Analog output 2 minimum value	0	US45	%	
US 45	Analog output 2 maximum value	US44	100	%	
US 46	Operation mode under minimum value	0	1		

Condenser fan					
Parameters	Description	min	max	M. U.	Resolution
FA 1	Fan configuration output 0 = Not enabled 1 = Always on 2 = ON/OFF regulation with steps 3 = ON/OFF Continuous regulation 4 = Proportional speed control	0	4		
FA 2	Fan operating mode 0= Dependent from the compressor 1= Independent from the compressor	0	1		

FA 3	If the condenser fan control is the triac output, when the regulation starts the trigger output will drive the condenser fan at the maximum voltage for the time FA 3 then, then the regulation will follow the temperature/pressure of the probe.	0	250	Sec	
FA 4	Phase shifting of the fan motor	0	8	Micro Sec	250µs
FA 5	Number of condensing circuits 0= one condenser circuit 1= tow condenser circuits	0	1		
FA 6	Pre-ventilation time before turning on the compressor in chiller mode. To turn on the fan at the maximum speed before the compressor and reduce the successive condensing temperature/pressure increasing. (only if FA01=4)	0	250	Sec	
	Fan in Chiller mode				
FA 7	Minimum speed for condenser fan in Chiller mode. To set the minimum fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
FA 8	Maximum speed for condenser fan in Chiller mode. To set the maximim fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
FA 9	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA 7 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 10	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the maximum speed FA 8 ON/OFF regulation FA01 = 2/3 SETpoint step n° 2	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 11	Proportional speed control FA01 = 4 Proportional band for condenser fan control in chiller To set the temperature/pressure differential between the minimum and the maximum of the fan speed regulation. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 1	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 12	Proportional speed control FA01 = 4 CUT-OFF differential in chiller. To set a temperature/pressure differential to stop the fan. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 2	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 13	Over ride CUT- OFF in chiller. To set a temperature/pressure differential to keep the minimum fan speed.	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 14	CUT-OFF time delay. To set a time delay before activating the CUT-OFF function after the fan start-up. If after the compressor start-up the proportional regulator requires to turn off the fan (cut-off) and FA14≠0, the fan is on at the minimum speed for the time set in this parameter. If FA14=0 the function is disabled.	0	250	Sec	
FA 15	Night speed in chiller. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
	Fan in Heat pump mode				
FA 16	Minimum speed for condenser fan in Heat Pump mode. To set the minimum fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
FA 17	Maximum speed for condenser fan in Heat Pump mode. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
FA 18	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA16 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 19	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the maximum speed FA17 ON/OFF regulation FA01 = 2/3 SETpoint step n° 2	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 20	Proportional speed control FA01 = 4 Proportional band for condenser fan control in heat pump To set the temperature/pressure differential between the minimum and the maximum of the fan speed regulation. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 1	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 21	Proportional speed control FA01 = 4 CUT-OFF differential in heat pump. To set a temperature/pressure differential to stop the fan. ON/OFF regulation FA01 = 2/3 Differential step circuit n° 2	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int

FA 22	Over ride CUT- OFF in Heat pump. To set a temperature/pressure differential to keep the minimum fan speed.	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
FA 23	Night speed in Heat pump. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	30	100	%	
	Hot start				
FA 24	Hot start setpoint	-30.0 -22	70.0 158	°C °F	Dec int
FA 25	Hot start differential	0.0 0	25.0 45	°C °F	Dec int
	3 / 4 step condenser Fan in Chiller mode				
FA 26	ON/OFF regulation FA01 = 2/3 SETpoint step n° 3	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 27	ON/OFF regulation FA01 = 2/3 SETpoint step n° 4	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
	3 / 4 step condenser Fan in heat pump				
FA 28	ON/OFF regulation FA01 = 2/3 SETpoint step n° 3	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
FA 29	ON/OFF regulation FA01 = 2/3 SETpoint step n° 4	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
	Antifreeze heaters – Integration heating - boiler				
Parameter	Description	min	max	m. u.	Risoluzione
Ar 1	Anti-freeze heaters/integration heating setpoint for air/air unit in Chiller mode. To set a temperature value, below this value the anti-freeze relay is activated.	-30.0 -22	70.0 158	°C °F	Dec int
Ar 2	Regulation band for antifreeze in Chiller mode.	0.1 0	25.0 45	°C °F	Dec Int
Ar 3	Set Anti-freeze heaters/integration heating setpoint for air/air unit in HP mode. To set a temperature value, below this value the anti-freeze relay is activated.	-30.0 -22	70.0 158	°C °F	Dec int
Ar 4	Regulation band for antifreeze in HP mode.	-30.0 -22	70.0 158	°C °F	Dec int
Ar 5	Antifreeze heaters / integration heating in defrost 0= ON only with thermoregulation control 1= ON with thermoregulation and during the defrosting cycle	0	1		
Ar 6	Antifreeze probe to manage heaters / support heaters in Chiller mode. 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet	0	3		
Ar 7	Antifreeze probe to manage heaters / support heaters in HP mode. 0= Not enabled 1= Evaporator inlet. 2= Evaporator outlet 1 and 2. 3= Evaporator outlet 1 and 2 and common outlet.	0	3		
Ar 8	Thermoregulation probe for anti-freeze / condenser heaters. 0= not enabled. 1= Condenser common water inlet probe. 2= Condenser common water inlet and condenser inlet 1 / 2 probe. 3= Condenser water outlet 1 / 2 probe. 4= Condenser water outlet 1 / 2 and common outlet.	0	4		
Ar 9	Anti-freeze heaters or condenser/evaporator water pump control with unit in remote OFF or stand-by mode: 0= Control not enable 1=Controlled by anti-freeze thermoregulation.	0	1		
Ar 10	Anti-freeze heaters control for condenser/evaporator faulty probe: 0= Anti-freeze heaters OFF 1= Anti-freeze heaters ON	0	1		
	Boiler function				
Ar 11	Boiler function 0=Not enabled 1=Enabled for integration heating 2= Enabled for heating	0	2		
Ar 12	External air temperaure setpoint for boiler heaters (on)	-30.0 -22	70.0 158	°C °F	Dec int

Ar 13	Temperature differential for boiler heaters (off)	0 0	25.0 45	℃ ℉	Dec int
Ar 14	Time delay before turning the boiler on	0	250		Min
	Boiler function in Chiller mode				
Ar 15	Setpoint for boiler heaters (on) in chiller	-30.0 -22	70.0 158	℃ ℉	Dec int
Ar 16	Proportional band for boiler heaters in chiller	-30.0 -22	70.0 158	℃ ℉	Dec int
	Boiler function in heat pump				
Ar 17	Setpoint for boiler heaters (on) in HP	-30.0 -22	70.0 158	℃ ℉	Dec int
Ar 18	Proportional band for boiler heaters in HP	0.1 0	25.0 45	℃ ℉	Dec int
Ar 19	External air setpoint to stop the compressor as integration function	-30.0 -22	70.0 158	℃ ℉	Dec int
Ar 20	External air differential to stop the compressor as integration function	0.1 0	25.0 45	℃ ℉	Dec int
	Anti freeze alarm				
Ar 21	Termoregulation probe anti freeze alarm in chiller mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar 22	Termoregulation probe anti freeze alarm in heat pump mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar 23	Termoregulation probe anti freeze alarm water condenser 0= not enabled. 1= Condenser common water inlet probe. 2= Condenser common water inlet and condenser inlet 1 / 2 probe. 3= Condenser water outlet 1 / 2 probe. 4= Condenser water outlet 1 / 2 and common outlet.	0	4		
	Anti freeze alarm				
Ar 24	Water pump / antifreeze alarm in OFF/ stand-by 0= Aways in OFF 1= ON only with thermoregulation control	0	1		
Ar 25	Termoregulation probe water pump in antifreeze mode 0= Not enabled 1= Evaporator inlet 2= Evaporator outlet 1 and 2 3= Evaporator outlet 1 and 2 and common outlet 4= External temperature	0	4		
Ar 26	Set point starting water pump in antifreeze alarm	-30.0 -22	70.0 158	℃ ℉	Dec int
Ar 27	Differential starting water pump in antifreeze alarm	0.1 0	25.0 45	℃ ℉	Dec int
	Defrost				
Parameter	Description	min	max	udm	Risoluzione
dF 1	Defrost configuration: 0= Not enabled 1= Temperature / pressure 2= start depends on par. dF24 stop for time duration 3= start depends on par. dF24 stop for external contact 4= defrost with condenser fan	0	4		
dF 2	Temperature or pressure of the defrost start-up	-30.0 -22 0.0 0	70.0 158 50.0 725	℃ ℉ bar psi	Dec int Dec Int
dF 3	Temperature or pressure of the defrost stop	-30.0 -22 0.0 0	70.0 158 50.0 725	℃ ℉ bar psi	Dec int Dec Int
dF 4	Minimum defrost duration.	0	250	Sec	
dF 5	Maximum defrost duration.	1	250	Min	
dF 6	Time delay between the defrost of two circuits	0	250	Min	
dF 7	OFF compressor delay before the defrost	0	250	Sec	
dF 8	OFF compressor delay after the defrost	0	250	Sec	
dF 9	Defrost interval time of the same circuit	1	99	Min	
dF 10	Temperature setpoint for combined defrost of the 1st circuit after parameter DF10 counting.	-30.0 -22	70.0 158	℃ ℉	Dec int

dF 11	Temperature setpoint for combined defrost end of the 1st circuit.	-30.0 -22	70.0 158	°C °F	Dec int
dF 12	Temperature setpoint for combined defrost of the 2nd circuit after parameter DF10 counting.	-30.0 -22	70.0 158	°C °F	Dec int
dF 13	Temperature setpoint for combined defrost end of the 2nd circuit.	-30.0 -22	70.0 158	°C °F	Dec int
dF 14	Activation of all the steps of the 1st circuit during the defrost. 0= Not enabled 1= Enabled	0	1		
dF 15	Activation of all the steps of the 2nd circuit during the defrost. 0= Not enabled 1= Enabled	0	1		
dF 16	Time delay between two compressor ON in defrost mode	0	250	Sec	
dF 17	Fan control during defrost / dripping time 0= Not enabled 1= Only in defrost 2= For both functions defrost / dripping time	0	2		
dF 18	Pressure / temperature setpoint to force the ventilation ON during the defrost.	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec Int
	Forced defrost				
dF 19	Minimum time delay before a forced defrost	0	250	sec	
dF 20	Pressure / temperature setpoint for a forced defrost	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec int
dF 21	Forced defrost differential	0.1 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
	Defrost operative mode				
dF 22	Defrost start-up with 2 circuits 0= Independent 1= If both have reached the necessary requirements 2= If one has reached the necessary requirements	0	2		
dF 23	End defrost for two circuits and common ventilation. 0= Independent 1= If both have reached the necessary end defrost requirements 2= If one has reached the necessary end defrost requirements	0	2		
	Start / stop defrost selection				
Parameters	description	min	max	udm	resolution
dF 24	Start / stop defrost probe 0= start and stop with condenser temperatur / pressure probe 1= start with evaporator pressure probe / stop with condenser temperatur / pressure probe 2= start with condenser temperatur / pressure probe / stop with evaporator pressure probe 3= start and stop with evaporator pressure probe	0	3		
	Supply fan operating mode during defrost cycle				
dF 25	Stop supply fan diuring defrost cycle 0= Not enabled 1= enable	0	1		
	Defrost only with condenser fan				
dF 26	Set point to enable defrost with condenser fan	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec int
dF 27	Hybrid exchangers summer set point	-30.0 -22	70.0 158	°C °F	Dec int
dF 28	Hybrid exchangers summer differential	0.1 0	25.0 45	°C °F	Dec int
dF 29	Hybrid exchangers winter set point	-30.0 -22	70.0 158	°C °F	Dec int
dF 30	Hybrid exchangers winter differential	0.1 0	25.0 45	°C °F	Dec int
	Sanitary water				
Parameters	Description	min	max	m. u.	Resolution
FS 1	Sanitary water regulation mode	0	2		
FS 2	Sanitary water thermoregulation priority	0	1		
FS 3	Sanitary water thermoregulation set point	FS05	FS06	°C/°F	dec/int
FS 4	Sanitary water thermoregulation band	0.1 0	25.0 45	°C °F	Dec int

FS 5	Minimum value of the sanitary water set point	-30.0 -22	FS06	°C °F	Dec int
FS 6	Maximum value of the sanitary water set point	FS05	90.0 158	°C °F	Dec int
FS 7	Full loads enabling to reach the sanitary water set point	0	1		
FS 8	Heaters enabling during the sanitary water thermoregulation	0	1		
FS 9	Operation working time to activate the heaters during the sanitary water thermoregulation	0	250	Min	
FS 10	Time delay to activate the sanitary water valve	0	999	sec	int
FS 11	Reversing cycle delay during sanitary water thermoregulation	0	999	sec	int
FS 12	Antilegionella function operating mode	0	1		
FS 13	Delay time between two Antilegionella cycles	0	250	Hr	0
FS 14	Antilegionella Set point	FS13	FS14	°C/°F	dec/int
FS 15	Minimum value of the Antilegionella set point	-30.0 -22	FS14	°C °F	Dec int
FS 16	Maximum value of the Antilegionella set point	FS13	70.0 158	°C °F	Dec int
FS 17	Hour selection for the Antilegionella activation	0	24.00	Hr	10 min
FS 18	Day selection for the Antilegionella activation	0	7		
FS 19	Minimum operating working time of the Antilegionella cycle	1	255	min	
FS 20	Temperature band for heaters deactivation during Antilegionella cycle	0.1 0	25.0 45	°C °F	Dec int
FS 21	Differential value to enable the freecooling function	0	25.0 45	°C °F	Dec int
FS 22	Differential value for the free cooling regulation	0.1 0	25.0 45	°C °F	Dec int
FS 23	Set point for solar panel activation	FS25	FS26	°C/°F	dec/int
FS 24	Differential value for solar panel deactivation	0.1 0	25.0 45	°C °F	Dec int
FS 25	Minimum value of the solar panel set point	-30.0 -22	FS23	°C °F	Dec int
FS 26	Maximum value of the solar panel set point	FS23	70.0 158	°C °F	Dec int
FS 27	Delay time to activate the sanitary water valve starting from pump activation	0	250	sec	
FS 28	Delay time to deactivate the sanitary water pump starting from valve deactivation	0	250	sec	
FS 29	Maximum operating working time of the Antilegionella cycle	0	250	min	
FS 30	Sanitary water: security set point	-30.0 -22	70.0 158	°C °F	Dec int
FS 31	Sanitary water: security differential	0.1 0	25.0 45	°C °F	Dec int
FS 32	Sanitary water: minimum interruption time	0	250	min	
FS 33	Sanitary water pump operation mode	0	1		
Alarms					
Parameters	Description	min	max	m. u.	Resolution
Low alarm					
AL 1	Low pressure alarm delay from analog and digital input	0	250	Sec	
AL 2	Low pressure alarm delay from digital input after compressor stop if the low pressure switch is used for the pump down. AL02= 0 low pressure alarm not enable with compressor OFF AL02≠ 0 low pressure alarm enable after AL02 time with compressor OFF	0	250	Sec	10 Sec
AL 3	Low pressure alarm setpoint from analogue input	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec int
AL 4	Low pressure alarm differential from analogue input	0.1 0 0.0 0	25.0 45 14.0 203	°C °F bar psi	Dec int Dec Int
AL 5	Maximum number of low pressure events from digital/analogue inputs: Manual reset if AL05 = 0 Automatic reset if AL05 =16 From automatic to manual reset if AL05= 1..15	0	16		
AL 6	Low temperature/pressure alarm during defrost 0= Not enabled 1= Enabled	0	1		
AL 7	Low temperature/pressure alarm delay during defrost	0	250	Sec	
AL 8	Low temperature/pressure alarm with unit in OFF or stand – by: 0 = Not enabled 1= Alarm enabled	0	1		
High Alarm					

AL 9	High temperature/pressure alarm from analogue input	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec int
AL 10	High temperature/pressure alarm differential from analogue input	0.1 0 0.0 0	25.0 45 14.0 203	°C °F bar psi	Dec int Dec int
	Oil Alarm				
AL 11	Low oil pressure / level delay from digital input	0	250	Sec	
AL 12	Minimum time for low oil pressure / level from digital input activation in normal working condition.	0	250	Sec	
AL 13	Maximum number of low oil pressure/level events: Always manual reset if AL13= 0 Always automatic reset if AL13 =16 From automatic to manual reset if AL13 = 1..15	0	16		
	Flow alarm				
AL 14	Configuration 0= Not enabled 1= Only for chiller 2= Only for heat pump 3= For both chiller and heat pump	0	3		
AL 15	"Flow switch / supply fan overload" alarm delay after pump/fun activation.	0	250	Sec	
AL 16	Maximum time flow switch alarm active befor to block the water pump	0	250	Sec	
AL 17	Minimum "Flow switch / supply fan overload" active time duration.	0	250	Sec	
AL 18	Minimum "Flow switch / supply fan overload" not active time duration.	0	250	Sec	
	Compressor overload alarm				
AL 19	Compressor overload alarm delay after compressor start-up	0	250	Sec	
AL 20	Maximum number of compressor overload alarm events Always manual reset if AL20 = 0 Always automatic reset if AL20 =16 From automatic to manual reset if AL20 =1..15	0	16		
	Pump down alarm				
AL 21	Maximum number of pump down alarm events per hour in stop condition. After this number the alarm is logged, displayed and signalled with alarm relay + buzzer. Manual reset if AL21 = 0 Automatic reset if AL21 =16 From automatic to manual reset if AL21 =1..15	0	16		
AL 22	Maximum number of pump down alarm events per hour in start-up condition. After this number the alarm is logged, displayed and signalled with alarm relay + buzzer. Always manual reset if AL22 = 0 Always automatic reset if AL22 =16 From automatic to manual reset if AL21 =1..15 and parameter AL23 config.	0	16		
AL 23	Select if the pump down alarm must change from automatic to manual reset: 0= Always automatic reset 1= Manual reset after AL21 alarm events	0	1		
	Anti-freeze alarm in Chiller mode				
AL 24	Minimum antifreeze setpoint in chiller (from –30 °C to AL24)	-30.0 -22	AL24	°C °F	Dec int
AL 25	Maximum antifreeze setpoint in chiller (from AL24 to 70 °C)	AL24	70.0 158	°C °F	Dec int
AL 26	Setpoint temperature for low anti-freeze alarm, low ambient temperature (air/air), low temperature air outlet (air/air). From AL24 to AL25.	AL24	AL25	°C/°F	Dec/int
AL 27	Differential of alarm reset in Chiller mode for anti-freeze, low ambient air temperature or low outlet air temperature alarms.	0 0	25.0 45	°C °F	Dec int
AL 28	Alarm delay for anti-freeze, low ambient air temperature or low outlet air temperature. The temperature must be lower than AL26 for this time duration before having the alarm event.	0	250	Sec	
AL 29	Maximum number of alarm events anti-freeze, low ambient air temperature or low outlet air temperature before changing from automatic to manual alarm reset: Always manual reset if AL29 = 0 Always automatic reset if AL29 = 16 From automatic to manual if AL29 = 1. .15	0	16		
AL 30	Anti-freeze alarm configuration in chiller 0= to turn the compressors off when the anti-freeze control probe is lower than AL26 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are not activated. 1= to turn the compressors off when the anti-freeze control probe is lower than AL26 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are activated.	0	1		
	Anti-freeze alarm in Heat pump mode				

AL 31	Setpoint of the minimum limit in heat pump (va da – 30 °C a AL32)	-30.0 -22	AL31	°C °F	Dec int
AL 32	Setpoint of the maximum limit in heat pump (va da AL31 a 70 °C)	AL31	70.0 158	°C °F	Dec int
AL 33	Anti-freeze alarm setpoint in heat pump Setpoint temperature for low anti-freeze alarm, low ambient temperature (air/air), low temperature air outlet (air/air). (from AL31 to AL32)	AL31	AL32	°C/°F	Dec/int
AL 34	Alarm differential in heat pump. To reset the anti-freeze, low ambient Temperature (air/air), low temperature air outlet (air/air) alarms.	0 0	25.0 45	°C °F	Dec int
AL 35	Anti-freeze alarm delay in HP for low outlet air temperature (air/air) Attention If during the Stand-by or remote off there is an anti-freeze alarm event, and the AL35 <>0, starting the heat pump mode, from keyboard or digital input. In this case the anti-freeze alarm is aborted and the compressor starts for the AL35 time to heat the air or the water. After the AL35 time if the antifreeze probe value is still lower than AL33 setpoint, for maximum AL36 seconds, the unit is stopped and the anti-freeze alarm is generated again.	0	250	Sec	
AL 36	Anti-freeze alarm delay for low air ambient temperature or low outlet air temperature in heat pump normal condition. The detected temperature must be lower than AL33 for the time AL36 before giving the alarm	0	250	Sec	
AL 37	Maximum number of anti-freeze alarm events for low air ambient temperature or low outlet air temperature in heat pump. It sets the alarm reset condition: Always manual reset AL37 = 0 Always automatic reset AL37 = 16 From automatic to manual reset if AL37 = 1..15	0	16		
AL 38	Anti-freeze alarm configuration in heat pump 0= to turn the compressors off when the anti-freeze control probe is lower than AL33 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are not activated. 1= to turn the compressors off when the anti-freeze control probe is lower than AL33 (after the time delay), the display shows the alarm label. Buzzer and Alarm relay are activated.	0	1		
	Compressor high discharge temperature				
AL 39	Compressor high discharge temperature setpoint	0 0	150 302	°C °F	Dec / int int
AL 40	Compressor high discharge temperature differential	0 0	25.0 45	°C °F	Dec int
AL 41	Number of compressor high discharge temperature events per hour to determine the alarm reset condition: Always manual reset if AL41 = 0 Always automatic reset if AL41 =16 From automatic to manual if AL41 = 1..15	0	16		
	Generic alarm 1				
AL 42	Maximum number of generic alarm events (each event stop the regulation) before turning the alarm from automatic to manual: Always manual AL42 = 0 Always automatic AL42 =16 From manual to utomatic if AL42 value is between 1 and 15	0	16		
AL 43	Generic alarm delay time after the digital input activation	0	250	Sec	
AL 44	Generic alarm delay time after the digital input is not activate	0	250	10 sec	10 sec
	Alarm relay				
AL 45	Enable alarm relay with unit in off or stand – by: 0= Alarm output not enabled 1= Alarm output enabled	0	1		
	Password reset: Alarm log – Compressor overload				
AL 46	Password value to reset the alarm log or the compressor overload alarm.	0	999		
AL 47	Thermal alarm of the compressor 0= lock the compressor 1= lock the whole circuit	0	1		
AL 48	Thermal alarm when the compressor is OFF 0 = Not enabled 1= Alarm enabled	0	1		
	Oil alarm in OFF				
AL 49	Oil alarm when the compressor is OFF 0 = Not enabled 1= Alarm enabled	0	1		
	Generic alarm / signal 2				
AL 50	Functioning generic alarm n° 2 0= only signal always automatic reset 1= the alarm block the unit reset depends on the value of parameter AL51	0	1		

AL 51	Maximum number of generic alarm events before turning the alarm from automatic to manual: Always manual AL51 = 0 Always automatic AL51 =16 From manual to utomatic if AL51 value is between 1 and 15	0	16		
AL 52	Generic alarm delay time after the digital input activation	0	250	Sec	
AL 53	Generic alarm delay time after the digital input is not activate	0	250	Sec	10 sec
	Reset High pressure / temperature alarm				
AL 54	Maximum number of high pressure / temperature alarm events before turning the alarm from automatic to manual: Always manual AL54 = 0 Always automatic AL54 =16 From manual to utomatic if AL54 value is between 1 and 15	0	16		
	Flow alarm condenser				
AL 55	"Flow switch water condenser alarm delay after pump activation.	0	250	Sec	
AL 56	Maximum time flow switch alarm active befor to block the water pump	0	250	Sec	
AL 57	Minimum "Flow switch water condenser active time duration.	0	250	Sec	
AL 58	Minimum "Flow switch water condenser not active time duration.	0	250	Sec	
	High water evaporator inlet temperature				
AL 59	Maximum number of high water temperature alarm events Always manual reset if AL59 = 0 Always automatic reset if AL59 =16 From automatic to manual reset if AL59 =1..15	1	16		
AL 60	High water temperature alarm delay time from ON compressor	0	250	Sec	10 sec
AL 61	Set point higt water temperature	-30.0 -22 0.0 0	70.0 158 50.0 725	°C °F bar psi	Dec int Dec int
AL 62	Differential higt water temperature	0.1 0 0.0 0	25.0 45 14.0 203	°C °F bar psi	Dec int Dec int
AL 63	Analogue input configuration.Allows to select which probe value NTC/PTC (Pb1..Pb10)	1	10		
AL 64	Low pressure alarm delay	0	250	Sec	
AL 65	Sanitary water flow switch alarm delay	0	250	Sec	
AL 66	San. water flow switch delay to stop pump	0	250	Sec	
AL 67	Sanitary water flow switch activation time	0	250	Sec	
AL 68	San. water flow switch de-activation time	0	250	Sec	
AL 69	Solar panel flow switch alarm delay	0	250	Sec	
AL 70	Solar panel flow switch delay to stop pump	0	250	Sec	
AL 71	Solar panel flow switch activation time	0	250	Sec	
AL 72	Solar panel flow switch de-activation time	0	250	Sec	

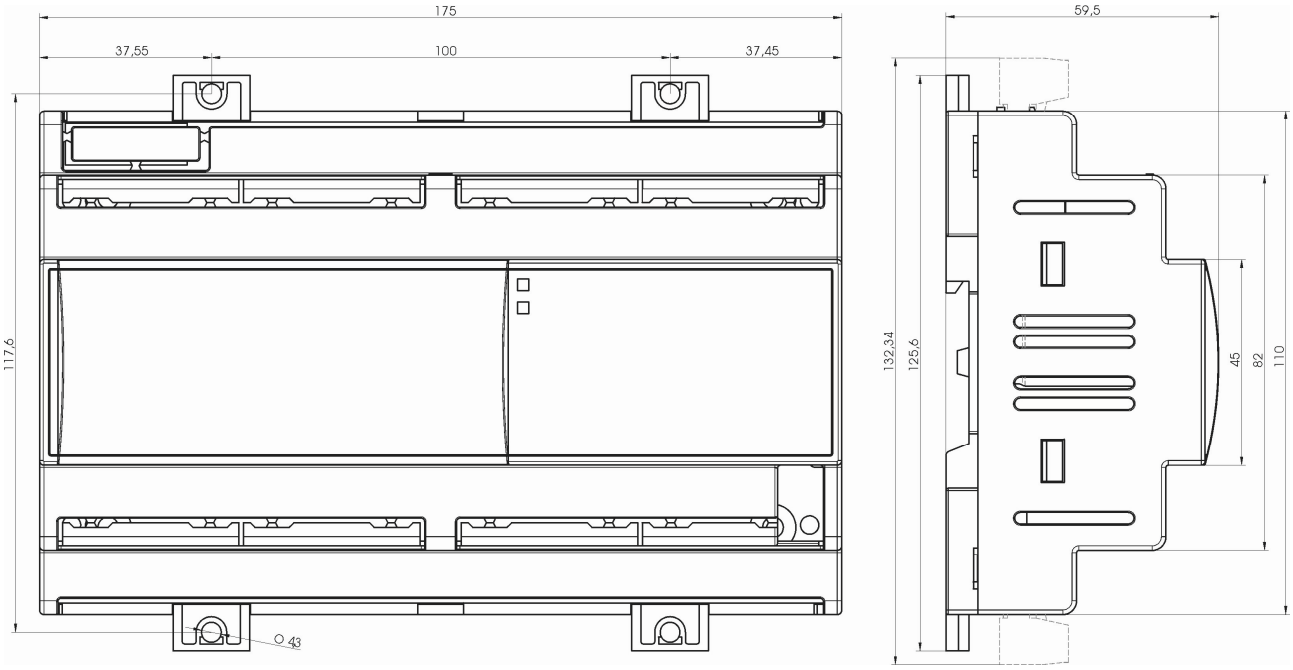
36. BLACK-OUT

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

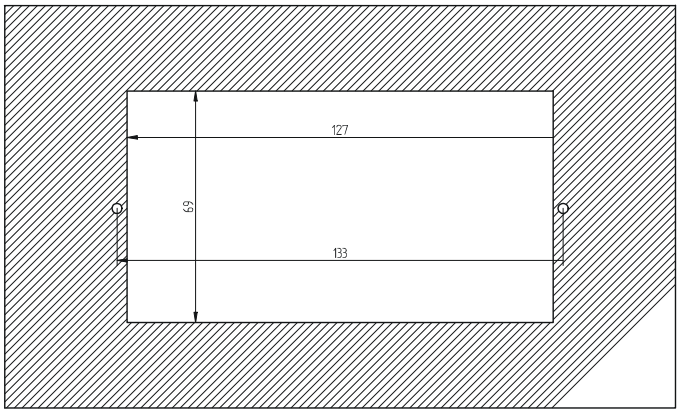
37. INSTALLING AND MOUNTING

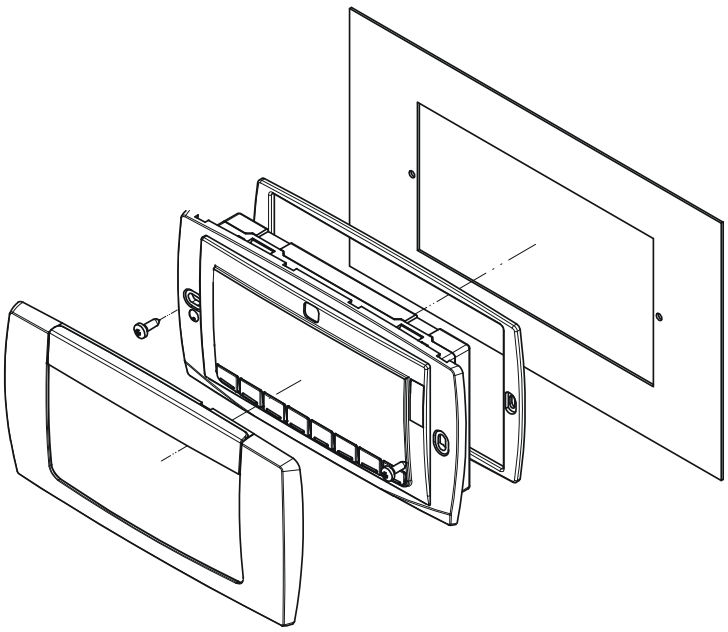
37.1 ICHILL 290D/291D DIMENSIONS

WARNING: all the distance show in the figure below are expressed in mm



VGI890 panel cut out dimensions





38. ELECTRICAL CONNECTIONS

The instrument is provided with:

- 3 removable terminal blocks MOLEX with 0.5 mm^2 wires: 16 / 8 /22 ways for digital / analogue inputs and modulating outputs
- 4 removable screw terminal block STELVIO for 2.5 mm^2 wires connection: 3 / 4 / 5 / 6 ways for the relay outputs.
- 5 ways connector for TTL RS485 interface outputs.
- 3 ways connector for keyboard VGI890 (to be connected with cable **CABC3J30**

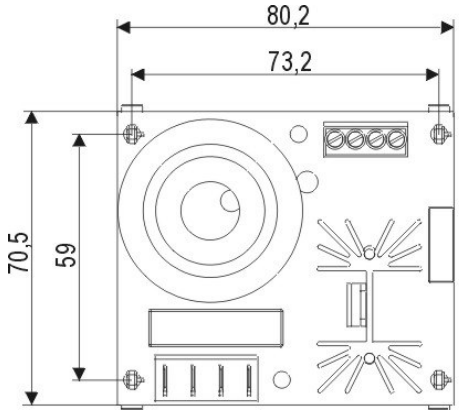
The **LW30 KIT** is the complete kit with MOLEX + 3 mt wires already connected and the STELVIO terminals.

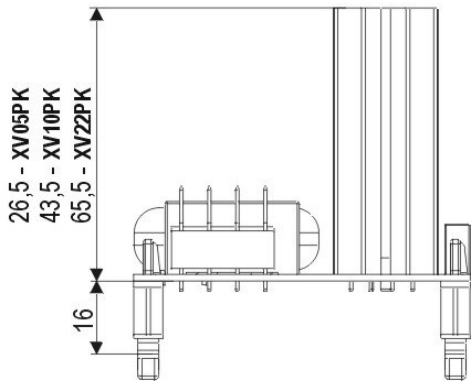
Check the connecitons and the line voltage before turning on the power supply.
Keep low voltage cables far from power cables and terminals to prevent.
Respect the maximum load current of each relay output, in case of power loads use filtered contactors.

39. ACCESSORIES

Monophase fan control: 230vac and cut phase control

Models	XV05PK	XV10PK	XV22PK
Power	500W	1000W	2200W
Ampere	2A	4A	9.5A
Scheme	1	1	1





Power supply			
230Vac	Input		
0 - 230Vac	output		
-10 - 65°C	Operating temperature		
Naylon supports			
D	15mm		
Height			
Model	**XV05PK**	**XV10PK**	**XW22PK**
Y	25mm	42mm	64mm
Connections			
A 1(+), 2(-)	**PWM** input control		
B 3(+), 4(-)	**PWM** output repetition signal		
F	Phase		
N	Neutral		
5 - 6	Fan output		
Terminals 3 and 4 allows to connect another board in parallel to control two separate fans with the same input control.			
Terminals 1 / 2 / 3 / 4 are for screw for a 2.5mm wire			
Terminals 5 / 6 / F / N are 6,3mm faston			

Transformer

The standard power supply is 12 volt AC/DC or 24 volt AC/DC (optional)
Trasnformer models: **230/12 Vac** , **230 /24 Vac**, **110 / 12 Vac, 24 / 12 Vac**

40. TECHNICAL DATA

Ichill 290D / Ichill 291D
Housing: self extinguishing ABS.
Case: 10 DIN
Mounting: 10 DIN rail
Index of protection: IP20
Keyboard frontal protection: IP65 with gasket

Display:
Top Display 3 digits with d.p.
Bottom Display 4 digits with d.p.
Connections: Removable screw terminal block 2,5mm2.
Power supply:
12Vac/dc,-10%÷+15% or
24 Vac/dc±10%. 50/60 Hz
Power absorption: 10VA max
Probes: 6 temperature probes (NTC/PTC) + 4 temperature or pressure probes (NTC/PTC/4 ÷ 20ma / 0 ÷ 5Volt)
Digital inputs: 18 (free voltage)
Relay outputs: 10 (IC290D/L) or 14 (IC291D/L): SPDT 5(2) A, 250Vac.
Data storing: on the non-volatile memory (EEPROM)
Operating temperature: -10÷55 °C
Storage temperature: -30÷85 °C
Relative humidity: 20 ÷ 85% (no condensing)
Measuring range:
Temperature measured by NTC probe: - 50÷110 °C (-58 ÷ 230 °F)
Temperature measured by PTC probe: -50÷150 °C (-58÷302 °F)
Pressure: 0÷ 50 bar (0÷725 psi)
Resolution: 0,1 °C or 1 °F (selectable)
Accuracy of the controller at 25°C: ±0,7 °C ±1 digit

dixell S.r.l.
32010 Pieve d'Alpago (BL) ITALY - Z.I. Via dell'Industria, 27
Tel +39.0437.9833 - Fax +39.0437.989313
www.dixell.com - dixell@dixell.com
EMERSON Climate Technologies