dIXƎLL®

iCHiLL

Quick reference guide

IChill 290D/291D
(Firmware rel. 1.8)

Index

1. General Advice

1.1 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.

1.2 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 s.r.l." with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (seeTechnical 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.

⚠ Full Manual

Dixell S.r.l. reserve to itself the right to modify this instruction manual without any warning.

Last available can be downloaded from he internet site. dixell@dixell.com

2. General Features

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

Additional features :
- Heat pump with gas reversibility

2.1 Main Function

Chiller management:
- One circuit up to 4 compressors
- Two circuits with different compressor number per circuit
- Double circuit up to 6 compressors
- Screw compressors

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

Compressor Soft start:
- With step valve
- Automatic start-unloading (without load).
- External by-pass gas valve.

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

Thermoregulation of the compressors
- Time running hours
- Number of start-up per hour

Cooling liquid injection
- With dedicated PTC probe

High temperature alarm of the compressor discharge side
- With dedicated PTC probe

Complete management of two pump groups of the water side
- 2 pumps evaporator side
- 2 pumps condenser side

Other display readings
- Safety digital inputs
- Compressors running hours
- Number of compressor start-up
- Pump running hours
- Delay counting to the next defrost
- Proportional output percentage status
- Compressors discharge temperature

Alarm reset with custom password
- Alarm list
- Compressor thermal protection alarm

Single circuit stand-by
- Circuit maintenance
- To work with only one circuit

Single compressor stand-by
- Compressor maintenance
- Compressor malfunction

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
- Two configurable relay outputs not depending from the control algorithm can be managed through NTC, PTC or pressure probes.

Weekly Energy saving
- Three different time bands per day (only with RTC onboard)
- From digital input

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

Dynamic setpoint:
- Determined by analogue NTC input or 4÷20mA current input.

Change over :
- Automatic chiller or heat pump functioning depending from NTC analogue input.

Remote OFF:
- From configurable digital input.

Remote change over:
- From configurable digital input.

Hot start :
- Air / air unit

Defrost management:
- Combined control with temperature and pressure
- Forced defrost with low temperature of external air
- From configurable digital input
- Manual from keyboard

Boiler:
- For electrical integration heating or anti-freeze heaters

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 in free cooling or recovery
- To control an external relay

Complete alarm management
- Internal Data logger up to 100 events

Supervisor / monitoring
- TTL output for XJ485 interface (Mod #Bus protocol) for XWEB300 / XWEB3000 Dixell monitoring system for local and remote control

3. IC290D/291D Table of the 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 through parameter
- opt = optional
- ● = default

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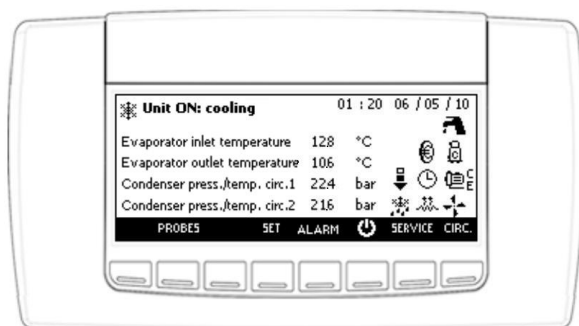
In the main visualization it is possible to read:
- status of the unit: cooling, heating, remote OFF or STD-BY
- date and time, available if the Ichill is provided by internal clock
- 4 probes value; it is possible to manage 4 lines to visualize the probe temperature / pressure (parameters dP06..dP09)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

4.1 Keyboard configuration

[icon]	Keyboard configuration

It is possible to set:
- o contrast and backlight (it is strongly recommended to reduce as possible the activation time of the backlight)
- o language selection
- o read information about:
  - o Ichill firmware release (to verify the compatibility Ichill ←→ Visograph keyboard)
  - o Visograph keyboard firmware release
  - o Visograph keyboard bin release
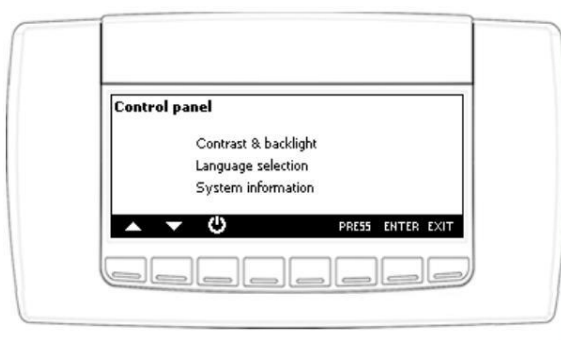
How to modify the configuration:
- o press ▲ or ▼ to select the configuration to change
- o press SET
- o press ▲ or ▼ to change the configuration
- o press SET to confirm
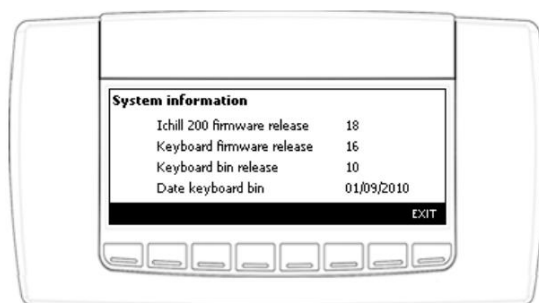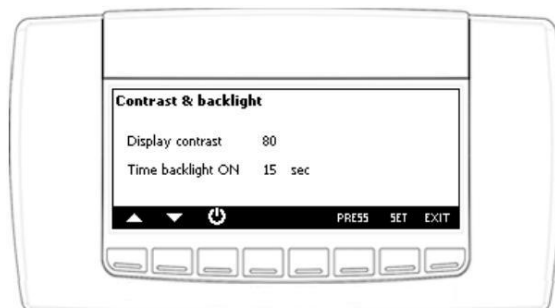
4.2 Chiller / Heat pump selection

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
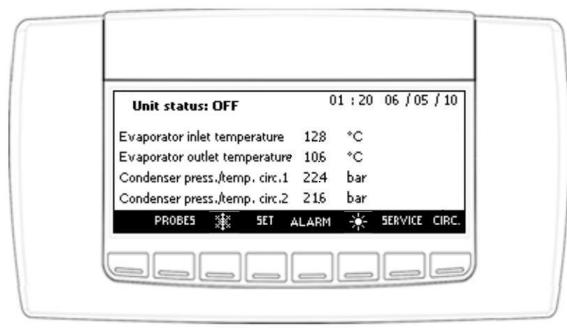
When the Ichill is ON, press [⏻] to put the machine in STD-BY.
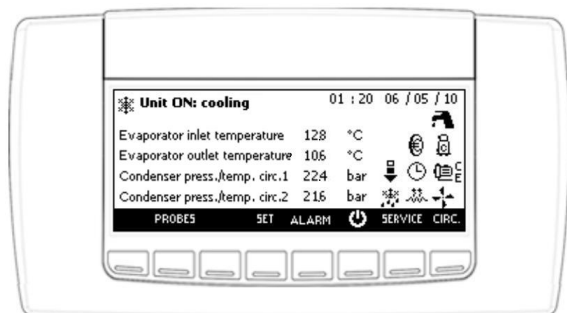
4.3 Visualization / modification of the set point configuration

SET	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
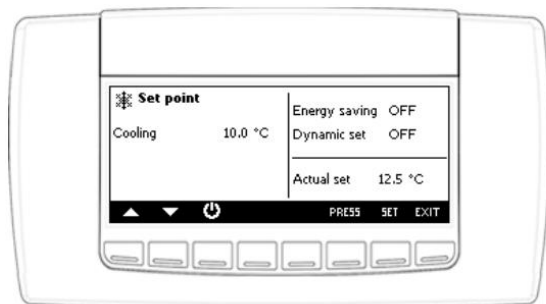
4.4 Alarm visualization and reset

ALARM	Alarm visualization and reset

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

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

Manual reset procedure:
- o press ▲ or ▼ to select the alarm;
- o press RESET to reset the alarm

In case of compressor overload alarm when the password is requested, follow this step:
- o press ▲ o ▼ to select the compressor overload alarm
- o press RESET
- o press SET
- o press ▲ or ▼ to insert the password value (parameter AL46)
- o press SET to confirm the operation
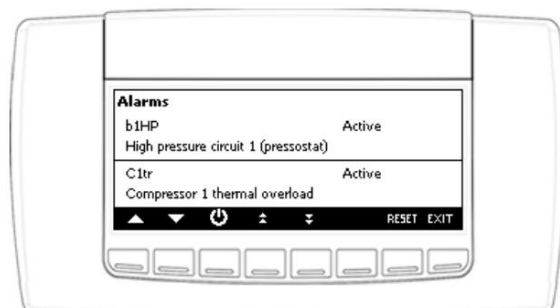
4.5 Menu SERVICE

SERVICE	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**.**
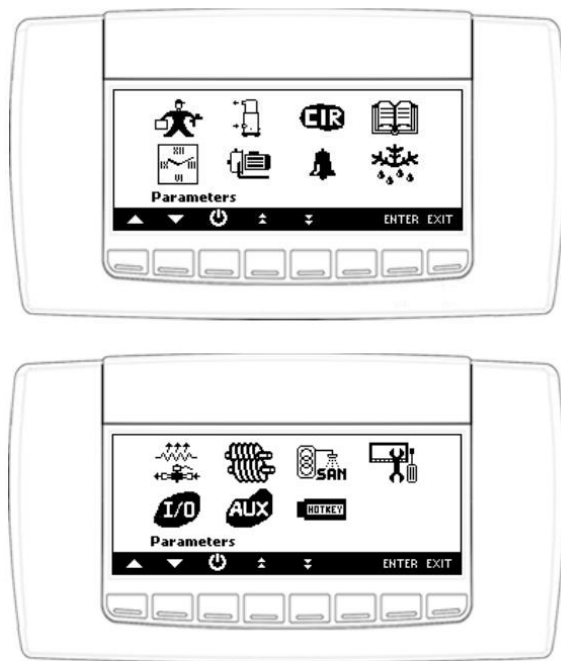
4.6 Parameters programming

	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
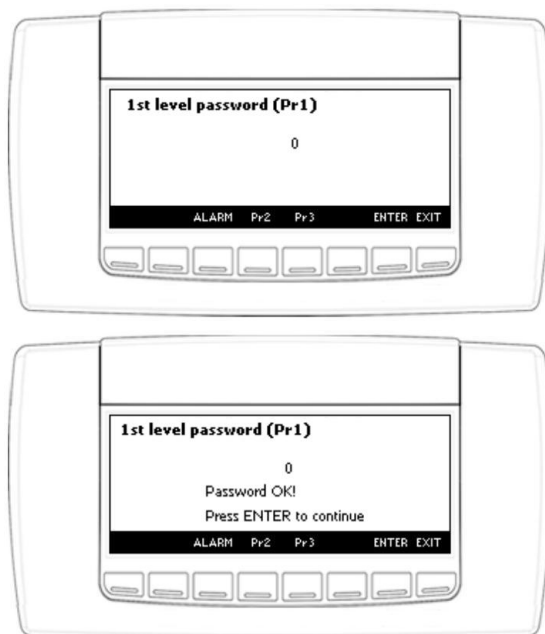
Pressing △ or ▽ it is possible to select the group of parameters to modify, then press ENTER.
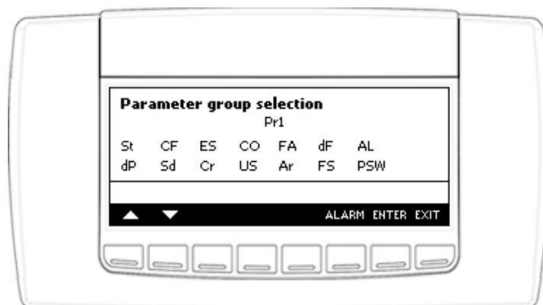
How to modify the value of the parameter:

- press △ or ▽ to select the parameter to modify
- press ENTER
- press △ or ▽ to modify the value

- press ENTER to confirm
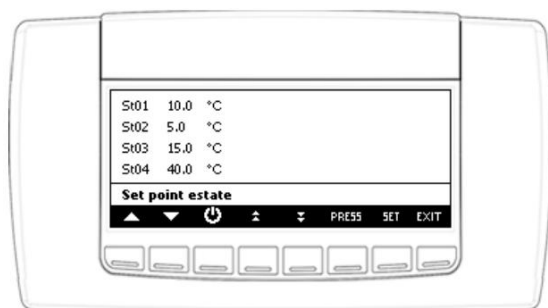
Press ↕ or ↕ to scroll the parameters.

4.7 Clock programming and Energy saving / ON_OFF scheduling visualization

XII	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
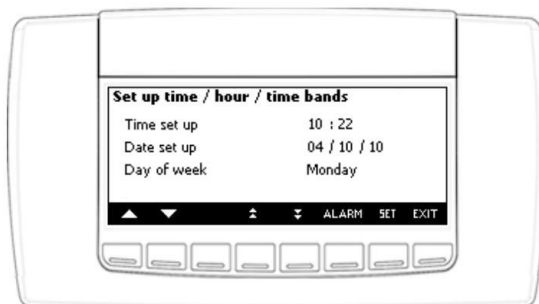
Pressing ⬆ or ⬇ it is possible to read the information about the Energy saving and ON/OFF scheduling.

To modify the hour of the time band and to enable the function is necessary to enter the parameter programming (ES parameters).
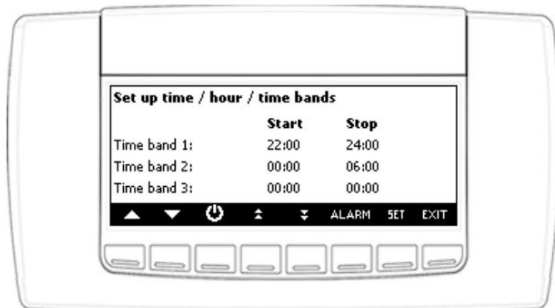
4.8 Parameters programming with Hot Key 64

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
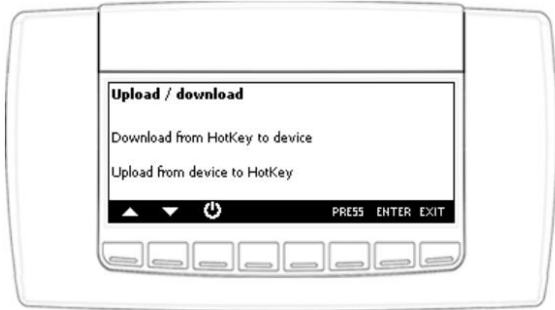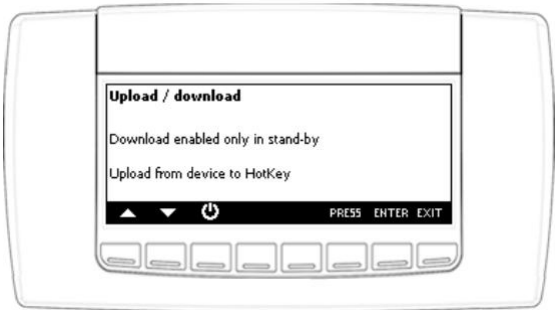
5. Table Of The Output Status In Alarm Condition

The alarm codes are made of letters and numbers to define the different typologies:.

5.1 ALARM

Alarm Code	Alarm description	Compressor	Anti freeze heaters Boiler	Support heaters	Evaporator Pump / Supply fan	Condenser fan Cir1 / Cir2	Auxiliary relay
AP1 AP10	Probe PB1..Pb10 alarm	Yes (6)	Yes (1)	Yes			
ALti	Low air temperature of the evaporator inlet (air / air unit) Alarm						
AEFL	Evaporator flow alarm	Yes	Yes (boiler)		Yes evaporator water pump (3)	Yes	
ACFL	Condenser flow alarm	Yes			Yes condenser water pump (3)	Yes	
AHFL	Sanitary water flow switch alarm	Yes (6)			Yes sanitary water pump (3)		
APFL	Solar panel flow switch alarm	Yes (6)			Yes solar panel water pump (3)	Yes	
AtSF	Supply fan overload alarm	Yes		Yes	Yes supplay fan	Yes	
AEUn	Unloading signalling from evaporator						
AtE1	Evaporator 1 water pump	Yes (4)	Yes (boiler) (5)		Yes evapor	Yes	

	overload alarm				ator water pump 1		
AtE2	Evaporator 2 water pump overload alarm	Yes **(4)**	Yes (boiler) **(5)**		Yes evaporator water pump 2	Yes	
AtC1	Condenser 1 water pump overload alarm	Yes **(4)**			Yes condenser water pump 1	Yes	
AtC2	Condenser 2 water pump overload alarm	Yes **(4)**			Yes condenser water pump 2	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						
Atr1	Remote keyboard n° 1 alarm						
Atr2	Remote keyboard n° 2 alarm						
ArtF	Clock failure						
ALOC	Generic alarm	Yes			Yes	Yes	Yes
AEE	Eeprom alarm	Yes			Yes	Yes	Yes
ACF1 ACF1 2	Configuration alarm	Yes			Yes	Yes	Yes
ArtF	Faulty clock						
ArtC	Clock error						

Alarm Code	Alarm description						
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					

(1) = if probe configured as anti-freeze / boiler control and Ar10 = 0
(2) = if probe configured as auxiliary relay control
(3) = manual alarm procedure
(4) = compressors switched off when only 1 water pump is configured or both water pumps are in alarm
(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) = If the faulty probe is the regulation probe or circuit probe (condenser probe, suction probe)

5.2   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*)IP	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

5.3   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*) maintenane		

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

6. Wiring Connections

6.1   Hardware Resources: IC290D / 291D

10 relays IC290D / 14relays IC291
(MAX current on the relay contacts 5(2)A 250V; MAX current in the common line of the relays 12A 250V)
18 digital inputs (free voltage)
10 analogue inputs: configurable (6 NTC or PTC, 4 NTC or pressure transducer 4÷20mA or ratiometric 0÷ 5.0 Volt)
2   PWM output (to manage the condenser fan)
6   0..10V output
1 output for remote keyboard (max 2 remote panels)
1 TTL output to connect an "Hot Key 64" (parametrs programming)
1 RS 485 output
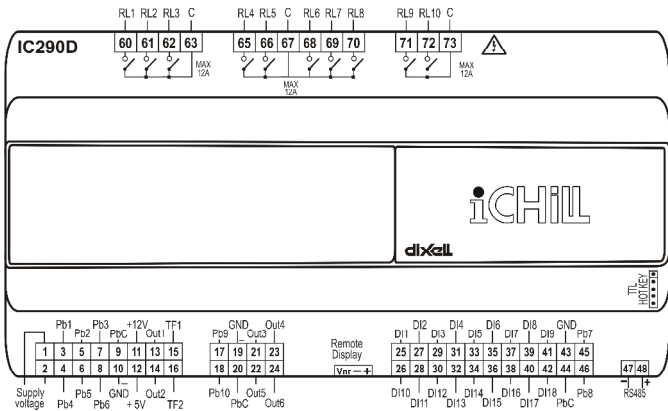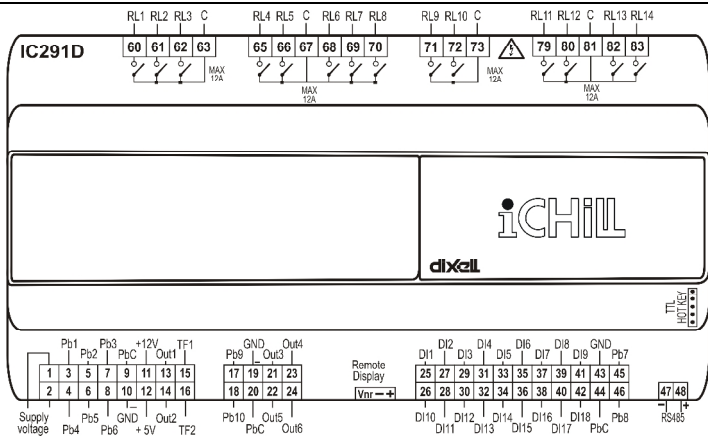
6.2   Ichill 290/291D dimensions
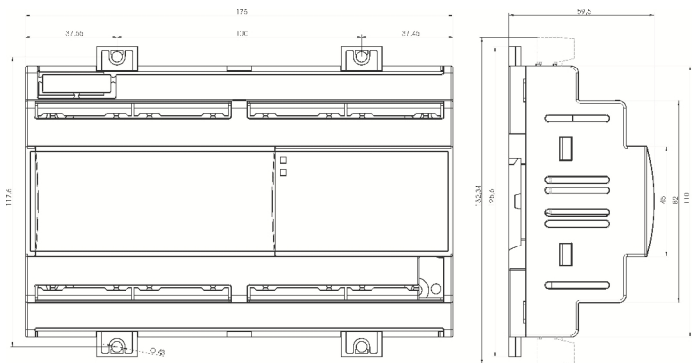
All the measures are expressed in mm.

6.3   Keyboard VGI690 panel cut out
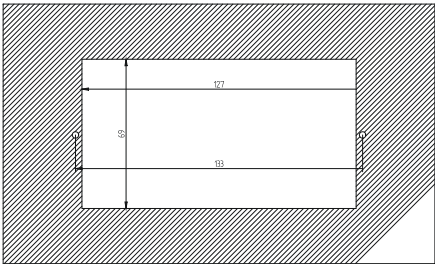
7. Electrical Connections

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 the cable **CABC3J15**.
- 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, such as analogue/digital inputs/outputs and probes, away from power cables and terminals.

Respect the maximum load current of each relay output, in case of power loads use filtered contactors.

8. Probe and relay configuration

8.1 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 25 the display configuration can be selected from **o 1** to **c67** that allows to set an analogue input as digital input (see polarity of the digital input/outputs).

8.2 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 30 the display read-out goes from "**o 1"** to "**c67** that allows to set an analogue input as digital input (see polarity input of digital inputs).

8.3   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

8.4 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. Recovery valve circuit 1
21. Recovery valve circuit 2
22. Free cooling ON/OFF valve
23. Auxiliary output circuit 1
24. Auxiliary output circuit 2
25. Solenoid valve Intermittent for screw compressor 1
26. Solenoid valve Intermittent for screw compressor 2
27. Solenoid valve of the liquid injection for compressor 1
28. Solenoid valve of the liquid injection for compressor 2
29. Sanitary valve 1
30. Sanitary valve 2
31. Sanitary heater 1
32. Sanitary heater 2
33. Sanitary heater 3
34. Solar panel water pump
35. Solar panel valve
36. Sanitary water pump
37. Hybrid exchanger 1
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

8.5 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)

8.6 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 read-out number 4 the display goes from the label "**o 1**" to "**c38** (see input/output polarity), that allow to configure the output as digital output to control an external relay.

9. Table Of The Parameters

MENU SELECTION

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	1	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 c67		
CF 9	PB2 Configuration If configured as digital input	0 o 1	28 c67		
CF 10	PB3 Configuration If configured as digital input	0 o 1	33 c67		
CF 11	PB4 Configuration If configured as digital input	0 o 1	33 c67		
CF 12	PB5 Configuration If configured as digital input	0 o 1	33 c67		
CF 13	PB6 Configuration If configured as digital input	0 o 1	33 c67		
CF 14	PB7 Configuration If configured as digital input	0 o 1	28 c67		
CF 15	PB8 Configuration If configured as digital input	0 o 1	28 c67		
CF 16	PB9 Configuration If configured as digital input	0 o 1	28 c67		
CF 17	PB10 Configuration If configured as digital input	0 o 1	28 c67		
Probe Offset					
CF 18	PB1 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 19	PB2 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 20	PB3 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int

CF 21	PB4 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 22	PB5 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 23	PB6 Offset	-12.0 -21 -5.0 -72	12.0 21 5.0 72	°C °F bar psi	Dec int dec int
CF 24	PB7 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 25	PB8 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 26	PB9 Offset	-12.0 -21	12.0 21	°C °F	Dec int
CF 27	PB10 Offset	-12.0 -21	12.0 21	°C °F	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	c67		
CF 37	Configuration of ID2	0	c67		
CF 38	Configuration of ID3	0	c67		
CF 39	Configuration of ID4	0	c67		
CF 40	Configuration of ID5	0	c67		
CF 41	Configuration of ID6	0	c67		
CF 42	Configuration of ID7	0	c67		
CF 43	Configuration of ID8	0	c67		
CF 44	Configuration of ID9	0	c67		
CF 45	Configuration of ID10	0	c67		
CF 46	Configuration of ID11	0	c67		
CF 47	Configuration of ID12	0	c67		
CF 48	Configuration of ID13	0	c67		
CF 49	Configuration of ID14	0	c67		
CF 50	Configuration of ID15	0	c67		
CF 51	Configuration of ID16	0	c67		
CF 52	Configuration of ID17	0	c67		
CF 53	Configuration of ID18	0	c67		
Relay Outputs					
CF 54	Configuration of RL1	0 -o1	c68		

CF 55	Configuration of RL2	0 -o1	c68		
CF 56	Configuration of RL3	0 -o1	c68		
CF 57	Configuration of RL4	0 -o1	c68		
CF 58	Configuration of RL5	0 -o1	c68		
CF 59	Configuration of RL6	0 -o1	c68		
CF 60	Configuration of RL7	0 -o1	c68		
CF 61	Configuration of RL8	0 -o1	c68		
CF 62	Configuration of RL9	0 -o1	c68		
CF 63	Configuration of RL10	0 -o1	c68		
CF 64	Configuration of RL11	0 -o1	c68		
CF 65	Configuration of RL12	0 -o1	c68		
CF 66	Configuration of RL13	0 -o1	c68		
CF 67	Configuration of RL14	0 -o1	c68		
	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 C38		
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 C38		
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 C38		

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 C38		
	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 -21	12.0 21	°C °F	Dec int
CF 77	Offset of the probe of the remote terminal 2	-12.0 -21	12.0 21	°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

		-30	70.0	°C	Dec
Sd 22	Winter outside temperature relay AUX1	-22	158	°F	int
Sd 23		-30.0	30.0	°C	Dec
	Summer temperature differential relay AUX1	-54	54	°F	int
Sd 24		-30.0	30.0	°C	Dec
	Winter temperature differential relay AUX1	-54	54	°F	int
Sd 25		-30.0	30.0	°C	Dec
	Dynamic set point: summer offset relay AUX2	-54	54	°F	int
Sd 26		-30.0	30.0	°C	Dec
	Dynamic set point: winter offset relay AUX2	-54	54	°F	int
Sd 27		-30	70.0	°C	Dec
	Summer outside temperature relay AUX2	-22	158	°F	int
Sd 28		-30	70.0	°C	Dec
	Winter outside temperature relay AUX2	-22	158	°F	int
Sd 29		-30.0	30.0	°C	Dec
	Summer temperature differential relay AUX2	-54	54	°F	int
Sd 30		-30.0	30.0	°C	Dec
	Winter temperature differential relay AUX2	-54	54	°F	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	1	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 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).	1	250	10 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.	1	250	Min	
CO 49	Number of steps for circuit with active unloading 1= 1st step 2= 2nd step 3= 3rd step	1	3		
CO 50	Minimum ON time of the capacity step after the unloading function start (only for capacity compressor)	0	250	Sec	
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	70.0 158	°C °F	Dec int
CO 56	Differential unloading compressor from low evaporator water temperature	0.1 0	25.0 45	°C °F	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 inverter controlled	0	250	sec	
CO 61	Minimum value proportional output from start up compressor	0	100	%	
CO 62	Minimum time capacity variation from start up compressor inverter controlled	0	250	sec	
CO 63	Minimum percentage continuative of work of the compressor inverter controlled before to start counting CO64 time	0	100	%	
CO 64	Maximum time continuative of work of the compressor with percentage less of CO63	0	250	Min	10 Min
CO 65	Time of forcing the compressor inverter controlled to the maximum power	0	250	sec	10sec
CO 66	Maximum time continuative of work of the compressor inverter controlled	0	999	Hr	1Hr
CO 67	Minimum value of the compressor 1 inverter controlled	0	CO68	%	
CO 68	Maximum value of the compressor 1 inverter controlled	CO67	100	%	
CO 69	Minimum value of the compressor 2 inverter controlled	0	CO70	%	
CO 70	Maximum value of the compressor 2 inverter controlled	CO69	100	%	
CO 71	Minimum time capacity variation compressor inverter controlled	1	250	sec	
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 relay 1 summer minimum set point	-30.0 -22 0.0 0	US5	°C °F Bar Psi	Dec int Dec int
US 4	Auxiliary relay 1 summer maximum set point	US5	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 5	Auxiliary relay 1 summer set point	US3	US4	°C °F Bar Psi	Dec int Dec int
US 6	Auxiliary relay 1 winter minimum set point	-30.0 -22 0.0 0	US8	°C °F Bar Psi	Dec int Dec int
US 7	Auxiliary relay 1 winter maximum set point	US8	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 8	Auxiliary relay 1 winter set point	US6	US7	°C °F Bar Psi	Dec int Dec int
US 9	Auxiliary relay 1 summer differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 10	Auxiliary relay 1 winter differential	0.1 0 0.1 1	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
	Auxiliary relay circuit 2				
US 11	Auxiliary relay 2 operating mode (See graph and auxiliary relay functions) 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 12	Analogue input configuration for auxiliary relay 2 control . Allows to select which probe value Pb1..Pb10 controls the relay	1	10		

US 13		-30.0		°C	Dec
		-22	US15	°F	int
		0.0		Bar	Dec
	Auxiliary relay 2 summer minimum set point	0		Psi	int
US 14			70.0	°C	Dec
		US15	158	°F	int
			50.0	Bar	Dec
	Auxiliary relay 2 summer maximum set point		725	Psi	int
US 15				°C	Dec
		US13	US14	°F	int
				Bar	Dec
	Auxiliary relay 2 summer set point			Psi	int
US 16		-30.0		°C	Dec
		-22	US18	°F	int
		0.0		Bar	Dec
	Auxiliary relay 2 winter minimum set point	0		Psi	int
US 17			70.0	°C	Dec
		US18	158	°F	int
			50.0	Bar	Dec
	Auxiliary relay 2 winter maximum set point		725	Psi	int
US 18				°C	Dec
		US16	US17	°F	int
				Bar	Dec
	Auxiliary relay 2 winter set point			Psi	int
US 19		0.1	25.0	°C	Dec
		0	45	°F	int
		0.1	14.0	Bar	Dec
	Auxiliary relay 2 summer differential	1	203	Psi	int
US 20		0.1	25.0	°C	Dec
		0	45	°F	int
		0.1	14.0	Bar	Dec
	Auxiliary relay 2 winter differential	1	203	Psi	int
US 21	Maximum operating time of auxiliary realys	0	250	min	
	Auxiliary proportional output n° 1				
US 22	Auxiliary proportional output n° 1 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 23	Analogue input configuration for auxiliary control 1 Allows to select which probe value Pb1..Pb10 controls output	1	10		
US 24		-30.0		°C	Dec
		-22	US26	°F	int
		0.0		Bar	Dec
	Analog output 1 summer minimum set point	0		Psi	int
US 25			70.0	°C	Dec
		US26	158	°F	int
			50.0	Bar	Dec
	Analog output 1 summer maximum set point		725	Psi	int

US 26	Analog output 1 summer set point	US24	US25	°C °F Bar Psi	Dec int Dec int
US 27	Analog output 1 winter minimum set point	-30.0 -22 0.0 0	US29	°C °F Bar Psi	Dec int Dec int
US 28	Analog output 1 winter maximum set point	US29	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 29	Analog output 1 winter set point	US27	US28	°C °F Bar Psi	Dec int Dec int
US 30	Analog output 1 summer differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 31	Analog output 1 winter differential	0.0 0 0.0 0	25.0 45 14.0 203	°C °F Bar Psi	Dec int Dec int
US 32	Analog output 1 minimum value	0	US33	%	
US 33	Analog output 1 maximum value	US32	100	%	
	Auxiliary proportional output n° 2				
US 34	Auxiliary proportional output n° 2 operating mode 0= Not enabled 1= Always available with direct action 2= Available only when the unit is on with direct action 3= Always available with reverse action 4= Available only when the unit is on with reverse action	0	4		
US 35	Analogue input configuration for auxiliary 2 control Allows to select which probe value Pb1..Pb10 controls output	1	10		
US 36	Analog output 2 summer minimum set point	-30.0 -22 0.0 0	US38	°C °F Bar Psi	Dec int Dec int
US 37	Analog output 2 summer maximum set point	US38	70.0 158 50.0 725	°C °F Bar Psi	Dec int Dec int
US 38	Analog output 2 summer set point	US36	US37	°C °F Bar Psi	Dec int Dec int
US 39	Analog output 2 winter minimum set point	-30.0 -22 0.0 0	US41	°C °F Bar Psi	Dec int Dec int

US 40		US41	70.0	°C	Dec	
			158	°F	int	
			50.0	Bar	Dec	
	Analog output 2 winter maximum set point		725	Psi	int	
US 41		US39	US40	°C	Dec	
				°F	int	
				Bar	Dec	
	Analog output 2 winter set point			Psi	int	
US 42		0.00	25.0	°C	Dec	
			45	°F	int	
		0.00	14.0	Bar	Dec	
	Analog output 2 summer differential		203	Psi	int	
US 43		0.00	25.0	°C	Dec	
			45	°F	int	
		0.00	14.0	Bar	Dec	
	Analog output 2 winter differential		203	Psi	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.	0	100	%	
FA 8	Maximum speed for condenser fan in Chiller mode. To set the maximim fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 9	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA 7 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-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.	0	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.	0	100	%	
FA 17	Maximum speed for condenser fan in Heat Pump mode. To set the maximum fan speed percentage value (30..100%), it is related to the fan power supply.	0	100	%	
FA 18	Proportional speed control FA01 = 4 Temperature or pressure limit to enable the minimum speed FA16 ON/OFF regulation FA01 = 2/3 SETpoint step n° 1	-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

		min	max	m. u.	
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.	0	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	°C °F	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	°C °F	Dec int
Ar 16	Proportional band for boiler heaters in chiller	-30.0 -22	70.0 158	°C °F	Dec int
	Boiler function in heat pump				
Ar 17	Setpoint for boiler heaters (on) in HP	-30.0 -22	70.0 158	°C °F	Dec int
Ar 18	Proportional band for boiler heaters in HP	0.1 0	25.0 45	°C °F	Dec int
Ar 19	External air setpoint to stop the compressor as integration function	-30.0 -22	70.0 158	°C °F	Dec int
Ar 20	External air differential to stop the compressor as integration function	0.1 0	25.0 45	°C °F	Dec int
	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	°C °F	Dec int
Ar 27	Differential starting water pump in antifreeze alarm	0.1 0	25.0 45	°C °F	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	°C °F 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	°C °F bar psi	Dec int Dec Int
dF 4	Minimum defrost duration.	0	250	Sec	
dF 5	Maximum defrost duration.	0	250	Min	
dF 6	Time delay between the defrost of two circuits	0	250	Min	
dF 7	OFF compressor delay before the defrost	0	250	Sec	
dF 8	OFF compressor delay after the defrost	0	250	Sec	
dF 9	Defrost interval time of the same circuit	1	99	Min	
dF 10	Temperature setpoint for combined defrost of the 1st circuit after parameter DF10 counting.	-30.0 -22	70.0 158	°C °F	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	70.0 158	°C °F	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	70.0 158	°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	250	sec	int
FS 11	Reversing cycle delay during sanitary water thermoregulation	0	250	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	FS15	FS16	°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	FS14	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	0	250	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	0.1	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	70.0	°C	Dec
		-22	158	°F	int
		0.0	50.0	bar	Dec
		0	725	psi	int
AL 4	Low pressure alarm differential from analogue input	0.1	25.0	°C	Dec
		0	45	°F	int
		0.0	14.0	bar	Dec
		0	203	psi	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	70.0	°C	Dec
		-22	158	°F	int
		0.0	50.0	bar	Dec
		0	725	psi	int
AL 10	High temperature/pressure alarm differential from analogue input	0.1	25.0	°C	Dec
		0	45	°F	int
		0.0	14.0	bar	Dec
		0	203	psi	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	AL26	°C °F	Dec int
AL 25	Maximum antifreeze setpoint in chiller (from AL24 to 70 °C)	AL26	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	AL33	°C °F	Dec int
AL 32	Setpoint of the maximum limit in heat pump (va da AL31 a 70 °C)	AL33	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	
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	70.0 158	°C °F	Dec int
AL 62	Differential higt water temperature	0.1 0	25.0 45	°C °F	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	

10. Technical Data

Ichill 290D / Ichill 291D
Housing: self extinguishing ABS
Case: 10 DIN
Mounting: 10 DIN rail
Index of protection: IP20 IC290D / 291D; IP40 keyboard VGI890
Keyboard frontal protection: IP65 with gasket
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 (IC260D/L) or 14 (IC261D/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