GreenCom by PowerTech

INSTALLATION AND USER MANUAL

GCB SERIES A-C

GCB SERIES H A-C

1. INTRODUCTION

Thank you for buying a product manufactured by POWERTECH MANUFACTURER. This product, has been manufactured according to the European Quality Standards, incorporates prime grade materials and its correct working has been tested before it leaves our facilities.

Through this Installation and User Manual, you will be guide towards the correct and safety installation of the product. It is necessary to carefully read this manual before make any handling to avoid problems arising from the misuse of the product.

The company POWERTECH MANUFACTURER reserves the right to modify the information included in this document at any time without prior notice.

2. GENERAL INDICATIONS

1. Safety notes

- The incorrect or inappropriate use of this product could lead to hazardous situations, causing damage or injuries to the user, third parties or even to the product itself or material goods.
- The installer has the responsibility to install the minimum safety devices (hydraulic and electrical) set out in this Manual. In case of failure, the lack of any device may cause burns or other injuries.
- The installer has the responsibility to inform the user about the function and placement of the safety devices installed into the device and the installation.
- The water outlet temperature could reach 65 degrees (depending on the model). Do not touch the pipes while the system is working to avoid any risk of burns.
- Do not use not approved anticorrosive materials in the water circuit. It may cause damage to the components.
- The system has to be charged with R134A or R407C coolant (depending on model). These coolants should not be released to the atmosphere. It is responsibility of the installer to check the tightness of the installation before making the gas charge.

2. Installer's qualification

Since the installation of the Heating Thermodynamic Module involves handling coolant as well as carry out welding work, it is needed the technical staff have the official certification that accredits them as authorized to handle coolants.

The installer must explain the user the application of the product and the use and management of the unit, and he should provide the user all the documentation supplied with the equipment.

3. Package contents

The GCB system comprises the following components:

- Thermodynamic panels which number depend on the model
- Liquid distributors
- Anchoring elements
- Silent blocks
- Heating Module
- User Manual

4. Indications about transport and unpacking the unit

The GCB is supplied packed into a wooden pallet properly secured to prevent damage during transport.

The material that POWERTECH MANUFACTURER uses to the packing are recyclables, so dispose it in an appropriate container.

Use a forklift or hand pallet truck to transport the unit to the installation site, always introducing the forks into the bottom of the pallet being careful not to damage the unit.

In case you identify any damage at the time of the reception of the unit, it is mandatory to register it in the reception note of the transport company, and then, submit the complaint.

For this reason, it is recommended to make a thorough visual inspection of the goods before signing the reception note.

3. TECHNICAL INFORMATION

The GCB series is divided into two lines according to the outlet water temperature that the system could achieve:

- GCB Standard Series: It is suitable for medium and low temperature applications. Hot water production up to 55 degrees.
- GCB-H High Temperature Series: It is suitable for high temperature applications. Hot water production up to 65 degrees.

Both series are manufactured with high quality and maximum reliability materials:

- Stainless steel 316L plate heat exchanger
- High efficiency Scroll compressor
- Electronic expansion valve
- Liquid receiver
- Filter drier
- Oil separator
- High and low pressure switch
- Safety compressor thermostat

- Electric switchboard with overcurrent and short circuit protections.

- Flow switch
- Temperature sensors placed at inlet and outlet water pipe.
- Steel lacquered casing

Below are indicated the technical data of both series:

Standard models	GCB 6	GCB 8	GCB 12	GCB 16	GCB 20	GCB 24	GCB 28	GCB 36
Heating capacity range (1), W	11.450 - 7.420	14.100 - 9.280	17.000 - 11.310	21.710 - 14.310	26.350 - 17.430	36.630 - 23.770	44.440 - 29.050	52.790 - 34.550
Input power range (1), W	1.980 - 1.820	2.630 - 2.550	3.010 - 3.000	3.540 - 3.530	4.130 - 4.070	5.700 - 5.680	6.950 - 6.910	8.200 - 8.080
Heating capacity range (2), W	10.000 - 6.810	12.850 - 9.150	15.500 - 11.150	18.940 - 13.420	22.730 - 15.970	31.150 - 21.770	37.900 - 26.540	44.570 - 31.400
Input power range (2), W	2.830 - 2.640	3.760 - 3.650	4.460 - 4.420	5.630 - 5.690	6.620 - 6.610	8.730 - 8.600	10.500 - 10.220	12.820 - 12.570
Maximum water temperature. °C	55							
Refrigerant	R407c							
Power supply	230 / 1 / 50				380 / 3 / 50			
Number of panels	6	8	12	16	20	24	28	36

High temperature models	GCB 6-H	GCB 8-H	GCB 12-H	GCB 16-H	GCB 24-H	CGB 28-H	CGB 36-H
Heating capacity range (1), W	9.810 - 6.340	11.350 - 7.300	14.050 - 9.010	20.900 - 13.150	28.000 - 18.050	35.700 - 22.900	43.800 - 27.800
Input power range (1), W	1.740 - 1.630	1.930 - 1.820	2.460 - 2.260	3.960 - 3.550	4.890 - 4.430	6.270 - 5.630	7.610 - 6.880
Heating capacity range (2), W	8.530 - 5.710	9.830 - 6.620	12.250 - 8.220	17.900 - 11.800	24.400 - 16.200	30.800 - 20.300	37.500 - 24.500
Input power range (2), W	2.640 - 8.530	2.980 - 2.750	3.740 - 3.430	5.620 - 4.940	7.310 - 6.510	9.210 - 8.030	11.150 - 9.580
Maximum water temperature. °C	65						
Refrigerant	R134a						
Power supply	230 / 1 / 50			380 /3 /50			
Numer of panels	6	8	12	16	24	28	36

4. INSTALLATION STEPS

Before starting the installation, check the availability of all the necessary components and tools:

- High and low pressure manometers
- Vacuum pump
- Scales
- Coolant bottle (R134A o R407C depending on the model)
- Nitrogen bottle
- Refrigerant quality copper pipe
- Pipe-cutter
- Tube bender
- Pipe expander
- Welder
- Copper Rods (40% Siver)
- Insulating hose
- Drill
- Screwdriver
- Hydraulic installation components
- Electric installation components

Once it has been checked that it is available all the necessary components and tools, the installer should follow the next steps:

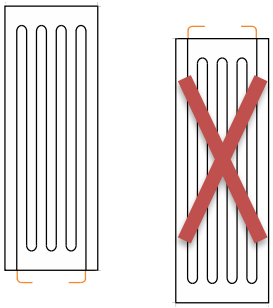
1. Placing and anchoring panels
2. Installation of the liquid distributors
3. Installation of the gas manifold
4. Joining and welding the refrigerant pipes
5. Placing the Heating Module
6. Joining and welding liquid and suction line between heating module and panels.
7. Nitrogen pressure test (maximum10 bar)
8. Vacuum
9. Pre-load coolant
10. Hydraulic installation
11. Electric installation
12. Commissioning
13. Adjustment of refrigerant load

5. THERMODYNAMIC SOLAR PANELS INSTALLATION

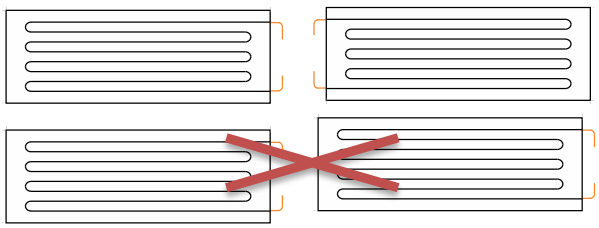
1. Site selection

The choice of the installation site of thermodynamic panels is a key factor in the final performance of the heating module. For this reason, we recommend to follow the indications in order to achieve the best performance:

- South orientation is indeed the best to take the maximum advantage of solar radiation. Panels may also have other orientations, but northerly orientation is the worst to receive solar radiation.
- Inclination: The minimum inclination of the panel is 15 ° in order to ensure the correct evaporation of the coolant. It is recommended to install the panel with an inclination between 45° and 90 °.
- Orientation: It is possible to install the panel both in vertical or horizontal position



When the panel is installed in vertical position, always the inlet and outlet connection has been at the bottom. (It is not allow to install the reverse)



If the panel is installed at horizontal position, it is recommended to install pair of panels confronted for having less piping towards the distributor.

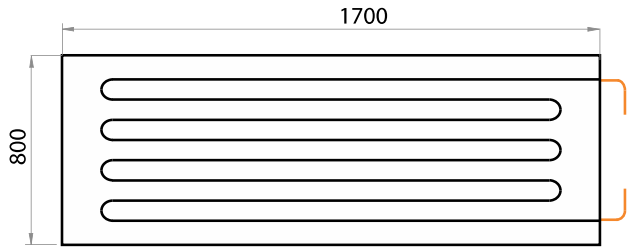
IMPORTANT: If the panel is installed at horizontal position, refrigerant inlet pipe should be connected into the bottom connection

Distances to heating module:

- The maximum allowed distance from the farthest panel to the heating module is 15 meters.
- It is recommended not to exceed 20 meters of total length from the heating module to the panels.

- Gap between panels: A minimum distance of 50 cm between panels should be kept in order to have enough space to fit the pipes and collectors.

In the picture below is shown the dimensions of the panel:



2. Anchoring panels

Besides the panels a bag is supplied with anchoring elements which contains the following parts:

- 6 x Aluminium support (L shape)
- 6 x Screws M5
- 12 x Nuts M5
- 18 x Washer 5
- 18 x Sheet Metal Screws
- 18 x Blocks M6

Anchor the panels using the lateral and front holes to the suitable surface.

c. Liquid distributor connections

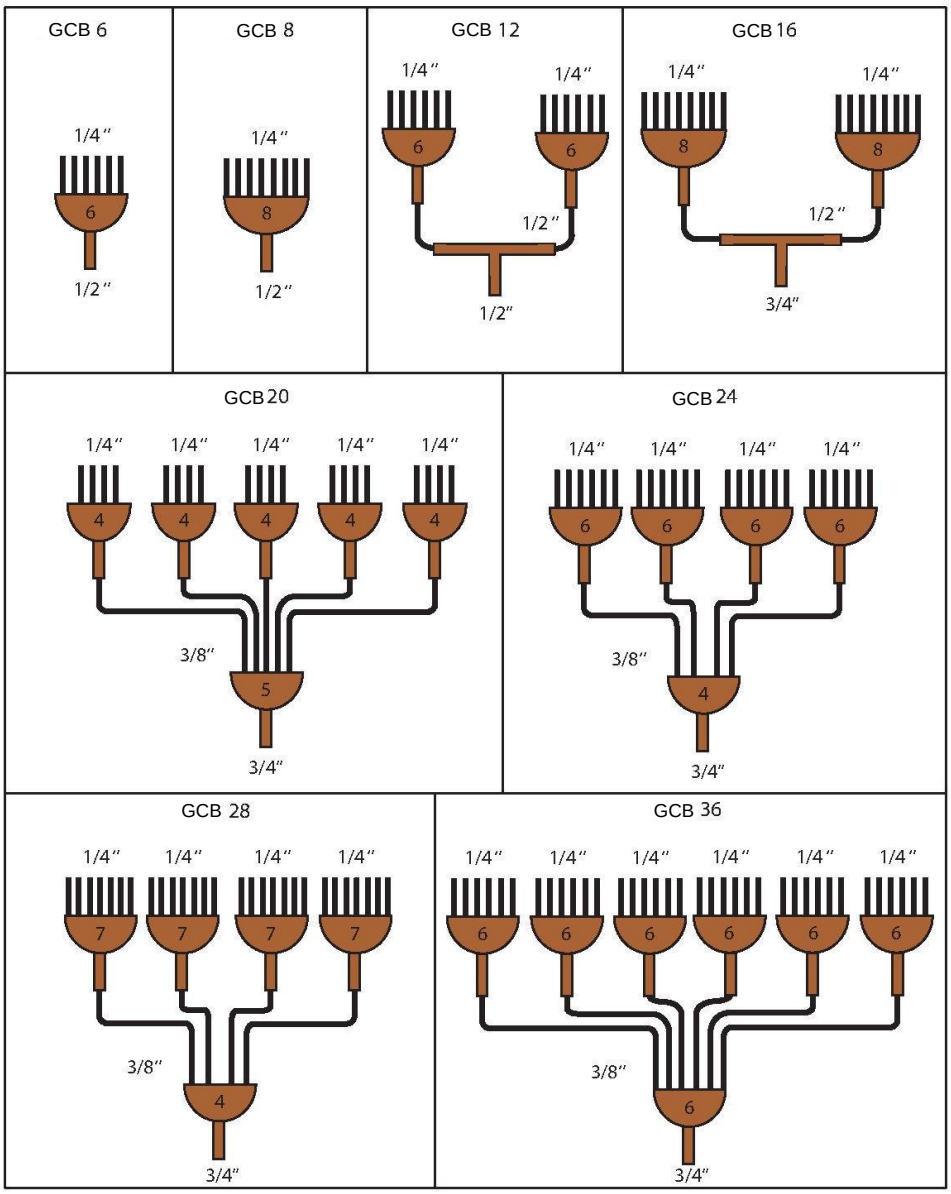
IMPORTANT: It is recommended to weld pipelines by oxyacetylene welding.

Welding is a critical step in the installation and to do it well ensures that the system will run properly along its useful life.

Only expert staff should make this step by using proper tools and high quality materials.

Once panels are anchored, the next step consists on the installation of the liquid distributor. Its function is to ensure the homogeneous refrigerant flow in the whole panel installation.

According to the model, the distributor scheme is different. Possible distributor scheme is shown in the next picture:

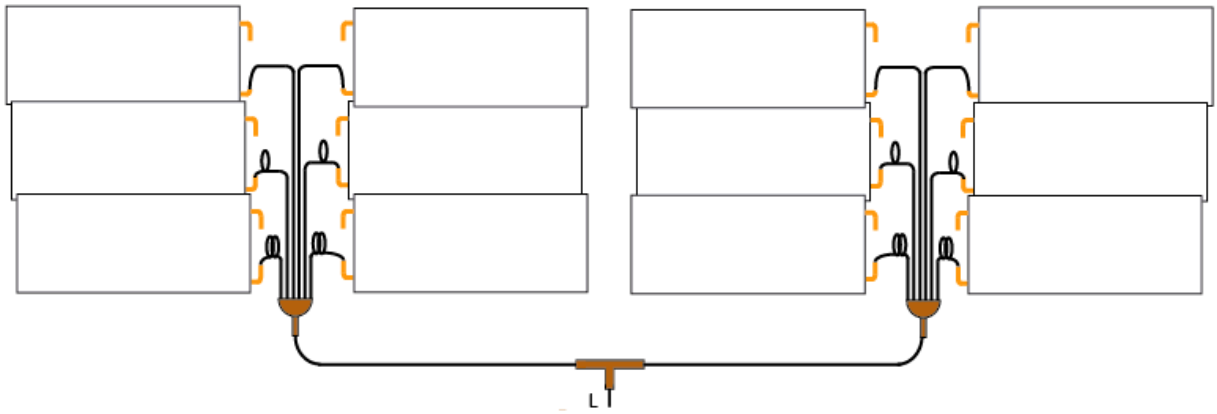


Install the distributor vertically, face upwards according to the picture.

IMPORTANT: To ensure the same flow of refrigerant in every panel and consequently take advantage of the evaporation surface entirely; you should install the same tube length from the distributor to every panel. If a pipe is too long for the length require, it must be rolled up.

Panels are supplied with two nuts at the inlet and outlet connection. The inlet to each panel is ¼ inch diameter. The installer has to insert the nut into the copper pipe, flare the pipe and then use the nut to fit it.

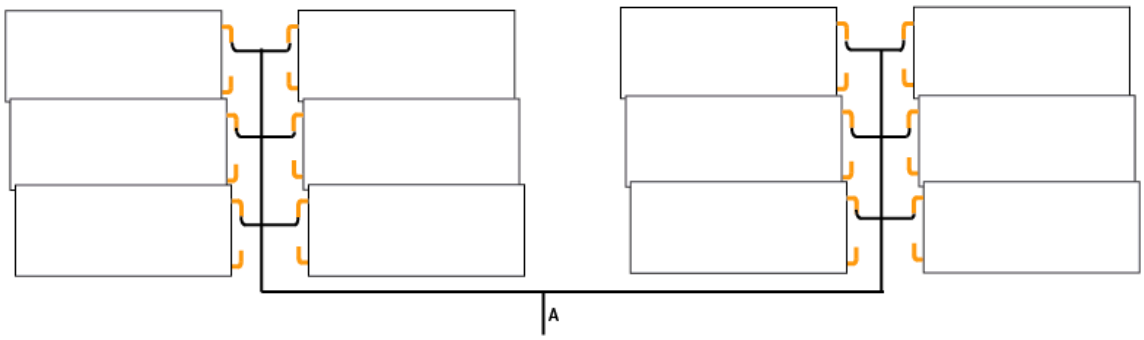
Repeat the procedure with the outlet connection using 3/8 inch copper pipe.



L: Liquid line

3. Collector

Join every panel outlet to a secondary collector in a simple way. All the secondary collectors will be joined to the main suction line.



A: Main suction line

4. Pipe connections

5.

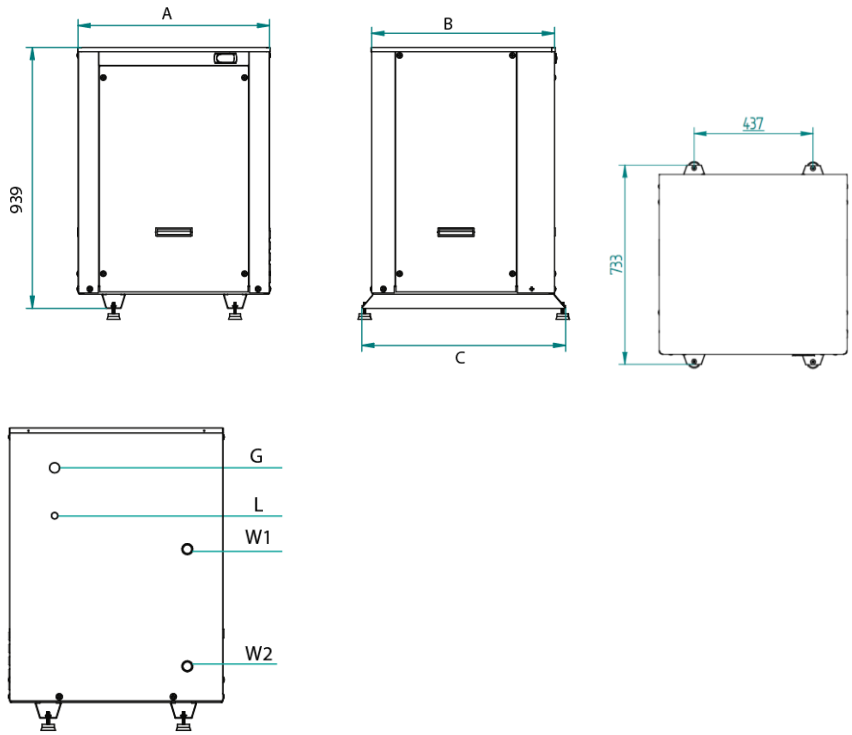
Once the panel scheme is made, proceed to join the liquid and suction line.

Refrigerant quality copper pipe is used to make the connection, with a diameter specified in the following table:

Models	Suction Line	Liquid Line
GCB 6- GCB 6-H	3/4"	1/2"
GCB 8- GCB 8-H	3/4"	1/2"
GCB 12- GCB 6-H	7/8"	1/2"
GCB 16- GCB 16-H	7/8"	3/4"
GCB 20	7/8"	3/4"
CGB 24- GCB 24-H	1 1/8"	3/4"
GCB 28- CGB 24-H	1 1/8"	3/4"
GCB 36- GCB 36-H	1 1/8"	3/4"

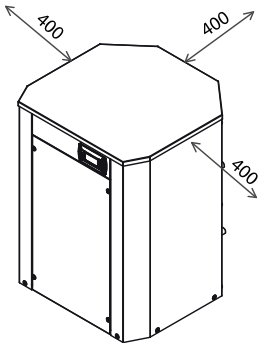
6. PLACING HEATING MODULE

Firstly check the dimension of the heating module and the connections disposition:



Models	A mm	B mm	C mm	W1 Water Outlet	W2 Water inlet	G	L	E Electric connection
CGB 6	690	658	734	1”		3/4”	1/2”	2/ 4 wires (3 phase version , T)
CGB 8				1”		3/4”	1/2”	
CGB 12				1”		7/8”	1/2”	
CGB 16				1 1/4”		7/8”	3/4”	2/4 wires (3 phase version , T)
CGB 20	800	800	876	1 1/4”		7/8”	3/4”	4 wires
GCB 24				1 1/4”		1 1/8”	3/4”	
CGB 28				2”		1 1/8”	3/4”	
CGB 36				2”		1 1/8”	3/4”	

The place where the module will be installed should allow an easy access to it in order to make maintenance work or inspection. It is recommended to leave at least 400 mm of free space.



Beside these factors, it is important to take into account the following indications regards the installation site:

- The system has been designed and manufactured for it indoors utilization. In case the system has to be placed outdoors, it must be protected against the adverse weather conditions (direct solar radiation, rain, snow…)
- Since the Heating Module could cause vibrations and noise, it is recommended to install it far away from bedrooms or resting places.
- Try to place the heating module as near as possible of the panels' installation, and also near to the buffer tank.
- Installer must install the supplied Silent blocks to avoid the transmission of vibration.

7. CONNECTION BETWEEN HEATING MODULE AND PANELS

CAUTION: Heating Module is preload with a 20 kg of Nitrogen to ensure its tightness during the transport. Liquid and suction connection are sealed, so before handle the module, the installer must discharge the nitrogen through the charge ports located at the high and low pressure line.

a. Check the tightness

Firstly, put the pressure gauge into the charge ports of the high pressure line and low pressure line.

Then, check that the pressure at the module is not lower that 15 bar. If the pressure has decreased, check the installation looking for leakages before continuing with the procedure.

b. Discharge Nitrogen

Discharge the nitrogen preload, opening the load ports until empty.

c. Cut the refrigerant pipes

Inlet and outlet refrigerant pipes are protected by insulating hoses. Firstly, remove the isolation and through the use of pipe cuter, cut the ends of each tube.

d. Expand tubes

Use the tube expander for expanding the inlet and outlet refrigerant pipe in order to proceed with the welding. Another option is to install a coupler between pipes.

e. Welding

Join the suction line that comes from the panels to the coolant inlet, and the liquid line to the coolant outlet. Then weld it by the oxyacetylene welding.

f. Nitrogen load

In order to check the tightness, introduce nitrogen by using the pressure gauge already installed into load ports.

CAUTION: Never exceed a nitrogen load greater than 10 bars.

Use soapy water at every welding and even in panel's connections to verify the absence of leaks.

g. Vacuum

Connect the vacuum pipe to the pressure gauge to carry out a vacuum of the whole installation. The recommended vacuum time is shown in the table below:

Models	Vacuum time
CGB 6- GCB 6-H	45 min
CGB 8-CGB 8-H	1 h
GCB 12- CGB 12-H	1h 15 min
GCB 16-GCB 16-H	1h 30 min
GCB 20-GCB 20-H	2 h
GCB 24- GCB 24-H	2 h 30 min
GCB 28-GCB 28-H	3 h
GCB 36-GCB 36-H	3 h 30 min

h. Coolant load

Depending on the model of the heating module, the installer has to fill a minimum load of refrigerant according to the following table:

Standard Models	Refrig.	Minim.Load (kg)	High temp. Models	Refrig.	Minim. Load (kg)
GCB 6	R407C	1,5	**GCB 6-H**	R134A	2,5
GCB 8		1,8	**GCB 8-H**		2,8
GCB 12		2,2	**GCB 12-H**		3,2
GCB 16		2,5	**GCB16-H**		3,5
GCB 20		2,8			
GCB 24		3,1	**GCB 24-H**		4,1
GCB 28		3,4	**GCB 28-H**		44
GCB 36		4,5	**GCB 36-H**		5,5

IMPORTANT: Refrigerant 407C, is a zeotropic mix that is composed by 3 different components. For this reason, the refrigerant has to be in liquid state at the moment of the loading to ensure the homogeneous charge of each compound.

Do the load always taking the refrigerant of the bottom of the recipient

Load the refrigerant ALWAYS WITH THE MODULE SWITCH OFF and using the load port located at the high pressure line, always in liquid state.

Once the initial load has been done, make hydraulic and electric installation.

When the heating module has been connected to the grid, switch on the grid voltage via the line circuit breaker.

DO NOT ACTIVE TH SYSTEM BY THE THERMOSTAT: The heating module must be switch off at least 10 minutes, while the crankcase heater is heating the compressor in order to avoid any risk of liquid hammer in the compressor.

After this period, switch on the heating module using the thermostat key (or the switch) and start the refrigerant load until achieve the appropriate load. For this issue, check the ambient temperature and load refrigerant until the evaporation pressure (indicated in the pressure gauge) match with the values at the table below:

Refrig.	Tem. Ext. ºC	Evapor. Pressure bar	Refrig.	Tem. Ext. ºC	Presión evap. bar
R407C	0	1,6	R134A	0	1
	5	2,15		5	1,2
	10	3		10	1,5
	15	3,6		15	2
	20	4,5		20	2.5
	25	5,4		25	3,2
	30	6,55		30	3,9

8. HIDRAULIC CONNECTION

In Annex 1 is shown two recommended hydraulic schemes.

The installer must install the following components of the hydraulic circuit:

- Circulation pump
- Ball valves
- Lined Filter Strainer (Y Type)
- Pressure reducing valve
- Expansion vessel
- Safety valve

For the selection of the circulating pump it is needed to take into account the pressure loss in pipes and accessories (pipe elbow, filter, valves).

In the following table is shown the water flow that must flow at least through the heat exchanger :

Standard models	Water flow (L/h)	Pressure loss (kPa)	High temp. models	Water flow L/h)	Pressure loss (kPa)
GCB 6	1.300	20	**GCB 6-H**	1.500	20
GCB 8	1.800	22	**GCB 8-H**	1.700	22
GCB 12	2.015	31	**GCB 12-H**	2.200	38
GCB 16	2.320	38	**GCB16-H**	3.100	22
GCB 20	3.000	20			
GCB 24	4.060	32	**GCB 24-H**	4.200	34
GCB 28	4.950	34	**GCB 28-H**	5.300	42
GCB 36	5.900	36	**GCB 36-H**	6.500	50

Temperature probe

The installer has to install the temperature probe B1 in one of the following points:

- Inside the buffer tank
- Return water pipe
- If the buffer tank has a coil, in the return water pipe of the coil

Once the hydraulic connections are made, vent the circuit to avoid the air inside the installation.

9. ELECTRICAL CONNECTION

The electric switchboard is located in the front of the module. The installer has to make the following connections:

1. Power supply:

Connect the system directly from the general control panel. The minimum wire section and the characteristics of the circuit breaker that the installer has to install are shown in the following table:

Standard Models	Power Supply	mm2	Circuit breaker	High temp. Models	Power Supply	mm2	Circuit breaker
GCB 6	230 V/ 1ph /50 Hz	4	20 A- curve D 30 A- curve C	GCB 6-H	230 V/ 1ph /50 Hz	4	20 A- curve D 30 A- curve C
GCB 8	230 V/ 1ph /50 Hz	6	25 A- curve D 35 A- curve C	GCB 8-H	230 V/ 1ph /50 Hz	6	20 A- curve D 30 A- curve C
GCB 12	230 V/ 1ph /50 Hz	6	30 A- curve D 40 A- curve C	GCB 12-H	230 V/ 1ph /50 Hz	6	25 A- curve D 35 A- curve C
GCB 16	380 V/ 3ph /50 Hz	4	15 A- curve D 25 A- curve C	GCB16-H	380 V/ 3ph /50 Hz	2,5	15 A- curve D 25 A- curve C
GCB 20	380 V/ 3ph /50 Hz	4	15 A- curve D 25 A- curve C				
GCB 24	380 V/ 3ph /50 Hz	4	20 A- curve D 30 A- curve C	GCB 24-H	380 V/ 3ph /50 Hz	4	20 A- curve D 30 A- curve C
GCB 28	380 V/ 3ph /50 Hz	4	25 A- curve D 35 A- curve C	GCB 28-H	380 V/ 3ph /50 Hz	4	25 A- curve D 35 A- curve C
GCB 36	380 V/ 3ph /50 Hz	6	30 A- curve D 40 A- curve C	GCB 36-H	380 V/ 3ph /50 Hz	6	30 A- curve D 40 A- curve C

These data are calculated based on a maximum distance of 15m. In case of higher distances contact with technical department for a new dimensioning.

2. Circulator pump

Connect the circulator pump to the heating module. The system will control automatically the operation of the pump when it is needed.

The connection is single-phase 230V/ 50 Hz. Pump must not exceed 5 A current.

In the Annex 2 and 3, are shown electric schemes. Connect the pump in the terminals 8-8.

3. Remote start/stop

There is the possibility of connecting an external switch to control the ON/ OFF of the system. It is a zero-voltage contact, that must be connected to the terminals 2-2.

If the installer does not use an external switch jumper connect the terminal blocks 2-2. In this case, the module will be switch on through the thermostat (see section 10. Commissioning).

10. COMISSIONING. CONTROLLER.Display

10.1. Meaning of the keys

This terminal, illustrated in the figure above, features six buttons, with the following meanings:

Key	Meaning
⚠	Display the list of active alarm
⊙	Enter the main menu tree
↩	Return to the previous screen.
↑	Scroll a list upwards or increase the value shown on the display.
↓	Scroll a list downwards or decrease the value shown on the display.
↵	Enter the selected submenu or confirm the set value.

10.2. Screen

The screens can be grouped into three fundamental types: main screens, the navigation menu and the parameter settings. The rows on the main screen (unit) are arranged as follows:

1. **Date, time and unit connected**
2. **Main readings and corresponding values**

Icon	Meaning
🌡	**Any active request**

	Hot water request by primary circuit only

3. Main actuators active

Icon	Meaning
	On when a compressor is running.
	On when one of the heating system pumps is on, except for the solar collector pumps.
	On when one or more solar collectors are installed and operating.
	On when the supplemental heating system (heater or boiler) is operating. If the "solar collectors" icon is activated at the same time, only the latter is displayed.

4. Unit status

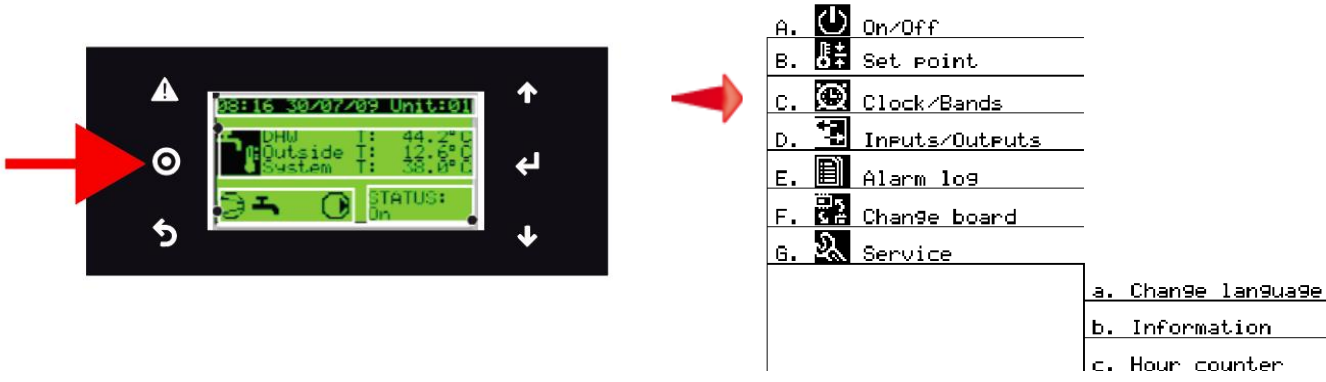
The unit status may be:

OFF	AUTO-ES
ON	Din-OFF
ENERGY S	BMS-OFF
AUTO-OFF	ALARM-OFF
AUTO-ON	PROTECT

IMPORTANT: In case of three-phase unit, when DIN-OFF appears at the screen, it means that the phases have not been properly connected. Change the order of the phases and proceed to connect the unit again.

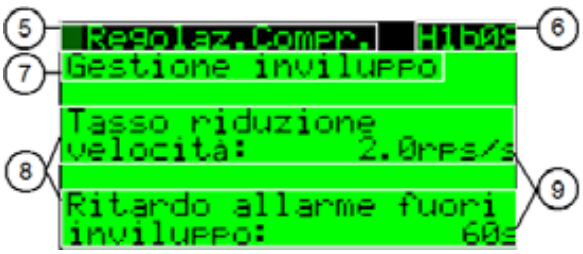
10.3. Menu

By pushing the key, the user can access to the controller's menu:



	Icons	Menu	Meaning
A		UNIT ON-OFF	Set the unit status and change modes.
B		SET POINT	Used to set the set point for solar collector, heat pump (heating / cooling), DHW, Antilegionella…
C		CLOCK/ TIME BANDS	*Setting the time and schedule. The user can decide the hours that the unit will be ON, OFF, in ENERGY SAVING MODE. Also allows to select vacation mode.*
D		INPUTS/ OUTPUTS	Informative. View the actual temperature of the system probes.
E		ALARM LOG	Alarm history. Compiles the information of the alarms.
F		CHANGE BOARD	No used
G		SERVICE	Change language (English, italian), see working hours, unit version…
H		MANUFACTURER	Access denied

The parameter setting screens, on the other hand, are shown in the example below:



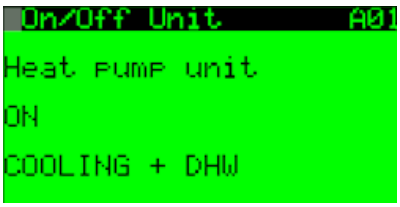
5. **Name of the current menu**
6. **Screen index**
7. **Name of the submenu where the parameters are being edited**
8. **Name of the parameters**
9. **Settable value**

Use the keys ↑ and ↓ to change the menus and select the editable values. Push the ENTER key ↵ and change the value by using ↑↓. Confirm with ↵.

Push ↩ key to go back to the previous screen.

A. ON/ OFF 

The unit status can be set from the main menu (A.), based on the selection made.



On the first row the selection can be:

- ON = standard conditions,
- OFF = standby,
- ENERGY SAVING = "reduced" set point for greater energy saving,
- AUTO = scheduler activated.

The second row (only editable if OFF is selected on the first row), on the other hand, is used to select the heat pump operating mode

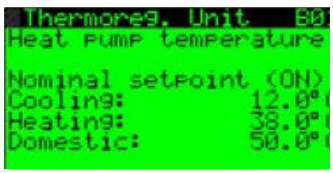
- HEATING
- DHW: **Disabled**

The remote ON-OFF digital input can be used to place the entire system in standby, including domestic hot water control.

IMPORTANT: The operating mode can be set ONLY when the unit is OFF .

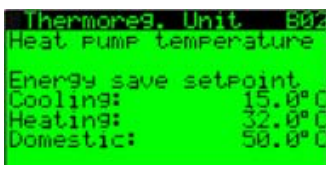
B. SET POINT

Used to set the set point for the solar collectors (if present), the Antilegionella function and the heat pump (standard and energy saving set point for "heating/cooling", and for domestic hot water production). The following figures only show the selection screen related to the heat pump set point.



In B01 it can be set the temperature set point of the ON mode:

Heating



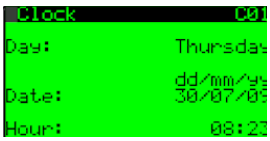
In B2 screen it can be set the temperature set point of Energy Save Mode

C. CLOCK / TIME BANDS

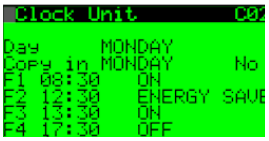
The controller s fitted with an internal clock with backup battery that stores the time and date for all the associated functions. The time, date, time bands, closing periods and holidays are set from the Clock/Time bands menu (C.). The screens are:

- Time and date setting
- Four daily time bands
- Closing periods, up to a max. of three
- Holidays/special dates, up to a max. of six

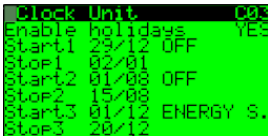
Below are the screens for setting the “unit only”:



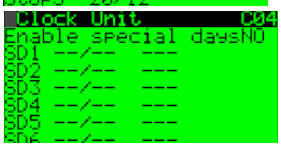
C01: Set time and date



C02: Time bands. Four different can be set on an any day, with the corresponding set point.



C03: Closing periods, up to a max. of three.



C04: Special dates, up to a max of 6.

C02: TIME BANDS

To set less time bands than the four allowed, simply leave the symbols “--:--“ in the field “hh:mm”, doing the same for the set point. On any day, four different time bands can be set, with corresponding set point for each band. After this each day of the week can be selected, either copying the previous day’s settings, or configuring them day-by-day. To select the set point see the corresponding paragraph and the parameters in the general table of parameters.

For these types of units, system inertia is on average quite long, as radiant systems very often have large masses; in these cases, the working set points (COMFORT and ECONOMY) are set very close together. Consequently, also the time bands are normally reduced, because they consider the significant inertia of the system.

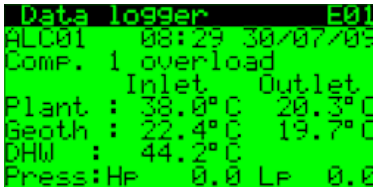
IMPORTANT: OFF status still guarantees unit antifreeze protection

D. INPUTS/ OUTPUTS

From the main menu (D.), both the type and the physical status of the inputs and outputs, digital and analogue, can be displayed in sequence. If the input or output has not been set (no device connected), “----“ will be displayed

E. ALARM LOG

From the main menu (E.) the logged alarms can be displayed in sequence; to reset the alarms, access the log from the service menu with password. The "ALARM" button on the other hand is used to mute the buzzer (if present), display the currently active alarms and reset them (obviously these remain in the log) and then access the log directly.



The list of active alarms can be accesed from the main page, by pressing  .

F. CHANGE BOARD 

Not used

G. SERVICE 

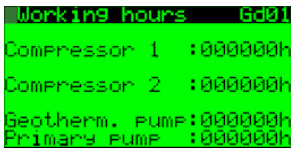
The service submenu is accessed from the main menu (G.), and is divided into two parts, the first (a,b,c,d) not password-protected is used to display and set the following data:

G.a. Change language: select one of the languages loaded in the application (Italian, English...).

G.b. Info: view information relating to the application code (and corresponding version) on the first screen, while the second shows information concerning the uPC board hardware .

G.c. Unit temp. control:

G.d. Operating hours: displays the operating hours of the main moving devices (compressors and pumps on the unit and that depend on the type of configuration) that may require periodical maintenance.



H. MANUFACTURER 

Access denied.

10.4. More features

The controller has other options only accessible through the Manufacturer Menu (password needed) . **These functions have to be activated from the factory.**

CHECK WITH THE MANUFACTURER

A. Integration

The controller allows controlling the operation of other sources of energy such as electric heaters, boilers, or solar collectors. In this case, the controller puts in operation these equipments according to the set temperature setpoint.

B. Antilegionella

A weekly algorithm can be activated (screen B03, if an integration system is enabled) that uses the domestic hot water integration output to avoid problems relating to the proliferation of Legionella, increasing the set point for a fixed time of 1h.This function is also active when the unit is OFF.

C. Temperature compensation

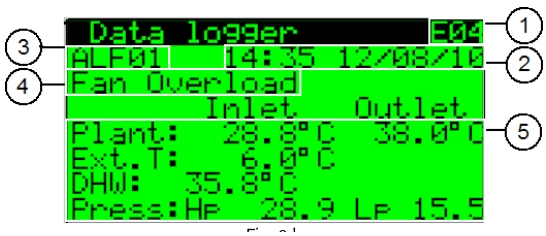
In heating operation, the primary circuit inlet set point can be compensated positively based on the outside temperature. This function is activated by selecting Dynamic operation on screen Gfc11 and defining an activation set point for the outside temperature with corresponding percentage gradient (e.g. if 50% is set, for a 1°C decrease in the outside temperature the outlet set point is increased by 0.5°C)

D. Comparing cost effectiveness between heat pump and boiler

The boiler can be managed either as an integration system or as an alternative to the heat pump.The outside temperature can be read, and the boiler is enabled based on the algorithm that is currently calculating the costs and efficiency of both systems (Heat pump and Boiler).

10.5. Alarms and Alarms Reset

From the main menu, push → E . The following alarm log screen can be accessed.



1. The chronological number of the event (this indicates the moment when the alarm was activated, that is, how "old" it is; E01 indicates the oldest alarm),
2. the time and date of the alarm,
3. the alarm code (see table below),
4. short description of the logged alarm,
5. the inlet and outlet temperature and pressure values.

Note: A maximum of 50 alarms can be logged, over this limit new events overwrite the older ones, which are deleted.

Use the ALARM button  , to show the current alarm and to reset it and access directly to the alarm log.

Alarm reset can be:

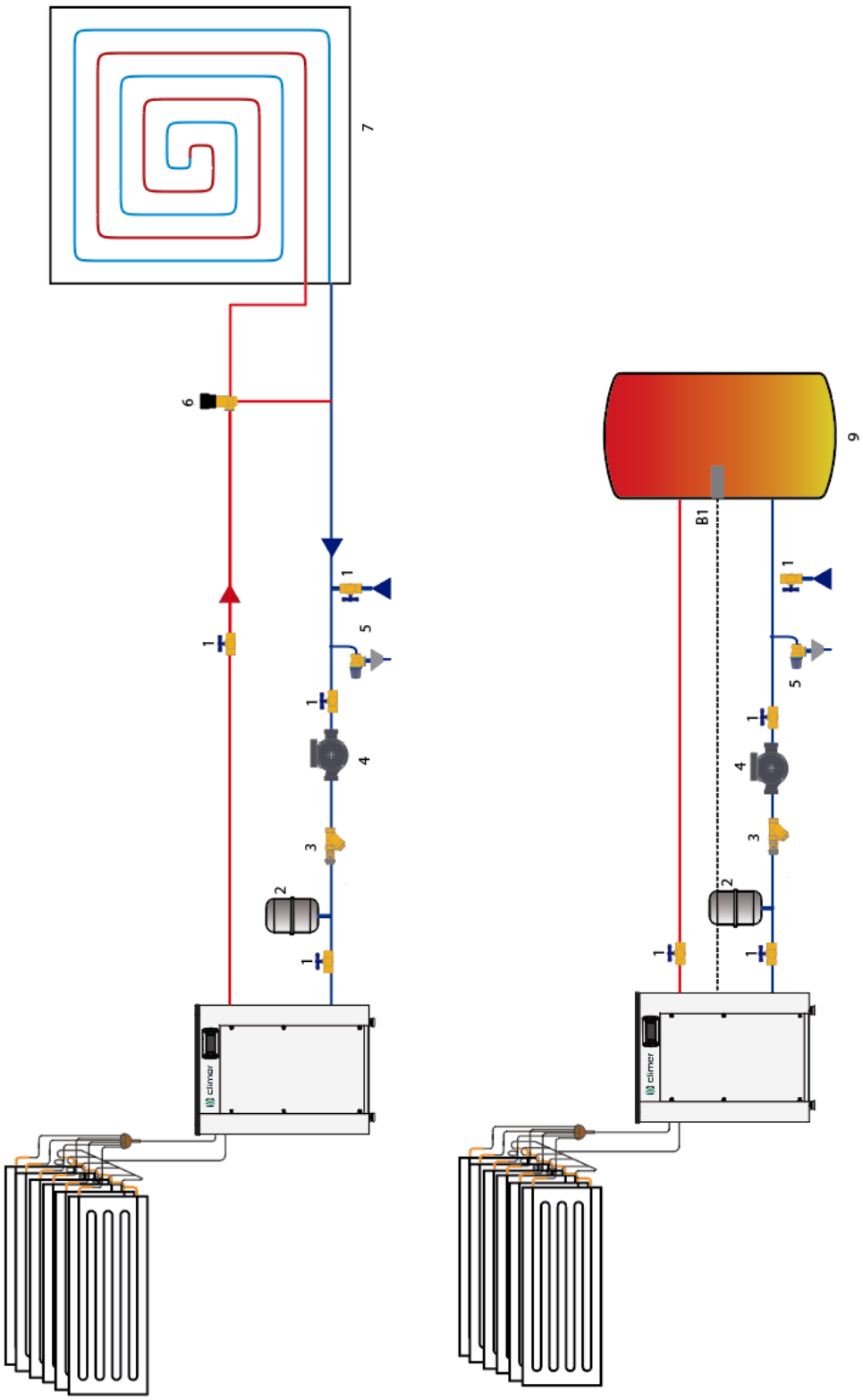
- Manual: The user has to reset the alarm manually
- Automatic: The system reset the alarm itself, but the alarm is logged.
- Per parameter: The system try to reset automatically the alarm up to 5 times. If the problem persist the reset has to be manual. If the problem is solved the alarm is logged.

Alarm		Alarm	
ALA01	Probe B1 faulty or disconnected	**ALR01**	System integ. Boiler/ heater alarm
ALA02	Probe B2 faulty or disconnected	**ALR02**	DHW boiler/ heater overload from digital input
ALA03	Probe B3 faulty or disconnected	**ALF01**	Fan overload
ALA04	Probe B4 faulty or disconnected	**ALT01**	Operating hour threshold reached by compressor
ALA05	Probe B5 faulty or disconnected	**ALT04**	Operating hour threshold reached by primary pump
ALB1	High pressure	**ALT05**	Operating hour threshold reached by DHW pump
ALB02	High pressure compressor from transducer	**ALT07**	Operating hour threshold reached by solar pump
ALB03	Low compressor pressure from transducer	**ALT08**	Operating hour threshold reached by outside exchanger fan
ALC01	Compressor overload or inverter alarm	**ALU02**	Primary exchanger antifreeze
ALC03	Compress operating outside envelope	**ALW01**	High DHW temperature threshold reaches
ALP02	Pump overload	**ALW02**	Max DHW temperature threshold to solar collector reached
ALP03	Primary circuit water flow switch	**ALW03**	Max end defrost time exceeded
ALP04	Solar circuit pump overload	**ALD05**	Low suction temperature

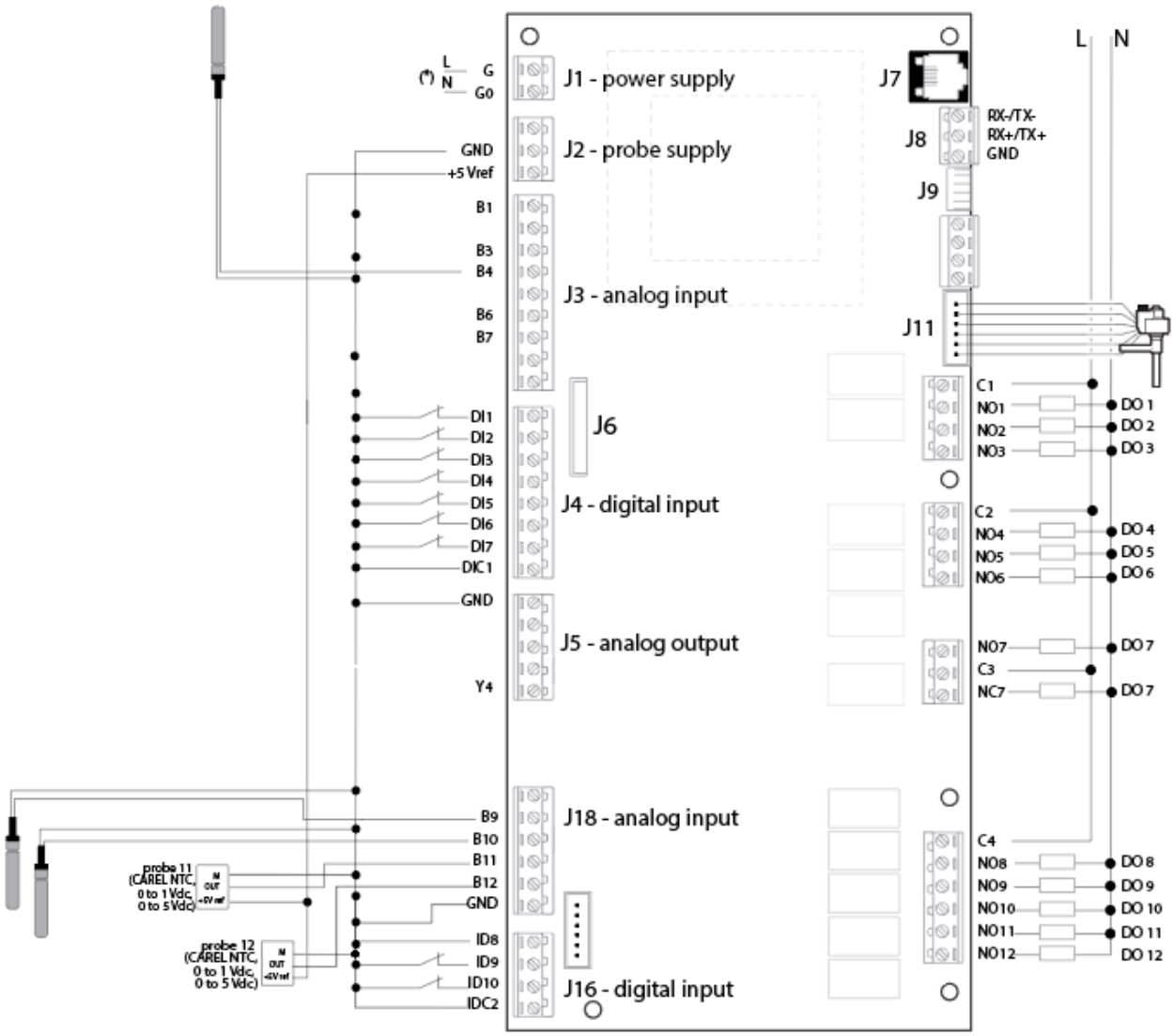
ALD01	Program alarm	**ALD06**	Low evaporation temperature
ALD02	Expansion valve probe faulty or disconnected	**ALD07**	High evaporation temperature
ALD03	Expansion valve motor error	**ALD08**	High condensing temperature
ALD04	Low superheat		

11. ANNEX

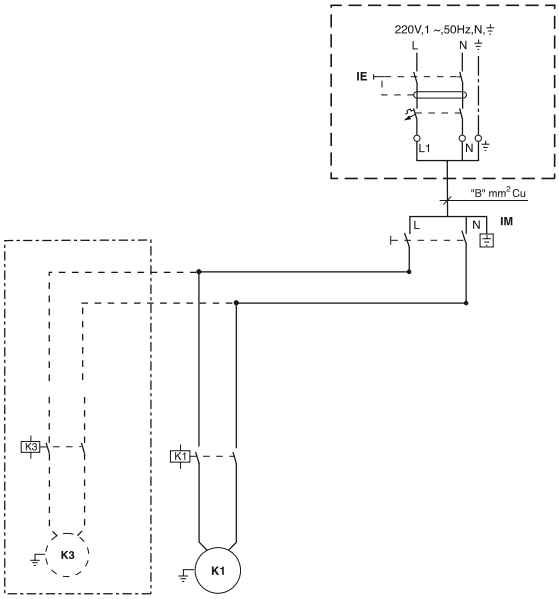
A) HYDRAULIC SCHEME

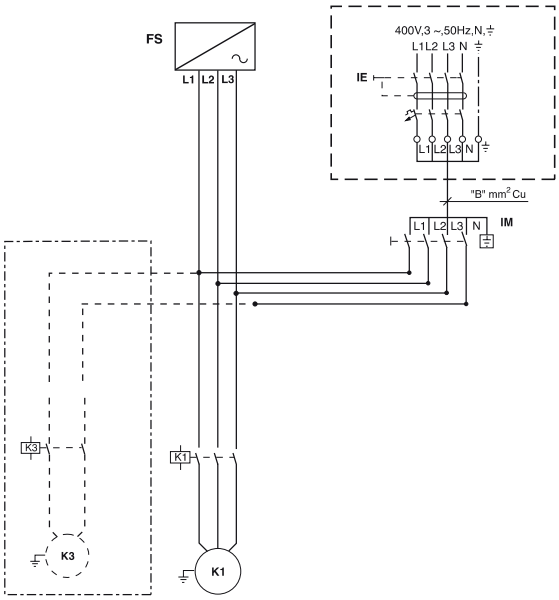


B) ELECTRICAL DIAGRAM

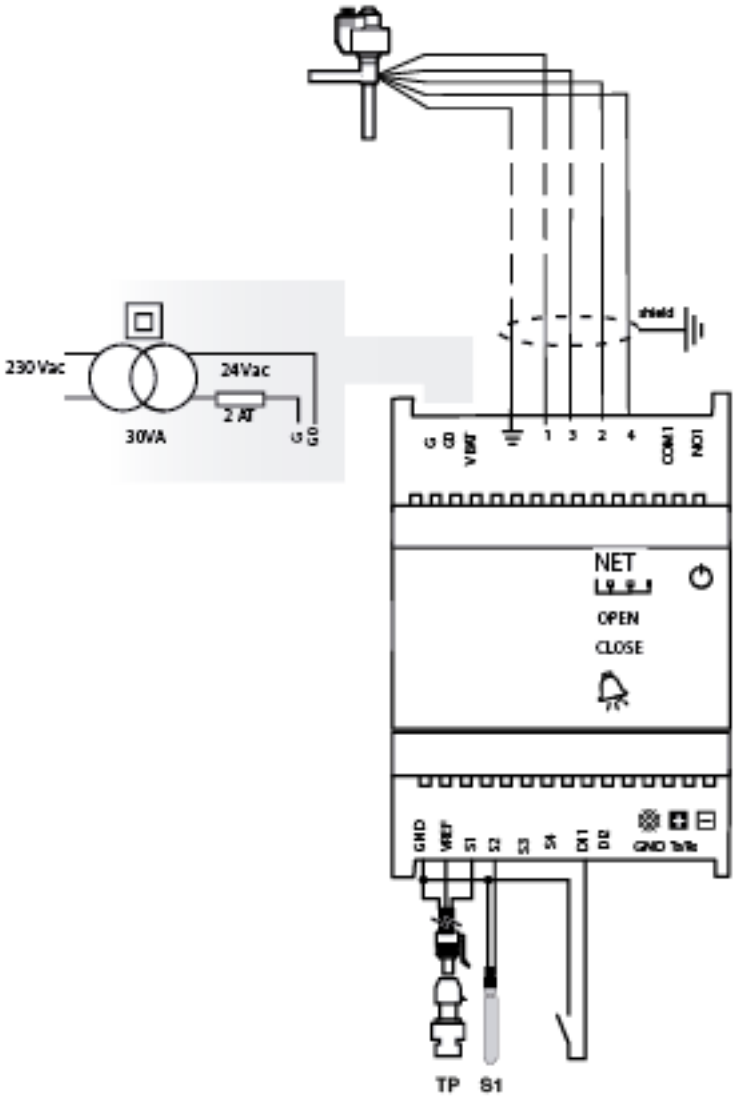


C) POWER CIRCUIT





D) ELECTRONIC EXPANSION VALVE DIAGRAM



E) SIMBOLOGY

Hydraulic Scheme	
1	Ball valve
2	Expansion vessel
3	Lined Filter strainer (Y type)
4	Pump
5	Safety valve
6	By-pass
7	Underfloor heating
8	Buffer tank
B1	Temperature probe

	Electrical diagram
NO1	Compressor
NO3	Primary circuit pump-p2
NO7	General alarm
Y4	Outside heat exchanfer fan
ID1	Condenser fan overload
ID2	Compressor overload
ID3	High pressure swicht-HP
ID4	Pump overload
ID8	Remote ON/OFF
ID10	Primary circuit flow overload
B1	Heat exchanger temperature (defrost)
B4	Primary system inlet temperature
B5	Solar collector temperature
B6	Outside air temperature
B7	Primary system outlet temperature
B8	DHW tank bottom temperature (for solar collector management)
B9	Compressor discharge gas temperature
B10	Suction temperature
B11	High pressure transducer
B12	Low pressure transducer
RC	Cranckcase heater

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