EN

USER AND INSTALLATION

ENERGIE®

THERMODYNAMIC SOLAR ENERGY

SOLAR BOX

Revision:1
Date: 11/10/2021

Directives:
2014/35/UE
2014/30/UE

Esteemed Client,

We would like to thank you for your choice when you acquired an equipment for sanitary water heating.

The thermodynamic solar system Solar Box will surely meet all your expectations and provide many years of comfort with maximum power saving.

Our organization dedicates much time, energy and economic resources in order to develop innovations that will promote power saving in our products.

Your choice has demonstrated your good sense and concern with pow-
er consumption, a matter that affects the environment.

We have taken on a permanent commitment to conceive innovative and efficient products so that this rational use of energy can actively contribute to the preservation of the environment and natural resources of the planet.

Keep this manual whose objective is to inform, alert and advise about the use and maintenance of this equipment.

Our services are always at your disposal. Feel free to call upon us!

INDEX

1. SYMBOLS

 WARNING	The entire process the supplier believes may imply danger of personal injury and/or material damage shall be marked with a DANGER SIGN. As a means of further classifying the danger, the symbol will be accompanied by one of the following words: • DANGER: when the operator and/or people in the vicinity of the equipment are subject to personal injury. • WARNING: when the equipment and/or nearby materials are subject to material damage.
 INFO	All the information the supplier believes may contribute to the enhanced performance and conservation of the equipment shall be marked with the information sign.

2. PRE- INSTALLATION

 WARNING	• The electrical installation of the equipment should comply with national regulations on electrical installations in force. • Solar Box will only work after receiving the respective cooling load. • The maximum admissible water pressure at the input to the hydraulic circuit is 300 kPa. • Electrical power: 230V, 50 Hz • If the power cable is damaged, it should be replaced by the manufacturer, the post-sales service or similar qualified personnel in order to avoid danger. • Solar Box will only work if the tank has been filled with water. • This appliance should not be used by persons (including children) with physical, sensorial or mental disabilities, or with a lack of experience or expertise, unless supervised by someone liable for their safety, or in the event the same have been trained in relation to how the equipment works.

3. SAFETY

The installer should notify the customer of how the equipment works, the inherent dangers, and the rights and obligations of the customer.

- The installation of thermodynamic equipment geared to heating sanitary water should be performed by personnel who are qualified and skilled in relation to the same;
- The appliance should not be installed in locations subject to the risk of impact or explosion;
- Keep the equipment in its packaging until the time of installation;
- Ensure all hydraulic connections are duly watertight prior to turning on the electrical power;
- The gas used in the entire process is R134a, free of CFCs, noninflammable and harmless to the ozone layer. Thus, the gas present when this equipment is used may not be released into the atmosphere by law.
- The gas present when this equipment is used should be handled by a qualified technician.

- Maintenance of the equipment should be carried out by the support service, performing the general and continuous cleaning operations, which may/should be executed by the users themselves;
- The electrical power of the equipment should always be turned off during maintenance operations;
- The supplier recommends the equipment be inspected at least once a year by a qualified technician;
- The operating principles of this equipment are directly associated with high temperatures and pressures, thus all the processes involved with the equipment should be designed to avoid the risk of burns and explosion.

4. OPERATING PRINCIPLE

The Solar Box Thermodynamic Solar System is a piece of equipment based on the principle of cooling by compression – the Carnot principle – which we have named Thermodynamic Solar Systems: Solar Panel and a Heat Pump. The solar panel, which is the main component, placed outdoors, ensures the capture of energy from:

- Direct and diffuse solar radiation;
- Outdoor air, via natural convection;
- The effect of the wind (almost always existent);
- Rainwater.

The temperature difference caused by the aforementioned external agents ensures the refrigerant fluid evaporates inside the solar panel.
The absence of glass in the panel ensures increased heat exchange via convection.
After passing through the panel, the refrigerant fluid is sucked in by the mechanical com- ponent of the system, the compressor, raising the temperature and pressure of the same; which in turn is transferred to the water circuit by means of the panel heat exchanger.
Before the refrigerant fluid returns to the solar panel the pressure needs to be reduced to guarantee it attains its liquid state once again, there by completing the cycle.
The ease with which we combine technology and the laws of nature (alteration of the state of a fluid), demonstrates the veracity and potential of Solar Box.

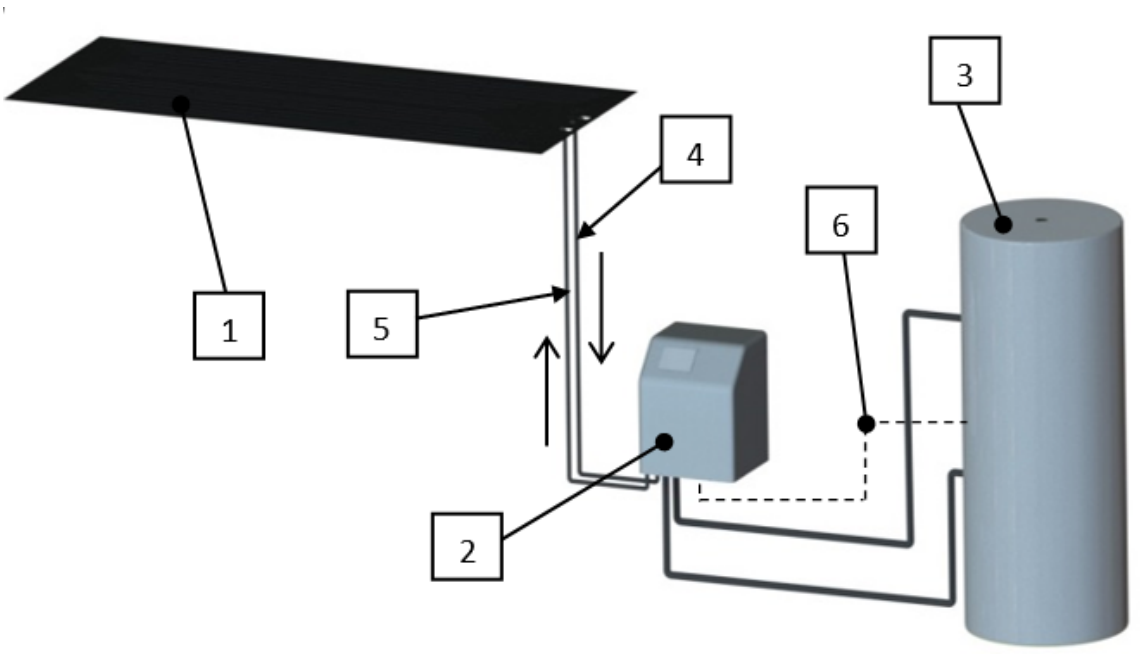
5. COMPONENTS

- Thermodynamic Solar Panel
- 1 SolarBox
- 4 Silent block M6
- 1 “Y” filter
- Solar Box setting 4 Screw + 4 rawlplug
- 6 brackets + 10 screws M6.3x40 + 10 plugs ø8+ 6 screws M6x20 + 6 nut M6 + 12 washers M6

6. TECHNICAL FEATURES

Solar Box	Unit	1 Panel	2 Panels
Thermal power supplied (med-max)	W	1690 - 2900	2800 - 4550
Power absorbed (med-max)	W	390 - 550	595 - 890
Electrical power	V/HZ	230/50	
Operating temperature	°C	-2 to 42	
Cooling fluid / Load	-/Kg	R134a / 0,8	R134a / 1,0
Maximum water temperature	°C	55	
Maximum operating pressure (water)	bar	7	
Weight	Kg	23,5	
Size of the packaging (a x l x p)	-	470 x 400 x 400	
Hydraulic connections (input|output)	Inches	1/2" | 1/2"	
Refrigerant connections (input|output)	Inches	3/8" | 1/4"	1/2" | 3/8"
Thermodynamic Solar Panel			
Weight	Kg	8	(2x) 8
Size of the packaging (a x l x p)	-	2000 x 800 x 20	(2x) 2000 x 800 x 20
Refrigerant fluid connections (in | Out)	Pol.	1/4" | 3/8"	
Tank Requirements			
Maximum Tank Capacity	lts	300	
Minimum Coil Area (when using back-up connections)	m2	1,5	

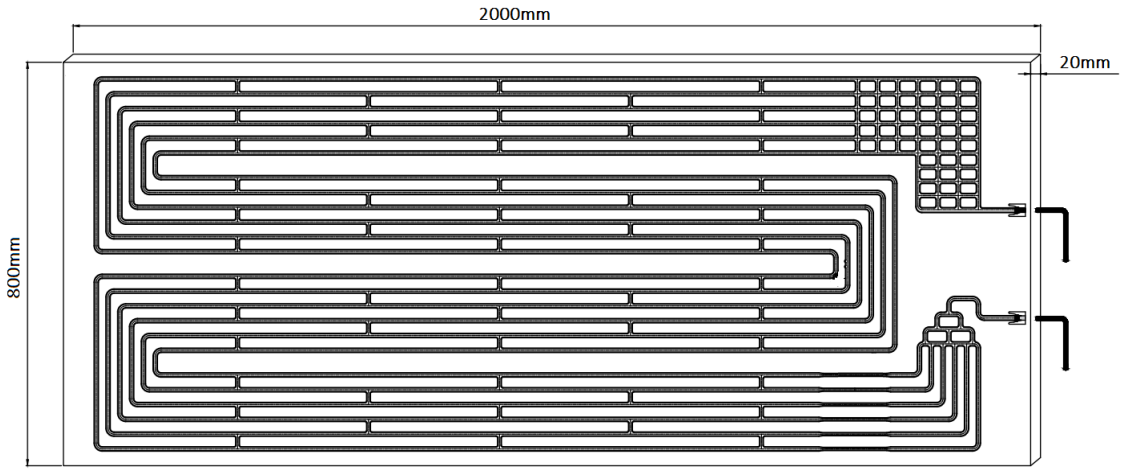
7. ASSEMBLY SCHEME



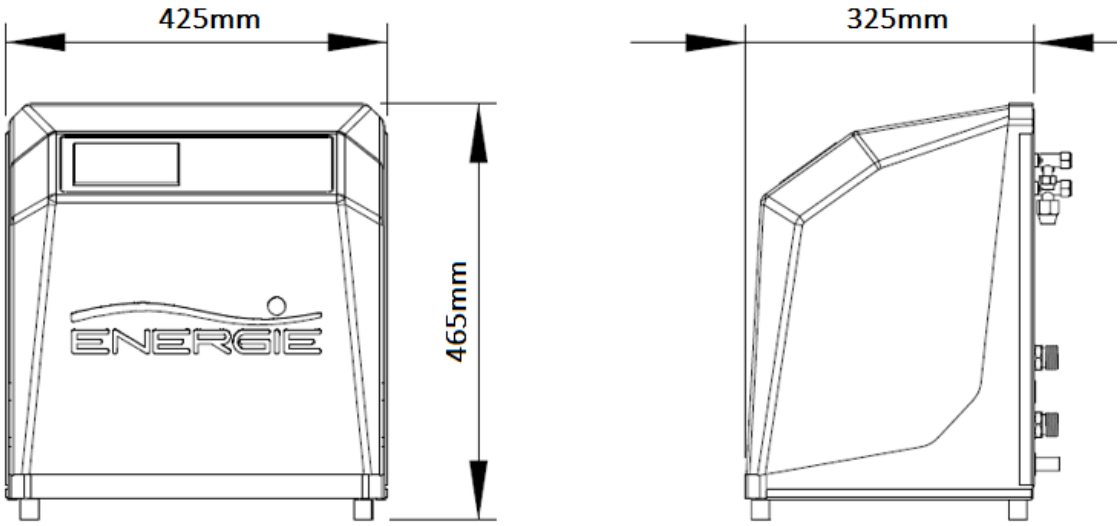
1	Thermodynamic solar panel	4	Suction line
2	SolarBox	5	Liquid line
3	Cylinder	6	Temperature probe

8. ASSEMBLY SCHEME

8.1 Thermodynamic solar panel



8.2 Solar Box

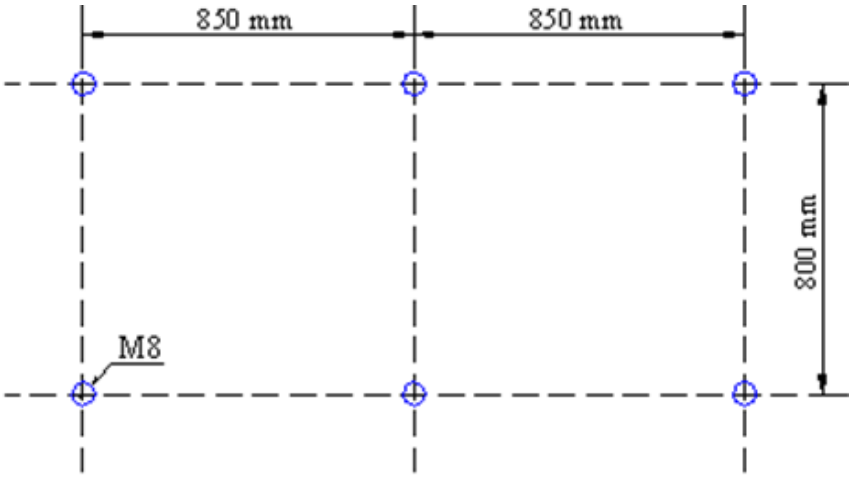


9. PLACING EQUIPMENT

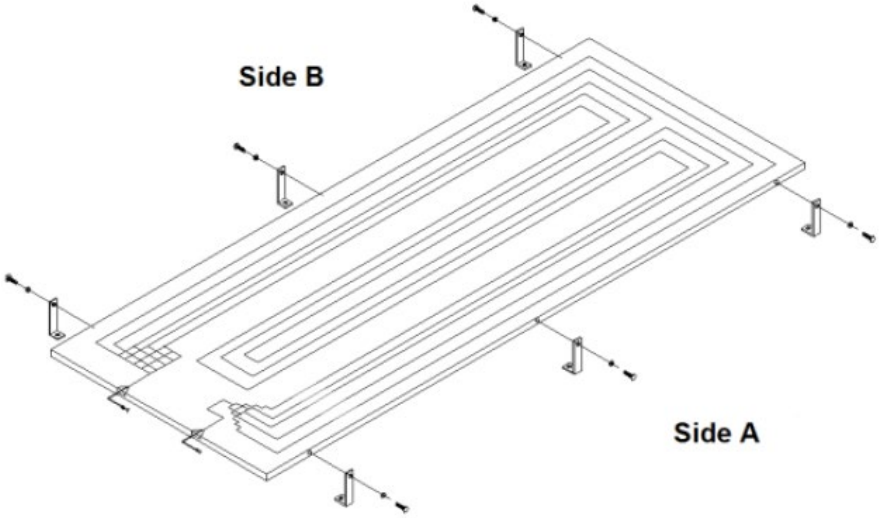
9.1 Thermodynamic solar panel

The location and the angle at which the panels are installed must be taken into account. In order to take full advantage of the solar radiation in question, the panels should be set at an angle of between 10° - 85° to the ground, and preferably pointing south.

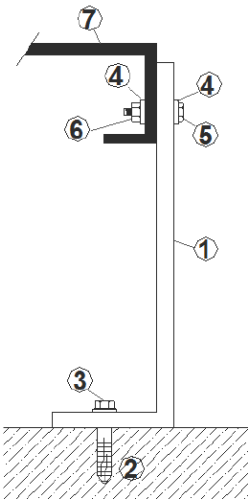
The panel comes with six M8 holes on the side flaps. The distance between the holes at the location where the panel is to be placed should coincide with the holes in the panel.



The panel has 3 small profiles (side A) and 3 large profiles (side B) which shall be fixed according stipulations in the diagram, giving the panel the desired level of inclination.



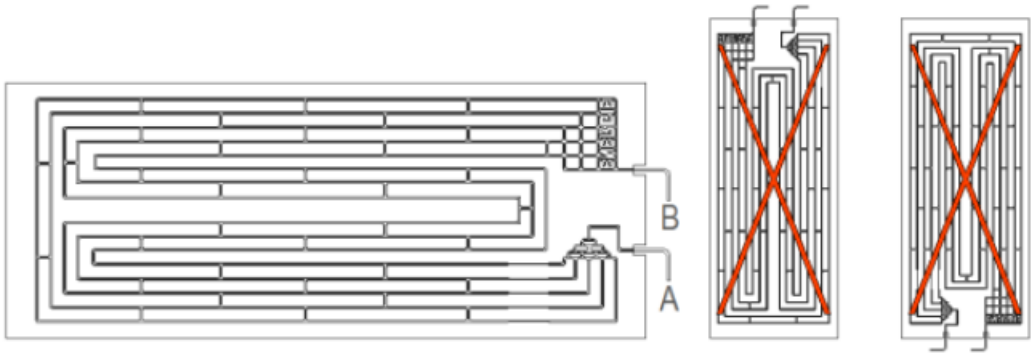
The profile shall be fixed to a base (e.g. a roof) via the provided plastic wall plugs and the self-tapping M6 screws. The M6 screws and the respective nuts and washers shall make the panel fixing to the profiles.



Panel profile fixing process

1	Aluminum profile
2	Plastic wall plug
3	Self-tapping screw (M6x40)
4	Washer M6
5	Screw (M6x20)
6	Nut M6
7	Panel

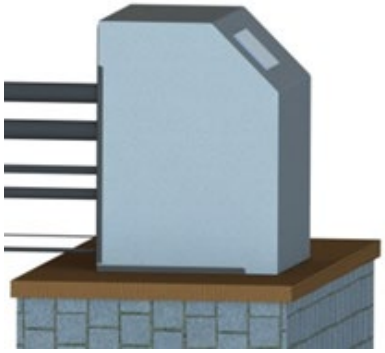
The solar panel shall always be installed with the connections facing downwards.
The right or left panel shall always be installed horizontally, not vertically.



A – Panel input | B – Panel Output

WARNING	The panel should always be installed downwards, with the connections facing down and shall be installed horizontally

9.2 Fixing Solar Box on horizontal surface



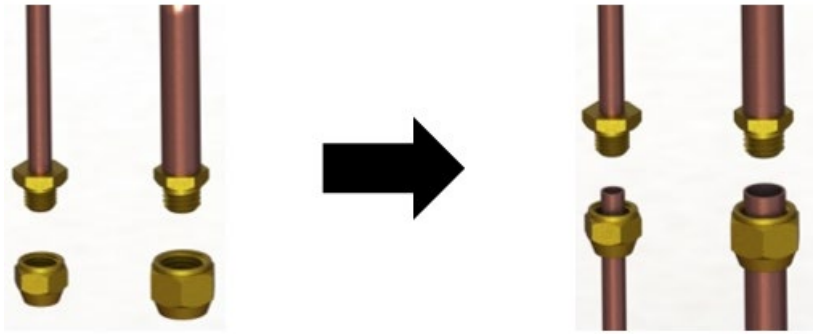
- A lay the structure on a level and stable surface, checking the four anti-vibratory brackets have been duly mounted;
- Remove the half holes from the rear of the structure by twisting the metal part you wish to remove;
- Secure the connections on the rear of the structure.

9.3 Refrigerant connections – Thermodynamic panel (1 panel)

WARNING	The refrigerant connections should be dealt with by a qualified technician holder of a professional skills certificate for the purpose.
INFO	The thermodynamic unit holds a pre-load of R134a fluid.
WARNING	The refrigerant connections should be thermally insulated in order to avoid burns and to ensure the maximum performance of the equipment.

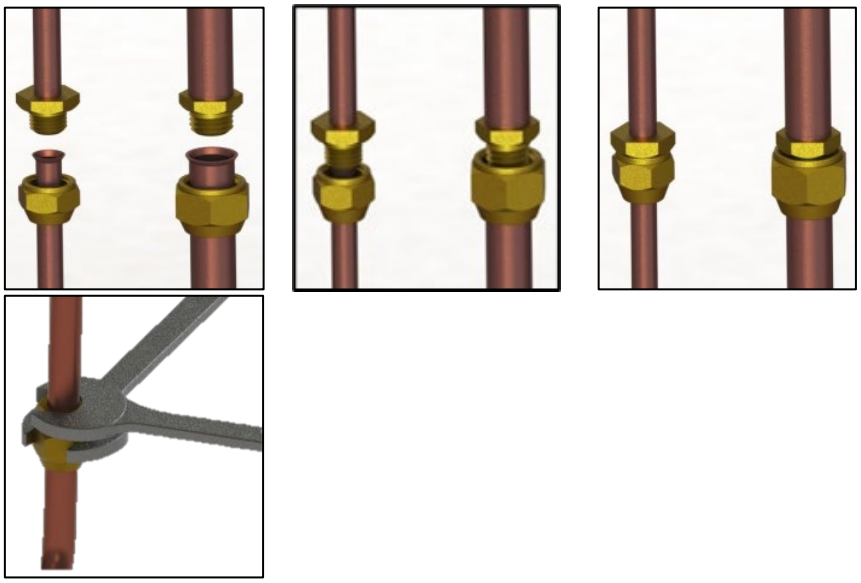
Pipe diameter		
Number of panels	Vapour (Suction line)	Liquid (Line to the panel)
1	3/8'' (9,52mm)	1/4'' (6,35mm)
2	1/2'' (12,7mm)	3/8'' (9,52mm)

a) Prepare the copper pipe, removing the protective caps from the ends;
b) Place the end of the pipe face-down, cut the pipe at the desired distance and clean any frayed edges;
c) Remove the nuts from the connections and place them on the side of the pipe;



d) Flange the pipe with an appropriate tool, forming a cone, ensuring there are no frayed edges or imperfections and the lengths of the walls are the same;

e) Tighten the nut a few turns with your hand, and then execute the final tightening by twisting in accordance with the values illustrated in the table.



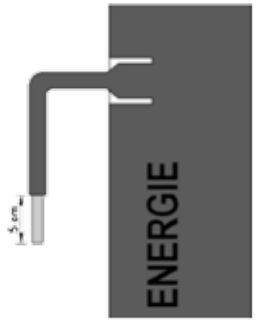
INFO

Pipe Diameter (inch)	Applied Torque (Nm)	Wrench nº
1/4”	14 a 16	19
3/8”	33 a 42	21

9.4 Refrigerant connections – Thermodynamic panel (2 panels)

Remove the protecting caps from the ends of the copper piping.
Place the end of the tube so that it is pointing downwards, cutting the pipe at the intended point, making sure to clean off any burrs (e.g. with a reamer).
Next, remove the covers from the panel connections, and with the aid of a cutting tool such as a penknife, remove 5 cm of the thermo-retractable sleeve.

Removal of thermo-retractable sleeve



A 3/8” piping expansion area must be made, with the aid of an appropriate tool, for proper connection to the panel.

Piping expansion (3/8”)

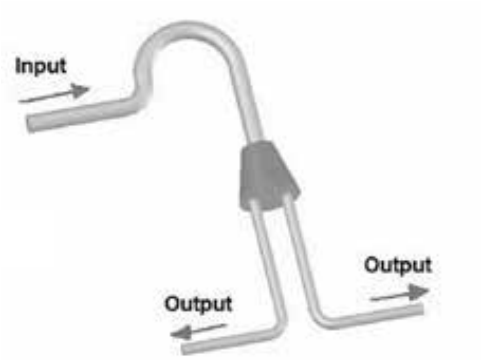
Line up the liquid and suction tubes, but before commencing the welding operation, make sure to protect the thermo-retractable sleeve by using a damp cloth.

The type of solder recommended for welding the pipes is type oxyacetylene (Oxygen/Acetylene). Other types of gases can also be used, such as propane for example.

After carrying out the panel connection welding operations, but before installing the Thermodynamic Block, make sure the apparatus has been cleaned with nitrogen.

For installations with two or more panels, it is essential that the fluid is homogeneously distributed (panel entry). The equipment already comes installed with a liquid distributor so that this process can be accurately put into effect.

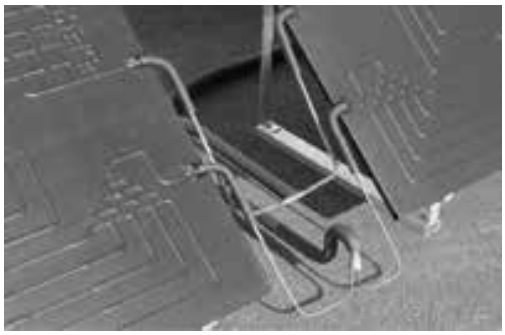
Liquid distributor



This distributor is placed between the two panels. The panel connecting pipes (1/4”) must be exactly the same length, their extremities connecting directly to the panels.

Liquid distributor (liquid line)

The same level of pipe symmetry exactness is not required in relation to the suction connections (Panel exit). This must be done by “denting” or with a “T” connection (in accordance with the following image), being properly insulated.



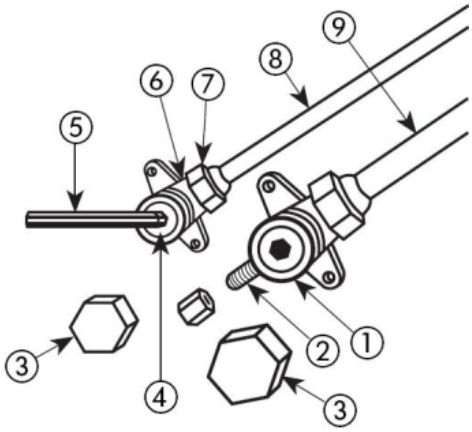
Suction line

9.5 Refrigerant connections – Solar Box

Some of the steps involved here are exactly the same as the procedures followed to connect the panel.

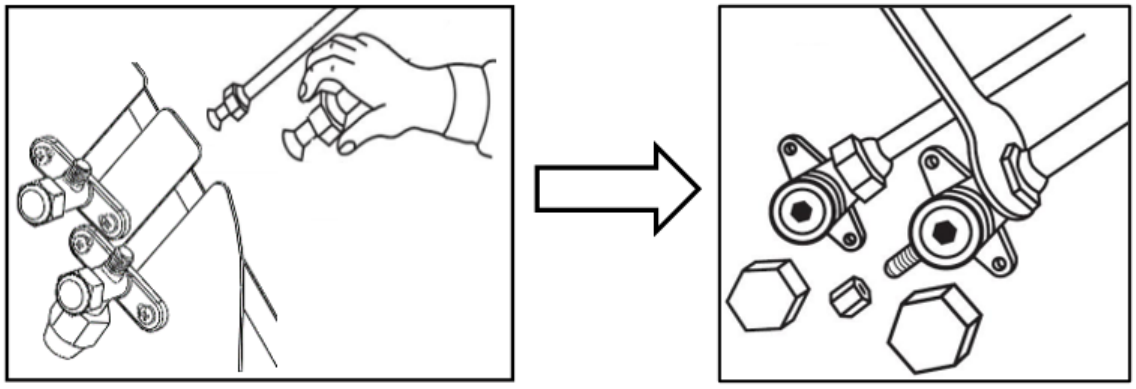
- Cut the pipe at the desired point with the end facing down. Clean any frayed edges.
- Flange the pipe not forgetting to place the nut on the side of the pipe.

Legenda:	
1	3-way valve
2	Pressure tap
3	Valve sleeve



4	Valve needle
5	Hexagonal spanner
6	2-way valve
7	Conical nut
8	Liquid line
9	Gas line

- Tighten the nut a few turns with your hand and then use an appropriate spanner to fully tighten the same as described above



INFO	**ALL THE PIPES SHOULD BE INSULATED!**

10. NITROGEN LOADING

Once the connections have been concluded the user needs to check there are no leaks. To this end, a load of nitrogen at a pressure of 10 bar should be injected via the pressure tap (3-way valve).

Cover all the connections in soap foam and check if the pressure on the gauges is constant.

11.VACUUM

a) Always use connections, vacuum pump and gauges duly adapted for R134a fluid;
b) Only use a vacuum pump to remove the air and moisture existing in the pipe;
c) Never use the system refrigerant to purge the pipes;
d) Keep the stop valves completely closed;
e) Connect the hose from the vacuum pump to the 3-way valve;
f) Create a vacuum with the pump connected to the pressure tap to the 3-way valve (for

30 minutes);
g) Once the vacuum process has been concluded (30 minutes), turn off the pump and the gauge should always display the same value;
h) Turn off the gauge taps;
i) After this vacuum process has been concluded, the two valves should be opened to enable the coolant to circulate throughout the system.

INFO	After creating the vacuum, do not remove the hoses until the system has been fully pressurized by the coolant.
	After creating the vacuum, do not remove the hoses until the system has been fully pressurized by the coolant.

12. WATER QUALITY

INFO

The water you use may contain impurities and/or substances damaging to the system and even harmful to your health. Make sure you use water with quality fitting for home consumption. The following table indicates some parameters according to which water must be subjected to chemical treatment.

Hardness (ºdH)	**pH**	**Treatment**
3,0 to 20,0	6,5 to 8,5	NO
3,0 to 20,0	<6,5 or >8,5	YES
<3,0 or >20,0		YES

13. HYDRAULIC CONNECTIONS

To assemble the couplings of the hydraulic circuit you must:

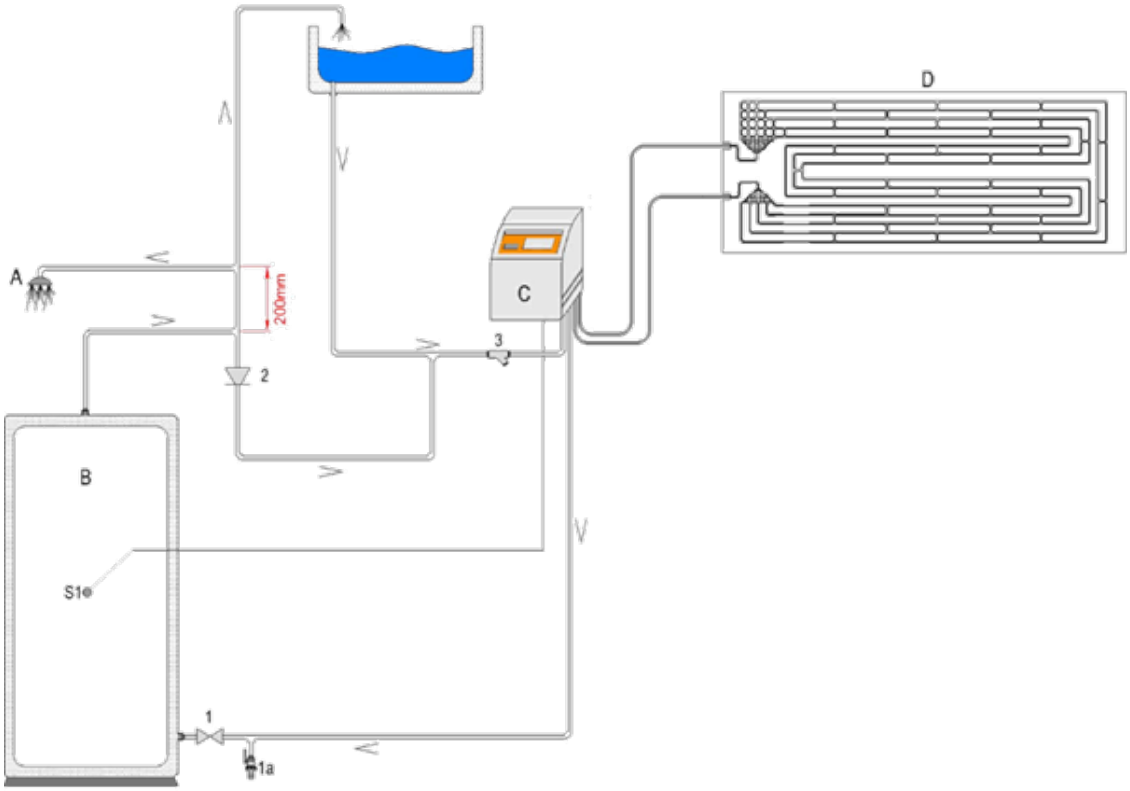
a) Connect the water inlet and outlet of the equipment with tubing or joints capable of supporting a combined temperature/pressure of a constant 75°C / 7 bar. For such we recommend the use of tubing which is resistant to high temperatures and pressures, such as PEX, PPR, among others.
b) A safety valve needs to be installed at the cold water line of the equipment. The safety device should comply with standard EN 1487:2002, discharge pressure of 7 bar (0.7 MPa).
c) In addition to this device other components need to be installed to guarantee the interruption of the hydraulic load, in the following order:

- One way valve
- Pressure reducing valve (3 bar)
- Safety discharge group
- Expansion vessel

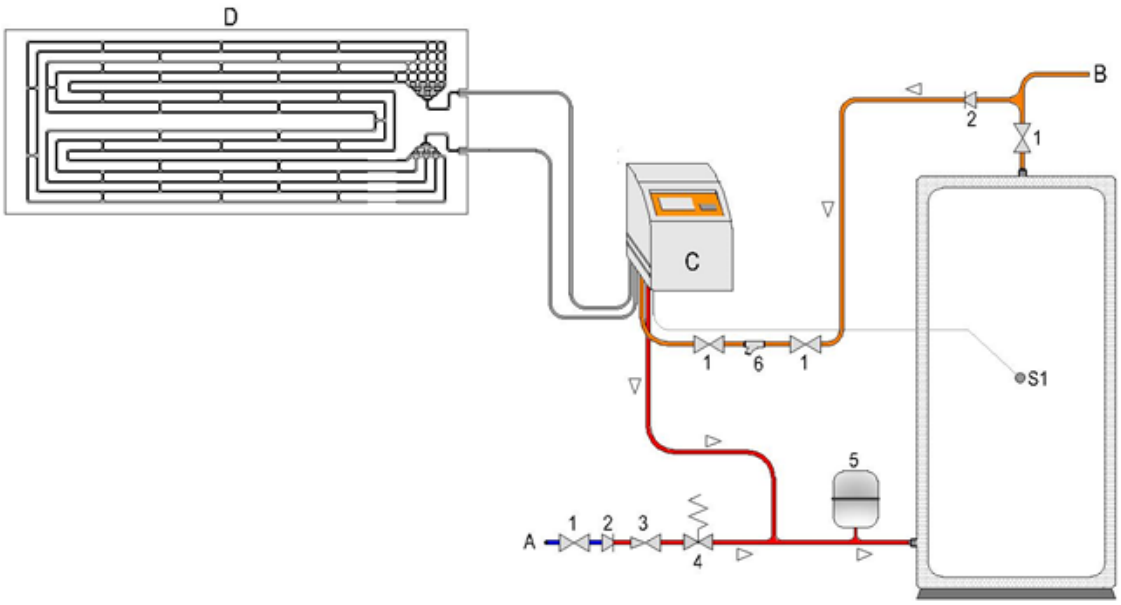
The safety discharge group should be connected by tubing with a diameter which is never less

than the cold water inflow connection.
The part of the exhaust should be connected to an interceptor, or, in the event this is inviable, raised at least 20mm above the floor to allow for visual inspection.
All the above recommendations are to guarantee the safety of people, animals and others. Solar Box may be installed in tanks with two or more connections.
The diagrams below illustrate types of connection to a tank:

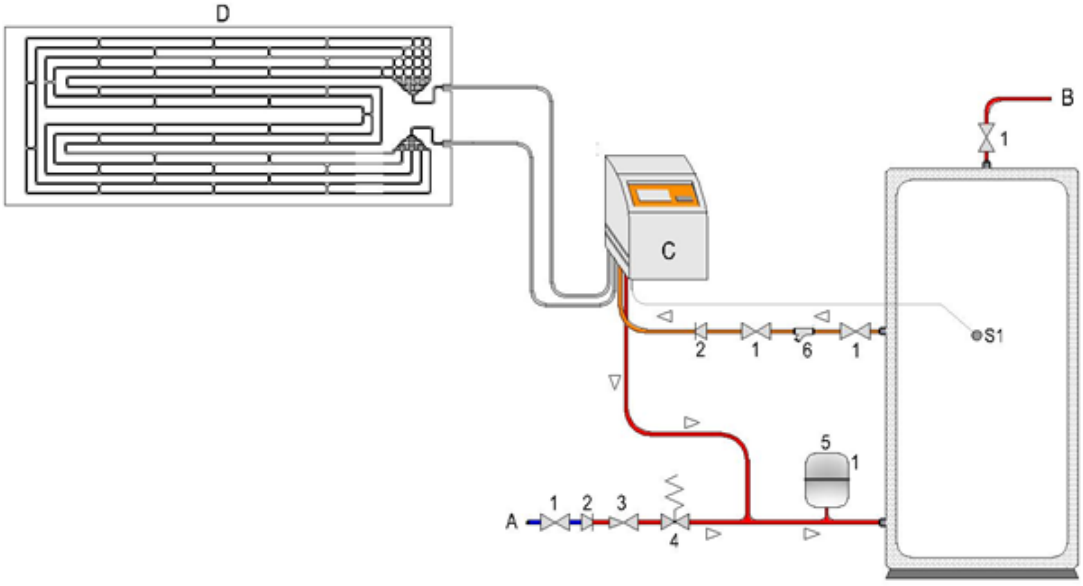
13.1 Vented installation



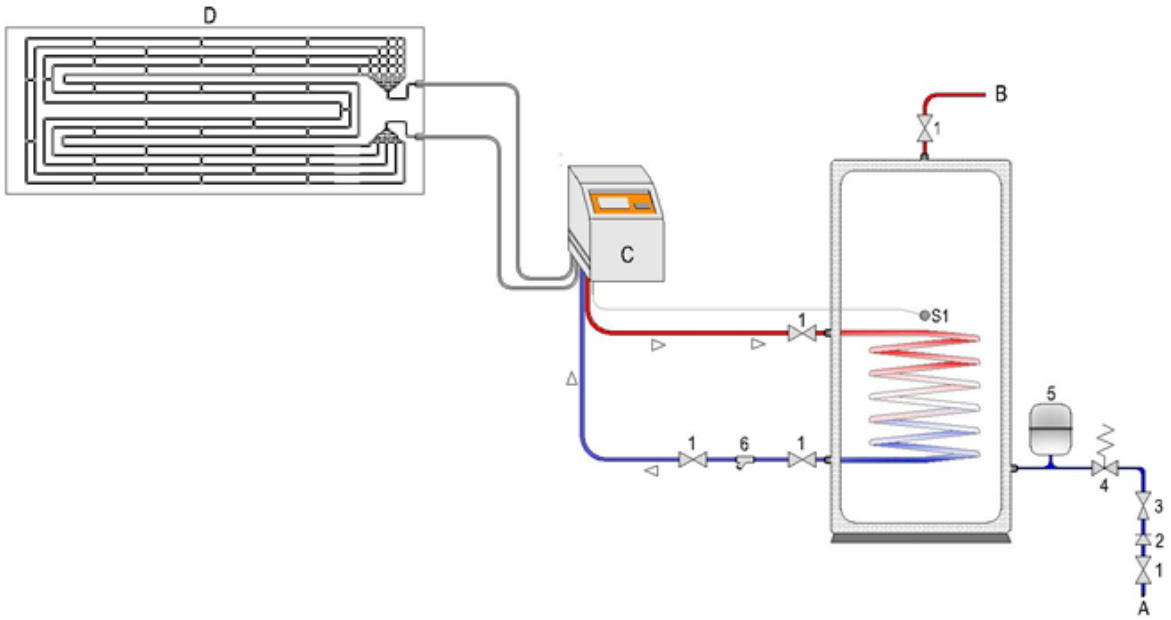
13.2 Tank with two connections



13.3 Tank with more than two connections



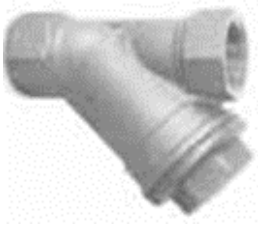
13.4 Tank with backup connections



Legend			
1	Open/closed Valve	7	Drain
2	Non return Valve	A	Mains Water
3	Pressure Reducing Valve	B	Hot Water Outlet
4	Security Group	C	Solar Box
5	Expansion Vessel	D	Thermodynamic Panel
6	Filter	S1	Temperature Probe

14.FILTER

The filter allows block any impurities present in the hydraulic circuits. Residue left in the heater pipes will damage the heat exchangers and cause the Solar Box to malfunction. It is recommended install the filter in the heater return line. It is indispensable in order to prevent serious damage to the heat exchanger.



WARNING	The equipment is supplied with a “y” filter placed on the Solar Box hydraulic return line, at the entrance of the heat exchanger.

15.AIR PURGE

After doing the correct installation of the system, the installer must purge all the hydraulic circuit before turning on the Solar Box.

a) Ensure that the valve 1a is closed;

b) Close de valve 1b;
c) Open the purge valve inside the Solar Box;
d) Open the discharge valve (drain) 7;
e) Open valve 1a;
f) Close the bleed valve inside the Solar Box (only when there is water with no bubbles leaving the valve);
g) Close the valve 1c (only when there is water with no bubbles leaving the valve);
h) Open the valve 1b;
i) Turn-on the Solar Box;

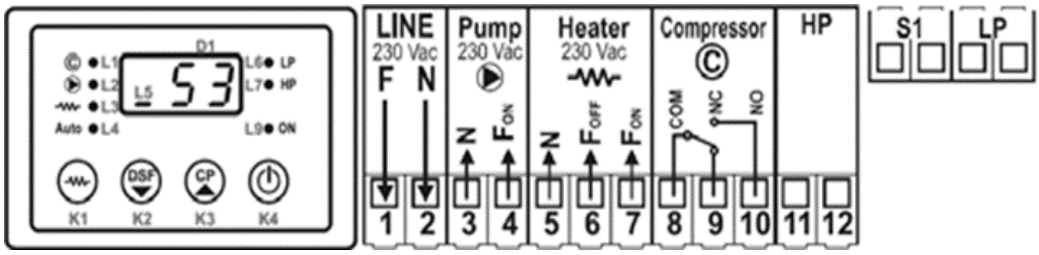
16. ELECTRICAL CONNECTIONS

Check the following conditions before implementing the electrical connections:

a) The thermodynamic equipment should only be powered electrically after the tank has been filled.
b) The thermodynamic equipment should be connected to monophasic voltage (230 VAC / 50 or 60Hz).
c) Connections should always comply with the installation regulations in force in the country in which the thermodynamic equipment is installed.
d) The equipment must be connected to an electrical grounded socket.

NOTE: The Solar Box equipment have a relay to allow the connection of a backup electric resistance with maximum power of 3kW.

17. ELECTRONIC CONTROLLER



	CODE	CONNECTORS	DEVICE	CHARACTERISTICS
INPUTS	S1	S1	Water Probe	Sensor NTC10K@25°C, functioning temperature 0÷120°C, Reading Range 0÷99°C
	LP	LP	Low Pressure Contact	Contact Open/Closed
	HP	11	High Pressure Contact	Contact Open/Closed
		12		
OUTPUTS	3	N	Pump	Power 230 Vac Max 3A 230Vac
	4	FON		
	5	N	Electrical Heater	Power 230 Vac Max 3A 230Vac
	6	FOFF		
	7	FON		
	8	COM	Compressor	Free contact Max 8A 230Vac
	9	N.C.		
	10	N.O.		
LINE	1	F	Input Line	230 Vac +/-10% 50 Hz; Protection Fuse T3,15 A
	2	N		
Absorbed Power:			2VA	
Applied rules:			EN 60730-1 50081-1 EN 60730-1 A1 50081-2	

1 – ON/OFF

The ON/OFF of the controller is performed by the extended pressure of the button K4

- The OFF state is signaled by OFF of the display and all leds;
- The ON state is signaled by the led L9 ON.

2 – START/STOP operations in ON state

- Fill the tank with water and expel any existing air, opening a hot water tap;
- The START/STOP of the operations is through the extended pressure of the button K3 (CP);
- The STOP is signaled by the led L9 blinking.

3 - Visualizations:

The display shows:

- L4 ON >> C01=1 Auto mode ON (configuration);
- L1 Blinking >> when timer T01 run (compressor timer);
- L6 Blinking >> when timer T02 run (error LP timer);
- L7 Blinking >> when timer T03 run (error HP timer);
- D1>>Currently the Probe Temperature;
- D1>> Damages or Alarms signaling;
- Lo: out of range to the low temperature (under 0°C): Probe broken;
- Hi: out of range to the high temperature (over 100°C): Probe in short circuit.

4 – Alarm Function

If the temperature read by the Probe is over the value Alarm Thermostat P04

- The acoustic and visual signal is activated;
- SILENCE Function: the acoustic signal could be deactivated for 5 minutes push- ing any button. After this time, if the alarm condition remains the acoustic signal starts again.

5 – Pump anti block Function

If the Pump is OFF for a time over Anti block Timer **T04**

The output PUMP is activated for **T05** seconds and the display shows **bLP.** The function is enabled also in **OFF.**

6 – K1 Manual Heater Function (BOOST)

Through the extended pressure of the **K1** button the heater is activated/deactivated the Manual Heater Function. The activated condition is showed by the Led L5.

7 – Disinfect Function

The disinfect function has 3 modality configurations:

- C02=0: the function is activated only manually pushing K2 (DSF) button for about 5 seconds;
- C02=1: the function is activated 1 time per week;
- C02=2: the function is activated 1 time per month.

If the disinfect function is activated:

- Heater ON while the S1 Temperature < P05;

The display shows dSF.

8 – Installer Menu

- Enter the MENU pushing together K1 and K4buttons for about 5 seconds;
- Scroll and visualize the parameters' code through K3 or K2 buttons;
- Visualize the parameter's current value through K4button;
- Modify the value through the K2 (decrease) / K3 (increase);
- Press K4to memorize the new value or press K1to go back without memorize; Press K1button to go back to the code visualization.

Exit from MENU

- Wait about 5 seconds or push the K1 button.

WARNING:

The admission to this Menu is only for INSTALLERS or EXPERT PERSONNEL, because parameters' changes could damage the product or could make the product not fit for the applications

18.INSTALLER MENU

Installer Menu

- Enter the MENU pushing together K1 and K4 buttons for about 5 seconds;
- Scroll and visualize the parameters' code through K3 or K2 buttons;
- Visualize the parameter's current value through K4 button;
- Modify the value through the K2 (decrease) / K3 (increase);
- Press K4 to memorize the new value or press K1 to go back without memorize;

Press K1 button to go back to the code visualization.

Exit from MENU

- Wait about 5 seconds or push the K1 button.

WARNING:

The admission to this Menu is only for INSTALLERS or EXPERT PERSONNEL, because parameters changes could damage the product or could make the product not fit for the applications.

Installer Menu Parameters	U.m	Code	Min	Default	Max
Thermostat of ON/OFF Compressor and Water Pump	ºC	P01	10	53	55
Differential P01	ºC	H01	1	3	10
Thermostat of ON/OFF Electrical Heater	ºC	P02	5	53	65
Differential P02	ºC	H02	1	3	20
Thermostat of ON/OFF Electrical Heater in Auto Mode	ºC	P03	5	18	25
Differential P03	ºC	H03	1	2	5
Thermostat of alarm activation	ºC	P04	70	75	80
Thermostat of ON/OFF disinfect function	ºC	P05	60	65	75
Timer Delay to turn ON Compressor	Min	t01	1	1	10
Timer Delay to turn ON Compressor after error LP	Min	t02	3	10	20
Timer Delay to turn ON Compressor after error HP	Min	t03	3	10	20
Timer of Anti-Block	h	t04	1	168	255
Timer of activation Pump in Anti-Block	sec	t05	0	10	99
Timer protection continuous operation of the compressor in Auto Modality.	h	t06	6	12	24
Auto Modality Configuration	***	C01	0	0	1
Disinfect modality configuration	***	C02	0	0	2
Holydays Configuration	days	C03	0	0	99
Outputs Test	***	t0	***	***	***

Outputs' Test:

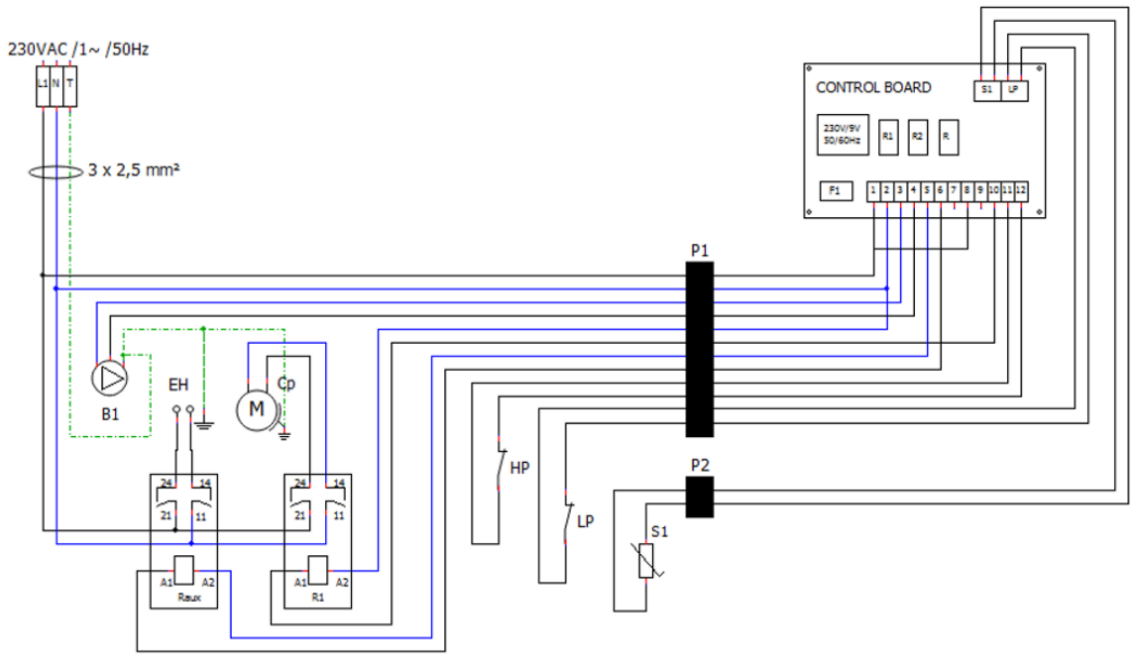
Enter in Installer Menu and scroll until the code t0

- Press the K1 button to enter in the Test;
- Press the K1 button to activate the Heater corresponding Led ON display shows tSt;
- Press the K2 button to activate the Compressor corresponding Led ON display shows tSt;
- Press the K3 button to activate the Pump corresponding Led ON display shows tSt.

The selected output will be activated until you release the button Exit from MENU

- Wait about 5 seconds

19.WIRING DIAGRAM



NOTE: "EH" is not included on the equipment. It's the responsibility of the installer to make its Installation.

Legend			
Cp	Compressor	LP	Low Pressure Switch
B1	Circulator Pump	HP	High Pressure Switch
Raux	Auxiliar Relay	S1	Temperature Probe
EH	Backup Electric Heater		

20.TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES	REMARK
Fault in the electronic panel	Lack of power	Check for the presence of electrical power
		Check the corresponding circuit breaker is turned on
	Disconnected or damaged cabling	Check the integrity of the electronic board's electric circuit.
		Check electrical protection (Fuse)
	Equipment disconnected	Press the ON/OFF button
		Check the equipment is connected to the socket.
		Check the corresponding circuit breaker is turned on.

Low water temperature	Absence of electrical current or damaged cabling	Check the cabling; Check the power cable is disconnected from the electronic cable; Check the electrical protection.
	Error in the performance of the components	Check for errors on the electronic panel and consult the error table.
	Temperature programmed on Setpoint low	Adjust the Setpoint temperature.
	Compressor disconnected	Turn on the compressor using the "COMP" button.
	Hot water returning to the cold water circuit (dam- aged or incorrectly installed safety valve)	Close the cold water inflow valve to turn off the safety group. Open a hot water tap. Wait for 10 minutes and if hot water is available replace the defective pipe and/or correct the position of the safety group.
		Clean the safety group filter.
Excessively hot water	Faulty gauge	Check for errors on the electronic panel.
Low hot water flow	Loss or blockage of the hydraulic circuit	Check the state of the hydraulic circuit.
Water leaking from the safety valve	Absence of or incorrectly-sized expansion tank (if the leak is intermittent)	Installation and/or correct sizing of expansion tank.
	High network temperature (if leak is continuous)	Check the pressure reduction valve (if present).
		Install a pressure reduction valve (if absent)
Abnormally high constant consumption of electricity	Loss or blockage in the cooling circuit	Check the tubing for damaged.
		Use the appropriate equipment to check for leaks in the circuit.
	Adverse weather conditions.	
Others		Contact customer service.

21. ERRORS

ERROR	DESCRIPTION	POSSIBLE CAUSES
LO	Probe S1	Value out of range or low temperature (under 0°C): Probe broken or disconnected.
Li	Probe S1	Value out of range or high temperature (over 100°C): Probe in short circuit
LP	Protection system activated (low pressure)	Insufficient load of refrigerant fluid
		Refrigerant fluid leakage
		Low outdoor temperature
		Low water inlet temperature
		Damaged low-pressure switch
		Disconnected or damaged cabling
		Damaged electronic panel
HP	Protection system activated (high pressure)	Presence of air in the refrigerant
		Lack of water in the circuit
		Damaged circulator pump
		Dirty condenser/filter (if exists)
		Excess fluid
		Damaged high-pressure switch
		Disconnected or damaged cabling
		Damaged electronic panel

22. WARRANTY

This warranty covers all defects to the confirmed materials, excluding the payment of any type of personal damage indemnity caused directly or indirectly by the materials.
The periods indicated below start from the purchase date of the apparatus, 6 months at the latest from the leaving date from our storage warehouses.

Water Cylinder (Domestic and Industrial)	**Thermodynamic Solar Panel**	**Electrical components and moving parts:**
5 Years: Stainless Steel (2+3 Years)* 5 Years Enamelled (2+3 Years)* Manufacturer Warranty	10 years against corrosion	• Thermodynamic Block • Solar Block • Solarbox • Split • Monobloc (except cylinder) • Thermobox • Inverter 2 Years

*The warranty extension of 3 years, against corrosion of the internal tank (Enamelled / Stainless Steel), is conditioned to the submission of:

- Warranty and Check Sheet at maximum 15 days after the installation.
- Documental evidence of the magnesium anode annual replacement (if applicable).
- Pictures of the installation where it's shown safety group, expansion vessel, hydraulic and electrical connections.

In case of warranty, the parts replaced are property of the manufacturer. A repair under the warranty is not reason for an extension of its term.

Warranty Exclusions

The warranty ceases to be effective when the apparatus is no longer connected, used or assembled in accordance with manufacturer instructions, or if there has been any form of intervention by unauthorized technicians, has the appearance of modifications and/or if the series number appears to have been removed or erased. The equipment should be installed by qualified technicians according to the rules in effects and/or the rules of the trade, or the instructions of our technical services. Further exclusions from warranty:

- Hot water tanks have been operating in water with the following indexes:
  - Active chlorine > 0.2 ppm
  - Chlorides > 50 mg/l (Inox)
  - Hardness > 200 mg/l
  - Conductibility > 600µS/cm (20ºC)
  - PH < 5,5 or PH > 9 (Sorensen at 20ºC)
  - Magnesium > 10 mg/l
  - Calcium > 20 mg/l
  - Sodium > 150 mg/l
  - Iron > 1 mg/l
  - If one of the water parameters has a higher value than stipulated by directive 236/98 (Portugal) or equivalent standard in the costumer's country
- Parts are subject to natural wear and tear – levers, switches, resistances, programmers, thermostats, etc.
- Breakdown due to incorrect handling, electrical discharges, flooding, humidity or by improper use of the apparatus.
- The warranty lapses if it is transferred to another owner, even if within the guarantee period.
- The warranty lapses if this certificate is incorrectly filled in, if it is violated or if it is returned after more than 15 days have passed since the installation or purchase date of the apparatus.

NOTE: This sheet must be properly filled, signed and stamped by the installer / reseller and returned to ENERGIE EST, Lda., otherwise the warranty will not be validated.
Send this installation sheet to **warranty@energie.pt**, writing the serial number of the equipment as subject.


ENERGIE