TECHNICAL MANUAL ENG

ENERGIE®

ECO-NOMIC

Dear Customer,

We would like to thank you for your choice by acquiring this thermodynamic solar system for domestic hot water.

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

Our company dedicates her best efforts developing new and innovative products that can promote savings.

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.

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1. IMPORTANT

1.1. Symbols

	Every step where the supplier believes that may be harmful, dangerous and/or could damage some part is signalled with a danger sign. For a better characterization of the danger, the symbol will be followed by one of these words: • **DANGER**: when there is the possibility of harm to the operator and/or people in the vicinity of the equipment. • **WARNING**: when there is the possibility of material damage to the equipment and/or attached materials.
	All the information that the supplier believes to be an asset for better performance and preservation of the equipment, will be signalled together with the information sign.

1.2. Pre-installation Information

 **DANGER**	The electrical installation of the product must comply with the national regulations for electrical safety. **ECO-NOMIC** will only operate after refrigerant charge. The maximum water pressure into the hydraulic circuit inlet is 0.3 MPa and the minimum pressure is 0.1 MPa. The power supply is 230V, 50Hz, and the power supply cable should be plugged into a socket with earth connection. If the power supply cable is damaged, it must be replaced by the manufacturer, customer service, or technicians with similar training in order to avoid any danger.

 **DANGER**	This appliance is not intended for use by people (including children) with physical, sensorial or mental handicaps, or by people lacking experience and knowledge, unless they have received training or instructions regarding the use of the appliance in a safe way, and are aware of the dangers involved. Children and pets should be supervised so as not to interfere with the operation of the equipment.

1.3. Safety Information

When installing

- The installation of a thermodynamic system for domestic hot water must be carried out by a trained technician qualified for this purpose;
- The device should not be installed in places with presence of risk of impact, shock or explosion;
- Keep the equipment packed until it reaches the place and moment of installation;
- Make sure all hydraulic connections are well tight before connecting the equipment to the power supply.

Maintenance of the equipment

- Equipment maintenance should be carried out by customer service, except operations of general and continuous cleaning which could/should be carried out by the end user;
- Power supply to the equipment must be disconnected when doing maintenance operations;
- The supplier recommends, at least once a year, an inspection to the equipment, by a qualified technician;
- Cleaning and maintenance must not be carried out by children unless they are under supervision.

High pressure and temperature

- The principle for running this equipment is directly linked to high temperature and pressure, thus, the processes that imply contact with the equipment must be thought out with caution to prevent the risk of burns and projection of material.

Refrigerant

- The refrigerant used is R134a, CFC-free, non-inflammable and without harmful effects for the ozone layer;
- However, according to the law, the refrigerant in this equipment cannot be released into the environment;
- Handling of the refrigerant in the equipment must be carried out by a qualified technician.

Information for the end user

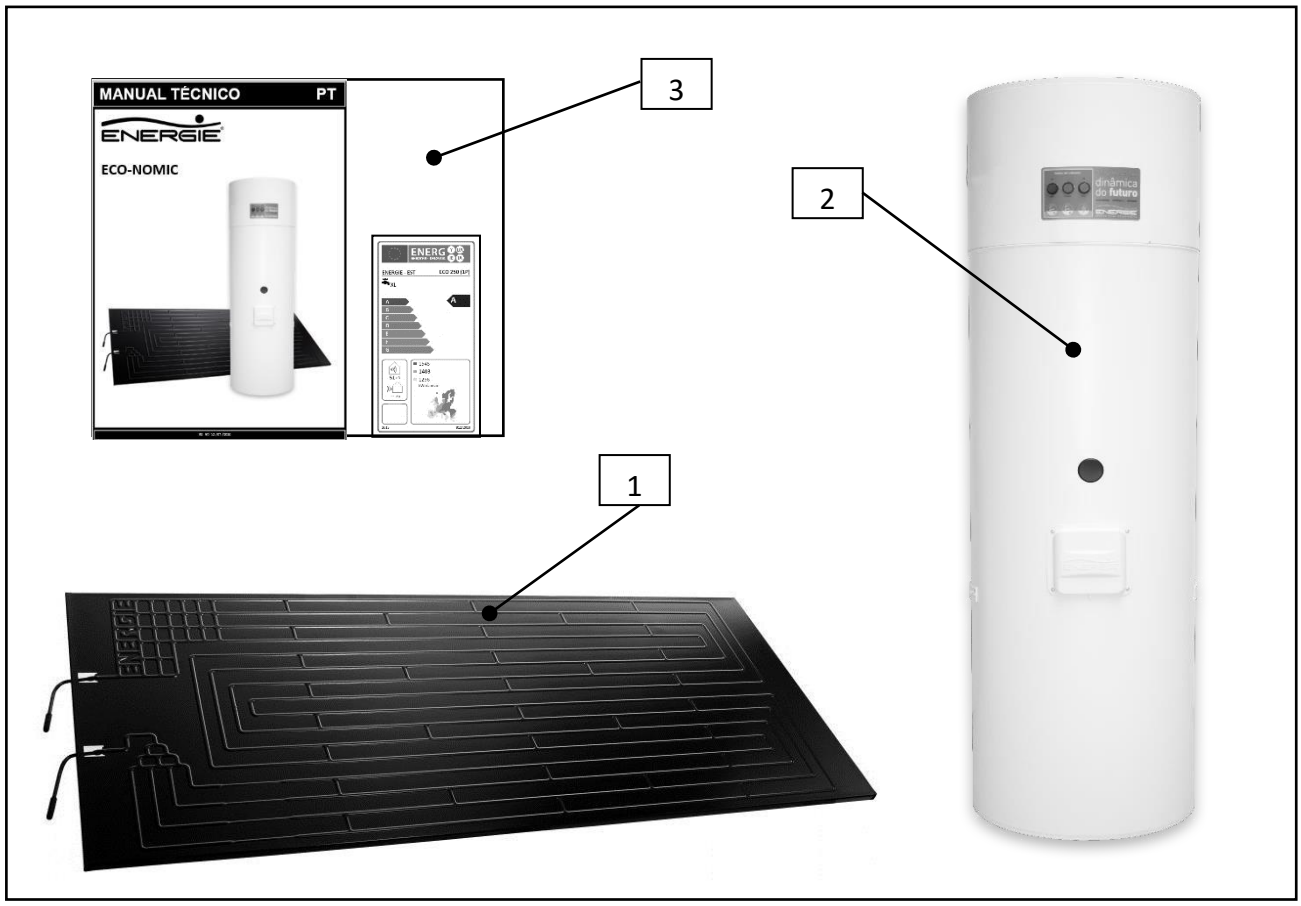
- The Installer must inform the end user about the principle of the equipment, its dangers, rights and duties of the client.

2. PACKAGE

2.1. Contents

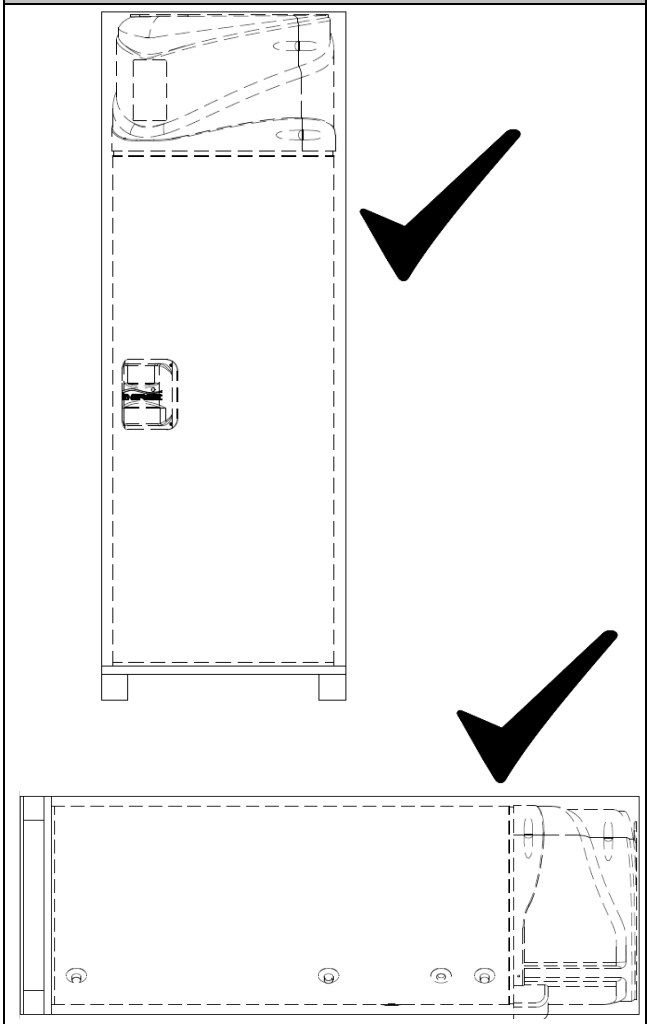
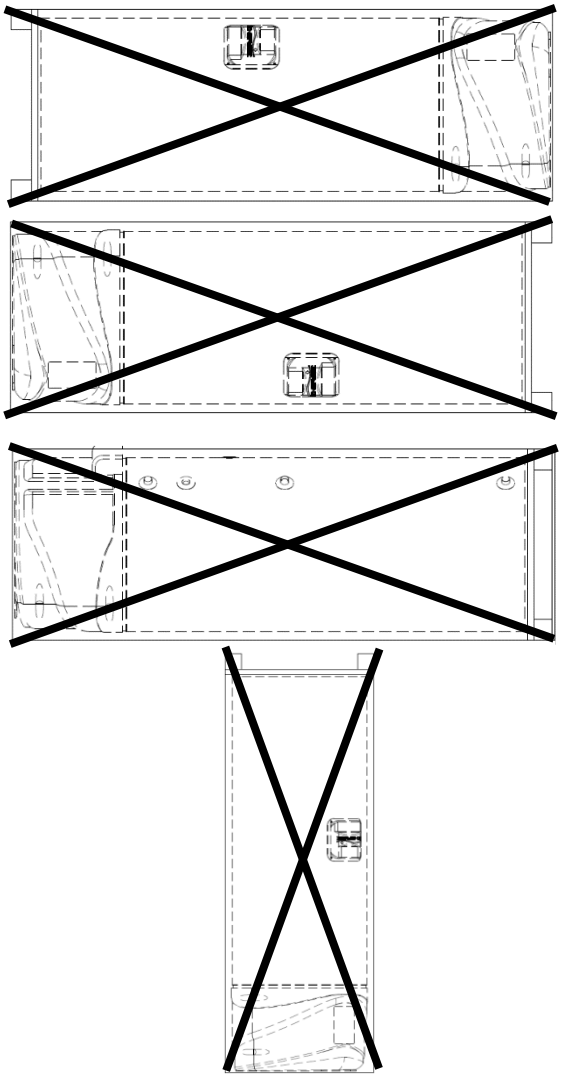
The equipment is supplied in two packages, one is the thermodynamic solar panel and its fixation elements; the other is the hot water cylinder with thermodynamic block together The packages contain:

1. Thermodynamic panel and its fixing elements
2. Hot water cylinder with thermodynamic block on top
3. Installation manual, warranty sheet, ERP label, product datasheet



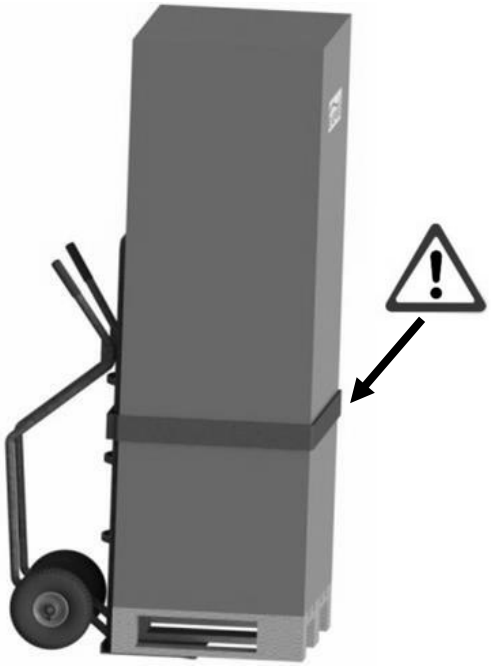
2.2. Transport

WARNING	Transporting the equipment must be carried out with an inclination below 45º; The equipment must be raised and lowered with extreme care to avoid any impact that can damage the unit; Make sure the belts and/or transportation straps do not damage the material; Always use ways of transportation suitable for the equipment (pallet lift, forklift, etc.…).

OK	NOK
	

The equipment must be transported in its original package to the place of installation. Check, before beginning transport the unit, if the path you will travel is unobstructed, in order to prevent collisions that could cause damage to the device. The packages contain the following information symbols:

	Fragile, handle with extreme caution		Keep the package dry
	Make sure the arrows are always up		Do not stack packages



3. SPECIFICATIONS

3.1. Running Principle

The thermodynamic solar system Eco-Nomic is based upon the refrigeration working principle by compression – Thermodynamic principle of Carnot – which we designate by Thermodynamic Solar Systems: solar panel and heat-pump.

The solar panel it's the main component, shall be placed outside. Is also responsible for collecting the energy from:

- Diffuse and direct solar radiation
- Air, by natural convection
- The wind effect (almost always available)
- Rain

The temperature gradient between the external agents mentioned above and the fluid inside the solar panel, makes the fluid to evaporate on its inside. The absence of glass in the solar panel allows for an increased thermal heat exchange by convection.

After circulating in the solar panel, the fluid is aspirated by the system's mechanical component, the compressor, which will increase its temperature and pressure; then the temperature is transferred to the water circuit by a heat exchanger.

Before the fluid returns to the solar panel it's pressure and temperature are reduced by passing thru a expansion valve, completing the cycle.

The easy way we combine technology with a law of Nature (change of state of a fluid), demonstrates the true potential of the Thermodynamic Solar System – ECO-NOMIC.

3.2. Technical Features

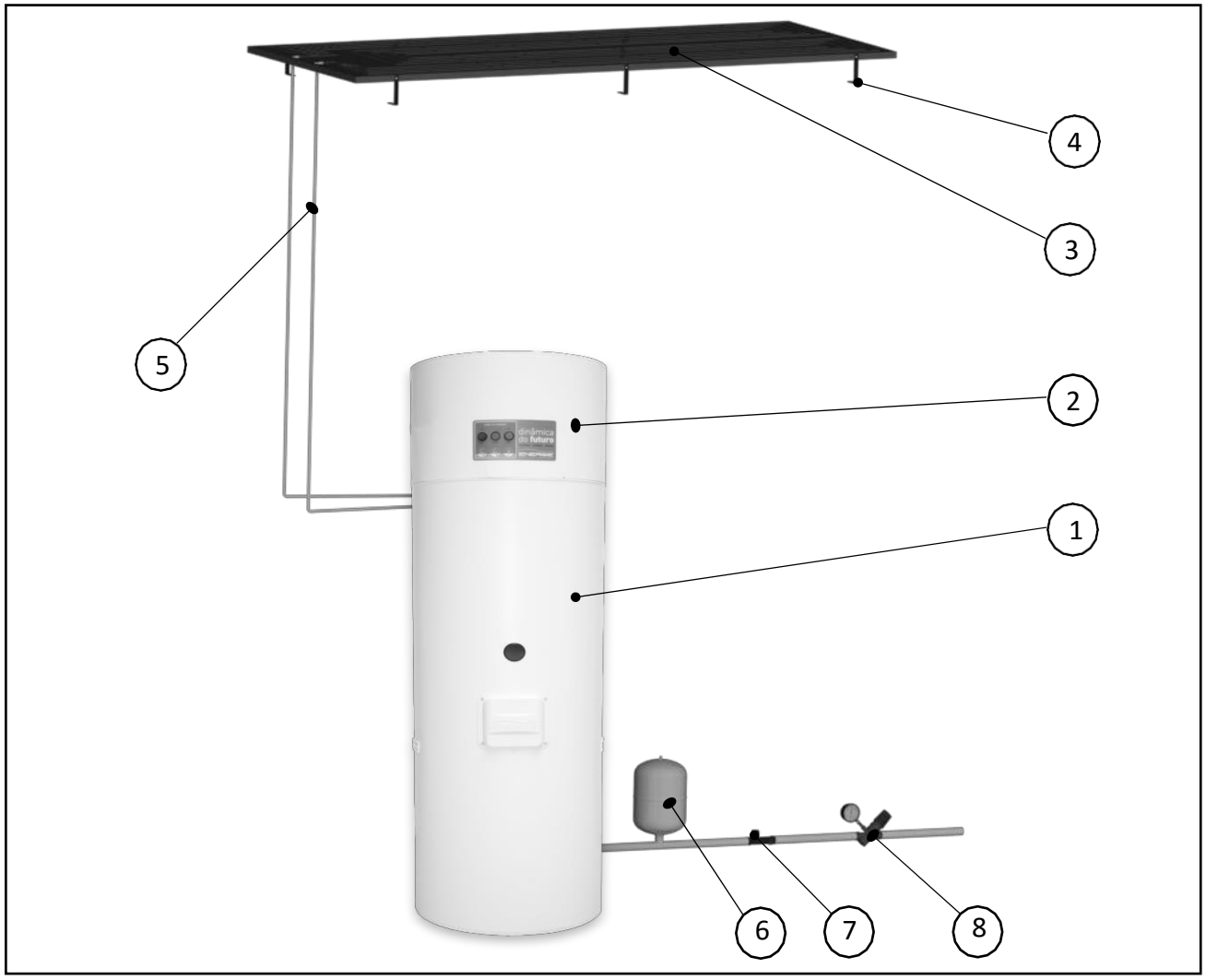
			Un.	250i
HOT WATER CYLINDER	Dry Weight		Kg	102
	Capacity		l	250
	Internal Protection		-	Stainless Steel AISI444
	Cathodic Protection		-	Magnesium Anode (1"1/4 F)
	Hydraulic Joints	Water – Inlet and Outlet	Pol.	3/4" Male
		TP Valve		1/2" Female
		Recirculation		3/4" Male
	Insulation		-	High Density Polyurethane
	Maximum Allowed Pressure		bar	7
	Maximum Allowed Temperature		°C	80
	Heat Loss (EN 12897)		kWh/24h	1,01
THERMODYNAMIC SOLAR PANEL	Material		-	Solokote Anodized Aluminium
	Dimensions (L x W x H)		mm	2000 x 800 x 20
	Weigh		kg	8
	Max Working Pressure		bar	12
	Exposure Temperature(Min|Max)		°C	-40 | 120
THERMODYNAMIC BLOCK	Absorbed Power (Med|Max)		W	390 | 550
	Thermal Power (Med|Max)		W	1690 | 2900
	Electrical Backup Power		W	1500
	Refrigerant / Qt.*		- / g	R134a / 1100*
	Piping Material		-	Copper (DHP ISO1337)
	Refrigerant connections (Liq. |		pol.	1/4" | 3/8"
	Power Supply		V / Hz	220-240 / 50 / Single phase
	Running Temperature (Min|Max)		°C	- 5 | 45
PERFORMANCE **	Load Profile		-	XL
	COP	Air 2 ºC	-	2,9
		Air 7 ºC	-	3,3
		Air 14 ºC	-	3,7
	Energy Efficiency Class	Air 2 ºC	-	A
		Air 7 ºC	-	A+
		Air 14 ºC	-	A+
	Energy Efficiency	Air 2 ºC	%	119
		Air 7 ºC	%	137
		Air 14 ºC	%	151
	Annual Energy Consumption	Air 2 ºC	kWh/y	1411
		Air 7 ºC	kWh/y	1287
		Air 14 ºC	kWh/y	1111
	Amount of Useful Water at 40 ºC		l	389
	Factory Setpoint		ºC	53
	Sound Power Level Indoor		dB	51

*The amount of fluid must be checked by the installer. In some cases, it is necessary to add or remove refrigerant in order to ensure the correct operation of the system.

**According EN 16147, Commission Delegated Regulation (EU) No. 812/2013 and No. 814/2013 for the three climate zones: Colder (2 ºC), Average (7 ºC), Warmer (14 ºC)

3.3. Main Components

3.3.1. General Assembly



[1] Hot water cylinder

[2] Thermodynamic block

[3] Thermodynamic solar panel

[4] Fixation elements

[5] Insulated copper pipes (not supplied)

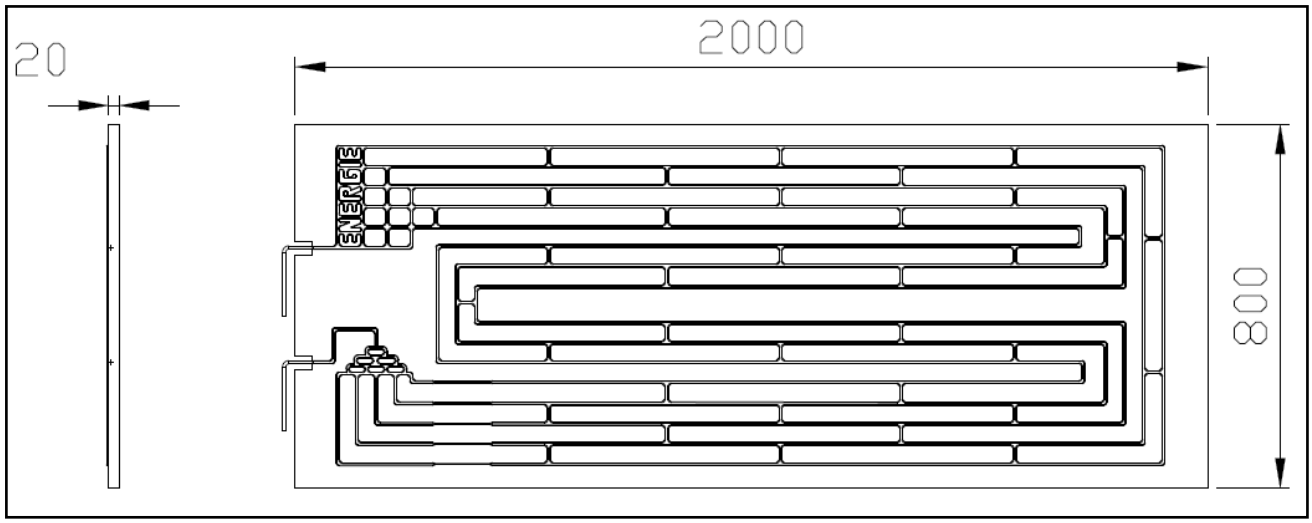
[6] Expansion vessel (not supplied)

[7] Safety group (7bar)

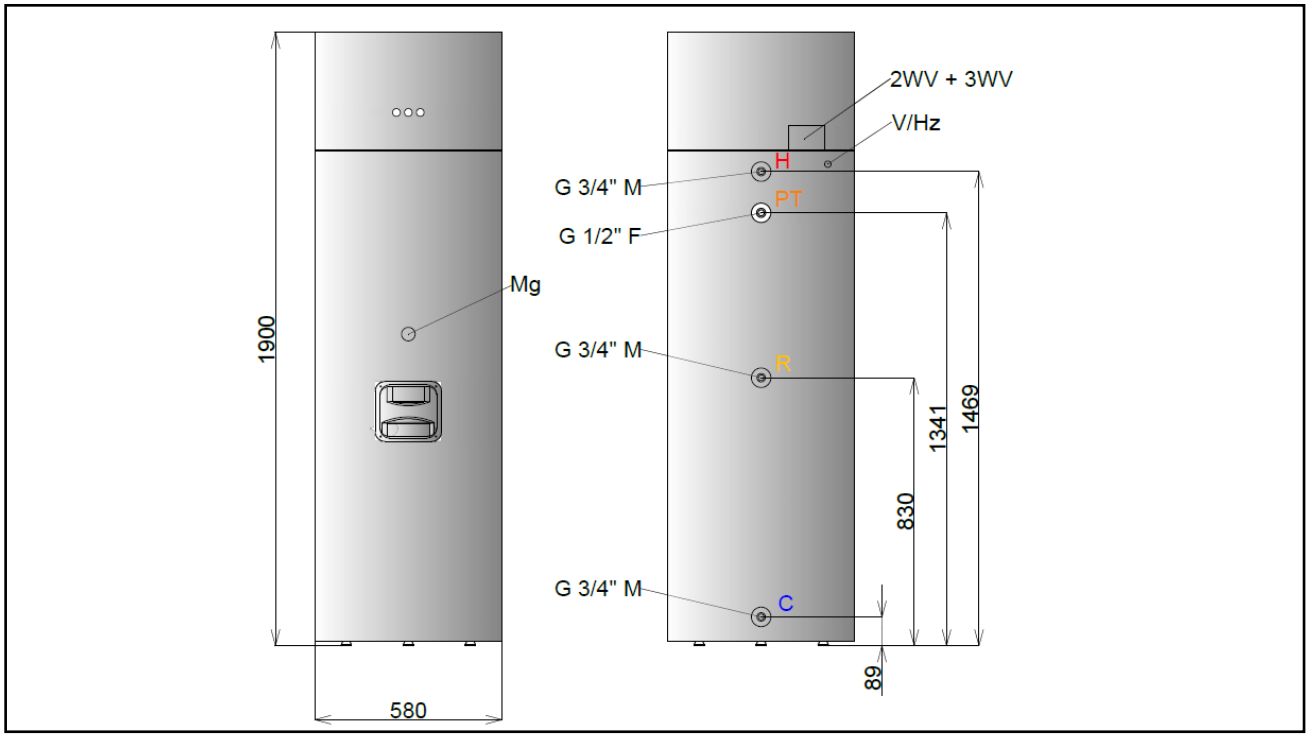
[8] Pressure reduction valve (3bar) (not supplied)

3.3.2. Dimensions

Thermodynamic Solar Panel

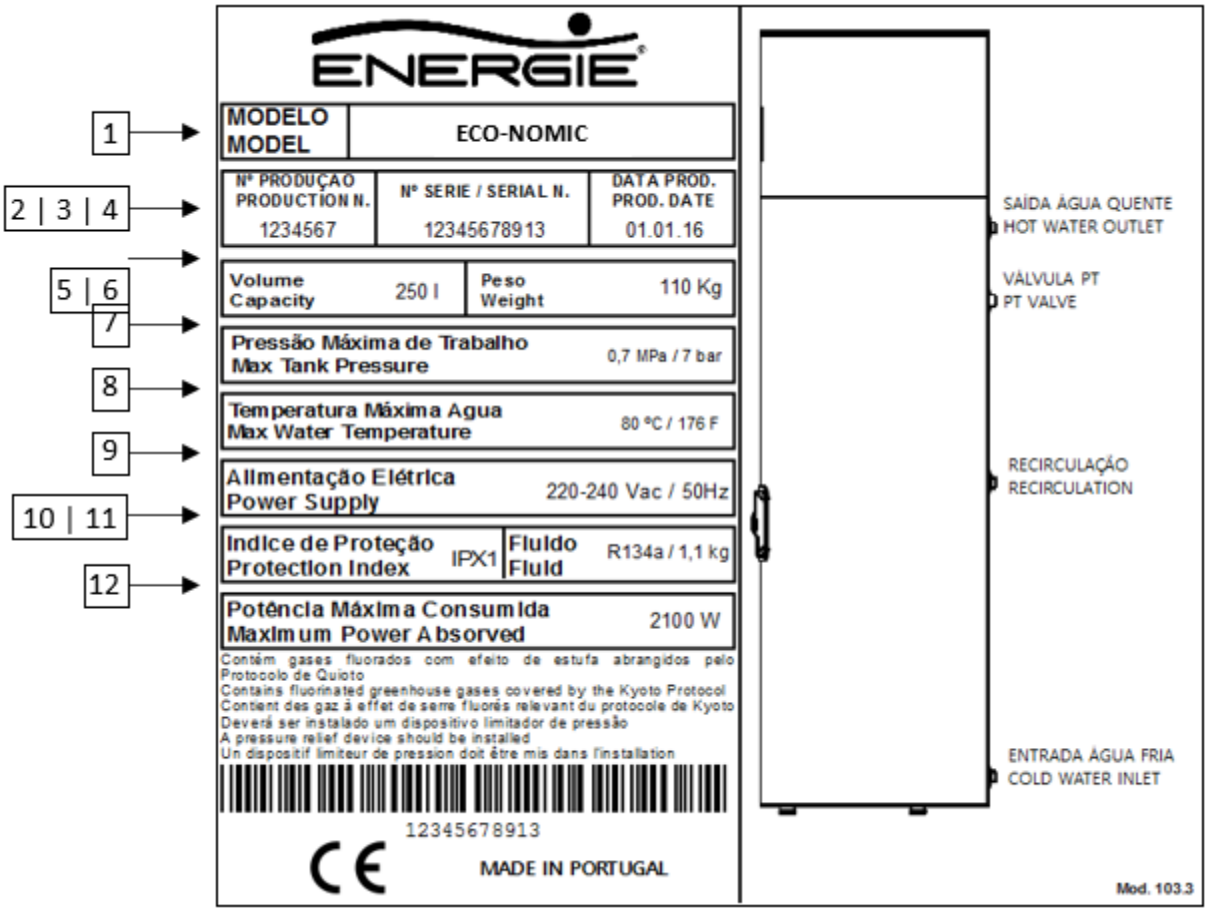


Indoor Unit



[C]	Cold water inlet	**[H]**	Hot water outlet
[R]	Recirculation	**[V / Hz]**	Power supply
[AN]	Magnesium Anode	**[2WV / 3WV]**	Refrigeration connections (2way;
[PT]	TPR Valve (optional)		

3.3.3. Characteristic Plate



[1] Model
[2] Production number
[3] Serial number
[4] Production date
[5] Capacity
[6] Weight
[7] Max Working Pressure
[8] Max Water Temperature
[9] Power Supply (voltage / frequency)
[10] Protection Index
[11] Fluid (type / amount)
[12] Maximum Power Absorbed (with electric heater backup)

When contacting the installer or manufacturer, make sure you have the following within reach:

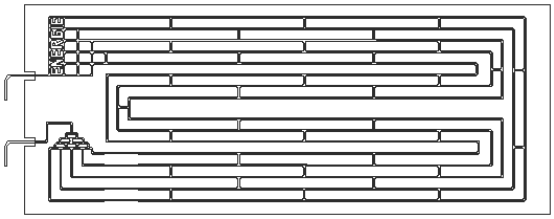
- Model;
- Serial number;
- Production number;
- Date of production.

This information will make communication easier and, consequently, you will receive a quicker and accurate reply.

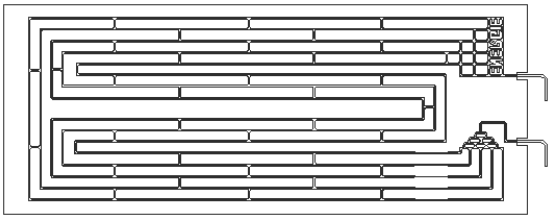
3.3.4. Thermodynamic Solar Panel

The solar panel is a double channel pressed aluminium, anodized and painted with Solokote hydrophobic layer. There are two types of panels available: left and right (designated according to side of connections).

Left Panel



Right Panel

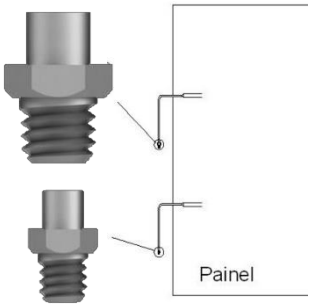


The panels have the following pipe diameters:

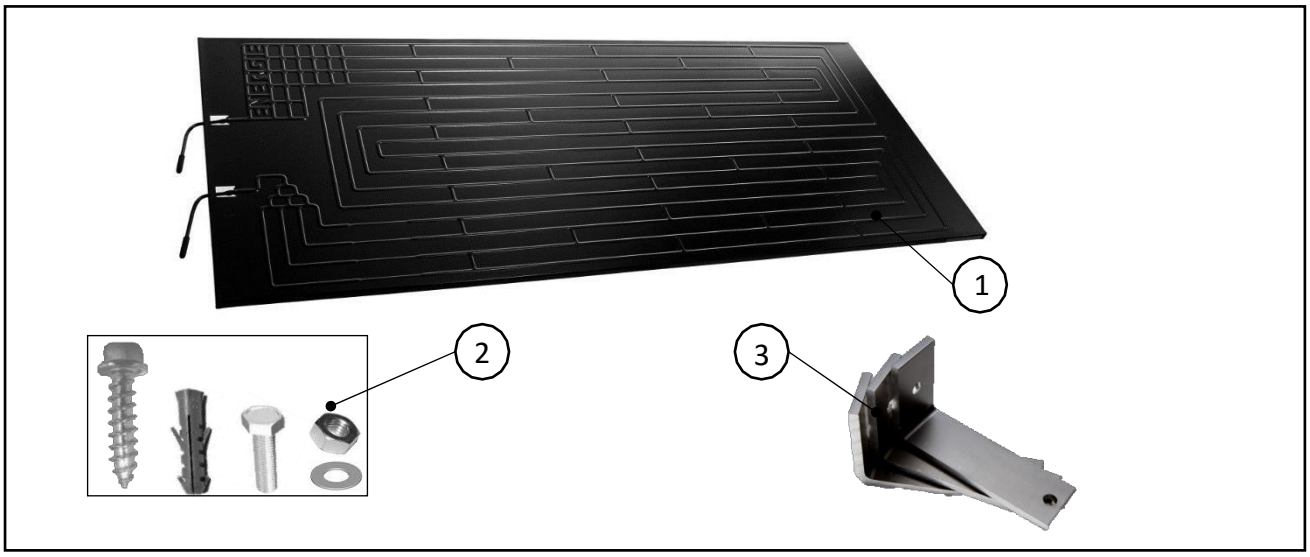
- 3/8” Aspiration (upper connection)
- 1/4" Liquid (lower connection)

ODS (welded to panel) 3/8” flare Male SAE

ODS (welded to panel) 1/4” flare Male SAE



The parts provided <u>for each panel</u> are the following:



[1] Thermodynamic Solar Panel
[2] Fixing elements
[3] Aluminium brackets (3x small + 3x large)

3.3.5. Refrigerant

The R134a is a HFC fluid, thus not harmful to the ozone layer. It has great chemical and thermal stability, low toxicity, non-inflammable and is compatible with most materials.

The following graphic depicts the behaviour of pressure according to evaporation temperature:

T (ºC)	P (bar)
-20	0,33
-15	0,64
-10	1,00
-5	1,43
0	1,92
5	2,49
10	3,13
15	3,90

T (ºC)	P (bar)
20	4,70
25	5,63
30	6,70
35	7,83
40	9,10
45	10,54
50	12,11
55	13,83

3.4. Safety and Control Devices

3.4.1. Safety Thermostat

The safety thermostat is set by the supplier to ensure that the water temperature in the storage water heater does not exceed the standard value. Should the temperature exceed this value, the thermostat switches off the support resistance. Switching on is done manually by qualified staff, after analysing the reasons for the switch off.

3.4.2. Protection against corrosion

The hot water cylinder in this equipment is made of stainless steel AISI444.

Besides being resistant to corrosion, the storage water heater has in addition a magnesium anode that should be checked periodically according to information by the installer.

3.4.3. Expansion Vessel (not supplied)

The expansion vessel is a device whose purpose is to compensate for the increase in water volume due to temperature rise and to reduce the consequence of any water hammer effect.

Installing this device is a recommended procedure for a correct installation of the equipment.
Installing this device is the responsibility of the installer.
As a general rule it is installed in the cold water pipe.

3.4.4. Safety Group

The safety device allows the system to be protected against anomaly situations: cold water supply, hot water flowing back, emptying the storage water heater and high pressure. The valve is calibrated to activate at 0.7 MPa.

In order to drain the water in the storage water heater, you should close the supply valve and open the discharge valve.

The safety valve discharge pipe must be open into the atmosphere, driven to the sink because the valve may drip or even discharge water.

The safety valve must be opened regularly to remove impurities and check that it is not blocked. The discharge pipe must be installed in a vertical position and not placed in a freezing location.

WARNING DANGER	The installation of the safety group must take into consideration the right direction of the hydraulic flow. The right direction is represented by an arrow on the component. An incorrect installation poses a danger to people and to the equipment.

3.4.5. **Pressure Reducing Valve** (not supplied)

The pressure reducing valve must always be installed upstream from the safety device, and ready to activate in situations when the pressure in the circuit exceeds 3 bar. This valve comes with a pressure gauge.

WARNING DANGER	The installation of the pressure reducing valve must take into consideration the right direction of the hydraulic flow. The right direction is represented by an arrow on the component. An incorrect installation poses a danger to people and to the equipment.

4. INSTALLATION

Assembly sequence:

4.1. Thermodynamic solar panel attachment
4.2. Set-up of the hot water cylinder + thermodynamic block
4.3. Refrigerant connections
4.4. Hydraulic connections
4.5. Electric connections

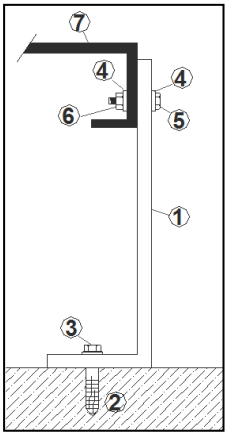
4.1. Thermodynamic Solar Panel Installation

The nature of the site and the inclination angle where the panels are installed are important factors to consider. In order to benefit the most from the sunlight exposure, the panels should have a pitch between 10^{o} and 85^{o} relative to the horizontal plane, and preferably oriented to the south (on the north hemisphere).

The panel already comes with 6 holes for M8 in the lateral bends. The distance between holes in the place where the panel rests should coincide with the holes made in the panel.

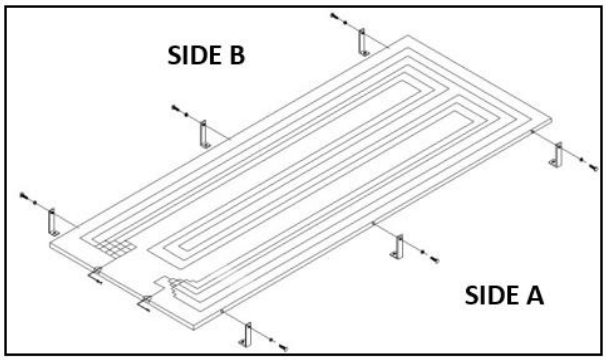
WARNING	Fixation in <u>at least</u> 6 points (3 points at the top and 3 points at the bottom) is mandatory! The lack of at least one of these points may cause deformities in the panel and, in some cases, may cause the panel to move away from the place of installation.

Attachment of brackets



[1] Aluminium brackets
[2] Nylon plug
[3] Screw M6.3x40
[4] Washer M6
[5] Screw M6x20
[6] Nut M6
[7] Thermodynamic solar panel

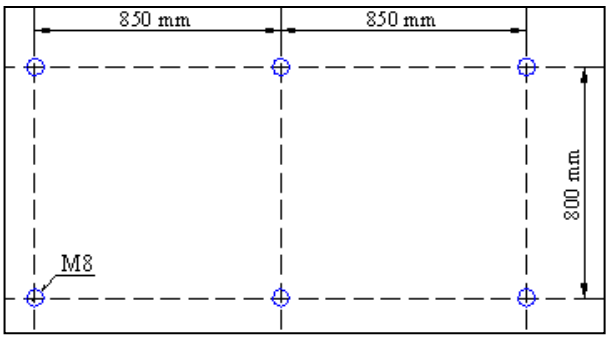
The system has 3 small brackets (side A) and 3 large brackets (side B) that should be attached as shown in the picture. The desired inclination of the panel should be adjusted.



The profile should be attached to the base (e.g. roof tile) through a plastic bushing and a self-thread M6 bolt which have been supplied.

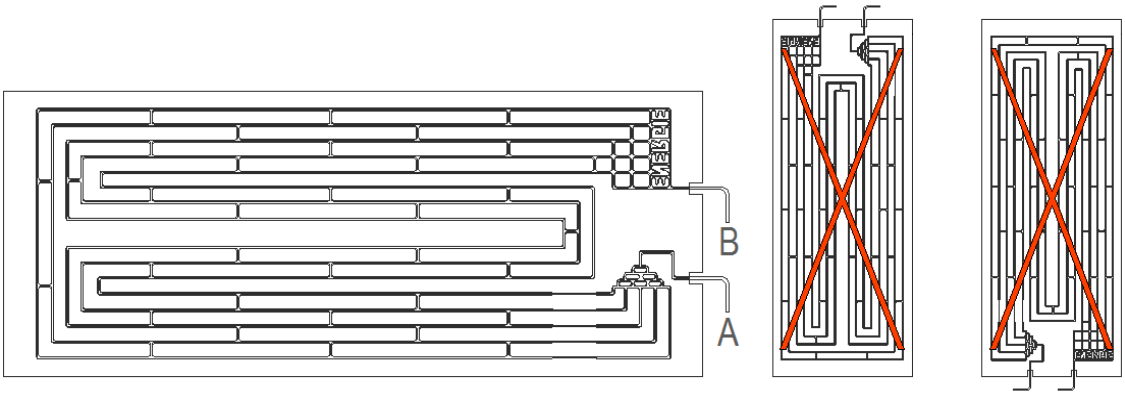
The attachment of the panel to the brackets is done through M6 screws, its nuts and washers.

The panel's packaging has a marking that serves as a guide bar for the holes drilled at the base. This marking follows the diagram below:



⚠ WARNING ⚠

The panel must be installed facing down, the connections must be turned down.



A - Liquid inlet

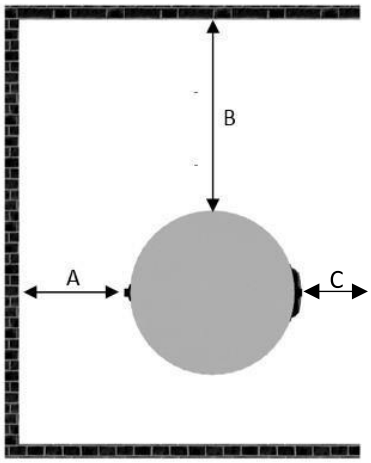
B - Vapour outlet

4.2. Set-up of the Hot Water Cylinder + Thermodynamic Block (Indoor Unit)

Pre-requisites:

- Keep the equipment sheltered of places susceptible of ice particles
- Choose the position closer to the main user points
- Always insulate the piping
- The temperature around the equipment must not exceed 40 °C
- The hot water cylinder must never be kept outside, and avoid exposure to sunlight
- Make sure the support surface is enough to accommodate the weight of the storage water heater filled with water
- Make sure that those sides with electrical appliances have at least a 500 mm gap for the purpose of maintenance

Ensure the recommended free space:



A: 250mm B: 500mm C: 500mm

4.3. Refrigerant Connections

DANGER	The refrigerant connections must be done by a qualified technician, with a professional certification for this purpose. The refrigerant connections must be thermally insulated in order to prevent burns and to ensure an optimal system performance. The system has a pre-charge of refrigerant R134a.

The pipes used must be made of dehydrated refrigeration copper without seams (Cu DHP type according to standard ISO1337).

PIPES DIAMETER	
VAPOUR (aspiration)	LIQUID (panel inlet)
3/8''	1/4''

Flowchart of refrigerant connections:

4.3.1. Connection of Copper Pipes to the Panel

↓

4.3.2. Connection of Copper Pipes to Indoor Unit

↓

4.3.3. Nitrogen Load and Leak Test

↓

4.3.4. Vacuum

↓

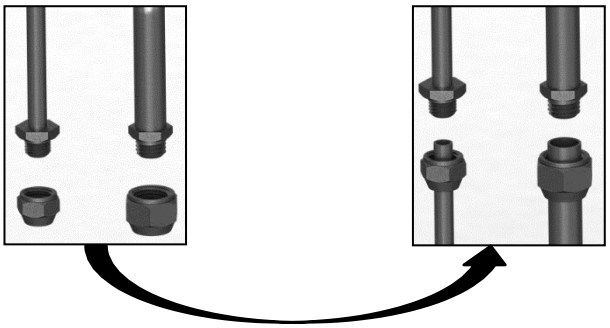
4.3.5. Fine Tuning

↓

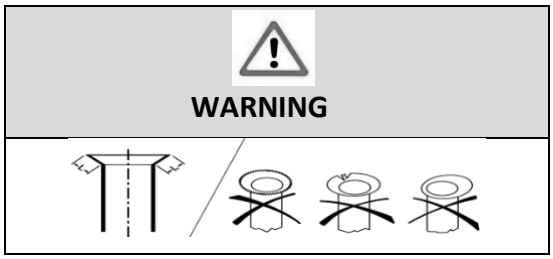
4.3.6. Complementary Charge

4.3.1. Connection of Copper Pipes to the Panel

a) Prepare the copper pipe, removing the protective caps from the extremities
b) Place the extremity of the pipe upside down, cut the appropriate size of pipe and trim the rough edge
c) Remove the females from the connections in the panel and insert them in the pipe



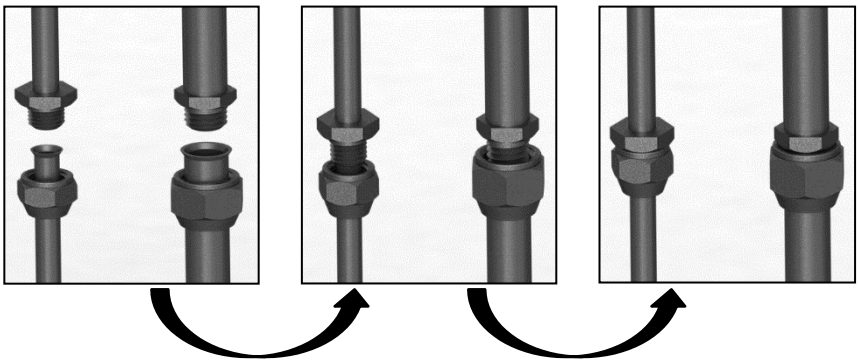
d) Flange the pipe with the appropriate tool shaping a conic edge, make sure that there are no rough edges or imperfections and that the vertical of the walls are uniform



e) Tighten the female coupling with your hands, turning it a few times

	We recommend the use of a suitable thread sealant! The sealant should be placed between these two steps [e) and f)]. If in doubt, please contact the manufacturer.

f) Then fully tighten applying a torque in conformity with the table

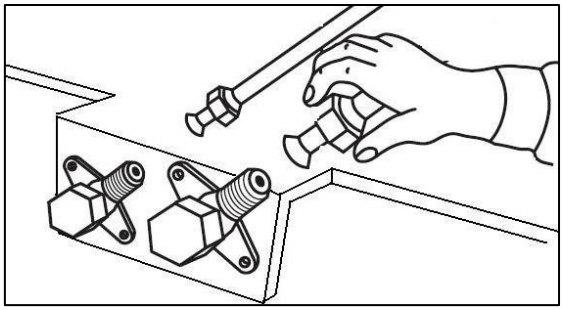


Pipe Diameter (inches)	Torque (N.m)	Wrench nº
1/4”	14 to 16	19
3/8”	33 to 42	21

4.3.2. Connection of Copper Pipes to Indoor Unit

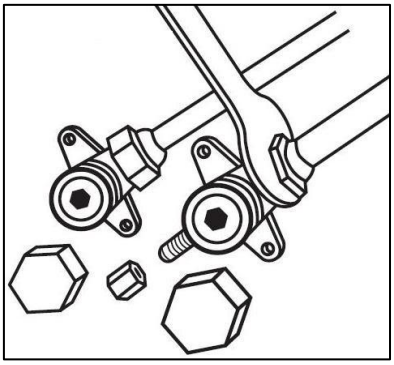
	Some of the required steps are a repetition of the procedures for the panel connections. All connections must be insulated!

a) Cut the required measure of the pipe with the edge turned upside down and trim any remaining rough edges
b) Shape a conic edge in the top of the pipe and do not forget to place the female coupling on the side of the pipe
c) Tighten the female coupling with your hand by giving it a few turns

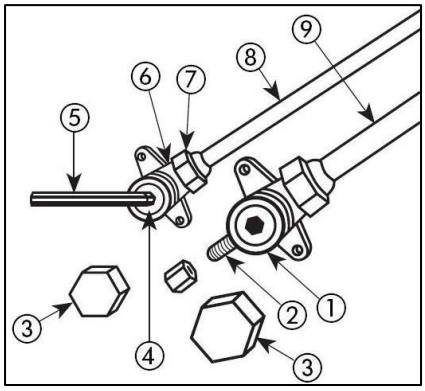


	We recommend the use of a suitable thread sealant! The sealant should be placed between these two steps [c); d)]. If in doubt, please contact the manufacturer.

d) Secure with wrench applying the torque as before



AVISO	It is important to keep the valves closed before moving on to the next points. The hot water cylinder + thermodynamic block set is under fluid charge. The closed valves ensure that the fluid will not escape during the subsequent steps.



Caption:	
1	3-Way Valve
2	Pressure intake
3	Valve cap
4	Valve needle
5	Allen Key
6	2-Way Valve
7	Conic nut
8	Liquid line (small diameter)
9	Vapour line (large diameter)

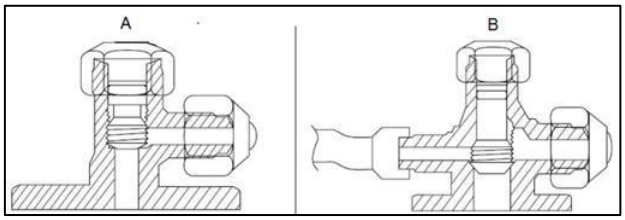
4.3.3. Nitrogen Load and Leak Test

a) After finishing the connections, make sure there are no leaks. For this purpose, load the circuit with nitrogen with a pressure of 10 bar through the low pressure access valve (3-way valve).
b) Brush every coupling with soap foam and make sure that the pressure in the pressure gauge stays constant.

4.3.4. Vacuum

a) During the whole procedure make sure all connections, vacuum pump and pressure gauges are suitable for fluid R134a
b) Use a vacuum pump to remove the air and humidity of the circuit
c) Never use the system refrigerant to purge the pipes
d) The valves must be completely closed during the vacuum process, in order to create vacuum only in the piping

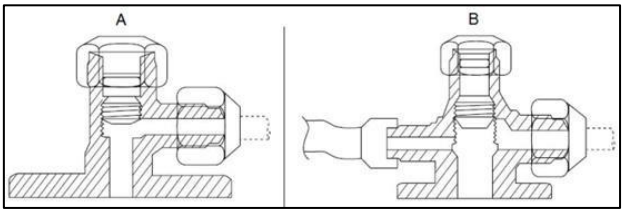
Valves Closed



A - 2 Way Valve B - 3 Way Valve

e) Create a vacuum with the vacuum pump plugged to the 3-way valve as depicted, keeping the valves completely close. Keep the vacuum pump working for at least 30 min
f) Once the vacuum procedure is over, shut the vacuum pump valves. The vacuum pressure gauge should indicate the same reading after the pump has been stopped, ensuring the installation is on vacuum and ready for be loaded with refrigerant
g) After concluding the vacuum procedure, you must open the two and three way valves so that the fluid may circulate through the whole system
h) Remove the hose connected to the 3-way pressure valve.

Valves Open



A - 2 Way Valve B - 3 Way Valve

	After concluding the vacuum, do not remove the hoses while the system is not completely pressurized with fluid – R134a. This will prevent the atmospheric air (atmospheric pressure) from entering the system (vacuum).

4.3.5. Fine Tuning

To check whether your equipment is running correctly, start it, wait at least 30 minutes and then check these conditions:

- Superheating, without solar radiation directly over the panel, should be between 5ºC and 10ºC (Superheating = $T_{aspiration} - T_{evaporation}$);
- The difference between room temperature and evaporation temperature should be between 16 ºC and 20 ºC.

4.3.6. Complementary Charge (if necessary)

Your unit is pre-charged for connections up to 12 m (horizontal) between the panel and the indoor unit. Long distances will decrease the performance of your equipment.

Before carrying out an additional charge of refrigerant fluid, you must prepare all the equipment and tools necessary for the operation, such as:

- Refrigerant bottle and their hoses
- Allen key to open the 3-way valve
- Balance with 10 g of precision

To carry out a complementary charge of refrigerant, follow these steps:

a) Place the refrigerant bottle on a balance with a 10 g precision and take note of the weight
b) Connect the hose of the fluid bottle (R134a) to the inlet of the 3-way valve
c) Switch off the compressor on the electronic panel
d) Open carefully, and very slightly, the handle of the fluid bottle, notice the variation of the weight on the balance (as you load fluid into the circuit, the weight in the balance will decrease)
e) When your reach the figure intended for the injection of cooling fluid into the circuit, close the bottle handle and remove the hose connected to the 3-way valve
f) Switch on the compressor and check the pressures and superheating values.

4.4. Hydraulic Connections

WARNING / DANGER

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

To make the hydraulic connections:

a) Connect the water inlet and outlet of the equipment with a pipe and fittings that can cope with constant temperature / pressure of 80 ºC / 7 bar. For this reason, we recommend the

use of piping with resistance to high temperature and pressure. We recommend the use of pipe type PEX, PPR, MULTILAYER, amongst others.

b) It is necessary to install a safety device at the cold water inlet of the appliance. The safety device must be in compliance with the standard EN 1487:2002, maximum pressure 7 bar (0.7 MPa)
c) Besides this device, other components will be necessary to ensure the interruption of the hydraulic load, installed according to this sequence:
    - Cut-off valve
    - Pressure reducing valve
    - Safety group with discharge valve
    - Expansion vessel

 **WARNING DANGER**	The safety/discharge valve must be connected with piping whose diameter is not less than the cold water inlet coupling. The discharge must be connected to a sewage siphon or, if this is not possible, elevated to a distance of at least 20 mm from the pavement to allow visual inspection. All the above recommendations have been made to ensure the safety of people, animals and others.

	We recommend the installation of a cut-off / section valve between the gate valve and the hot water cylinder for the purpose of maintenance, safety or emergency. The Manufacturer is not responsible for damage related to not following these recommendations / warnings.

4.5. Electric Connections

To establish the electric connection of the equipment, check these conditions:

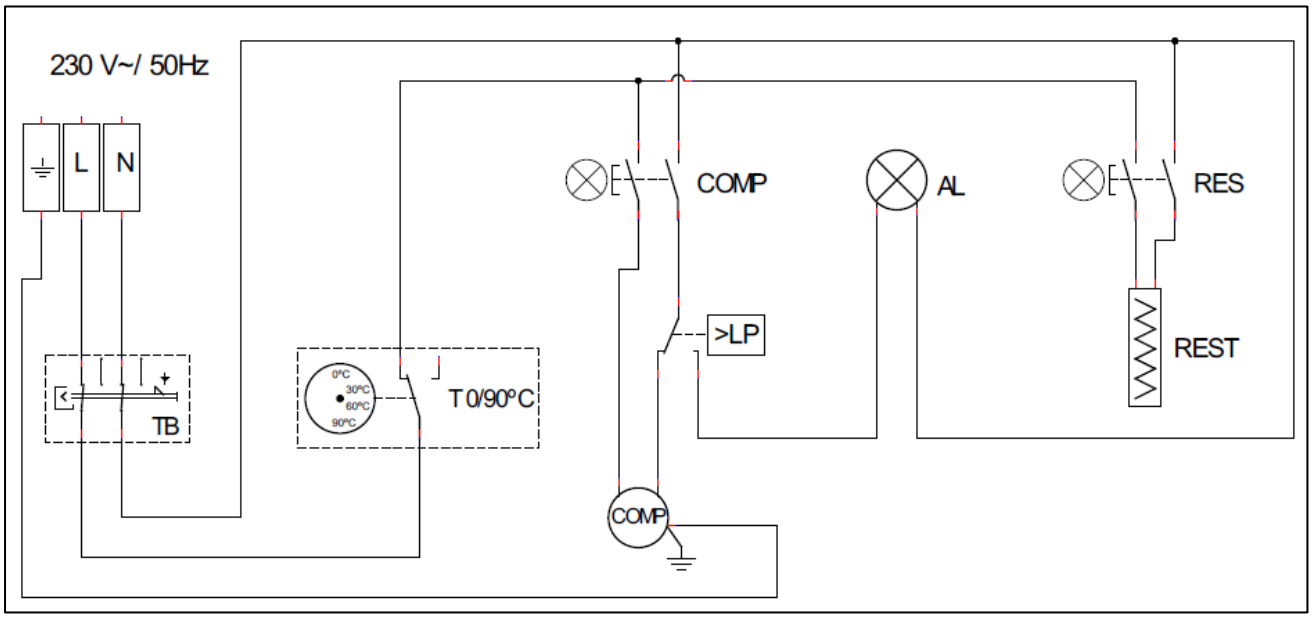
a) The thermodynamic equipment must be plugged to the power supply only after filling entirely the hot water cylinder
b) The thermodynamic solar system must be connected to a single phase voltage (230 V AC/50Hz)
c) The connections must comply with the local standards
d) Earth wiring is mandatory

It's recommended that the installation includes:

- Bipolar circuit-breaker with connection cable with a section at least of 2,5 mm
- Protection differential circuit breaker of 30 mA

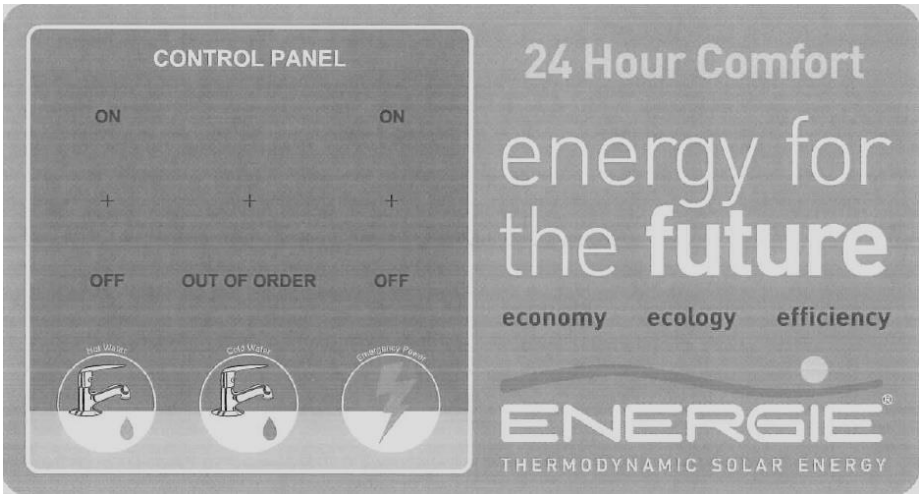
 **WARNING**	The safety thermostat of this thermodynamic equipment must not, under any circumstance, undergo any repair outside the installations of the manufacturer. Not complying with this clause invalidates the warranty of the equipment.

Electric Diagram



[AL]	Alarm light	[RES]	Electric heater button
[T0/90 °C]	Thermostat 0-90 °C	[REST]	Electric heater
[LP]	Low pressure switch	[TB]	Safety thermostat
[COMP]	Compressor		

5. SYSTEM OPERATION



In case of an anomaly in the system, the orange sign (A) on the control panel will light up. If this happens, switch the green button off (B1) and turn on the electrical resistance by pressing the red button (B2). The water will be electrically heated until the system is repaired by a certified technician.

6. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	HOW TO PROCEED
Low water temperature	Equipment is switched off	Press the key ON/OFF.
	Absence of power supply or damaged cable	Check the connection of equipment to the
		Check that the corresponding circuit-breaker is connected
		Check the integrity of the cables
	Error in the running of components	Check the presence of error on electronic board and consult the table of errors
	Use of large amount of hot water	Activate the support resistance
	Support resistance is off	Make sure the support resistance has power supply
	Compressor is off	Switch the compressor on by pressing the corresponding button
	Return of hot water into the cold water circuit (safety device incorrectly installed or damaged)	Shut off the cold water supply valve to switch off the safety device. Open a hot water tap. Wait 10 minutes and if you get hot water, replace the faulty plumbing and/or proceed with the correct positioning of the safety device.
		Clean the filter of the safety device.
Water is too hot	Problem with the thermostat	Check correct running of thermostat
Slow running of Thermodynamic Solar System	Outside air temperature is very low	The running of the equipment depends on weather conditions
	Inlet water temperature is very low	The running of the equipment depends on the inlet water temperature
	Installation has low electric voltage	Make sure the installation is supplied with the indicated value for voltage
Low hot water flow rate	Loss or clogging of hydraulic circuit	Check the condition of the hydraulic circuit
Loss of water through safety device	Absence or incorrect dimensioning of expansion tank (if leak is not continuous)	Installation and/or correct dimensioning of expansion tank
	Pressure in circuit is high (if the leak is continuous)	Check the throttle valve (if there is one installed)
		Installation of a throttle valve (if it lacks one)
		Check that the piping is not damaged

Power consumption is abnormally high and constant	Loss or obstruction in cooling circuit	Employ equipment suitable for checking leaks in the circuit
	Dire environmental conditions	
Support resistance does not work	Thermostat failure	Check the condition of the thermostat
	Defective resistance	Check the condition of the resistance
Bad odour	Absence of siphon or siphon without water	Install and make sure the siphon has water
Others		Contact customer service

7. SYSTEM MAINTENANCE

DANGER	Before undertaking any maintenance operation on the equipment, make sure it is not plugged to the power supply! Any task should be performed by a qualified technician.

7.1. General Inspection

During the equipment's useful life, the owner should carry out a general inspection of the equipment, according to the place where the equipment is set up:

- External cleaning of equipment and surrounding areas with a wet cloth
- Visual inspection of the whole equipment, with the purpose of detecting possible leaks and damaged devices

7.2. Magnesium anode

This equipment has a magnesium anode that together with the building material of the tank will provide an effective protection against corrosion.

The internal shielding of the tank will ensure an effective protection against corrosion contributing to a water quality within the parameters considered normal. However, the characteristics of the water change according to the installation.

In your living area, the quality of the water can be aggressive to your equipment. So together with the equipment there is a magnesium anode that wears over time (disposable device), thus protecting your equipment.

The wear of the anode always depends on the characteristics of the water you use. Thus, checking the condition of the anode is very important, particularly in the first years of the installation, so that you will have a good perception of the useful life left for the appliance.

Seek advice with your installer about how you should proceed to control the anode's condition.

To check the condition of your anode, follow these steps:

a) Shut off water supply
b) Remove pressure (for example, open a hot water tap)
c) Unplug the appliance from the power supply
d) Unscrew the anode with a suitable tool
e) Check the level of wear of the anode and replace it, if necessary

7.3. Cleaning Filter of Pressure Reducing Valve

For a periodic cleaning of the filter of the throttle valve, you should:

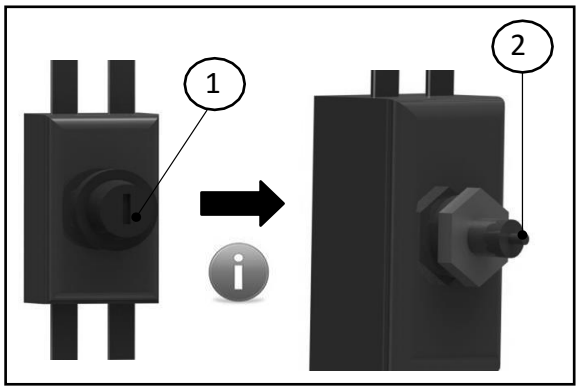
a) Close the water supply.
b) Turn anti-clockwise until you remove tension from the spring
c) Remove the handle
d) Remove filter and clean

7.4. Safety Thermostat

The safety thermostat is deactivated whenever there is an anomaly in the system, so that every time you plan to activate it, determine what happened that caused it to change its status mode.

If you could not determine what happened and it is still deactivated, contact customer service to have your problem solved. If everything is in order and you intend to reactivate the thermostat, follow this procedure:

a) Remove the top cover of equipment
b) Unscrew the cap of the safety thermostat (1)
c) Press the re-arm pin (2)
d) Re-cap the thermostat and the equipment



7.5. Empty the Hot Water Cylinder

DANGER	Remember that the water in the storage water heater is at high temperature, so there is an associated risk of burns. Before emptying the storage water heater allow the water temperature to drop to a level that will avoid burns.

After ensuring the water temperature is on a safe level that will avoid burns, follow this procedure:

a) Unplug the system from the power supply
b) Shut off the water supply valve and open a hot water tap
c) Open the system discharge valve

8. DISPOSAL OF EQUIPMENT

This appliance contains R134a refrigerant gas that should not be released to the atmosphere. If the appliance is to be deactivated definitively, you should contact a qualified technician for that purpose.

The “container” symbol on the type plate of the product indicates that this appliance may not be treated as household waste. Instead, it must be handed over to the designated collection point for electrical/ electronic equipment or returned to the retailer when buying new equipment. The end user is responsible for delivering the appliance at the end of its life cycle to the appropriate collection point. The appropriate selective disposal for subsequent recycling, treatment and environmentally compatible disposal of the appliance helps prevent possible harmful damage to health and the environment, favouring the recycling of the materials used to make the product. For more detailed information about the collection systems available, please contact the local household waste disposal service or the shop where you purchased the product.

Notes

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	5 Years (2+3 Years) * Manufacturer Warranty
Thermodynamic solar panel	10 Years defects and corrosion
Electrical components and Moving parts: • Thermodynamic Block • Monobloc (except cylinder) • Solar Block • Combi Block • Solarbox • Agrotherm • Split • DHW	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 replacement.
- 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
  - Hardness > 200 mg/l
  - Conductibility > 600 µS/cm (20 °C)
  - PH < 5,5 or PH > 9 (Sorensen at 20 °C).
  - If one of the water parameters has a greater value than stipulated by directive 98/83/CE
- 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 purchase date of the apparatus.

ATTENTION: Technical assistance costs even within the warranty period shall be supported by the customer (Km and assistance time). In cases where there is no justifiable breakdown and subsequent need for technical assistance, the client will pay for lost technical assistance time.

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