Enviro Energy Solutions Ltd

Your Gateway to the Sun

EBLH SERIES

HIGH CAPACITY HORIZONTAL TANKS WITH EXTRACTIBLE HEAT EXCHANGERS

TECHNICAL, INSTALLATION AND USE MANUAL

...BECAUSE WITH ENVIROENERGY SOLUTIONS THE SUN SHINES FOR EVERYONE...

V1-1.17

Before the installation and use of an ENVIROENERGY SOLUTIONS Solar Tank, Buffer Tank, Heat Pump Tank or electric Calorifier please read and observe carefully all the instructions concerning the installation, maintenance and use of the product, in this manual. The non-observance of these instructions may result in the cancelation of the warranty.

GENERAL SAFETY INSTRUCTIONS

- Attention when lifting the tank and always take precautions in order to avoid possible accidents, injuries and other hazards. During transportation and handling of the tank avoid abrupt movements as they may result in fall and damaging of the Tanks. To avoid damaging the tank, do not remove the packaging, until it reaches the installation location.
- All installations and maintenance must be performed by qualified and certified professionals, following all relevant local norms and regulations (1), industry codes, and according to the manufacturer's instructions.
- Always make sure that the installation site, especially on roof tops, is adapted to the weight and mechanical restraints of Tank when full (and eventually a 30% margin), as well as any further weight expected (snow, rain, etc...). **ENVIROENERGY SOLUTIONS** declines any responsibility that may arise from an improper or defective installation or from incorrect manipulation of the system or accessories composing it.
- Always make sure there is enough space around the Tank for maintenance purposes, as well as for the electric cabling and plumbing. It is recommended to agree with the client for the location of the installation and the routing of pipes and cabling.
- In case the Tank is placed Outdoors in regions with heavy snow fall or strong winds, it may be necessary to further anchor the system to the point of installation. In this case it is up to the installer along with the client to determine the best and safe way to install the Tank. Additional fixing points or equipment may be required.
- Never fill the closed circuit or connect the electric element with an empty tank. The tank must always be filled with water during these operations due to a risk of severe damage to the Tank.
- Before starting the installation or maintenance, the main power supply to the system must always be turned OFF, and the Heat Exchangers in case of Removable Heat Exchangers, must be removed.
- Improper installation and works can contaminate the potable water. Install the Tank hygienically and rinse the Tanks and piping thoroughly with potable water
- Install and use potable water pipes according to current standards and local norms and regulations.
- The use of plastic, PVC or polypropylene piping is not recommended, especially for the closed circuit, due to the very high temperatures developed by the installations. In any case, make sure that all the piping used in contact or close to the systems outlets can withstand minimum temperatures of 100ºC, or 180ºC if in contact with the primary (closed) circuit.
  ENVIROENERGY SOLUTIONS recommends the use of copper or stainless-steel piping for safer and higher performance.
- It is recommended that the Tanks be maintained by a professional, checked and cleaned at least every 2 years. In locations with hard or dirty water an annual maintenance and cleaning is recommended. Please refer to the "Maintenance and Servicing" section of this manual.
- A pressure release and safety valve is mandatory on the cold-water inlet of the tank and a pressure reducing valve is mandatory in case the pressure of the water coming into the tank is above 3 bar.
- A mixing valve is compulsory on the hot water outlet in order to limit risks of burning and Expansion Vessels are recommended in order to limit pressures in the Tank and unnecessary loss of Water.

GENERAL INSTALLATION INSTRUCTIONS

- Always make sure that all the piping of the primary and secondary circuits, going to and coming from the Tank, are very well insulated, even in hot climate regions and treated for UV radiation.

- Avoid leaving the Tanks for long periods without using hot water (holidays, prolonged absences, etc...) due to risks of overheating, or make sure all the heating sources (solar panels, heat pumps, electric elements, burners, etc…) are turned off or inactive during this period.

- In case of use of Electric Heating Elements, the Tanks must be grounded

- It is recommended that the installation location be equipped with functional drainage on the floor

- Hydraulic connections to the tank must be such as to limit the phenomenon of electrolysis

- Every service and maintenance should be recorded in the maintenance book. This record is a key element to the validity of the warranty and should be made available on request

- Under no circumstances should any welding or repairing be made on the tank's metal structure. Risk of deterioration or destruction of the tank and annulation of the warranty.

- The electric heating element is not part of the system but an additional part and it should be installed by a certified electrician. The electric back-up should be used only in case the water temperature in the Tank is under 50°C. The constant and unreasonable use of the electric back-up may cause damage to the tank and cause annulation of the warranty.

- The quality of the water entering the Tanks should be within potable standards and in any case be within the values of the table below. If the quality of the water does not correspond to these values then special filters and water softeners may need to be installed to satisfy these conditions, or the warranty will not be valid.

WATER QUALITY REQUIRMENTS						
Specification	**ph**	**Total Hardness**	**Chlorides**	**Free Chlorine**	**Conductivity**	**TDS**
Value	7-9	<100 mg/1	<0,5 mg/lt	<80 mg/lt	<650 mS/cm 25°C	<600 mg/lt

WARNING:

IF THE HOT WATER SYSTEM IS NOT USED FOR TWO WEEKS OR MORE, A QUANTITY OF HIGHLY FLAMMABLE HYDROGEN GAS MAY BE ACCUMULATED IN THE WATER HEATER. TO DISSIPATE THIS GAS SAFELY, IT IS RECOMMENDED THAT A HOT TAP BE TURNED ON FOR SEVERAL MINUTES UNTIL DISCHARGE OF GAS CEASES. USE A SINK, BASIN, OR BATH OUTLET, BUT NOT A DISHWASHER, CLOTHES WASHER OR OTHER APPLIANCE. DURING THE PROCEDURE THERE MUST BE NO SMOKING, OPEN FLAME OR ANY ELECTRICAL APPLIANCE OPERATING NEARBY. IF HYDROGEN IS DISCHARGED THROUGH THE TAP, IT WILL PROBABLY MAKE AN UNUSUAL SOUND AS WITH AIR ESCAPING.

- The safety of the Tanks and validity of the warranty are conditioned by the use of genuine **ENVIROENERGY SOLUTIONS** spare parts and accessories. Please only use genuine **ENVIROENERGY** spare parts and accessories from your nearest **ENVIROENERGY SOLUTIONS** dealer or contact the manufacturer.

ENVIROENERGY SOLUTIONS declines any responsibility that may arise from the non-observance of the installation, maintenance and use instructions herein, non-observance of relevant local norms, regulations and industry codes, improper or defective installation, or incorrect manipulation of the system or the accessories composing it.

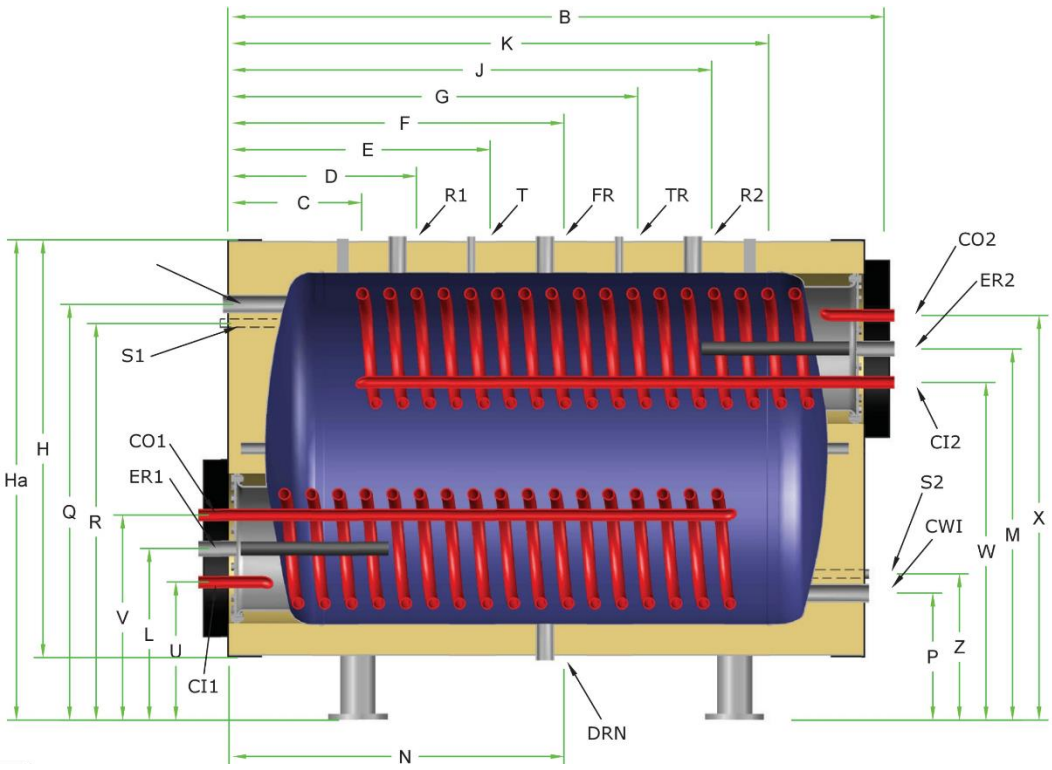
TECHNICAL SPECIFICATIONS

1. TECHNICAL CHARACTERISTICS

- Internal Tank Material: Steel
- Welding Type: Automatic
- Internal Tank Protection: Alimentary quality Epoxy Resin
- Anodic Protection: 4 magnesium rods Ø32 x 500mm
- Maximum Working Pressure: 10 bar
- Water Test Pressure: 15 bar
- Maximum Operating Temperature: 90°C
- Insulation: Removable Polyurethane foam thickness 100mm, density 52kg/m3
- Coil: Steel Tube
- Maximum Coil Working pressure: 16 bar
- Coil Test Pressure: 25 bar
- Maximum Coil Working temperature: 130 °C
- Electric Heater: Optional, Power Output Upon Request
- External Cover: Metallic or Soft PVC (color upon request)

EBLH SERIES TANKS WITH 1 OR 2 REMOVABLE HEAT EXCHANGERS, FLANGE AND ELECTRIC ELEMENT OPTIONS								
Model	**EBLH 1000**	**EBLH 1500**	**EBLH 2000**	**EBLH 3000**	**EBLH 4000**	**EBLH 5000**	**EBLH 7000**	**EBLH 9000**
Nominal Volume (Lt)	1000	1500	2000	3000	4000	5000	7000	9000
Actual Volume (Lt)	866	1480	1940	2940	3960	4700	6950	8960
Internal Tank Weight (kg)	390	405	479	808	928	1039	1394	1795
3,2m² Heat Exchanger Weight (kg)	78							
5,4m² Heat Exchanger Weight (kg)	N/A	109						
7,8m² Heat Exchanger Weight (kg)	N/A			154				
External Cover and Insulation Weight (kg)	16	20	24	34	39	45	58	67
Internal Tank Body Thickness (mm)	4	5			6		7	8
Internal Tank Caps Thickness (mm)	4	6			7		8	9
CI1/CO1 and CI2/CO2	1''F	1''F	1''F	1½''F	1½''F	1½''F	1½''F	1½''F
Coil Cross Section Ø	1''	1''	1''	1¼''	1¼''	1¼''	1¼''	1¼''
Recirculation (R)	2''	2''	2''	3''	3''	3''	3''	3''
Cold Water Inlet (CWI)	2''	2''	2''	3''	3''	3''	3''	3''
Hot Water Outlet (HWO)	2''	2''	2''	3''	3''	3''	3''	3''
Free Outlet (FR)	2''	2''	2''	3''	3''	3''	3''	3''
Thermometer (Tr)	½''	½''	½''	½''	½''	½''	½''	½''
Thermostat (T)	½''	½''	½''	½''	½''	½''	½''	½''
Flange Ø External/Internal (mm)	508/420	508/420	508/420	620/508	620/508	620/508	620/508	620/508
Drain (DRN)	1 ½''							
Electric Back-up Heating Element (ER1 and ER2)	1 ½''							

2. DIMMENSIONS



ABREVIATIONS	
CWI	Cold Water Inlet
HWO	Hot Water Outlet
CI1	Coil 1 Inlet
CO1	Coil 1 Outlet
CI2	Coil 2cInlet
CO2	Coil 2 Outlet
S1 / S2	Sensors 1 and 2
T	Thermostat
TR	Thermometer
ER 1 / ER 2	Electric Heating Elements 1 and 2
FR	Free Outlet
DRN	Drain
R	Recirculation

EBLH SERIES TANKS DIMENSSION								
	EBGLH 1000	**EBGLH 1500**	**EBGLH 2000**	**EBGLH 3000**	**EBGLH 4000**	**EBGLH 5000**	**EBGLH 7000**	**EBGLH 9000**
B	2150	2150	2150	2700	2700	2700	3280	3400
C	389	389	389	531	530	530	951	1013
D	575	575	575	684	684	684	806	867
E	825	825	825	1017	1017	1017	1223	1283
F	1075	1075	1075	1350	1350	1350	1640	1700
G	1325	1325	1325	1683	1683	1683	2057	2117
J	1575	1575	1575	2016	2016	2016	2474	2533
K	1759	1759	1759	2170	2169	2168	2322	2387
H	1000	1300	1400	1500	1700	1800	2000	2200
Ha	1200	1500	1600	1700	1900	2000	2200	2400
Q	891	1189	1290	1286	1592	1696	1890	2089
R	865	1163	1274	1259	1566	1670	1864	2062
V	523	569	582	640	625	629	631	632
L	418	462	470	533	518	522	624	525
U	313	348	368	420	405	409	510	412
P	309	310	311	406	302	304	303	303
Z	335	337	338	432	320	331	329	329
W	675	931	1028	1060	1260	1363	1561	1760
M	780	1038	1130	1173	1373	1471	1668	1867
X	885	1152	1232	1275	1480	1584	1781	1980

3. COIL HEAT EXCHANGER CHARACTERISTICS

COIL HEAT EXCHANGER POSSIBLE COMBINATIONS			
Tank Model	**Bottom H.E.**	**Upper H.E.**	**Total H.E. Surface**
1000lt	**3,2m²**	**3,2m²**	**6,4m²**
1500lt	3,2m²	3,2m²	6,4m²
	5,4m²	**3,2m²**	**8,6m²**
2000lt	3,2m²	3,2m²	6,4m²
	5,4m²	3,2m²	8,6m²
3000lt	3,2m²	3,2m²	6,4m²
	5,4m²	3,2m²	8,6m²
	7,8m²	3,2m²	11m²
4000lt	3,2m²	3,2m²	6,4m²
	5,4m²	3,2m²	8,6m²
	7,8m²	3,2m²	11m²
5000lt	3,2m²	3,2m²	6,4m²
	5,4m²	3,2m²	8,6m²
	7,8m²	3,2m²	11m²
7000lt	5,4m²	3,2m²	8,6m²
	7,8m²	3,2m²	11m²
9000lt	5,4m²	3,2m²	8,6m²
	7,8m²	3,2m²	11m²

COIL HEAT EXCHANGER EFFICIENCIES							
Tank Model	Flow Rate	Bottom H.E. 3,2m²	Upper H.E. 3,2m²	Bottom H.E. 5,4m²	Upper H.E. 5,4m²	Bottom H.E. 7,8m²	Upper H.E. 7,8m²
1000lt	1800 Lt/h	49,10kW	48,10kW	---	---	---	---
	2600 Lt/h	55,20kW	54,50kW	---	---	---	---
	3900 Lt/h	62,20kW	61,40kW	---	---	---	---
1500lt	1800 Lt/h	49,10kW	48,10kW	65,30kW	64,60kW	---	---
	2600 Lt/h	55,20kW	54,50kW	78,40kW	79,20kW	---	---
	3900 Lt/h	62,20kW	61,40kW	91,10kW	90,90kW	---	---
2000lt	1800 Lt/h	47,80kW	47,80kW	65,00kW	64,70kW	---	---
	2600 Lt/h	55,10kW	54,95kW	77,95kW	78,50kW	---	---
	3900 Lt/h	61,10kW	61,10kW	90,50kW	91,60kW	---	---
3000lt	3000 Lt/h	57,30kW	57,20kW	82,10kW	82,00kW	104,60Kw	104,80Kw
	4000 Lt/h	62,20kW	62,15kW	91,50kW	90,60kW	119,40Kw	119,50Kw
	5000 Lt/h	64,70kW	64,90kW	98,30kW	98,80kW	130,00Kw	129,60Kw
4000lt	3000 Lt/h	57,30kW	57,20kW	82,30kW	82,50kW	104,60Kw	104,80Kw
	4000 Lt/h	62,20kW	62,15kW	91,45kW	91,55kW	119,40Kw	119,50Kw
	5000 Lt/h	64,70kW	64,90kW	97,30kW	96,80kW	130,00Kw	129,60Kw
5000lt	3000 Lt/h	57,30kW	57,20kW	81,95kW	82,15kW	104,60Kw	104,80Kw
	4000 Lt/h	62,20kW	62,15kW	91,30kW	91,20kW	119,40Kw	119,50Kw
	5000 Lt/h	64,70kW	64,90kW	97,50kW	97,90kW	130,00Kw	129,60Kw
7000lt	3000 Lt/h	57,30kW	57,20kW	---	---	104,60Kw	104,80Kw
	4000 Lt/h	62,20kW	62,15kW	---	---	119,40Kw	119,50Kw
	5000 Lt/h	64,70kW	64,90kW	---	---	130,00Kw	129,60Kw
9000lt	3000 Lt/h	58,50kW	58,10kW	---	---	104,70Kw	105,40Kw
	4500 Lt/h	65,40kW	65,25kW	---	---	125,30Kw	124,20Kw
	6000 Lt/h	70,60kW	70,10kW	---	---	138,60Kw	137,30Kw

- Heat Exchanger Efficiencies for DHW Heating from 15°C to 60°C
- Heat Exchanger Inlet Temperatures 80°C

MAINTENANCE AND TROUBLESHOOTING

A. MAINTENANCE AND SERVICING OF THE SYSTEM

1. General maintenance

In order to ensure the constant well-functioning of the Tanks, they must be reviewed and maintained periodically (see warranty sheet) and the warranty sheet accompanying must be completed accordingly by the installer.

All installations and maintenance must be performed by qualified and certified professionals, following all relevant local norms and regulations (1), industry codes, and according to the manufacturer's instructions.

Before starting any maintenance work, the main power supply to the system must always be turned OFF, and the Heat Exchangers in case of Removable Heat Exchangers, must be removed.

Revisions consists of:

- The optical and physical inspection of the tightness of all joints and connections (hydraulic and electrical), verification that all safety valves, pressure reducing valves and mixing valves are working properly (safety valves on primary and secondary circuit), that the insulation of all the pipes is in good condition.

- Making sure that scale and salts have not accumulated in the valves or in the Tank. Poor water quality at the water can result in scale formation and may block the safety valves and Tank outlets leaving the tank unprotected against very high temperatures above 90°C and high pressure (greater than 10 bars).

- Making sure the electrical heating elements and thermostats are working properly and do not have scale or salts accumulation.

- Cleaning of the Tanks and removal of scale or deposits inside the Tanks, on the Heat Exchangers and on the electric elements, valves, etc…

- Making sure that the Heat exchanger is in good conditions and perfect working order

- The anode (magnesium rod) must be checked every year and replaced if it has been worn-out or reduced to 50% of its initial size or weight or if it has been covered by the accumulation of salts.

- Verifying that the weight of the thermal fluid in the primary circuit is adapted to local climatic conditions. The thermal fluid must in any case be changed at least every 3 years as it loses its properties through time.

- Verifying that the water quality entering the Tank is within standards as per the requirements in the table in the General Installation Instructions in this manual and the eventual filters and water softeners are in proper working order.

Attention: do not use any detergents, acids or any other corrosive products that may damage the enamel lining of the Tanks.

2. Replacing the sacrificial anodes (magnesium rods)

For optimal protection of the system against electrolysis, all **ENVIROENERGY SOLUTIONS** tanks include magnesium rods (sacrificial anodes) which must be checked and replaced if necessary, at least every year depending on the quality of the water. The size of the anode varies depending on local norms and requirements. For replacing the anode, proceed as follows:

- Shut down the main power supply
- Remove the safety valves or expansion vessel.
- Empty the tank.
- Remove the protective cover of the flange and Heat exchanger.
- Pull out the thermostat with caution.
- Remove the flange and unscrew the anode. Screw-on a new anode and following the same procedure backwards prepare and set the system back to work.

B. TROUBLESHOOTING

In case the Solar Water Heater does not produce enough hot water, please verify the following:

1. That all hydraulic connections of the system are water tight and there are no leaks.
2. That there are no leaks on the taps or on the piping of the building
3. That the heating sources are working properly.
4. If the level of the thermal fluid in the closed circuit is not too low. Set to level filling with thermal fluid mixture through the fluid inlet where the safety valve or expansion vessel is placed.
5. That the pipes connecting the heating source to the tank are not bent twisted nor have any angles.
6. That there is no air trapped in the closed circuit of the system.
7. That the supply of cold and hot water is connected.
8. That the temperature set on the mixing valve is not too low (below 50ºC depending on local regulations)
9. If the electric back-up is working. In case it is not working please check the following:
    - That the main power supply is ON
    - That the thermostat is not set too low
    - That the back-up element is not on security mode. The security button must be pushed-in
    - That the thermostat and back-up element are not damaged
    - That the back-up element wiring is properly connected and to the relevant terminals

If problems persist, then please consider:

a) That the weather conditions allow the proper heating of the system
b) The hot water consumption does not exceed the installation's capacity, or the consumers' expectations of are not above this capacity.
c) The consumer has understood the use of the electrical back-up

Note: all verifications and interventions must be carried out by qualified and certified personnel.

WARRANTY CONDITIONS

1. The present warranty covers the repair or substitution of the defective parts or part of the products from authorised personnel. The replacement of the complete product can only happen if the repair is not possible. In any case of failure or malfunction of the product, the buyer must immediately inform the company as well as the distributor.
2. The present warranty covers only the supply of spare parts and in any case does not cover any expenses for shipping costs. Dispatch costs as well as any authorized personnel expenses or expenses for replacement of the defective parts are on clients charge.
3. In case of malfunction, the dispatch of the defective parts/products to the company headquarters or place of repair of the defective product is on clients charge. Otherwise, all costs for on-spot repair from authorised personnel at the client's location is at client's expense. The company reserves the right of decision on the type and how the repair will be made according to its judgment. Every repair crew visit, even for just auditing and checking the system is charged with the expenses and fees of the technician.
4. Any warranty claim can only be valid if this original warranty card is presented accompanied with the original purchase receipt edited by the distributor and the Maintenance Book. Furthermore, for the warranty to be valid the buyer must complete and sign both parts of the warranty (clients copy and distributors copy) and send the relative parts to the parties intended within 10 days from the date of installation.
5. All spare parts or parts repaired or replaced have the same benefit of warranty period as the remaining period of the general warranty of the system.
6. The electric parts of the system (electric element, thermostat, etc…) carry only two (2) years warranty from the date of purchase.
7. The warranty does not cover the anode (magnesium rod) or its replacement
8. The manufacturer assumes no responsibility and the present warranty is invalid in the following cases:
   A. When the product has not been checked, repaired, altered or installed by non-authorized personnel by the manufacturer or the distributor – or his partners
   B. If the ordinary services of the product have not been performed by authorised by the company personnel and as per Maintenance Recommendations in the product Installation Manual. The 1st service must be conducted within 1 year (12 months) after the date of purchase of the product at the clients care and expense. Proof of service is the signature and stamp of the authorised personnel at the bottom of the present warranty card in combination with the original invoice of the service from the service technician.
   C. When any damage or malfunction is done to people or thing or the product itself due to accident, mishandling, improper or inappropriate use (intentional or unintentional), negligence, maltreatment or bad installation of the product, lack of servicing of the product, wrong technical intervention on the product or its parts, or to wrong connexions – cabling of the electrical resistance or other electrical parts, other the instructions provides by the manufacturer.
   D. If damage or malfunction of the system is due to bad weather conditions and natural disasters or vandalism (such as: natural disaster, frost, storms, floods, hail, earthquakes, fires, arson, etc…)
   E. Damage to the heating element of the tank or the Tank itself due to excessive salt, scale, dirt or other external bodies concentration. Damage of the tank caused by overheating or excessive pressure of the water supply network or generally by extreme operating conditions and extrinsic factors. Damage due to lack of safety equipment installation to protect the Tank or people (such as safety valves, mixing valves, pressure reducing valves, etc…). Damage caused by improper maintenance, or unauthorized third-party intervention.
   F. In case of normal wear and deterioration (due to time, etc…) of the external parts of the product which do not affect the proper use of the system, or in case of damage to any valves (safety valves, mixing valves, pressure reducing valves, etc…). Or in case water standards do not correspond to the standards and values as these are specified in this manual.
9. Manufacturer retains the right of control of the validity of the warranty at each stage of product repair and to charge the owner for the costs of the repairs (value of the parts included) in this case the conditions described in detail in the present warranty card are not met.
10. The present warranty does not affect the owner's and consumer's rights, as these are foreseen by Cypriot law.

1st	2nd	3rd	4th	5th	6th	7th	8th

DATE STAMP AND SIGNITURE OF MAINTENANCE PERSON

Enviro Energy Solutions Ltd

Your Gateway to the Sun

**We do not inherit the earth
from our fathers,
We borrow it
from our children..."**

...BECAUSE WITH ENVIROENERGY SOLUTIONS THE SUN SHINES FOR EVERYONE...

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