supreme
PRODUCTS
Make Life Better!

World's best technolo gy
for serving hot water

ETC Solar water heater

Installation, Maintenance and User Manual

This manual contains all the necessary instructions regarding the installation, operation and maintenance of the product.

DOMESTIC HOT WATER REQUIREMENTS

According to the statistics, the average consumption of a family varies from 35 to 50 litres per day per person. Adding the consumption of the washing machine and the dishwasher - if they are connected to the water heater - it is necessary to add about 20 litres of water more for each of them (for one wash) per day. So, for example, a family of four, with average consumption is 40 litres of hot water per person, needs 150L water heater. By adding the household appliances connected to the water heater, the needs then increase to at least 40 liters per day. In order to get the most out of the operation of the water heater, hot water should be used mainly during the day, so that the system can constantly produce hot water during the hours of sunshine, thus maintaining its maximum yield.

SUPREME SOLAR SYSTEMS

Our system is an ecological proposal and an effective self-contained energy saving solution with high ef□ciency and ease of installation. They are made with excellent materials according to international speci□cations and have all the certi□cations and technical opinions that con□rm their quality. They are aesthetic systems superior with simple installation and quick to implement in harmony with the architecture of the buildings and thus provide free hot water almost all year round. Even in areas with low sunlight, they provide water preheating, which signi□cantly contributes to reducing conventional energy consumption. The use of solar systems in thermosiphon or forced circulation makes it possible to achieve an energy saving of 70-100%, since the operating time of the burner or electrical resistance decreases depending on the sunshine in the region concerned and the size of the system, with a simultaneous reduction in carbon dioxide emissions.

Each package includes all the necessary equipment as follows:
1. The solar water storage tank
2. The Evacuated Tube Collectors (ETC)
3. Support Base, Attachments and Accessories

Heating coil & Thermostat

The accessories are packed in a cardboard box.
All individual parts of the support system with connection accessories and other accessories are packed in a separate carton.
The accessories for each system are listed in the table below:

ACCESSORIES IN THE BOX Depends On Water Heater models			
	Heater Coil Dummy		SS Pipe 3/4 inch 30cm
	Bush 1/4 inch		Float and ball
	47 mm Dia Heater Dummy Washer		SS Pipe 3/4 inch 11cm
	Heater Coil Dummy cap		M8X12mm Fasteners
	58 Dia Anti Dust Black Washer		Heater coil
	47 Dia PVC Cup		58 mm Dia Silicon Washer

Technical characteristics
Solar Water Tank

Coating of the inner tank:Glasslined coating

Internal tank corrosion protection:

1. Glasslined coating completely protects and keeps the hot water clean and hygienic

2. Magnesium anode 3 cm in diameter and 50 cm long.

Welding: Plasma welded(CO2)

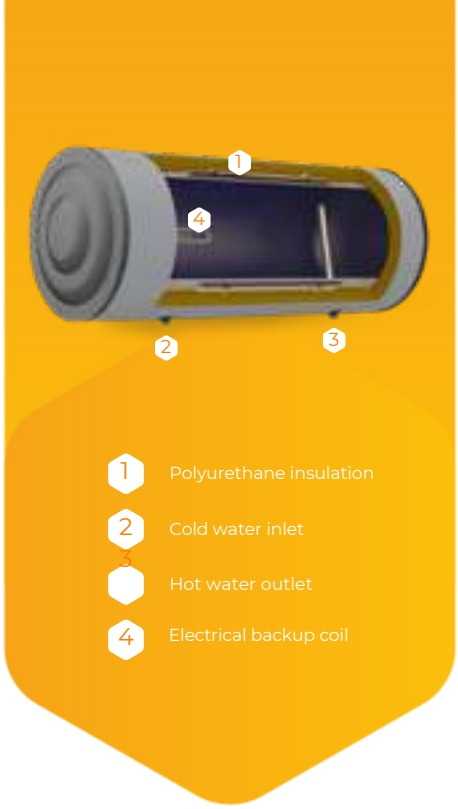
Insulation: High density expanded polyurethane (48Kgs/m)

Inner Vessel Maximum Working / Test Pressure:

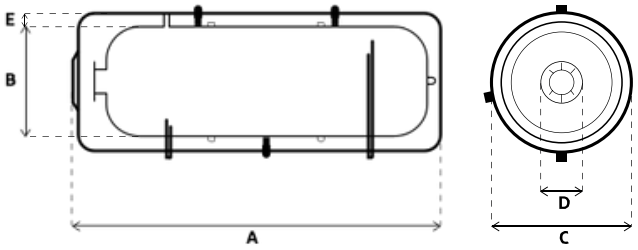
1.5 bar - 5 bar (10 min)

Maximum service temperature: 75°C

Siding : GI With Powder Coated, Resistance to chemical attack and corrosion in a humid environment



Dimensions and capacities
Solar Water Tank



SI.NO	PARTICULARS	SPECIFICAT ION
1	Inner Tank	1.2mm C.R.C.A sheet with co2 welding inside coated with prime guard coating /2.5mm for pressurized systems.
2	Connecting Pipes	SS ¾" (nominal bore 20 mm) for hot water outlet and cold water inlet, 1 ¼" (nominal bore 33.6mm) for heating element
3	Insulation:	50 mm thick PUF
4	Outer Cladding:	pre-coated laminated sheet(color:Half white)/ Mirror finish
5	End Caps:	GI with PP coating.
6	Support Structure:	Mild steel with powder coating.

Technical characteristics of the Vacuum Tubes

Made of borosilicate glass 1.6 mm thick.
Coating of selective solar absorber made of Aluminum Nitride (AlN).

The component of the absorber consists of double coated glass tube.
Due to special geometry (shape) of the absorber, maximal absorption of solar energy is achieved.

Vacuum Tube	
Length of Vacuum tube (Length of absorber)	1800 mm (1720 mm)
outer / Inner vacuum diameter	58 / 47 mm
Glass thickness	1.6 mm
Material	Borosilicate glass 3.3
Selective coating	SS - AlN/ Cu
Absorbance	0.90-0.95(AM1.5)
Emmitance	0.04~0.06 (80oC±5oC)
Vacuum Degree	P≤5.0×10-3 (Pa)
Stagnation Temperature	260~300oC
Max efficiency (for 20/15 vacuum tubes) Tm-Ta=0K & 1000W/m2	1383 W / 826 W

E vacuated Tube Collectors (ETC) based Solar Water Heaters

Evacuated Tube Collector is made of three layer borosilicate glass tubes evacuated for providing insulation. The outer wall of the inner tube is coated with selective absorbing material. This helps absorption of solar radiation and transfers the heat to the water which ows through the inner tube. Solar water heating is now a mature technology. Wide spread utilization of solar water heaters can reduce a signicant portion of the conventional energy being used for heating water in homes, factories and other commercial and institutional establishments. Internationally the market for solar water heaters has expanded signicantly during the last decade.

GENERAL INSTALLATION RULES

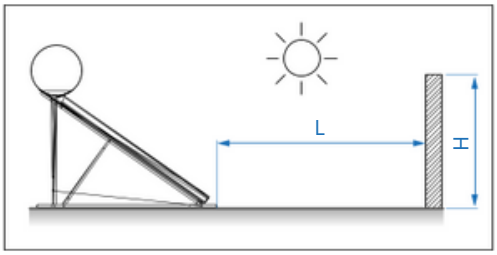
WARNING: The installation facility must comply with local and national regulations concerning water and electrical installations (plumbing, electricity, hygiene, town planning and others).

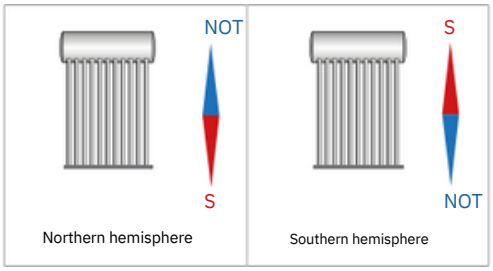
The solar water heater must be unpacked on the installation site to protect the device against knocks during transport. During installation, the collector windows must remain covered until the tank is filled with sanitary water in order to prevent the heat transfer. It is also necessary to eliminate the protective plastic caps by the connection of the water storage tank.

Installation Position - Shade: Before the installation of solar collectors, the correct choice of location (in agreement with the customer) and the control of the surface necessary for the installation of the device (taking into account its resistance static to support the weight of the system) are to be defined.

On sloping roofs, the storage tank should not be placed between two beams but plumb with one of them. The position chosen for the installation of the solar water heater should not be shaded by obstacles such as trees, buildings and the like during the whole year to reassure in order to obtain at least 4 hours of unobstructed exposure of the surface and harness maximum sunshine (noon).

LATITUDE	DISTANCE BETWEEN OBSTACLE AND COLLECTOR(S)
0oh- 25oh	1.0 x H
26oh- 35oh	1.5 x H
36oh- 45oh	2.0 x H
46oh- 50oh	2.5 x H
> 50oh	3.0 x H





Orientation-Optimal Angle: A fundamental factor for optimum performance of the system is the choice of inclination and the time during which the maximum gain will be achieved. The solar system should be placed so that the collector surface is oriented to geographic south, for the northern hemisphere (north and longitude for the southern hemisphere), i.e., looking always towards the equator.

Deviation from the orientation means a decrease in system performance. If a deviation from the correct orientation cannot be avoided, then system performance should be corrected by increasing the collector area, after further study and evaluation of the specific conditions. Due to the angle of incidence of solar radiation which varies with time and system location, the angle of the collectors should be approximately equal to the latitude of the installation location. From this angle, the maximum annual energy gain is derived. Overhead tank should be minimum 6ft height for domestic systems and 8-10ft for industrial systems.

Installation features: In case there is no compatibility between the surface where the solar water heater will be installed (inclined or flat) and the standard equipment supplied with the system another type of equipment should be used. The responsibility for the chosen equipment will be on the installer and in no case on the company, it is up to the installer to propose and install the various necessary equipment, which must be previously agreed with the customer.

Special weather conditions: In areas affected by heavy rains and snowstorms, be careful to clear snow continuously. For this case and for regions where rain, strong winds, rains, cyclones, hurricanes, the system must be installed on the roof as stable as possible and must be tightened with additional metal bands. In areas where the above conditions exist and there is hail with a diameter of more than 20mm, solar water heater insurance is recommended. In any case, keeping the solar water heater on the support base system with more metal strips is recommended. Evacuated tube solar hot water systems contain water filled glass risers. The water is in a vacuum so it cannot freeze. Evacuated tube solar hot water system is rated to operate at – 12 ˚C and so is suitable for the coldest parts of European countries.

Piping: The routing of the pipes and the wiring must be agreed between the installer and the customer, in order to ensure correct installation of the solar system in accordance with the local rules concerning water and electrical installations. The tubes connecting the water storage tank with the collector and the piping from/to the solar water heater must be insulated in such a way that they can withstand temperatures covering the range from -30°C to 120°C . UV protection should be used for insulation and piping should be finished properly insulated and covered against any rain and moisture.

INSTALLATION POSITION

Installation is only permitted on roofs and flat surfaces of adequate load-bearing capacity. Before proceeding with the installation, make sure that the roof and / or the construction has sufficient bearing capacity in terms of bearing capacity, always according to the maximum loads expected at the point of installation. If the installation site is an area with a particularly high risk of wind and snow, the system as a whole must be checked statically by a qualified person, for example, a specialist engineer. In special cases, reinforcing or stronger constructions may be required.

Collector			
INSTALLATION MODE		WIND LOAD [km/h] / [kN/m2]	SNOW LOAD [kN/ m2]
Inclined surface - Angle of inclination:	15° – 75°	151 / 0.5	0.67
Flat surface - Angle of inclination:	35°	151 / 0.5	0.67

The system can be installed only in regions with low wind and low snow loads than those mentioned above.

SPACE REQUIREMENTS FOR ROOFTOP INSTALLATION

TILED ROOF

When installing on the roof, pay particular attention to the following:

The minimum distances from the ends of the roof are:
- On the side: distance equal to the width of two tiles
- From the top of the roof: distance equal to three sets of tiles

The minimum distance limit of 0.8m must necessarily be respected, so that the sensors and mounting accessories are not exposed to winds whose power increases at the perimeter of the edges of the roof.

SPACE REQUIREMENTS FOR LOOSE FIXING

FLAT ROOF

The system should be installed at least 1.5m from the edge of the roof, in order to:

Allow access around the system for maintenance purposes. The collector and the fixing system must not be exposed to strong winds which are developed at the ends of the roof. Allow snow removal.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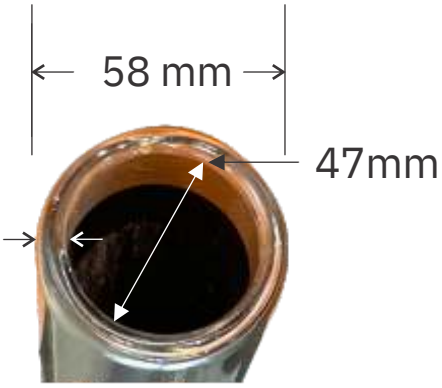
58 mm
47mm


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GENERAL PREVENTION MEASURES

Comply with the applicable accident prevention instructions and safety rules, during installation of solar systems and piping.

Keep the work area clean and free of objects that prevent work from being carried out.

Keep children, pets and unauthorized persons away from tools and installation site. This applies particularly in the case of buildings undergoing residential renovation.

During maintenance, repair, conversion and in the event of changes to the installation, remove electrical devices and secure the installations and electrical tools against unintentional activation. For collector cleaning should not be carried out at day time (sunny hours).

Use only components intended for this system. The use of other accessories or improper tools can cause accidents.

Conditions relating to personnel.

The installation of our Solar Thermal systems is carried out only by specialized companies, authorized and by quali□ed personnel should ITI or diploma holder.
Work on electrical installations or pipelines is only authorized for specialists and quali□ed technicians should be ITI or diploma holder (electrical).

Work uniforms

Wear protective goggles, suitable work uniform, protective shoes, protective helmet and a special net for long hair.

Do not wear loose clothing or jewelry because they can get caught in moving parts.

Wear a hard hat during installation work that is overhead or at head level.

Installation of the water storage tank

For transport, setting up and installation, use lifting devices corresponding to the dimensions and the weight of the tank.

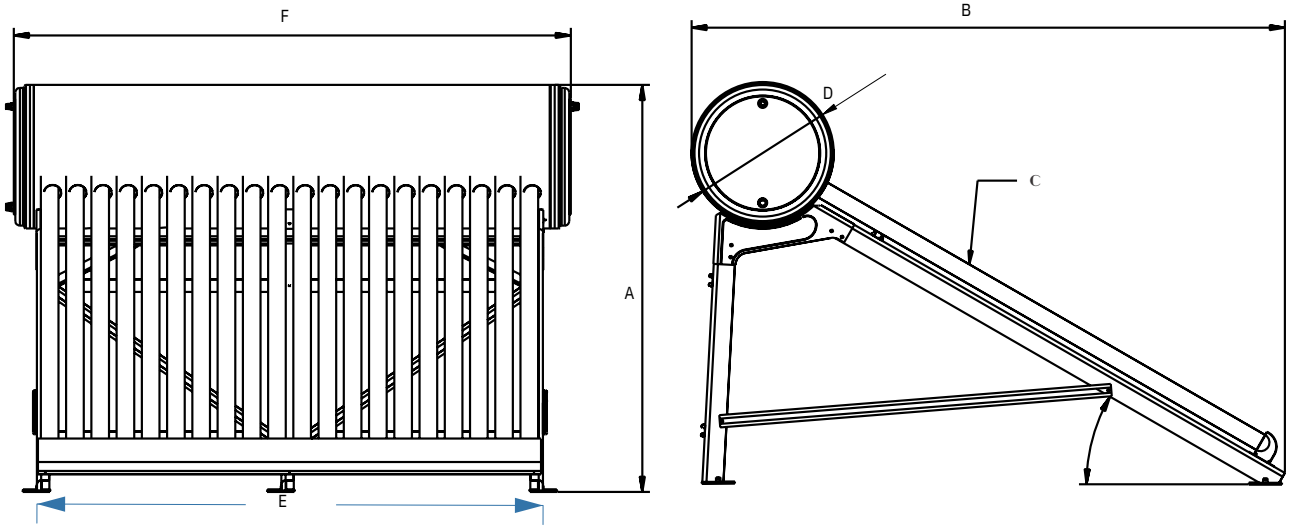
Protect the enamel coating of the tank against knocks during transport and installation.

Due to the weight of the storage tank, there is a risk of accidents. Please ensure that the load bearing capacity of the ground at the installation site is suf□cient when the storage tank is full.

PROTECTION AGAINST LIGHTNING

As per European standard EN 62305-3 particularly to assist in determining the protection measures required to establish protection measures to counter Lightning Electromagnetic Impulse (LEMP) within a structure with proper earthing. The metal construction complies with the general requirements of the standard and the speci□c lightning protection requirements of the standard which takes into account environmental conditions as well as altitude.

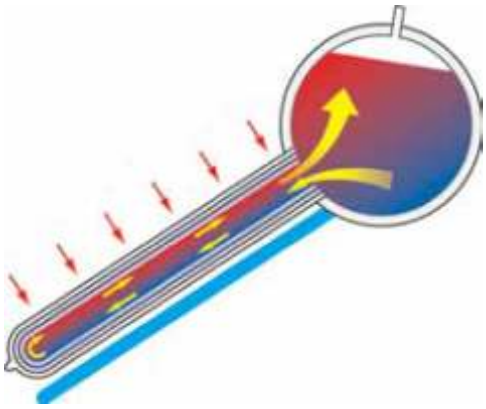
Product Dimensions

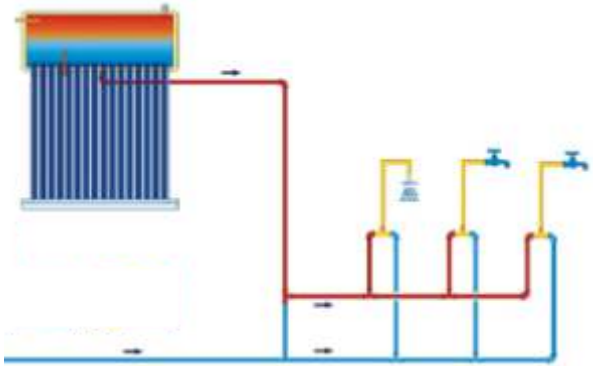


Model	A	B	C	D	E	F
Supreme 100 L PD	1342 mm	1976 mm	1800 mm	472 mm	778 mm	1053 mm
Supreme 150 L PD	1342 mm	1976 mm	1800 mm	472 mm	1193 mm	1468 mm
Supreme 200 L PD	1342 mm	1976 mm	1800 mm	472 mm	1608 mm	1883 mm
Supreme 300 L PD	1342 mm	1976 mm	1800 mm	472 mm	2023 mm	2713 mm
Supreme 500 L PD	1342 mm	1976 mm	2100 mm	550 mm	3040 mm	3350 mm

THERMOSIPHON PRINCIPLE

This type of solar water heater uses the sun to heat the water in the vacuum tubes. The solar collectors absorb solar radiation, converts the sunlight to heat and transfers it to the water. The heated water naturally rises through the solar collector into the tank where the water at the base of the tank is forced out and descends to the bottom of the collector. This is called thermosiphon circulation. The circulation works only under sunlight whereas active solar water heating system rely on electric pumps, valves, and controllers to circulate the water through the vacuum tube collector, a thermosiphon system relies on gravity and tendency for water to naturally circulate as it is heated. Since complex mechanical liquid pumps are not necessary, this types of systems are reliable and cost-effective solution for hot water generation. Thermosiphon systems are mainly used in regions with high solar radiation





TECHNICAL SPECIFICATION

SI.NO	PARTICULARS	SPECIFICAT ION
1	Vacuum Tube outer diameter	47/58 mm
2	Vacuum Tube inner diameter	37/47 mm
3	Tube length	1800 mm / 2100 mm
4	Outer Tank Diameter	480 mm / 550 mm
5	Inner Tank Diameter	380 mm / 450 mm
6	Tank Volume	100 LPD, 125 LPD, 150 LPD, 200 LPD, 250 LPD, 300 LPD, 500 LPD
7	Temperature	65 degree C to 85 degree C
8	Tank Insulation	PUF 50mm (polyurethane foaming)
9	Stand frame	Galvanized Power coated
10	Inner tank material	High-Grade Steel / Ceramic / Glasslined - enamel coated
11	Outer Tank Material	Galvanized Power coated
12	Method of Welding	Seam less and Non Welding Technology / MIG
13	Type of Fasteners	Galvanized
14	Type of Grommets	Silicon Rubbers
15	Type of Circulation	Therm os yphon
16	Electrical Back Up	2 KW/ 3 KW
17	Type of inlet feeding	Using gravity feeding tank of non-pressure.low mixing of hot and cold water,and long life of inner tank.(optional)

CAPACITY	47 mm	58 mm
100 LPD	12	10
125 LPD	15	–
150 LPD	18	15
200 LPD	24	20
250 LPD	28	24
300 LPD	35	30
500 LPD	55	50

THE WATER STORAGE TANK DOES NOT SUPPLY HOT WATER WHEN THE ELECTRIC HEATER IS USED.

The following tasks should only be performed by a quali□ed electrician.

1. Turn off the power supply and open the electrical component cover.
2. Check the cable connection between the thermostat and the heating element.
3. Check the temperature at which the thermostat is set, so that it is not less than that it is necessary for consumption.
4. Check the heating element.
5. Check the central electrical connection.
6. Turn on the electrical current and measure the voltage across the heating element.
7. Check the thermoelectric cut-out of the thermostat, which must be pressed. If not, turn the thermostat regulator to thethermoelectric fuse button appears. Press the one. Once it has been reset, thethermostat can work again.

MAINTENANCE SERVICE

Your solar water heater should be serviced every two years by an authorized representative or company technician. These periodic checks are necessary for the guarantee of the solar water heater. The inspection covers the entire system and more speci□cally:

1. Flange
2. Safety valve
3. The heating element - thermostat
4. Fittings
5. Piping
6. Insulation - Joints
7. Transparent cover (sunglass)
8. The support system
9. Replacing the anode and checking the closed circuit liquid.

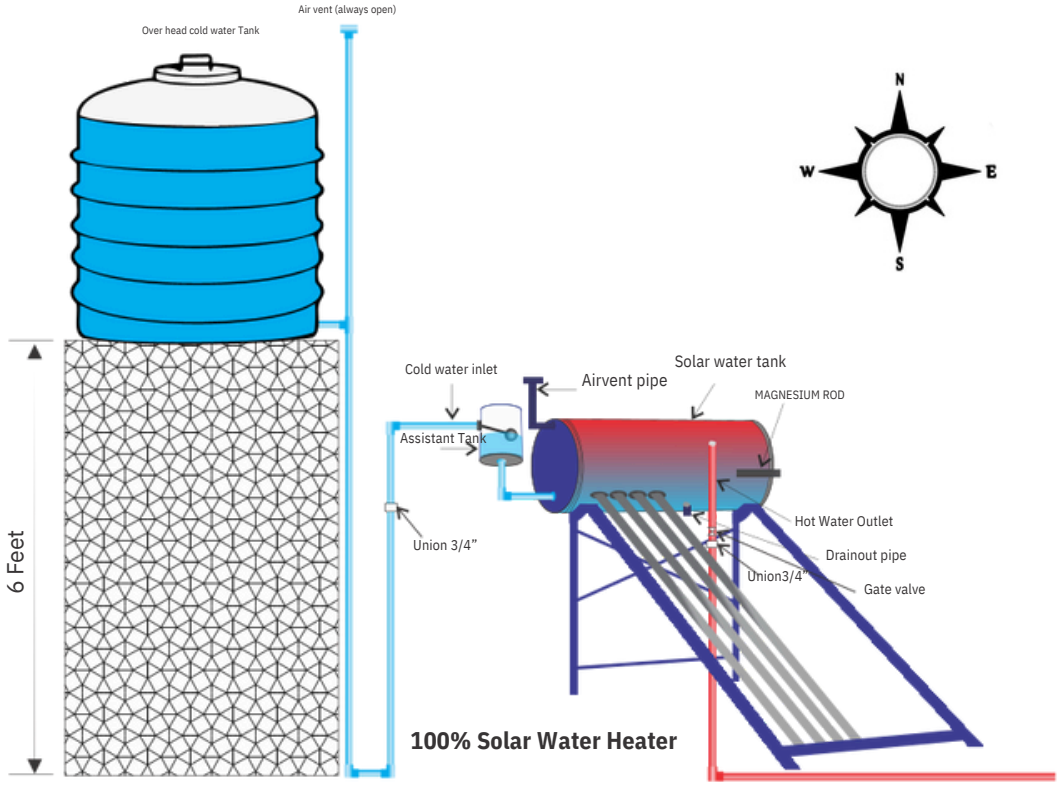
It is recommended that the water storage tank be inspected and cleaned every two years.

Especially for the replacement of the anode bar proceed as follows:

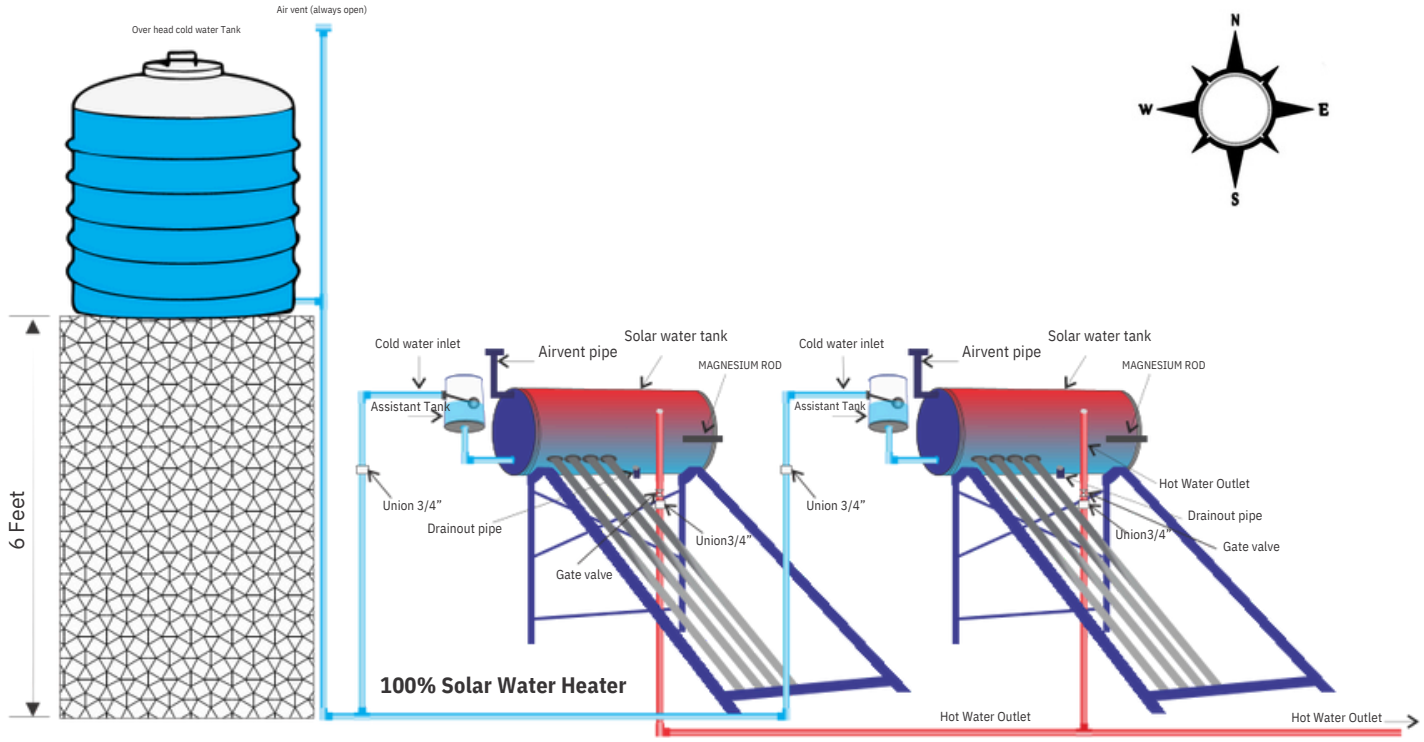
1. Switch off the power supply.
2. Empty the water from the water storage tank.
3. Remove the electrical protection cover.
4. Disconnect the three electrical cables.
5. Remove the electric heating element by removing the M8 screws.
6. Remove the magnesium anode from the heater element □ange.
7. Screw in the new anode.
8. Replace the heating element with the rubber gasket.
9. Turn on the water supply and a hot water tap until the water storage tank is□ll.
10. Check for water leaks.
11. Reconnect the electrical components to their designated outlets.
12. Check that the thermostat is □rmly attached to the heating element.
13. Replace the electrical component cover.
14. Reconnect the power supply.

For solar tanks with a coil, a periodic check by a quali□ed technician is recommended.

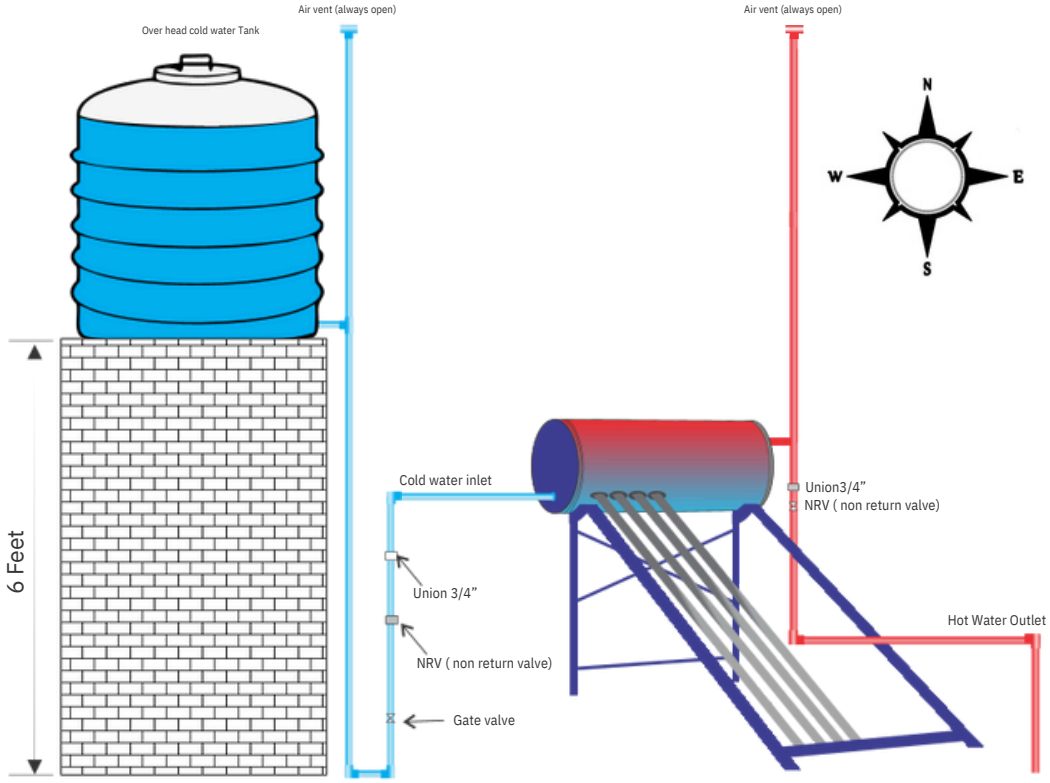
INSTALLATION DIAGRAM ETC 304 MODEL



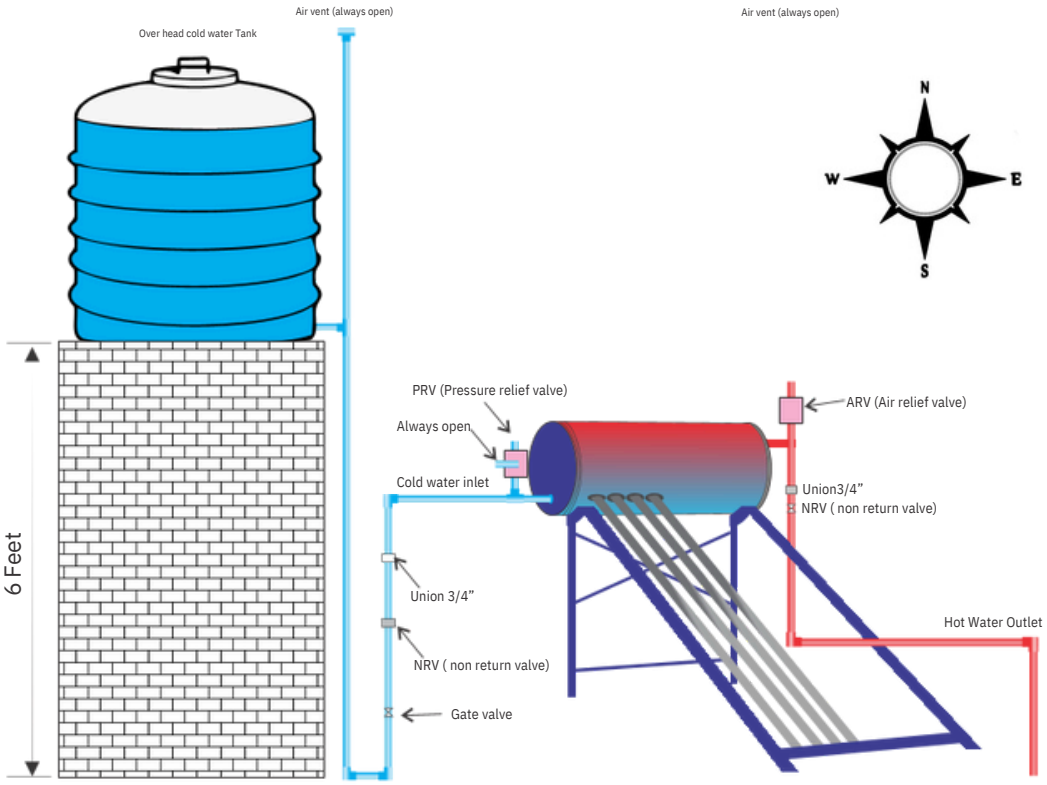
MULTIPLE INSTALLATION DIAGRAM WITH PARALLEL CONNECTION



INSTALLATION DIAGRAM ETC G-LINE MODEL



INSTALLATION DIAGRAM VAJRA PRESSURISED MODEL



TOP Home Appliance
SOLAR WATER HEATER SERIES

SUPREME ETC GLASS-LINED MODEL

SOLAR WATER HEATER(SS)

Technical Specifications

Type of collector	:	ETC
Specifications	:	58 - 2100
Frame angle	:	27 Degrees
Inner tank materials	:	Enamel steel of 2mm & 2.5mm with glass lined coating
Outer tank	:	Stainless steel
Inner dish	:	2.5mm
Insulation	:	50mm high quality PUF materials

SUPREME ETC GLASS-LINED MODEL

Technical Specifications

Type of collector	:	ETC
Specifications	:	58 - 2100
Frame angle	:	27 Degrees
Inner tank materials	:	Enamel steel of 2mm & 2.5mm with glass lined coating
Outer tank	:	Powder coated & Stainless steel
Inner dish	:	2.5mm
Outer dish	:	Aluminum with Powder coated
Insulation	:	50mm high quality PUF materials

More precisely: To connect the solar system heat exchangers to the central water system storage tank, follow the steps below:

1. Connect the connectors to inlet and to outlet of the exchanger.
2. Place a shut-off valve of the appropriate diameter.
3. Place the automatic air vents both on the water supply and on the return from the tank to the boiler.
4. Insulate all connecting pipes with at least 9mm insulating material.
5. Fill the system with water and check for leaks.

POSSIBLE PROBLEMS - SOLUTIONS

THE SOLAR WATER STORAGE TANK DOES NOT DELIVER A SATISFACTORY AMOUNT OF HOT WATER BY SOLAR ENERGY

1. Take weather conditions into consideration.
2. Avoid high hot water consumption over night.
3. Check if your hot water needs are not higher than the capacity of the system.
4. Ensure that your solar water heater is not shaded by any kind of obstacles.
5. Check that the system is level.
6. Carefully check all connections for tightness and tighten or replace all connections that are not over tight.
7. Check the building's plumbing and faucets for the possibility of a slow leak.
8. Ensure the hot water supply is not mixing with a cold water supply.
9. Ensure that the connecting pipes are not bent.
10. Ensure there is no trapped air in the water storage tank.
11. Collector must be covered from overheating and freezing during un use of solar water heater

recommendations on measures to reduce risk of Legionella proliferation

1. Regularly flush the system (especially outlets that are used infrequently)
2. Remove any dead legs/dead ends in the pipe system
3. Conduct a quarterly shower head/hose clean
4. Annually inspect cold-water storage tanks and clean when required
5. Drain hot water units to check for any debris or corrosion

If, after all the above checks, you are still not satisfied with the performance of your solar system, then please contact your local representative or the company's technical department.

ATTENTION !

- Any intervention - work on the solar water heater must be carried out only by specialized technicians and where the electrical components are concerned, only by quali□ed and authorized electricians.

- All solar water heater maintenance data must be mentioned on the cards on the warranty document (duration of warranty).

- In areas where extreme weather conditions are common (hailstorms, storms, tornadoes, etc.), it is recommended that the device is insured.

PRE- INSTALLATION TASKS

Before using the system, make a □nal check. Open all valves and check for leaks. Repeat the inspection after thirty minutes. Check that the system is □lled with water according to the company's instructions. In case of any failure condition a specialized technician should be called in. After its installation, the solar water heater requires about two days to reach a performance of the higher level. For this reason, the use of hot water for the □rst two days after installation is not recommended, even if there is strong sunlight. Periodic maintenance ensures the longevity and superior performance of the system.

- On-site monitoring of the device is recommended twice a year and have the collector tubes checked for damage (breakage), leaks in the connection pipes to the water and supply network, inspection of tube insulation and proper seating of the collectors.

- If the collector glass breaks, it must be replaced immediately.

- In the event of deterioration of attachments, screws, dowels, pipes etc., they must be replaced at the expense of the customer.

- In cases where there is no hot water withdrawal for a long time (summer vacation, for example), covering the collector surface is advisable with an opaque cover in order to avoid overheating, which could trigger the thermoelectric cut-out of the thermostat and break the electrical circuit.

- During the development of high pressures at the storage tank, it is possible to activate the safety valve and let water escape. This is normal operation and its purpose is to protect the solar water heater from pressure. If the water circuit pressure exceeds 4 atm., the adaptation of a pressure reducer, pressure- expansion tank required.

- Do not switch on the electrical resistance in the following cases:

A) In the event of a water cut in the water network.

B) In the event of frost, when the connection pipes are frozen and the water □ow from the solar water heater at the taps is not possible.

*Warning!*The use of a tap with thermostatic regulation up to 38°C on the domestic hot water supply is mandatory to avoid burns which can be caused by water stored at high temperature in the solar water heater .

We remain at your disposal for any further information. We can assure you that you have made the best choice. Thank you for choosing our products, we appreciate your trust.