

SUN AFRICA

Diversifying Energy Supplies!



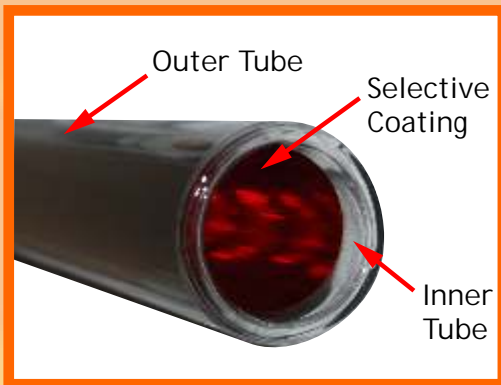
Solar Water Heating



Sun Africa designs and builds Solar Water Heaters at our Factory in Brits, Northwest Province, South Africa. We design and manufacture High Pressure Split systems and Low Pressure Thermosiphone systems using high quality Evacuated Tubes that we import. We design and build all standard size and purpose built Solar Water Heating systems, and we can install country wide through our network of accredited installers.

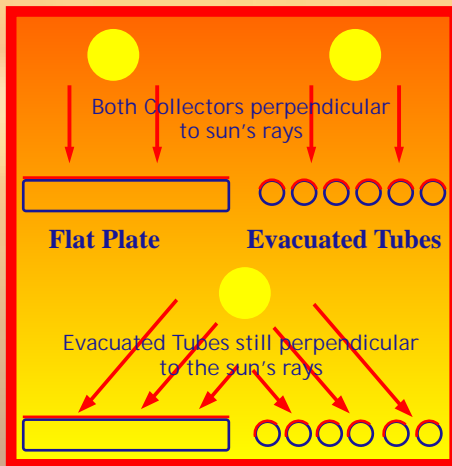
Evacuated Tube Technology

- The All Glass Evacuated Tubes are the key component of this Solar Collector.



Each Evacuated Tube consists of two transparent borosilicate glass tubes. The outer tube is manufactured according to SABS standards, and has a minimum thickness of 2mm and will resist hail of up to 35mm in diameter. The inner tube is coated with a special selective coating, which has excellent solar heat absorption and minimal heat reflection properties.

The air between the tubes is removed to form a vacuum, which eliminates conductive and convective heat loss, enabling the tubes to absorb the energy from the sun's infrared rays which can pass through the clouds. Wind and low temperatures have less of an effect on the performance of the Evacuated Tubes compared to flat plate collectors due to the insulating properties of the vacuum.

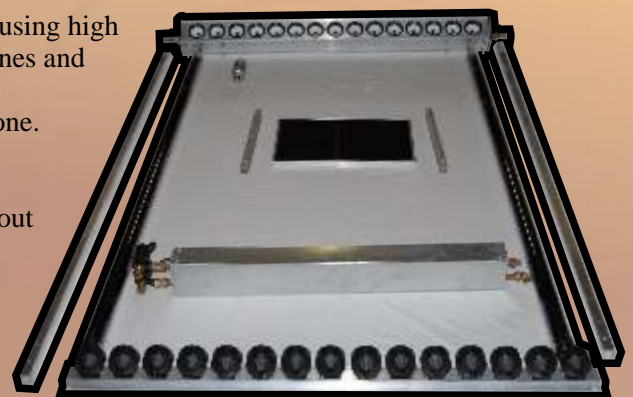


The tubes are aligned in parallel and should be installed in a North South orientation in order to passively track the sun's heat all day. The shape of the tubes provides superior absorption when compared to flat plate collectors for the following reasons.

- 1) As the tube is round, the sun's rays are always striking the tube's surface at right angles, thus minimising reflection.
- 2) If the collector is flat, the amount of solar radiation striking the collector surface is only at its maximum at midday when the sun is directly above the collector. In the morning or the afternoon, the sun's rays strike the collector's surface at an angle, and thus the amount of solar radiation striking the collector is reduced. Evacuated Tubes, however, are round and the amount of solar radiation striking the tube is relatively constant from morning to afternoon. The sun is always striking the tube at an angle which is perpendicular to the tube reducing reflection and increasing the efficiency of the collector.

The manifolds, brackets and stand parts are designed and manufactured, using high quality aluminium and copper, in South Africa according to strict guidelines and standards. Only a few rust resistant galvanized bolts and nuts are used to assemble the unit, and can be disassembled if maintenance needs to be done. No rivets are used.

The tube holders can be mounted and dismantled from the foot rail without using tools, thus enabling the evacuated tubes to be easily installed. The photovoltaic panel slides into a frame, affixed to the manifold, thus reducing unnecessary roof penetration.



The collector has been designed for African conditions resulting in the following.

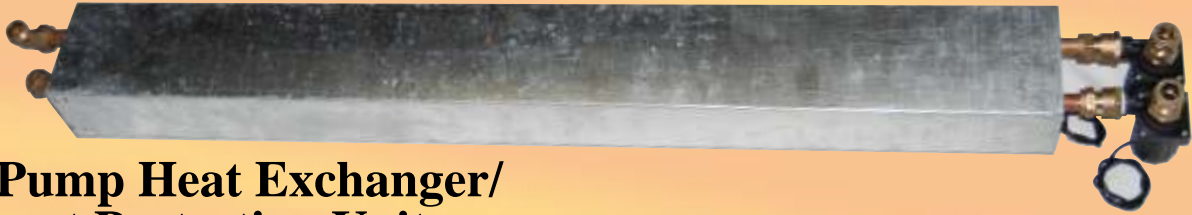
- Due to the amount of solar radiation in Africa, less evacuated tubes can be used. The Evacuated tubes can be mounted closer to each other resulting in a more compact collector that will add to the esthetical look of the building.
- No fluid passes through the evacuated tube and therefore, should a tube get damaged the system will function as normal with a minimal efficiency loss. The damaged tube can be replaced at a minimal expense while the system still functions effectively.

Split Collector Systems



With a Split Collector System, the Collector is split from the Storage Tank. The Storage Tank (Hot Water Geyser) resides in the roof of the building, or wherever the tank is installed, and the water is circulated between the collector, on the roof, and the storage tank via a solar powered circulation pump. One can therefore fit the Collector to an existing storage tank (Retrofit), resulting in a huge cost saving.

All of Sun Africa's split collector systems are fitted with our own locally designed Over Heat Protection System, and for areas where extreme cold temperatures occur, we suggest a heat exchanger.



Dual Pump Heat Exchanger/Overheat Protection Unit

The Heat Exchanging unit can very easily be installed, and is designed with a dual pump system. When using our Heat Exchanger, Glycol (Heat Transfer Liquid) is circulated through the collector and the water is heated within the Heat Exchanger. This is commonly referred to as an indirect system. The Glycol can not freeze, thus protecting your collector in extreme cold conditions.

Photovoltaic Panel

A photovoltaic panel converts sun energy into 12 volt DC electricity, powering the circulation pump/s, therefor making sun africa solar water heating systems electricity free



Photovoltaic Panel

Thermosiphone Systems

Non Pressurised

These systems consist of Evacuated Tubes and a low pressure storage tank which are assembled as one unit.

These Solar Water Heaters do not have an electrical back up and is ideal for farms, ablution facilities or places where there are no electricity.

Thermosiphone is the natural circulation of water when heated. The colder water in the tank flows down the Evacuated Tube, and when it is heated by the sun, the warmer water rises into the top of the storage tank.

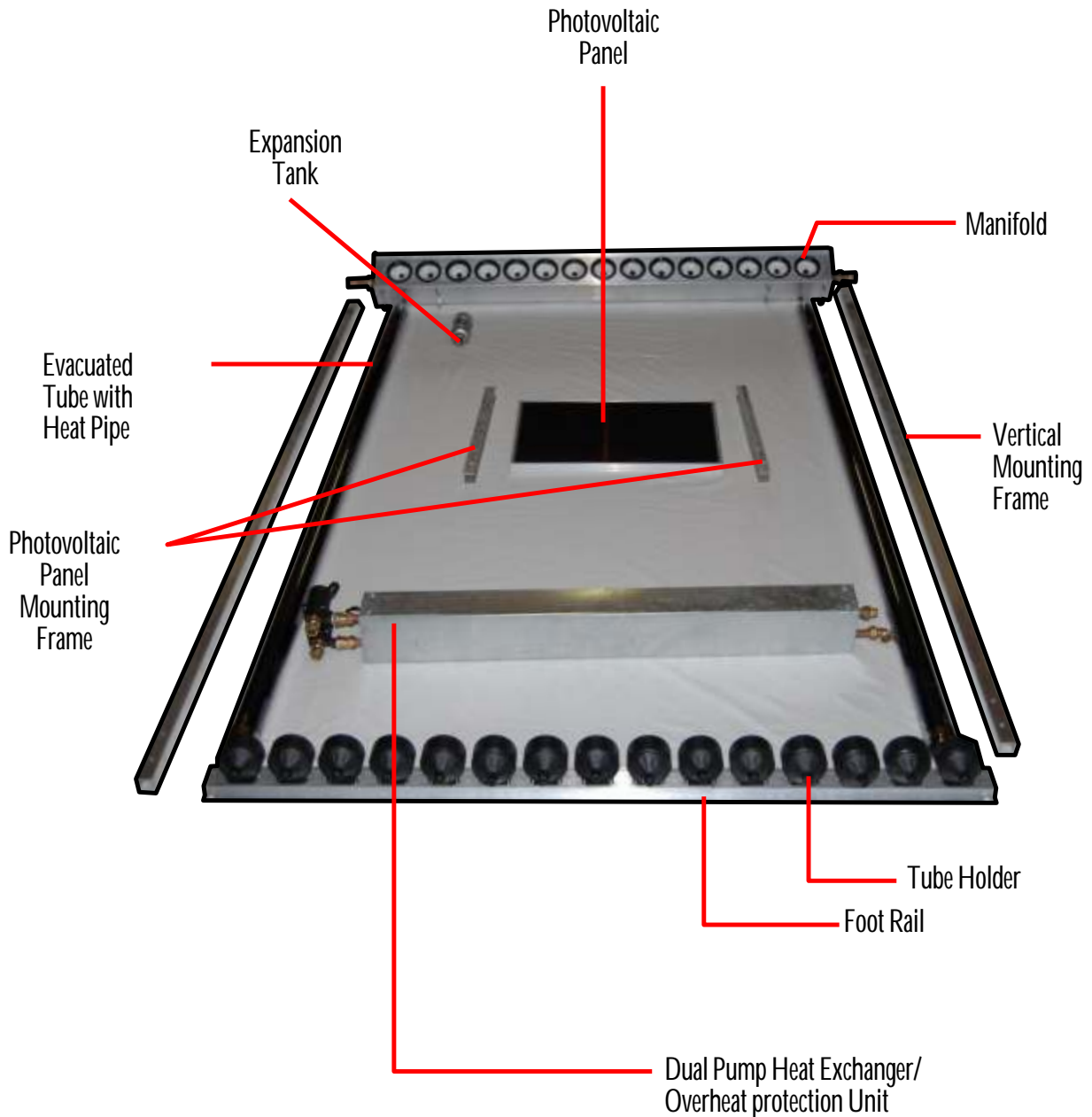
The Storage Tank has an open vent to the atmosphere, where steam is released when the temperature rises and the water pressure is controlled by the height of the installed unit. The higher it is mounted on the roof, the higher the pressure of the water out of the tank.

The Low Pressure Systems are typically the most cost effective systems available and can very easily reach high temperatures.



SUN AFRICA

SOLAR COLLECTOR COMPONENTS



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