

A solar thermosiphonic system for domestic hot water generation consists of the solar collectors and the water storage tank and can be of open or closed circuit.

In the case of an open circuit the storage tank water flows through the collectors and there is always the risk of a) water freezing and collectors damage as well as a) mineral deposits problems in the collectors piping system.

This is the reason why the open circuit is recommended when the temperature during the year does not fall below 3°C.

In an open circuit there are no such risks, because instead of water, propyleneglycol solution flows through the collectors, and the said fluid is not mixed with the storage tank water.

In order for the big temperature differences and the boiling to be avoided, the closed circuit is equipped with an expansion tank and a safety valve.

The cold water enters the underneath part of the water storage tank. From that point, and since it is of higher density, the water reaches the collector through the tubes, it gets heated and is leaded to the upper part of the tank in order to be used when necessary. The circulation of the water is natural, that is, it is based in the density difference between cold and hot water and that is why the tank is placed above the collector.

For the days when there is no sunshine, or the solar radiation is not strong enough for the generation of domestic hot water, there is also the possibility of the following auxiliary energy sources:

- a) [1,5- 4 kW electrical resistance](#)
- b) [Special heat exchanger](#) which is connected to the central heating system.

The solar thermosiphonic systems can be installed on both [flat](#) and [kinclined](#) inclined surfaces and are suitable for domestic use only.

A solar system in Greece saves 1400 kWh yearly. This quantity corresponds to the 70% of the annual hot water needs of a 4-member family.