

# What is solar thermal collector?

--- ( ONOSI Solar [www.onosisolar.com](http://www.onosisolar.com) ) 2021/02/03



**Solar collector** is a type of solar energy panel that uses solar thermal energy. The finality of solar collectors is converting solar radiation into thermal energy. Solar energy (solar radiation) is collected by the solar collector's absorber plates. Selective coatings are often applied to the absorber plates to improve the overall collection efficiency.

The most common solar collector types are: High efficient [CPC solar collector](#) popularly named [Compound Parabolic Collector](#), [Heat pipe solar collector](#) popularly named [evacuated tube solar collector](#) or [vacuum tube solar collector](#), [Air Solar Collector](#), [U-Pipe solar collector](#), Flat plate solar collector.

## 1: What is CPC solar collector



### Thermostatic heat pipe solar collector

CPC solar collector uses a compound parabolic reflecting surface to reflect and concentrate the solar radiation to the focal line.

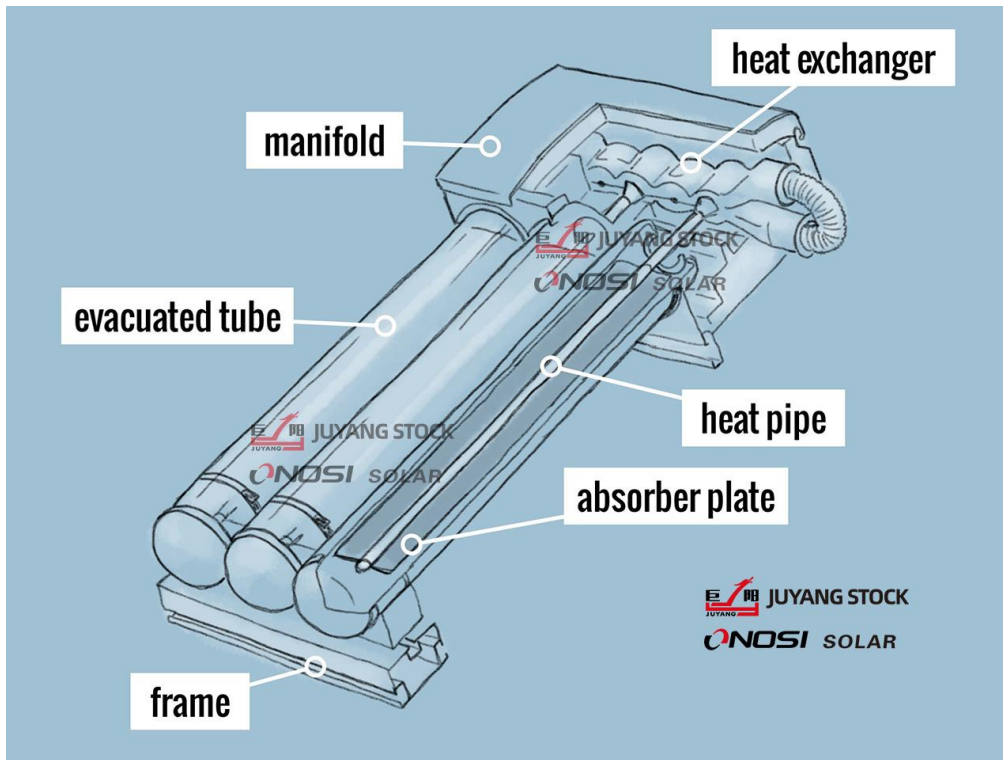
High performance (CPC Solar collector)

These concentrators do not have such strict requirements for the incidence angle as the parabolic troughs have, which makes them attractive from the point of view of system simplicity and flexibility. Like parabolic and other shapes, CPC concentrators can be applied in both linear (troughs) and three-dimensional (parabolocylinder) versions. The same as in "pure" parabola case, troughs are most widespread and useful for this type of concentrator.

[Learn more >>](#)

## 2: What is evacuated tube solar collector

**Evacuated tube solar collectors** usually consist of a **heat pipe** inside a **vacuum-sealed tube**. As the area of one tube is small, to increase the heat collection area a number of tubes are connected to one manifold, Depending on the collector size 10–20 tubes are used.



The heat pipe is a sealed copper pipe, which is attached to a black thin copper fin and forms the collector absorber plate. Each tube is terminated to a metallic vessel which is attached to the sealed pipe and acts as a condenser. The heat pipe contains a small amount of volatile fluid (usually methanol or ethanol) which, as long as there is sunshine, undergoes an evaporating-condensing cycle. The solar heat evaporates the liquid and converts it into a vapor which due to its lower density rises to the heat sink (metallic vessel) where it condenses by transferring its latent heat to the flowing fluid, usually water. The condensed fluid then returns back to the solar collector due to gravity. The cycle is repeated as long as there is sunshine and thus solar heat to evaporate the fluid. Water or water-glycol mixture usually flows through the manifold heated up from the condensation of the vapor. The circulated heated liquid is then directed either through a heat exchanger to supply heat to a process or is stored in a storage tank for later use.

### Evacuated tube solar collector installation videos:

<https://www.youtube.com/watch?v=dchOpl79gbo>

<https://www.youtube.com/watch?v=MAWuJTIszpo>

<https://www.youtube.com/watch?v=IAZSgyqPN2g>

<https://www.youtube.com/watch?v=OzuHzNJmJn0>

[Learn more about Evacuated tube solar collector >>](#)

### 3: What is air solar collector



#### Solar hot air collector

The solar air collector is a remote cousin of the more ubiquitous heating water solar collector. The principle of operation is similar. Sun radiation is absorbed in a layer of absorptive material, the energy in the light wavelength is converted to heat and trapped inside the collector casing (thanks to the greenhouse effect). The heat however is transferred to air and not to a liquid (water or anti-freeze liquid).

[Learn more >>](#)

### 4: What is u-pipe solar collector



#### U Pipe solar thermal collector

U-Pipe solar collector is a type of solar energy collector, which is appropriate in the central hot water supply system. “U” pipe vacuum tube collectors embed U-shaped metal pipe into vacuum tube the all glass tube. Vacuum tubes absorb solar energy, and through the flowing medium in the “U” pipe to reach the principle of heating water.

[Learn more >>](#)

### 5: What is flat plate solar collector



#### Flat plate solar thermal collector

Flat plate collector has advantages for simple structure , work reliable.and low density of heat flow. That means the media also has low temperature , it is more reliable .

Flat plate collector is a equipment for absorbing the sunshine then transfer heat to media. It is a special heat exchange equipment .the meida in collector to exchange the heat with the long distance sun.

[Learn more >>](#)