

SOLAR WATER HEATER



A solar water heater works by capturing sunlight in solar collectors, which heats water (or a heat-transfer fluid) and sends it to an insulated storage tank. This heated water is then ready for use, with a backup heater sometimes available for times of low sunlight.

What Are Solar Water Heaters?

Solar water heaters are devices designed to harness the abundant and free energy of the Sun to heat water. These devices capture and utilise solar energy to raise the temperature of water to a comfortably warm range, typically between 60-80 degrees Celsius. A solar water heater has four major components:

- Solar collector to absorb solar energy,
- Insulated tank for hot water,
- Supporting stand,
- Connecting pipes and other instrumentation.

The collector panel, which absorbs solar energy, is equipped with a black absorbing surface known as the absorber. The absorbed energy is then efficiently transferred to the water circulating through the collector. The heated water is collected in a specially designed tank, which is equipped with insulation to minimise heat loss. The circulation of water between the tank and the collector happens automatically. This circulation ensures that the water in the tank is consistently heated by the sun's energy, providing a reliable and steady supply of hot water.

What Are the Different Types of Solar Water Heaters?

Depending on the collector system used, solar water heaters can be classified into the following two types:

- Flat Plate Tube Collector

The flat plate tube collector consists of a flat, rectangular panel that absorbs sunlight and heats up water inside tubes or channels. The heat absorbing panels are typically made of copper or aluminium – materials that are excellent conductors of heat. The heated water is then transferred to a storage tank, where it can be used for various heating purposes.

- Evacuated Tube Collector

The evacuated tube collector consists of double-layered borosilicate glass tubes, each with a metal absorber tube inside. These tubes are highly insulated and create a vacuum, which minimises heat loss. When sunlight hits the absorber tube, it heats up the water inside, which is then transferred to a water heater storage tank.