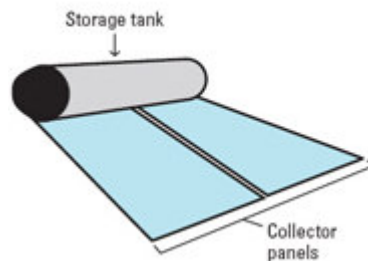


## Solar heater and heat pumps explained

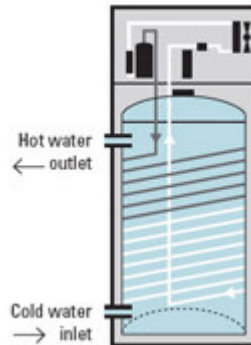
### Solar Heaters



The water is heated in solar collector panels on your roof and stored in a tank. Solar systems come in two main types:

- ▶ **Thermosiphon systems** have both the collector panels and the storage tank mounted on the roof. The liquid in the panels circulates into the tank via the thermosiphon effect (as water heats up, it becomes lighter and rises into the tank). In warm climates, the panels can heat water directly. However, in frost-prone areas, the water can freeze and damage the panels, so frost-tolerant panels which use a heat-exchange fluid with a freezing point lower than water are used. The panels heat the fluid, which then heats the water in the tank.
- ▶ **Pumped or split systems** have solar panels on the roof but the tank is located at ground level (or elsewhere in the building). Hot water is pumped from the panels to the tank. Boosters are needed in solar hot-water systems to keep up the hot water supply when there's not enough sunlight to do the job. Boosters can be either electric- or gas-powered, and are usually incorporated in the water tank.

## Heat pumps



Heat pumps don't use solar energy directly, but because they are very energy efficient they're classed with solar systems for rebates and other government incentives. Installation is generally similar to installing an electric hot-water system. Heat pumps draw energy from the surrounding air and convert it to heat in much the same way as an air conditioner or refrigerator.

- ▶ Air is drawn into the unit through an evaporator, where a cold refrigerant absorbs the air's heat.
- ▶ The refrigerant then flows into a compressor, where it's converted to a high-pressure, high-temperature gas.
- ▶ The gas passes through a condenser in the water tank, heating up the water. The refrigerant gas cools down and is cycled back to the evaporator.

Heat pumps tend to work best in warmer climates, such as coastal regions, but there are models (such as the Dux Airoheat Subzero) designed to operate in cold climates.