

HOW IT WORKS:

Closed Loop Schematic

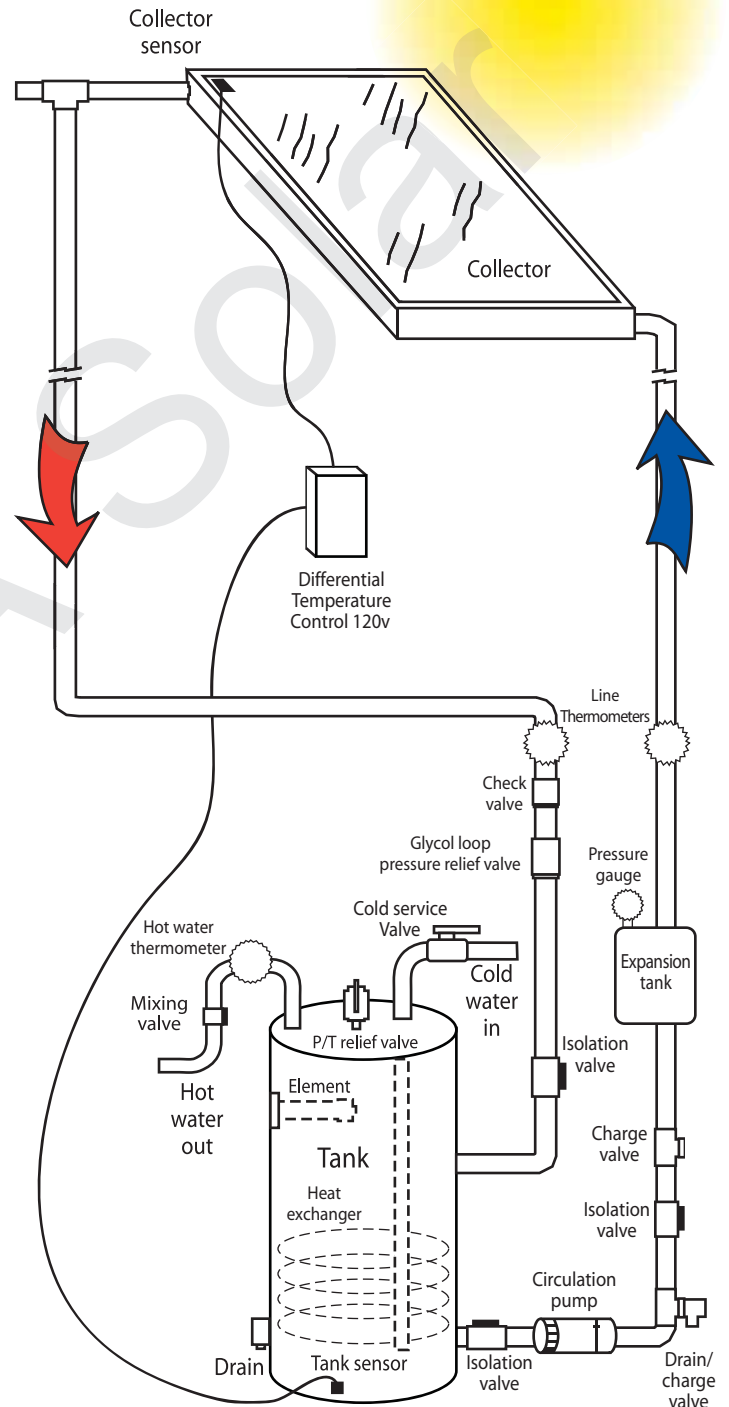
Closed Loop Systems

A closed loop system design is common in northern climates, where freezing weather more frequently occurs. An FDA-approved heat exchange solution circulates through the collector, and a heat exchanger transfers the heat from the solution to the tank water. Generally, if the heat exchanger is installed in the storage tank, it should be in the lower half of the tank.

In the system shown here, a heat transfer solution is pumped through a closed loop which includes the collector, connecting piping, pump, an expansion tank and a heat exchanger. Heat is harvested in the collector and transferred to the potable water through the heat exchanger in the lower half of the storage tank. An alternative of this design is to wrap the heat exchanger around the tank, which keeps it from contact with potable water.

The brain of the system is a differential controller. In conjunction with collector and tank temperature sensors, the controller determines when the pump should be activated to direct the heat transfer fluid through the collector.

We recommend using a food grade glycol solution which is a mixture of distilled water and antifreeze. This type of fluid freezes only at extremely low temperatures so the system is protected from damage caused by severe cold.



HOW IT WORKS:

Drainback Schematic

Drainback Systems

A fail-safe method of ensuring that collectors and collector loop piping never freeze is to remove all water from the collectors and piping when the system is not collecting heat. This is a major feature of the drainback system. Freeze protection is provided when the system is in the drain mode. Water in the collectors and exposed piping drains into the insulated drain-back reservoir tank each time the pump shuts off. A slight tilt of the collectors is required in order to allow complete drainage. A sight glass attached to the drain-back reservoir tank shows when the reservoir tank is full and the collector has been drained.

In this particular system, distilled water is recommended to be used as the collector loop fluid- transfer solution. Using distilled water increases the heat transfer characteristics and prevents possible mineral buildup of the transfer solution.

During the day, the pump is activated by a differential controller. Water is pumped from the reservoir to the collectors, allowing heat to be collected. It is then circulated through the heat exchanger at the bottom of the solar tank. The heat exchanger transfers heat from the collector loop fluid to the potable water in the solar tank.

