



Solar Hot Water System Types



Innovating Today's Solar Technology
for the Future of Tomorrow



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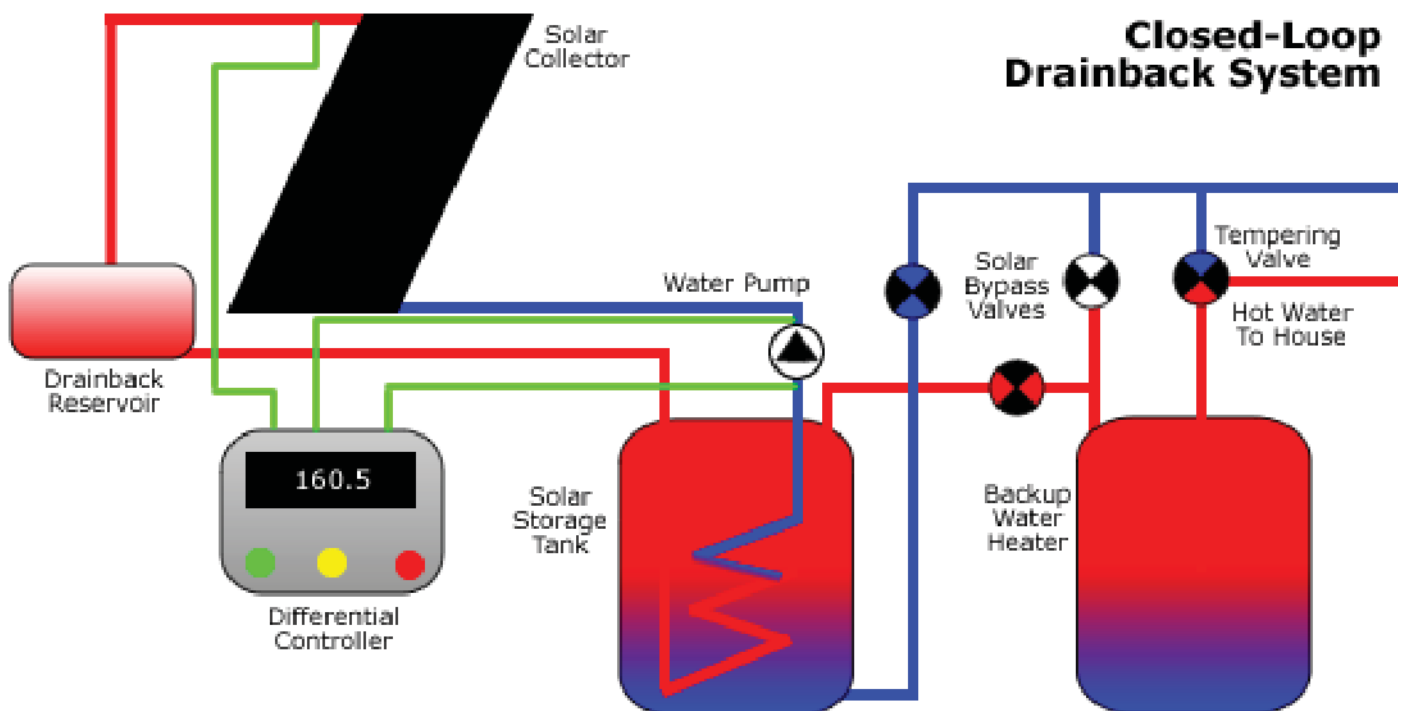
Closed-Loop Drainback

First developed in the 1980's, the Closed-Loop Drainback Systems have proven themselves to be reliable and highly efficient. They are essentially a non-pressurized closed-loop system that uses water as a heat transfer fluid (not a glycol mix). A small drainback reservoir is added to the collector loop, and the system is filled pure water to the top of the reservoir. Because the collectors are located above the reservoir, they remain dry when the system's pump(s) is off.

How they work – when the collectors are hotter than the water in the storage tank, the system activates automatically to heat the water. Then, when the water in the storage tank is hotter than the collectors, or reaches a pre-determined cut-off temperature, the system shuts down the pump and the water drains back to the reservoir.

Problems addressed

- Freeze protection gravity based
- The pump is shut down when the water temperature is correct, draining all excess water from the collectors
- Fewer components than other systems, reducing the risk of problems, and lowering any repair/ replacement costs





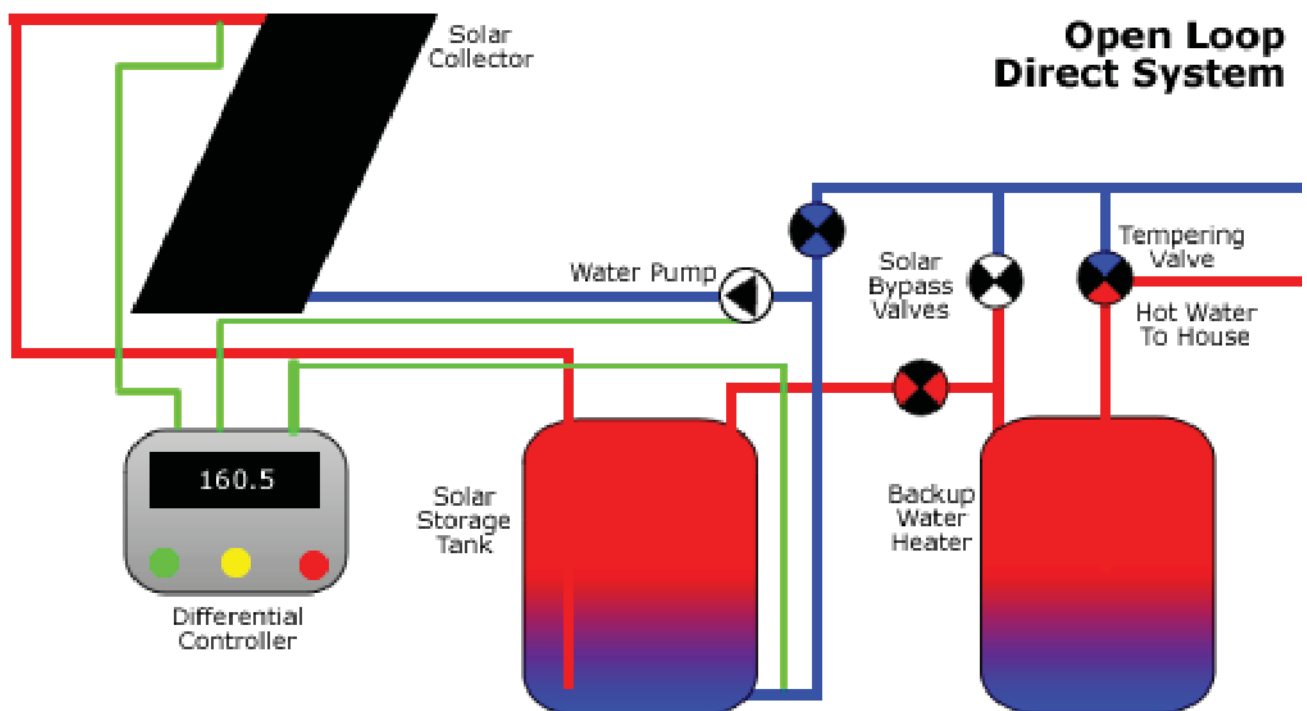
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Open-Loop Direct

The simplest of all direct systems is the Thermosyphon Water Heater. These systems operate on a very simple principle – water is circulated by natural convection and gravity – rising and falling in response to solar heat, just as air does. In their simplest form, Thermosyphon Systems are not suitable for cold weather climates because water remains in the collector at all times, creating a problem with freezing conditions. However, a valve can be added to drain the collectors when freezing temperatures occur.

A direct pump system is often used as flexibility in system layout and design becomes necessary. With this forced circulation, the tank does not need to be placed above, or even near, the solar collectors. In this system, the pump moves water through the collectors only when there is enough solar radiation to provide useful heat. When the pump shuts off the collectors are drained of water (assuming the drain valve has been installed).

Important Note: Direct systems, whether pumped or thermosyphoning, cannot be used in areas where water is hard or acidic. Scale deposits would quickly clog the inside of the absorber tubing, and the corrosion could render the system inoperable.





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Pressurized Glycol (Cold Climate) System

The pressurized glycol system is the most reliable configuration for Solar Water Heaters, but the initial cost in collectors and components, and the costs of maintenance and repair are significantly higher than any other system setup configuration.

If you never want to worry about freezing damages, and are not concerned with providing the lowest initial investment, and getting the fastest possible payback, the pressurized glycol system is the right choice for you. Changing your fluid (a water/glycol solution) regularly is recommended for the protection of your investment, but will modestly raise your maintenance time and costs.

Advantages:

- Will not freeze, except in extreme temperatures
- Uses a pressurized loop that circulates a food-grade glycol
- Indirectly transfers heat from the glycol solution to your potable water
- Requires the glycol solution to be changed every few years (at least)

