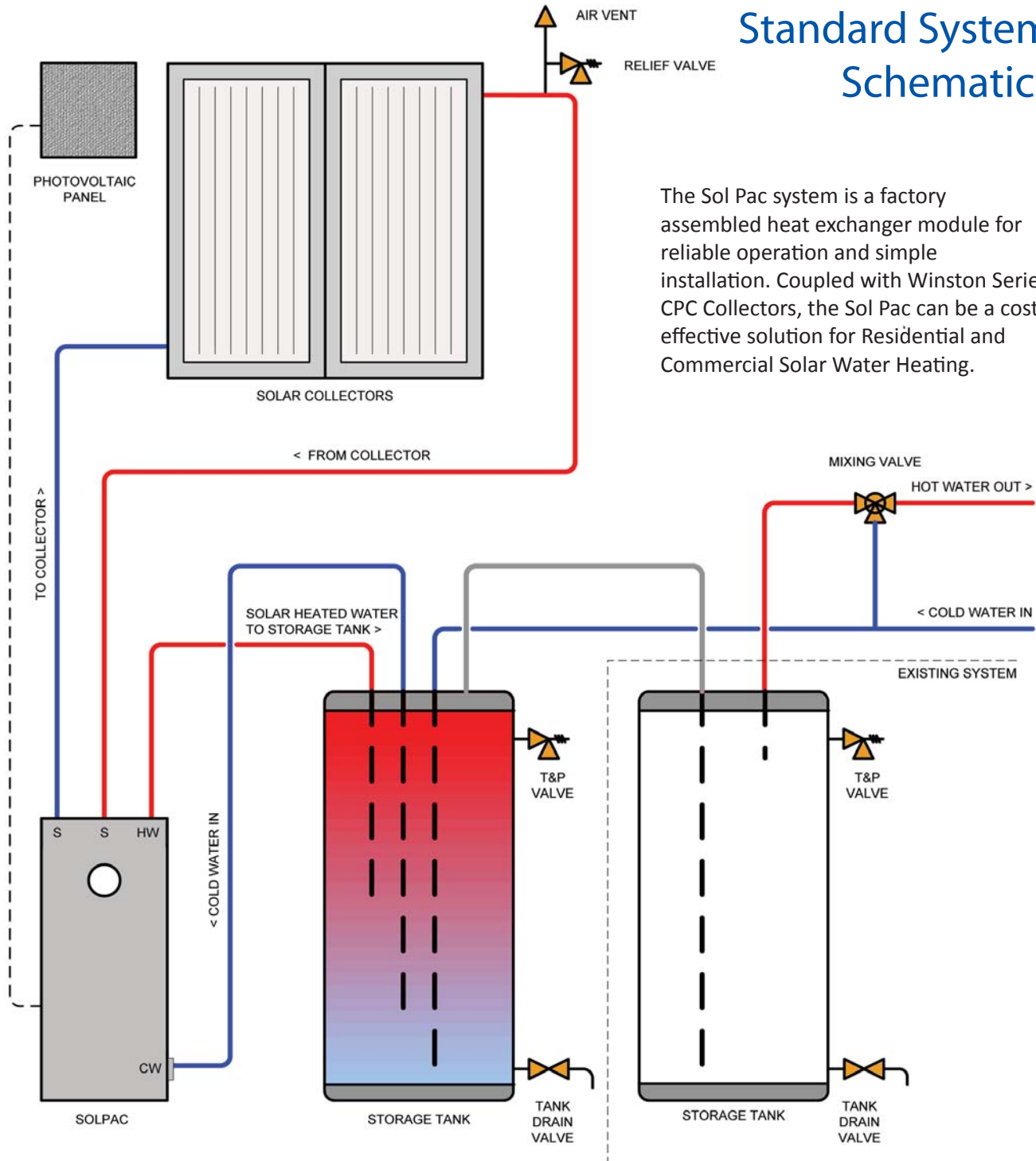


SOLARGENIX ENERGY

Sol Pac Heat Exchanger Module Standard System Schematics



The Sol Pac system is a factory assembled heat exchanger module for reliable operation and simple installation. Coupled with Winston Series CPC Collectors, the Sol Pac can be a cost effective solution for Residential and Commercial Solar Water Heating.

The non-toxic propylene glycol (anti-freeze) in the heat exchanger loop is circulated through the CPC collectors using a DC circulator powered by a photovoltaic (PV) panel. As the solar fluid is heated, water from the solar storage tank will thermosyphon through the heat exchanger in the Sol Pac. The natural convection between the water in the storage tank and the heated fluid in the Sol Pac will heat the solar storage throughout the day.

Solargenix Energy

Sol Pac Internal Schematics

The Sol Pac Heat Exchange Module Includes:

- Heat Exchange Module
- DC Circulation Pump with 20W PV panel
- Stainless Steel and Copper Components
- Summer and Vacation Bypass
- Simple to Install
- Compact and Attractive Design measuring:
12 7/8" x 13 5/16" x 30"



Front View

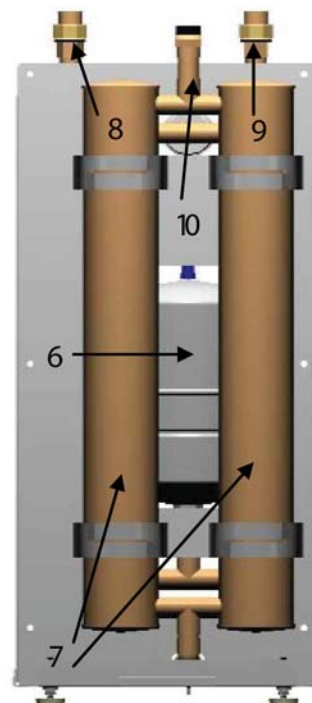
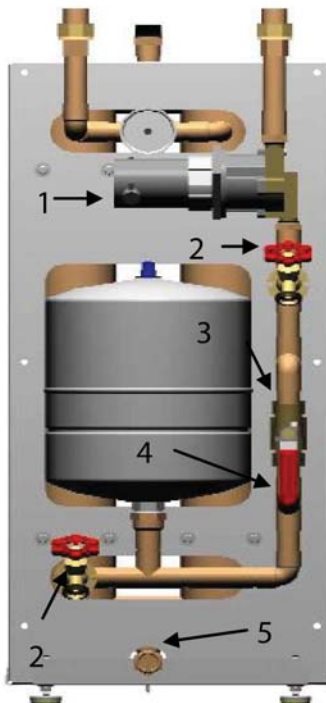
Rear View

FRONT VIEW:

- 1 - pump
- 2 - fill/drain valves
- 3 - check valve
- 4 - bypass valve
- 5 - cold water inlet

REAR VIEW:

- 6 - expansion tank
- 7 - heat exchangers
- 8 - connection to solar panels
- 9 - bypass valve
- 10 - hot water outlet to storage



SOLARGENIX ENERGY

Introduction

The procedures and recommendations described within this manual are intended for use with the Sol Pac Active System Retrofit Module only (herein referred to as the Sol Pac). Be sure to read and understand the operation and maintenance procedures of this manual prior to performing any operations and/or services. Failure to follow the procedures and practices described within this manual could result in harm to person and property and would void the manufacturer's warranty.

Code Compliance

The Sol Pac, and associated components, should be installed by a licensed solar contractor and in accordance with applicable local building codes, ordinances and regulations governing solar water heating system installations. If a solar contractor is not available, seek help from qualified plumbing, roofing and electrical service personnel.

Safety Precautions

Before attempting to install the Sol Pac, insure the electrical service to the water heater is turned off at the circuit breaker, the water service is shut off and the water heater is empty. The solar thermal collectors and the photovoltaic module (PV), which supply heat and electrical energy to the Sol Pac, should be covered with opaque coverings to impeded the generation of thermal and electrical energy during installation.

Placement

The Sol Pac should be installed next to the water heater and not in an area where leakage of the Sol Pac or connections will result in damage to the adjacent area or to lower floors of the structure. Where such areas cannot be avoided, it is recommended that a suitable catch pan, adequately drained, be installed under the Sol Pac. Whenever possible elevate or raise the storage tank above the level of the Sol Pac to enhance the thermosiphoning of the cold water in the storage tank.

Warning

The use of galvanized or plastic type piping (i.e. CPVC, PVC, etc.) is prohibited. Lead-free solder is to be used for all soldered connections. The use of 50/50 lead solder is prohibited. Damage resulting from the use of these products will not be covered under the warranty. Threaded connections should have no less than Teflon thread tape and the addition of Teflon thread sealant where applicable.

The PV module produces electrical energy when subjected to light. Insure the PV module is covered with an opaque covering prior to making electrical connections between the PV module and the Sol Pac.

Sol Pac Installation Guide

Description of Operation

The Sol Pac is an active indirect solar interface for new or existing domestic hot water systems. The unit is designed to work virtually free of user interface. A photovoltaic module is incorporated to deliver electrical energy to the 12 Volt pump, which circulates the heat transfer fluid media through the solar side loop of the unit. As the solar side loop is energized, it heats the fluid media flowing through the heat exchanger.

The tank side loop uses natural convection to heat the water in the water heater. The heated water rises out of the Sol Pac and dispenses into the top of the water heater. Colder, denser water is drawn from the tank to the bottom of the heat exchanger creating a natural circulation within the tank side loop. The system will continue to operate as long as there is light energy available to power the pump.

Maintenance

The Sol Pac is equipped with a "seasonal position" or SP valve, located on the face of the unit. During the colder months, as evening air temperatures drop, the unit is subject to reverse thermosiphon. The SP valve introduces a flow check valve to the solar side of the loop and prevents this loss of energy from occurring. During warmer months, the check valve is bypassed. This allows the system to flow freely and protects form overheating.

The SP valve should be on the closed (horizontal) position when the night time ambient temperatures fall below the ambient ground water temperatures. When the temperatures are equal or the night time air temperatures are higher, the SP valve should be in the open (vertical) position. The SP valve should only be adjusted twice a year. Always leave the SP valve in the open position during vacation periods.

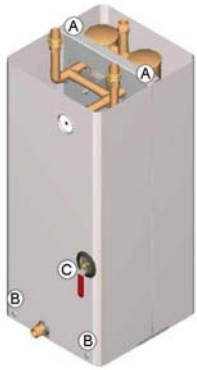
Installation Instructions

Inspection

Carefully remove all packaging materials and inspect for signs of damage. The Sol Pac outer cover has a translucent blue film protecting the material surface. Removal of this film will not impede or impair the function of the Sol Pac

Placement

Place the Sol Pac into the predetermined position adjacent to the water tank. Remove the lid and using a bubble type level, check the unit for plumb/level. Adjust the feet and tighten the locking nuts to secure unit once plumb/level is achieved.



Set Up

Remove the front cover by removing the lid and removing the fasteners as shown in figure 1.

A - 1/4" bolts and nuts (2x)

B - #2 Phillips head panels and rivets (2x)

C - ball valve nut and arm (1x)

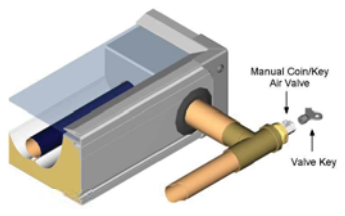
Figure 1 Tilt cover forward and pull upward/outward to release from connection grommet at the bottom of the unit. Replace the lid temporarily, prior to making the solar-siding connections.

Charging the System (solar-side)

After All connections have been made and a final pressure test has been performed, the system is ready to be charged. Air vents should be loosened to allow air to escape during the charging process.

Fill the system with an approved solution of anti-freeze and distilled water; secure the air vents. Pressurize the system to the required pressure and secure the expansion tank - ensure the tank pressure is properly set.

The return connection at the collector should include an air vent (manual, keyed) as shown in below.



Connections

Figure 2 illustrates a typical installation using the water tank drain as the cold water supply to the system(s). In this illustration, isolation valves, unions and an additional drain valve (all optional) are used as interconnects and allow for cut-off of the module if repair/replacement is required. Note: the tank-side loop of the Sol Pac relies on the effect of natural convection for circulation. The connection from the storage tank to the Sol Pac should have a gradual incline to minimize air entrapment. The cold water dip-tube should be removed and cut to a shorter length approximately 1/3 of the distance from the top of the storage tank.

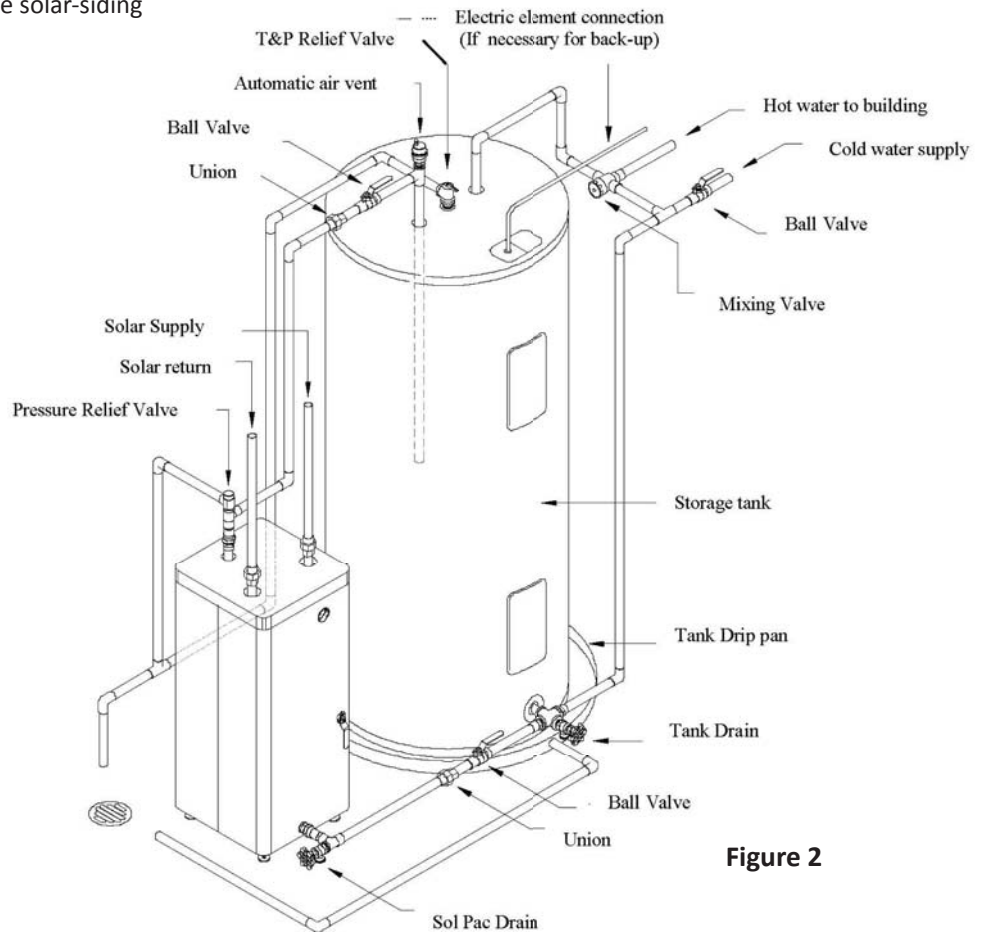


Figure 2

Reassemble & Test

Slide the Sol Pac lid up the collector feed lines far enough to replace and secure the front cover using the fasteners removed previously. Slide the lid back into position. Check to insure all tank-side drain valves are closed and isolation valves (if applicable) are open. Open the cold water supply valve to fill the water heater and tank-side loop of the unit. Open a faucet in the structure to allow air to escape while filling. Remove any coverings from the solar collectors and PV module.

Electrical Connections

The Sol Pac contains a 12 Volt seal-less magnetic drive pump used to circulate the heat-transfer fluid media throughout the solar-side loop of the unit. This is typically powered by a photovoltaic module (PV) mounted adjacent to the collectors, on the roof. The power supply cable should be of a size and type suitable for the application.