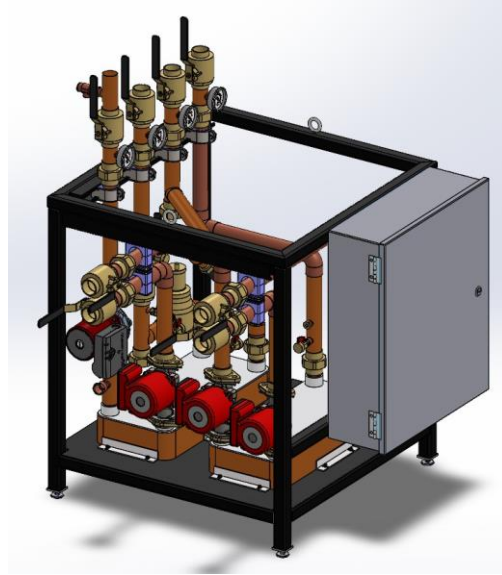


SunEarth TM

SolarStation XXL

Installation/ Owner's Manual



Description / Applications

System Overview

The SunEarth SolarStation XXL solar thermal drainback system. The SolarStation XXL allows for easy installation of large solar water heating systems.

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**WARNING**

Electrical Shock, Fire, Explosion and Burn Hazards

This system must be installed, adjusted, and put into operation only by a trained, qualified professional or service agency in accordance with the National Electric Code ANSI/NFPA 70 (Canada CSA C22.1), state and local codes, and authorities having jurisdiction.

The installer must carefully read and follow the installation and service instructions contained in this manual. Also make these instructions available to the equipment owner, so they can be kept for future reference.

Features

SunEarth SolarStation XXL Features

SunEarth has uniquely created the SolarStation XXL package which allow for the easy installation of a large scale industrial solar water heating system using an atmospheric solar storage tanks.

- Heat exchangers, circulators and state of the art digital controls in one space saving package
- Patent pending heat exchange process means the pumps run less, increasing savings
- Extra layer of protection with 2 heat exchangers between potable water and solar loop
- Decreased installation time
- Reduces labor and engineering costs
- Easy maintenance
- Scalability allows for a wide variety of applications
- 1.5 inch potable piping connections for easy tie in to back up tanks

**WARNING**

Electrical Shock and Fall Injury Hazard.

Use extreme caution when mounting collectors on a roof or when connecting any wiring or electrical hookups.

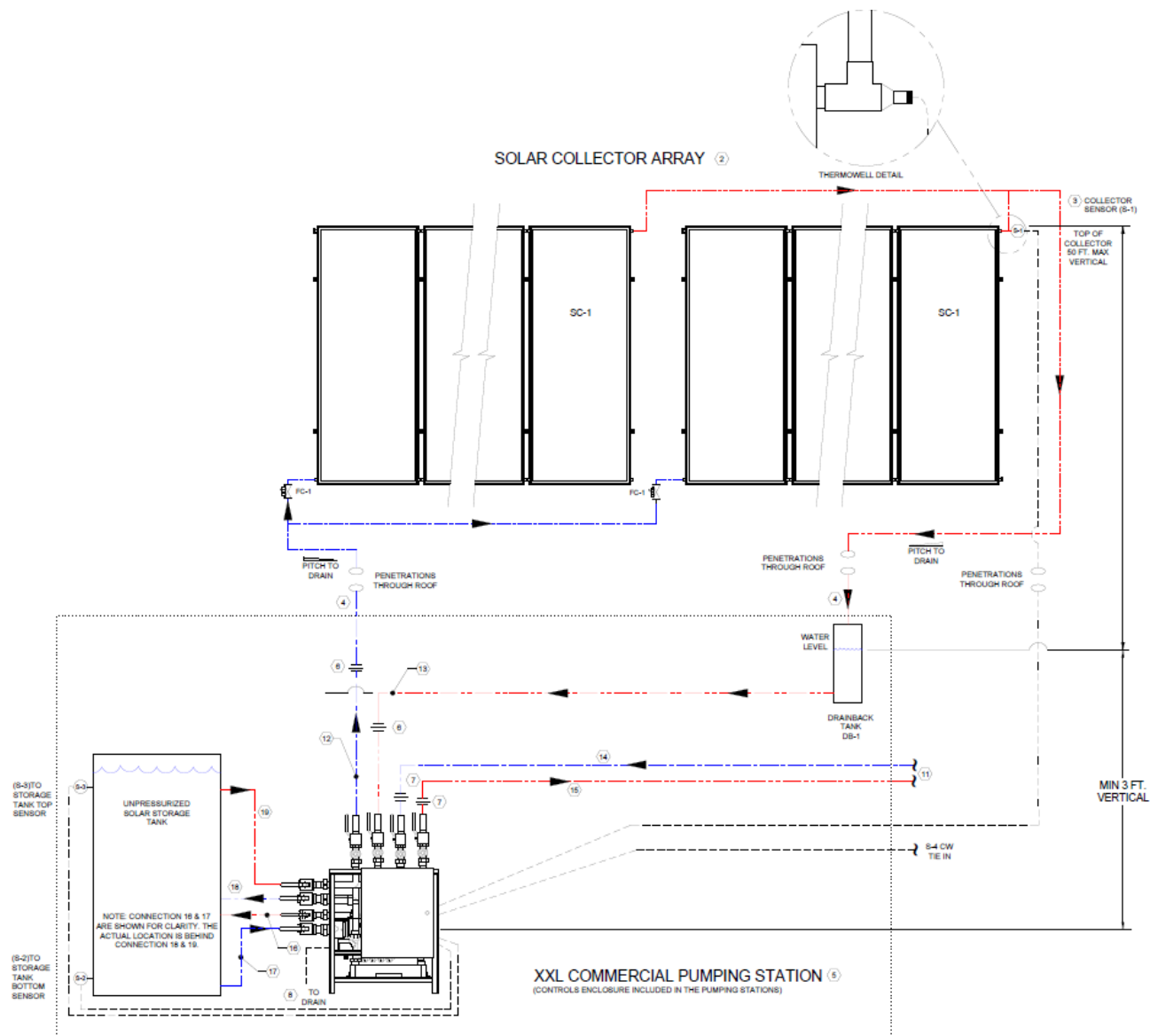
Safety

- Secure all ladders on level ground.
- Locate all possible hazards, overhead wires, loose shingles, etc.
- Make sure power is turned off before adding water to the system.
- NEVER connect power to the water heater or storage tank until it has been filled.
- Use a tempering valve or mixing valve to prevent scalding.
- Consult proper authorities and check with your local building inspector for permit requirements and local building codes before project commencement. The system must meet local code requirements for penetrating structural members and fire-rate assemblies.

Installation

Refer to **Figure 1** for the relative location of the pipes, collectors, and SSXXL pump package.

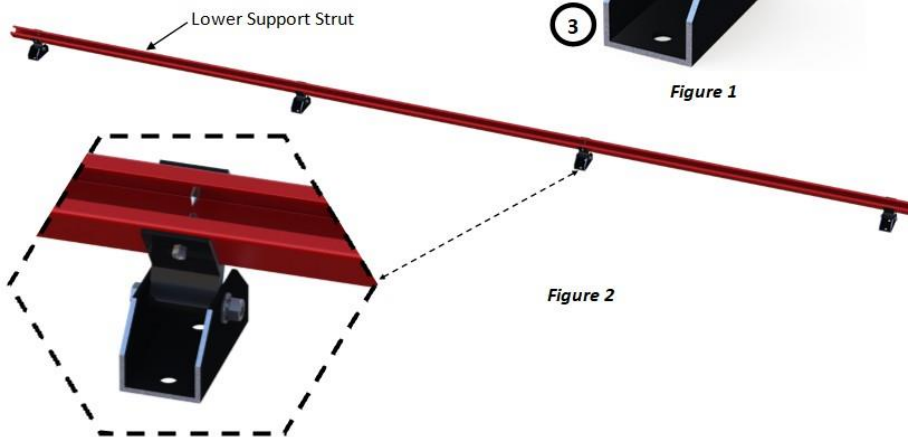
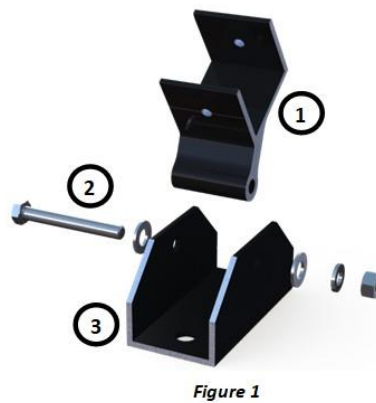
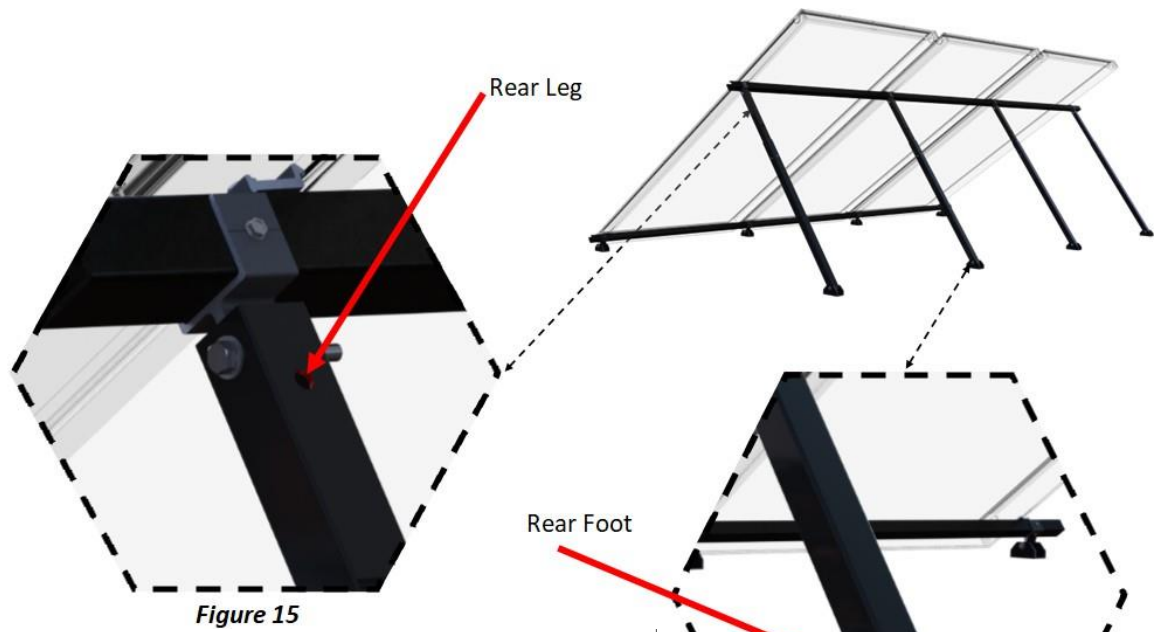
Figure 1 - Installation Diagram



Notes:

- The pipe size will be determined by the size of the collector array.
- DO NOT USE PLASTIC PIPES! PEX, PVC and other forms of non-metal pipes will burst at solar temperatures.
- An expansion tank should be installed on the potable water side for systems that do not allow backflow.
- Refer to manufacturer's instructions regarding installation of the tempering valve.

Collector Adjustable Mount



Installing the Temperature Sensor

1. Install PT1000 probe sensor at the collector outlet using **a SunEarth thermal well**.
2. For sensor to operate correctly it must be isolated from exterior conditions. All of the exposed copper, as well as the sensor itself, needs to be completely covered with insulation and UV jacketing.

Pipe Runs

Use copper or metal tubing sized for the array size and run lengths. All pipes should be wrapped with insulation. We recommend Elastomeric insulation. Outdoor pipes should also be jacketed with UV protection material or some other means to protect it from moisture and ultraviolet deterioration. All pipes must be well supported or they will sag. Sagging pipes may trap water. The hanger should spread the load so that the insulation is not compressed.

Installing the Tempering Valve

Refer to manufacturer's instructions for information on installing the tempering valve.

Installing the Differential Control

Your SSXXL system is automated by the differential controls located in the control box.

Place sensors as shown in Figure 1. The control for the solar loop uses a sensor installed at the outlet of the collector array and a sensor at the coldest part of the atmospheric tank. The potable loop uses a sensor placed on the cold in line between 2 closely positioned tees leading to 2 of the ball valves at the top of the SSXXL. Install the other sensor at the top of the atmospheric tank. Ensure that the tank volume does not drop below the position of the tank sensor.

Check Collector Circuit for Leaks

Filling the Solar Circuit

1. Flush the system with water to clean out any debris or sediment from the pipes and collectors. **DO NOT LEAVE WATER IN SOLAR CIRCUIT IF FREEZING CONDITIONS ARE POSSIBLE.**
2. Connect the outlet of a filling pump via a hose to the solar circuit drain/fill valve.
3. Open the solar circuit drain/fill valve.
4. Connect the filling pump inlet to a bucket.
5. Fill a bucket with the appropriate mixture of heat transfer fluid (HTF).
6. Run the transfer pump to fill the solar circuit while monitoring the drainback tank level. Fill to within 6-12 inches of top of drainback tank. Verify with dip stick or site level tube.
7. Close drain/fill valve and turn off the filling pump. Let the system sit for ten minutes.
8. Repeat previous steps until the fill level is stabilized.
9. Close drain/fill valve and record amount of HTF used for initial filling.
10. Turn off and disconnect filling pump.

Purging the Transfer Circuits

1. Flush the system with water to clean out any debris or sediment from the pipes.
2. Connect hose to transfer circuit pump suction drain/fill valve and domestic cold-water line. Close Return isolation valve. Open drain/fill valve and Supply isolation valve and fill with water purging air. Reverse isolation valves and fill with water purging air

Operation

Starting the System

1. Confirm that all shut-off valves are fully open.
2. Turn on the system and let it run. It is recommended to start system in the early morning with collector temperatures less than 100F.
3. Double-check every component and all pipe runs and fittings for leaks.

Emergency Shut Off

1. If there is a leak or other issue requiring the collector loop to be drained, turn the system off by setting the switch on the left side of the differential control to the "OFF" position.
2. Attach a hose to the drain/fill valve.
3. Open the drain valve.

Warning! DO NOT dispose of the heat transfer fluid on the ground or in the water system. Collect it in a container which can be sealed and dispose of it according to the manufacturer's directions.

Maintenance

The solar water system requires very little by way of maintenance, but a few regular system checks can extend the life of your system well beyond 20 years.

Freeze Protection

This system is designed to protect itself from freeze damage to temperatures as low as -30°F as long as the heat transfer fluid in the collectors is at least 40% GRAS propylene glycol(**pH Less than 9 greater than 7.8**). Freeze tolerance limits are based upon an assumed set of environmental conditions. In the event of extreme or prolonged cold weather, protect

your system by shutting it down and draining the collector loop as described in the "Vacation Settings" and "Emergency Shut- Off" sections.

Clear Sediment from Strainer

1. Turn off your solar water system with the switch on the side of the differential control and disconnect the power to the SSXXL by unplugging it from the wall outlet.
2. Close the two shut-off flanges. Open the clean out port.
3. Remove any sediment buildup from the clean out port.
4. Close and tighten clean out port.
5. Return shut-off flanges to the open position and reconnect the power to the SSXXL

Descaling the Heat Exchanger

1. Turn off your solar water system with the switch on the side of the solar differential control and disconnect the power to the SSXXL by unplugging it from the wall outlet.
2. Close the shut-off valves. Open the descaling ports and remove any sediment buildup from the clean out port.
3. Flush the heat exchanger with a weak solution of white vinegar and water.
4. Close and tighten descaling and clean out ports.
5. Return shut-off flanges to the open position and reconnect the power to the SSXXL.



WARNING Burn and Scald Hazard

Excessive water temperatures could cause explosion, burns, scalding, pressure relief flooding and fitting leaks. Carefully follow the outlined procedures for temperature sensor installation to ensure accurate water temperature sensing and effective control operation.

Change Heat Transfer Fluid

The heat exchange fluid contains buffers which keep the pH of the solution between 7.8 and 9.0. Heat and time may degrade these buffers, so it is important that you check the fluid annually and change the fluid if necessary.

To drain the system:

1. Turn the system off by setting the switch on the left side of the differential control to the "OFF" position.
2. Attach a hose to the drain valve on the lower left side of the SSXXL.
3. Open the drain/fill valve. Dispose of used heat transfer fluid according to manufacturer's directions.

WARNING Burn Hazard

Exercise extreme caution when draining, as the heat transfer fluid may be dangerously hot.

Pumps

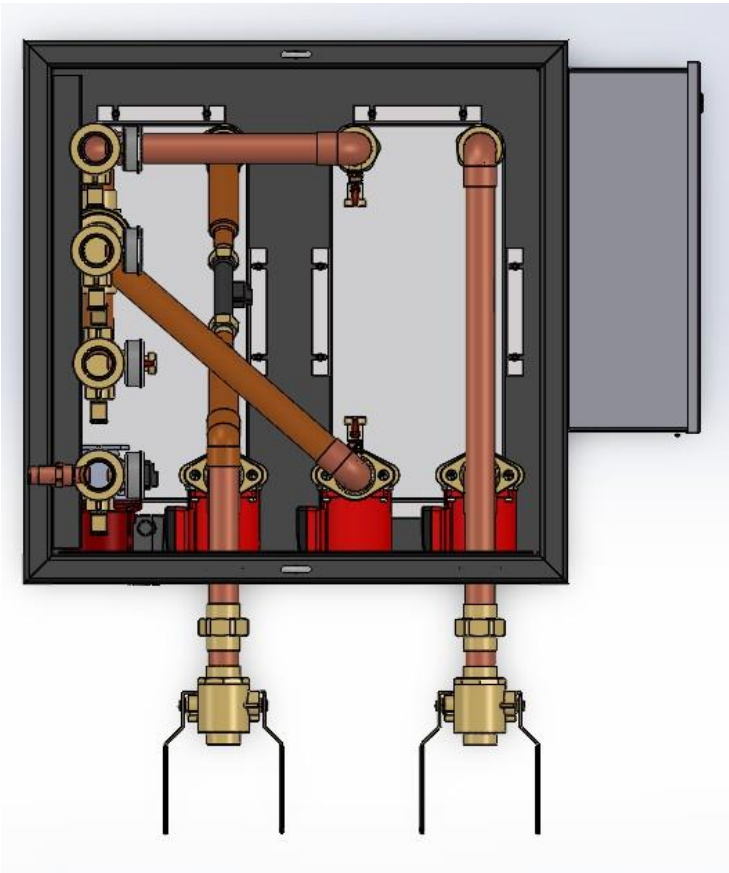
The circulation pumps have a life expectancy of 5-10 years. If a pump should require servicing or replacement:

1. Turn off the system with the switch on the side of the differential control.
2. Close all the ball valves at the top of the SSXXL. Leave the system off for several hours until the pumps are completely cooled to room temperature.
3. Solar pumps are flanged so they can be easily removed by loosening the flange's nuts and bolts. Potable loop pumps use bolts and must be unscrewed.

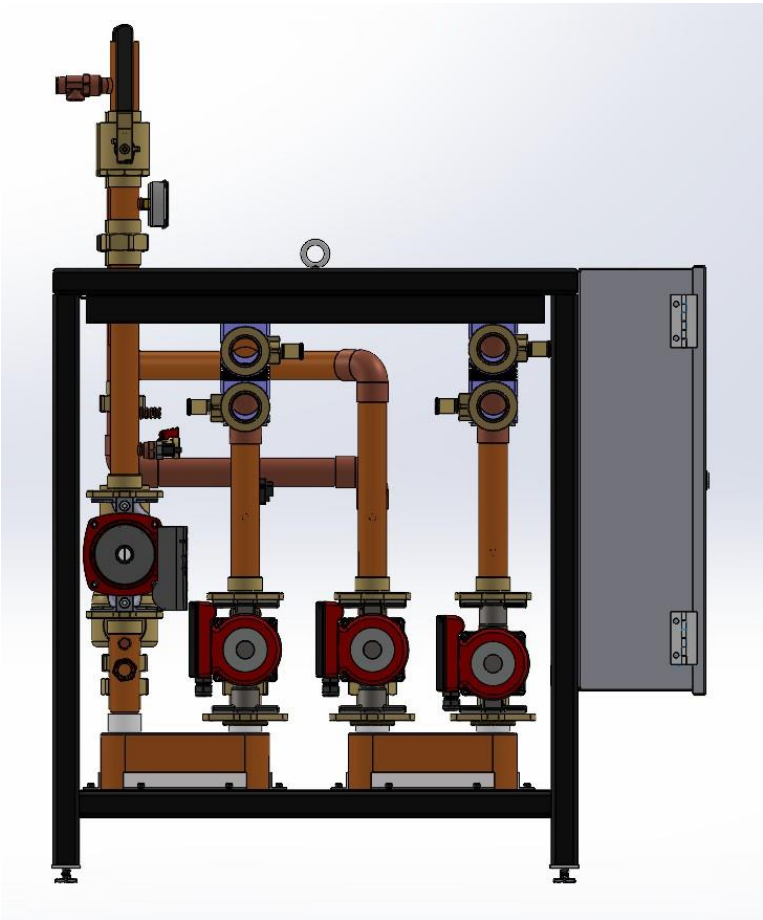
Service

To obtain service for your SSXXL, notify the dealer who installed or sold the SSXXL. In notifying your dealer, provide identification of your SSXXL, date of purchase (with proof), and the nature of the defect. To obtain the location of the nearest authorized SunEarth service and/or distribution facility, call (909) 434-3100 or email sales@sunearthinc.com

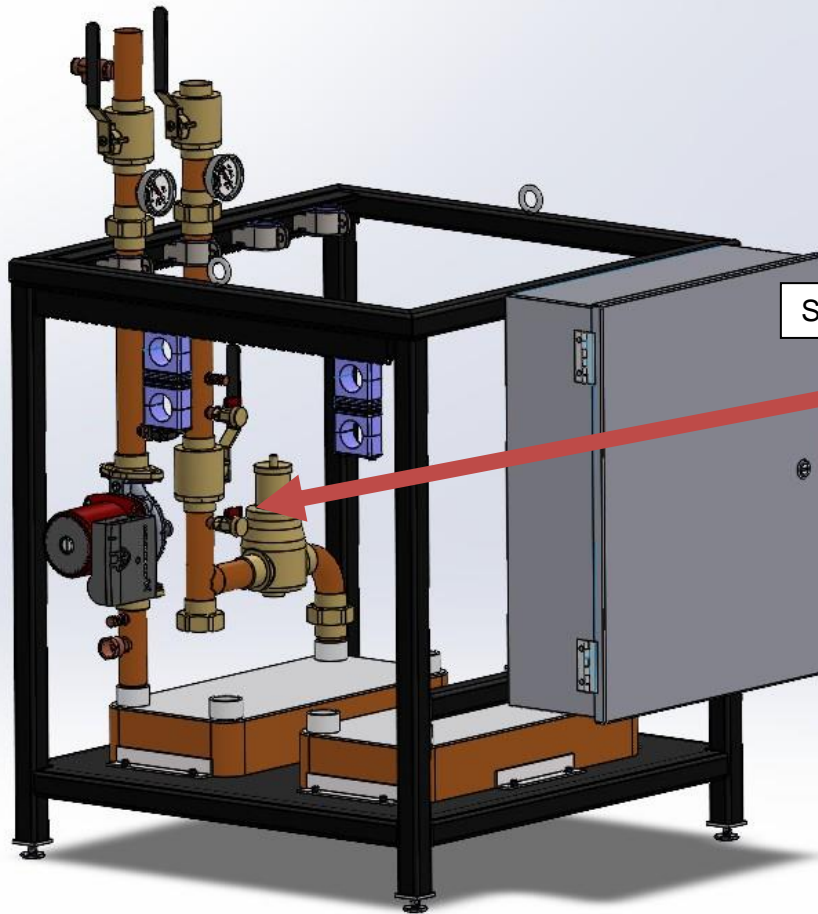
- P2** To Potable CW Tie In
- P1** From Potable CW Tie In
- S1** Solar Return From Collector
- S2** Solar Supply To Collector



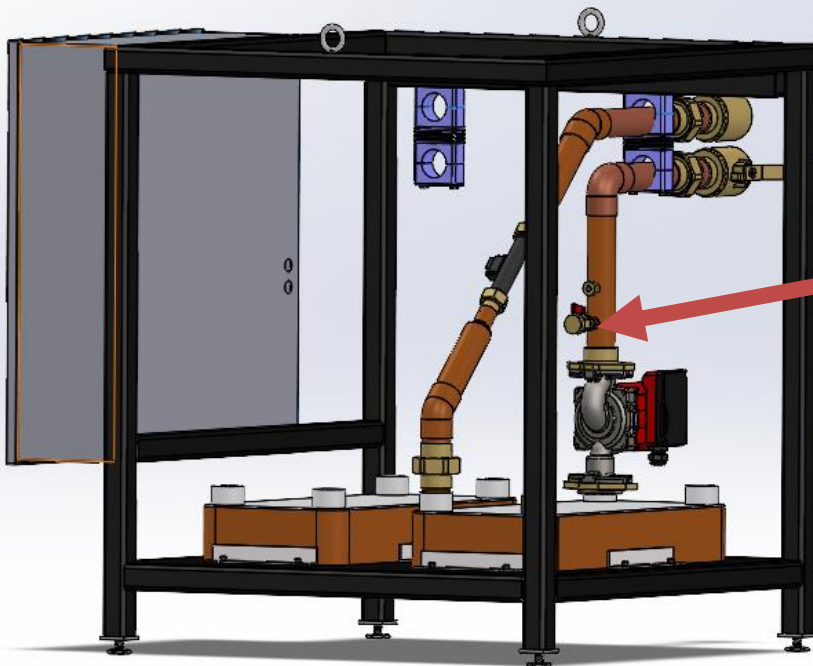
- T1** From XXL (Storage Tank)
- T2** To XXL (Storage Tank)



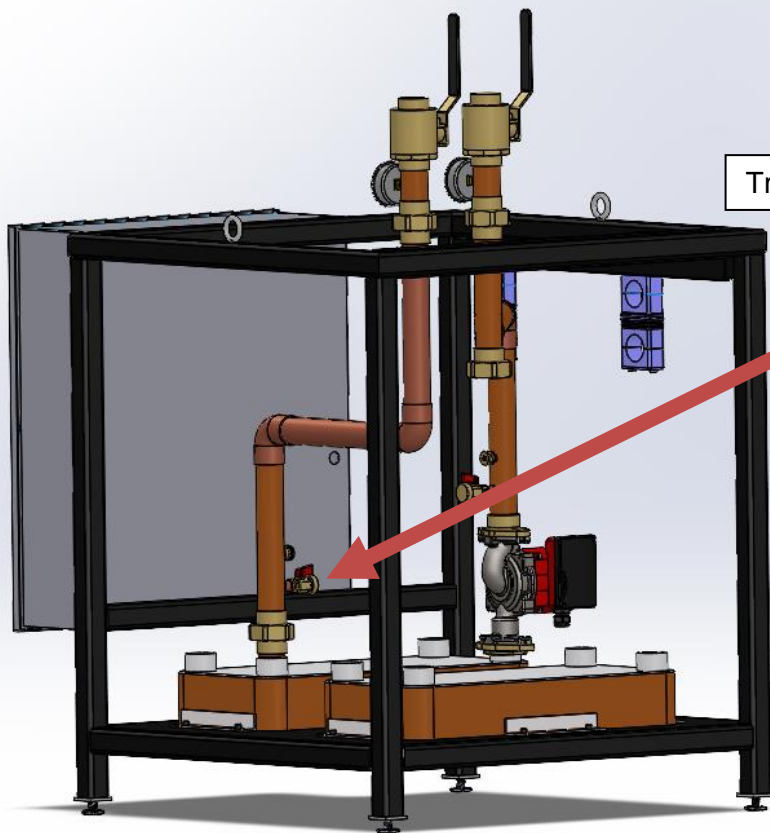
- T3** From XXL (Storage Tank Load)
- T4** To XXL (Storage Tank Load)



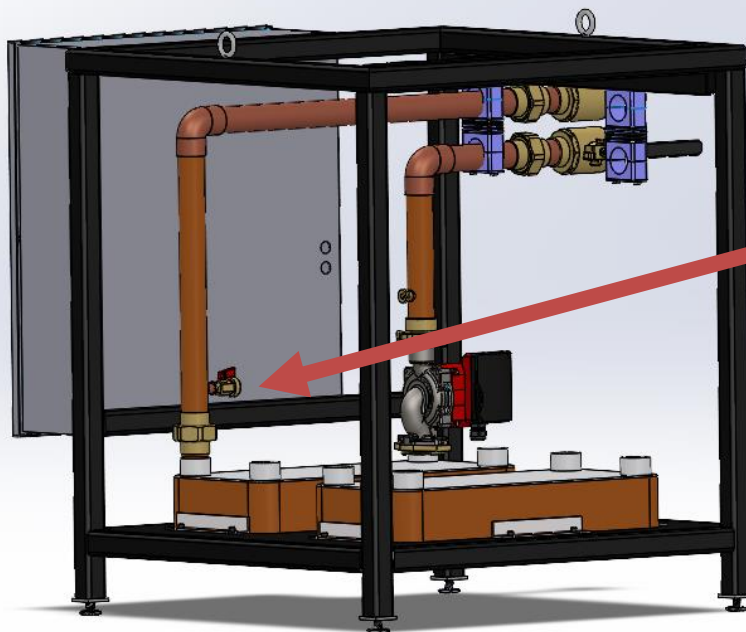
Solar Circuit Drain/Fill Valve



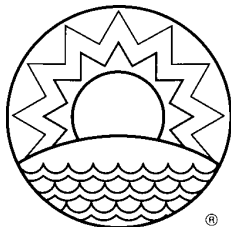
Transfer Circuit Drain/Fill Valve (Storage Tank)



Transfer Circuit Drain/Fill Valve (CW Tie In)



Transfer Circuit Drain/Fill Valve (Storage Tank Load)



SUNEARTH INC.
Quality Solar Energy Products

TWO-YEAR LIMITED PRODUCT WARRANTY

This warranty only applies to the following SunEarth products (hereinafter SunEarth Products):

Pump Stations: SRS Series, 100005-2 Series, 100005-5 Series, 100005-6 Series, 100005-7 Series

Under conditions of normal use and service the above SunEarth Products are warranted to the original, or subsequent users, for a period of **2 year** from the date of sale to be free of defects in material and workmanship pursuant to the exclusions detailed in this written warranty statement. SunEarth's liability for these products shall be limited to repairing or replacing at SunEarth's option, without charge, F.O.B. SunEarth's factory or an authorized SunEarth distributor or service center. SunEarth will not be liable for any costs of transportation, inspection, removal, reinstallation, or any other labor or freight charges that may arise in connection with a warranty claim, except as expressly set forth in this warranty.

SunEarth pump station Series SRS and 100005-6 are exclusively designed for use in residential domestic solar water heating systems. No other use or application of these products is covered under this statement of limited warranty.

FREIGHT AND SHIPPING EXPENSES

In the event of a valid warranty claim approved by SunEarth, SunEarth will pay for freight and shipping expenses as follows:

Year 1 of Warranty: SunEarth will pay the freight and shipping costs for the new or repaired SunEarth Product between SunEarth and the nearest local distributor, dealer, authorized service center, city, or shipping terminal.

THIS WARRANTY DOES NOT APPLY

This warranty **does not apply** to the following: (1) conditions resulting from a failed component or part that is not part of the above listed SunEarth Products; (2) to damage caused by freezing conditions; (3) to conditions resulting from misuse, abuse, neglect, accident, or alteration; (4) to conditions resulting from the introduction of harmful chemicals, caustic fluids, or deleterious fluids, including improperly applied or maintained heat transfer fluids; (5) to SunEarth Products in which heat transfer fluids other than potable water or propylene glycol (DowFrost HD recommended) are used; (6) to propylene glycol pH levels above 10 or below 8; (7) to periods of stagnation in excess of 30 days; (8) to excessive pressure; (9) to conditions resulting from floods, earthquakes, winds, fire, lightning, or circumstances beyond SunEarth's control; (10) to damage caused by installation methods, that do not conform to relevant national, state or local codes and ordinances, good industry practices, or to current applicable SunEarth manuals, diagrams, technical bulletins, or written installation instructions; (11) or to applications other than medium temperature (110 - 160F) domestic water heating.

If one of the above SunEarth Products is purchased outside the United States certain conditions of this warranty may **NOT** apply. Please contact your local SunEarth distributor or dealer for details.

LIMITED WARRANTY

EXCEPT AS EXPRESSLY PROVIDED IN THIS WARRANTY, THE ABOVE SUNEARTH PRODUCTS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR

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IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY OR NON-INFRINGEMENT. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

LIMITATIONS OF REMEDIES

IN NO EVENT SHALL SUNEARTH BE LIABLE FOR ANY DAMAGES FOR LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, ARISING OUT OF THE USE OR INABILITY TO USE THE ABOVE SUNEARTH PRODUCTS, OR FOR ANY CLAIM BY A THIRD PARTY. SOME STATES DO NOT ALLOW THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

EXCLUSIVE AGREEMENT

THIS WARRANTY CONSTITUTES THE ENTIRE, COMPLETE, FINAL, AND EXCLUSIVE AGREEMENT FOR THE SUNEARTH PRODUCTS LISTED ABOVE. THIS WARRANTY SUPERSEDES ANY PROPOSAL, AGREEMENT, OR REPRESENTATION, OR ANY OTHER COMMUNICATION, EITHER WRITTEN OR ORAL, MADE BETWEEN SUNEARTH AND SUNEARTH'S DISTRIBUTORS OR DEALERS, OR BETWEEN SUNEARTH AND THE END CONSUMER.

RETURNED GOODS

No material shall be returned without authorization or beyond the warranty period. When credit is issued it will be at the price charged, or prevailing price if lower, less handling charges based on costs of reconditioning, packaging, etc. Products which are obsolete or made to special order are not returnable.

TO MAKE A CLAIM

To obtain service under this warranty, the product in question must be returned to the distributor or dealer of SunEarth products nearest you, or an authorized SunEarth service center. Each claim must be accompanied by documentation providing the following:

- 1) Owner's name, address, email address, and phone number**
- 2) Installation contractor's name, email address, and phone number**
- 3) Original sales receipt**
- 4) Product model and serial number(s)**
- 5) Date of installation**
- 6) Date of failure**
- 7) Reason for failure**
- 8) Pictures of the suspected manufacturing defect – digital pictures of the suspected manufacturing defect also need to be submitted**

If you have any warranty questions, contact your installation contractor or SunEarth at (909) 434-3100.

SolarStation XXL SyStem



SunEarth Inc.

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www.sunearthinc.com