



Oasis



# SUN EARTH

## SunEarth Oasis Installation Manual



Oasis All Copper Pool and Spa Collector

Thank you and welcome to the SunEarth family! We hope you enjoy our Oasis All Copper Pool and Spa Collector for many years to come.

This manual provides procedures and recommendations for the installation of SunEarth's Oasis All Copper Solar Pool and Spa Collector. With proper care, this premium collector provides even more durability and longevity than the already long lasting polypropylene Oasis model.

**NOTE:** *The use of mounting systems that do not conform to the materials and methods detailed in this or any of SunEarth's other published installation manuals, guidelines, and technical bulletins are not recommended and may void your product warranty.*

**CAUTION:** *SOLAR COLLECTORS ARE OFTEN INSTALLED ON THE ROOFS OF BUILDINGS. UNLESS YOU ARE FAMILIAR WITH WORKING ON ROOFS AND HAVE THE PROPER LADDERS AND SAFETY EQUIPMENT FOR SUCH WORK, YOU SHOULD CONTACT A PROFESSIONAL. FAILURE TO OBSERVE SAFE PRACTICES ON A ROOF OR OTHER ELEVATED STRUCTURES MAY RESULT IN SERIOUS INJURY.*



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## Pool Heating Systems

### Overview

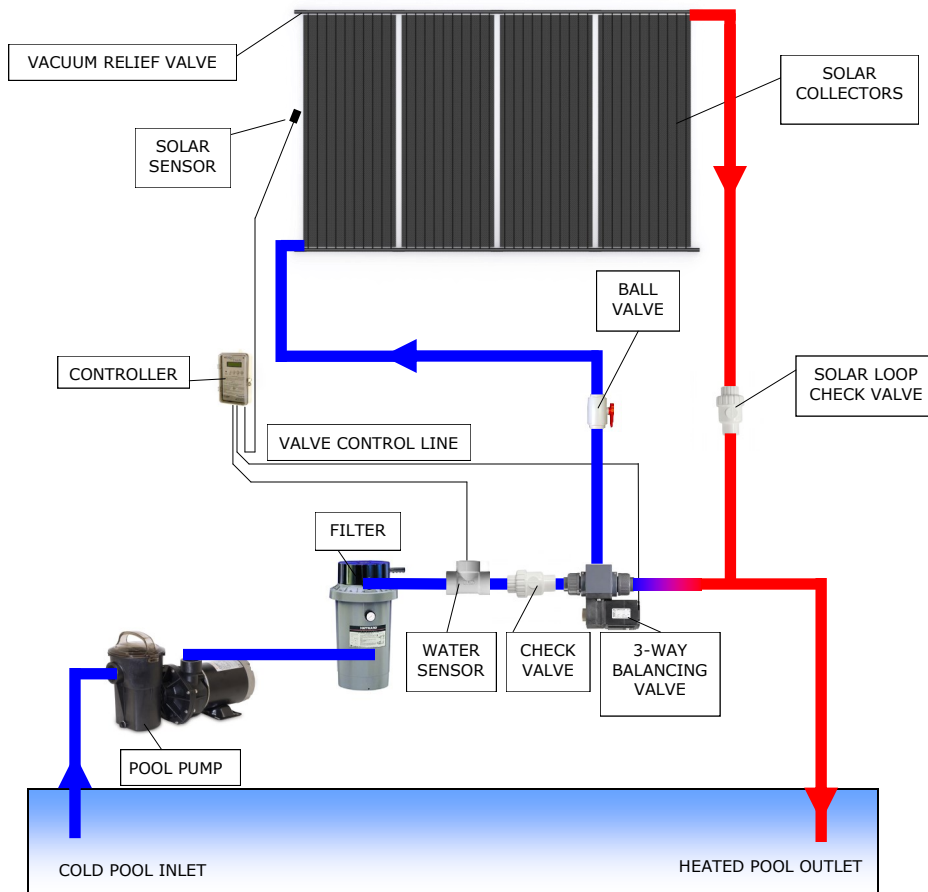
Pool water can be heated directly in the collectors or indirectly using a heat exchanger. Since pool water can be corrosive to copper, an indirect method of heating is generally recommended.

A direct system, as shown in **Figure 1** on page 4, pumps pool water through the Oasis collectors and back down to the pool. When using Oasis copper collectors directly, pH levels should remain between 7.4 and 7.8 and chlorine levels should remain between 0.5 and 5 parts chlorine per every million parts water to avoid damage to the copper collectors and piping in the form of corrosion and or discoloration. ***If pool pH and chlorine levels can not be closely monitored or the pool contains salt water, it is advisable to use an indirect system for use with copper collectors.***

An indirect system, as shown in **Figure 2** on page 5, will heat the pool water using a stainless steel or titanium heat exchanger. The Oasis collectors in this setup do not come into direct contact with the pool water in the system. Instead, a water or mix of water and glycol is used as the heat exchange fluid which passes within close proximity to the pool water thus exchanging heat. This setup separates the potentially corrosive pool water from the copper system.



## Direct Heating System

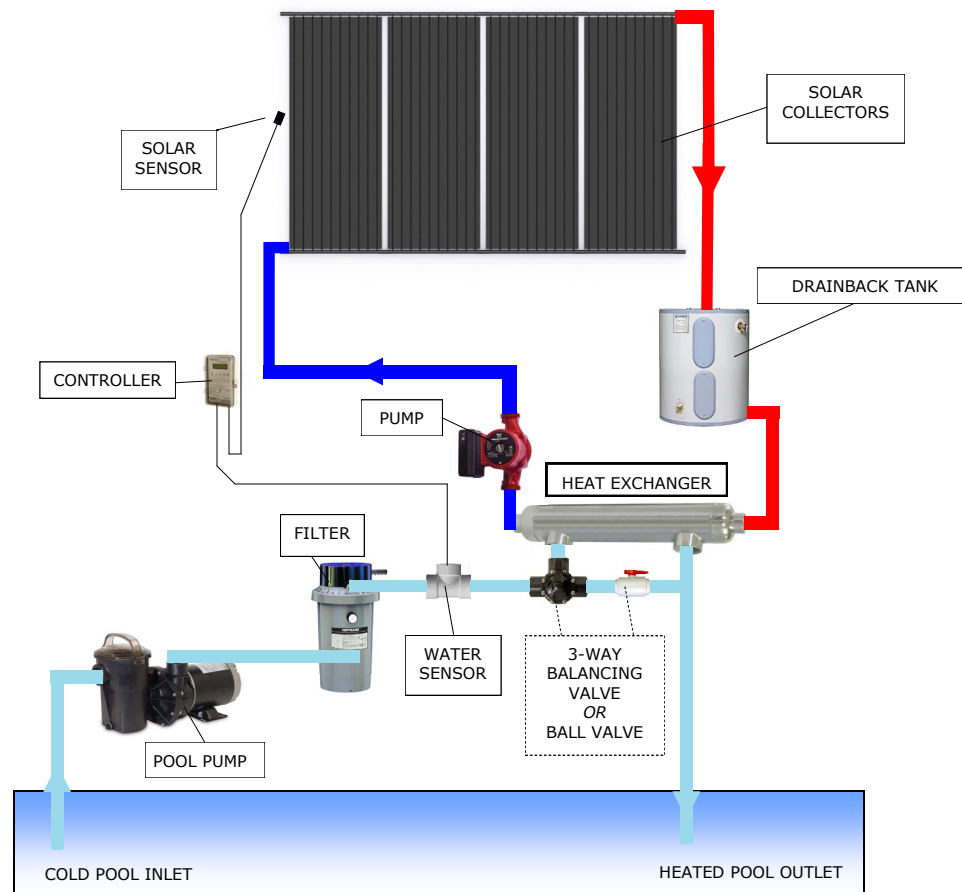


**Figure 1: Direct System Schematic**

This system is only recommended if pH and chlorine levels are closely monitored as discussed previously. This system is not intended for use with a salt water pool.

In this system, pool water is pumped from the bottom of a cold pool up through the roof mounted collectors where it absorbs heat from the sun. This heated water is then sent back to the pool. Because water's density changes with variations in temperature, the hotter water will tend towards the top of the pool while the cooler water will fall to the bottom. It follows that the cold water inlet should be placed near the bottom of the pool for optimal results.

## Indirect, Drain-back Heating System



**Figure 2: Indirect System Schematic**

This system utilizes a heat exchanger and is recommended for salt water systems or systems with pH and chlorines levels that are not closely monitored.

In this system the pool water does not circulate in the collectors. A separate fluid, usually water or a mix of water and glycol, is in the collector loop. This fluid is heated by the sun in the collectors and brought back down into the heat exchanger to deliver the heat to the pool water indirectly. The pool water passes through the heat exchanger picking up heat through metal conduction.

*This system also offers freeze protection via a drainback design.*

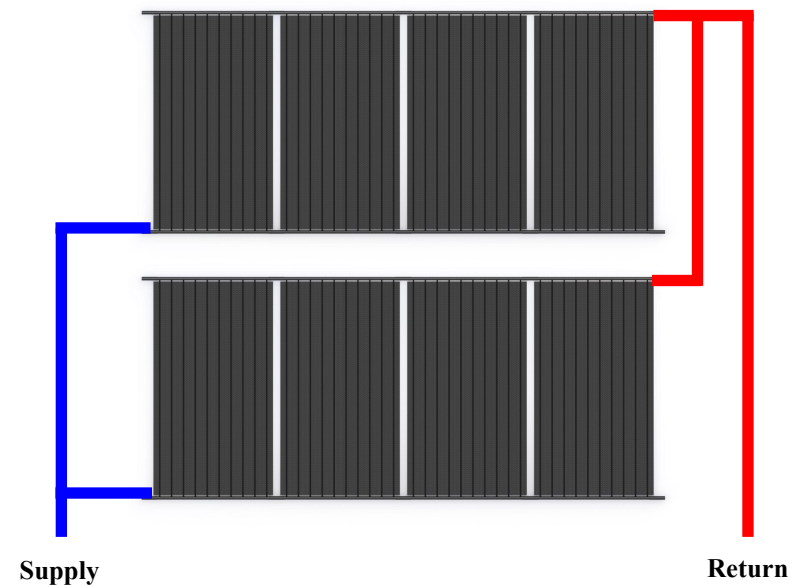
## Collector Plumbing Recommendations

Panels shall be plumbed together using approved connectors listed in **Table 1**. A maximum bank of 12 Oasis Copper panels in series is recommended. To ensure equal flow between banks of collectors, each bank of collectors should have an equal number of collectors and should be plumbed in reverse return as in **Figure 5** or with flow balancing valves located such that flow to each bank of collectors can be adjusted. This is to ensure all panels experience the same flow rates and panel efficiency is optimized.

*A vacuum relief valve should be installed at the highest point if a direct heating system is used, as described on page 4, **Figure 1**.*

Table 1: Approved Connectors
*Gates 76W Hose w/ Stainless Steel Clamps
1.5" CxC Coupling

*\*Hose connections are preferred as they allow for stress relief due to panel expansion and contraction and they are easier to service.*



**Figure 5: Reverse Return Plumbing**



## Collector Orientation Recommendations



If you reside in the northern hemisphere, the sun travels in an arch in the southern sky. As a result, the optimum direction or *azimuth* to point a solar collector is usually geographic south. Geographic south differs slightly from the direction you would find using a compass needle. This variation is called declination and should be compensated for depending on your location on earth. For location specific data please visit the National Oceanic and Atmospheric Administration website for further information.

If the selected roof section does not face geographic south, collector efficiency should not suffer greatly if panels are facing  $+45^\circ$  East or  $+45^\circ$  West of the ideal azimuth.

The angle of elevation or tilt for the collector panels can vary greatly. Typically, tilt will depend on the intended heating season, wind loading, and associated heat loss considerations. Collector panel tilt should, therefore, be further discussed with a professional solar contractor.

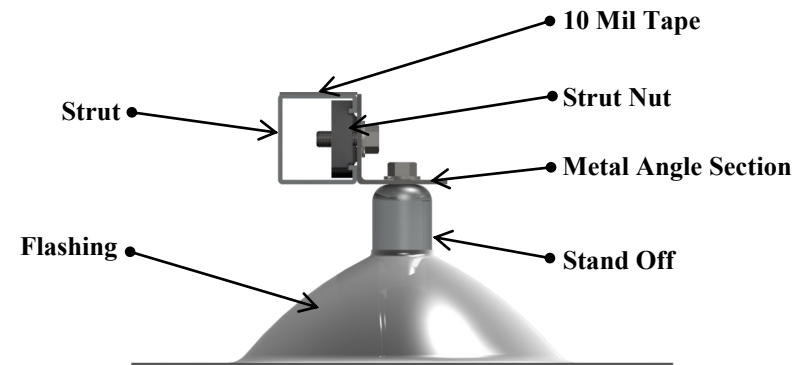




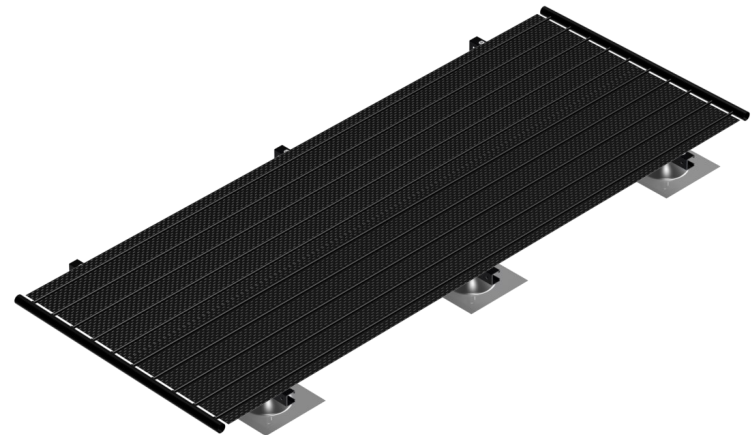
## Collector Mounting Recommendations

1. Mark the position of the top header for the last collector in the row. Be sure to consider roof obstructions.
2. Snap a horizontal chalk line from this point to the opposite end of the row. This chalk line should have a slope of at least 1/16 inch per foot to allow proper drainage of collectors.
3. Secure stand offs or hanger bolts into rafters, along chalk line using appropriate high quality sealant and flashing.
4. Using metal angle sections, and strut nuts secure strut material to standoff as shown in the **Figure 3**.

*Using a similar procedure, horizontal struts should also be installed to support the center, and bottom the collectors.*



**Figure 3: Roof Connection Detail**

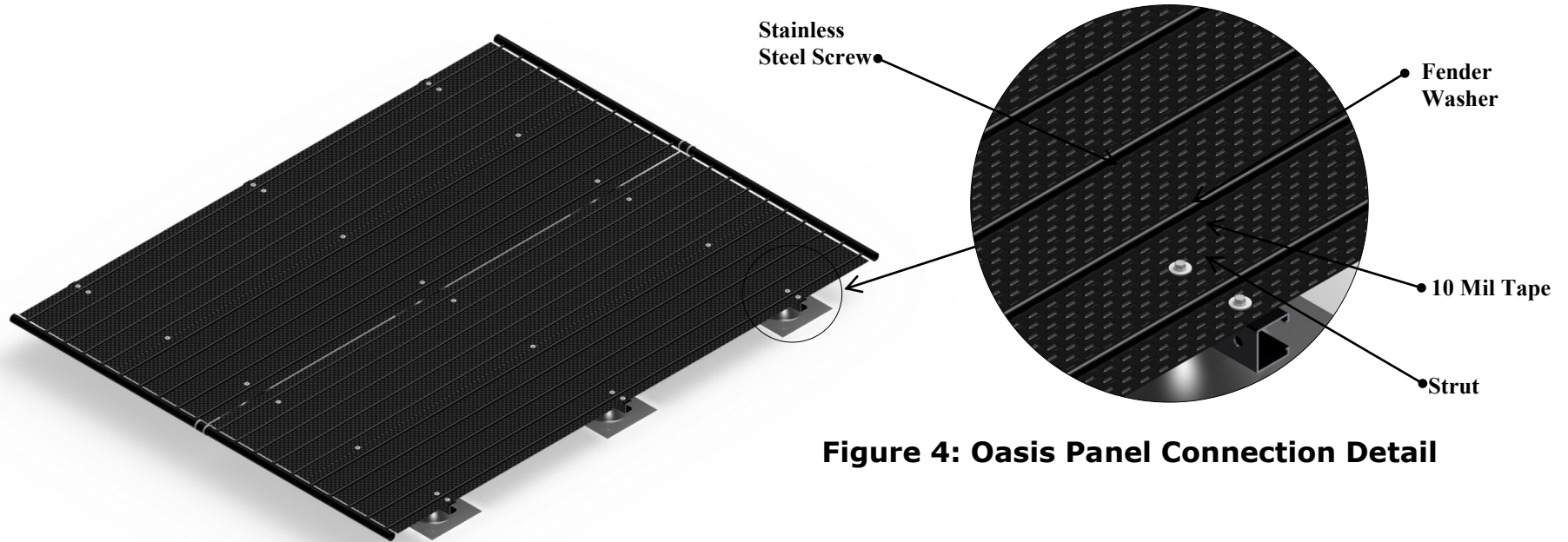






## Collector Mounting Recommendations

5. Using stainless steel self drilling screws, and stainless steel fender washers secure the collector flange to the strut material. 10 mil isolation tape should be used between the collector flange and the strut in order to protect the collector from galvanic corrosion between the dissimilar metals.
6. Intermediate panels should be secured using 3 screws per strut. Use an additional screw at the edge of the collectors that begin and end a row as shown in **Figure 4**.



**Figure 4: Oasis Panel Connection Detail**