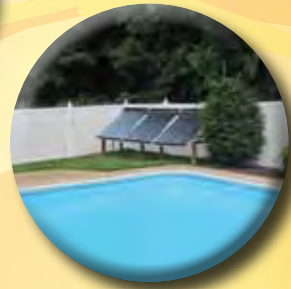


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SS20 EVT Installation Manual



CLEAN • EFFICIENT • SMART



INTRODUCTION

The JetSolar SS20 evacuated tube solar collector is a highly efficient, cost effective, reliable and “green” means to heat your swimming pool, using only the rays of the sun. The collectors are constructed of corrosion resistant materials, enabling the collectors to provide many years of reliable operation. Evacuated tubes are designed to rely on the sun's radiation rather than ambient temperatures. This allows the pool to still be heated when the outside temperature is lower than the pool's temperature. This is especially beneficial at the beginning and end of the season when daily air temperatures are cool.

Location

The collectors are designed to be installed either on a roof or ground mounted. Southern orientation is ideal but not critical to the performance. Because of the cylindrical shape of the tubes. The collectors have the capability of absorbing the sun's radiation from most orientations. The ideal location is always going to be the area of the property that gets the most hours of sun in a day. The more hours the collector is exposed to the sun, the more BTU's the unit will produce.



Danger- Risk of burns and scalding due to steam escape! The escaping steam and water can reach temperatures as high as 212° F.



Caution- Confirm that the collectors have cooled before servicing or cleaning the collectors. If a service is to be performed, the units should be shielded from the sun to prevent excessive heat build-up.



Caution- Always use extreme caution when working with evacuated tubes. They are made of glass and damaged or broken edges could be sharp, Work gloves and eye protection should always be worn when handling glass tubes.



Warning- Salt Pools - The collectors have tested with pool that are using Salt-Chlorine Generators. The units are approved for Salt Generators the provide salt level below 3000ppm. Pools that are maintained at higher levels risk damage to the manifolds and will not be covered by the warranty.

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Assembly Instructions

The SS20 is shipped in 3 Boxes.

BOX #1 Frame and Accessories

Frame Components

20- Black Dust Seals

20- Black Base Cups

4- Mounting anchors (L brackets)

2- U channel main support rails (connect to manifold)

2- U channel frame legs (used only for ground mount)

1- Main cross brace for main support rails (connects the main support rails together in the middle)

1- Front lower support rail (base cups anchoring point)

2- Side brace (connects the main support rails to the rear frame legs)
(ground mount only)

2- Rear legs x brace (connects frame legs in an X pattern) (ground mount only)

Hardware Bag (Bolts and nuts use 14mm wrench)

2 – 5/16 x 2" bolt

18 – 5/16 x 1" bolt

4 – 5/16 x 3/4" bolt

24 – 5/16 Nuts

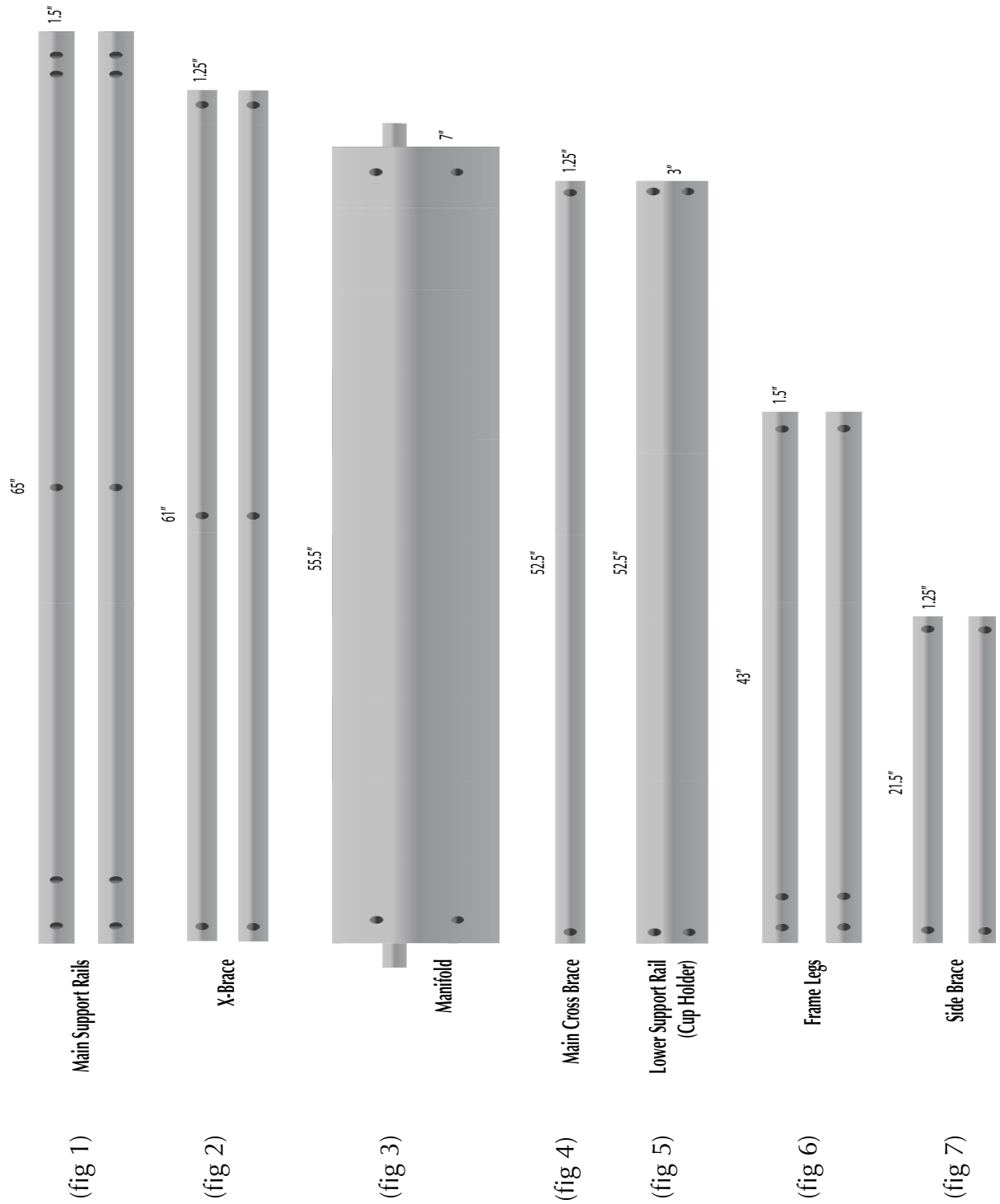
**BOX #2 Non Pressure Solar Collector**

1- Stainless steel heater manifold (securing nuts for main supports are on bolts)

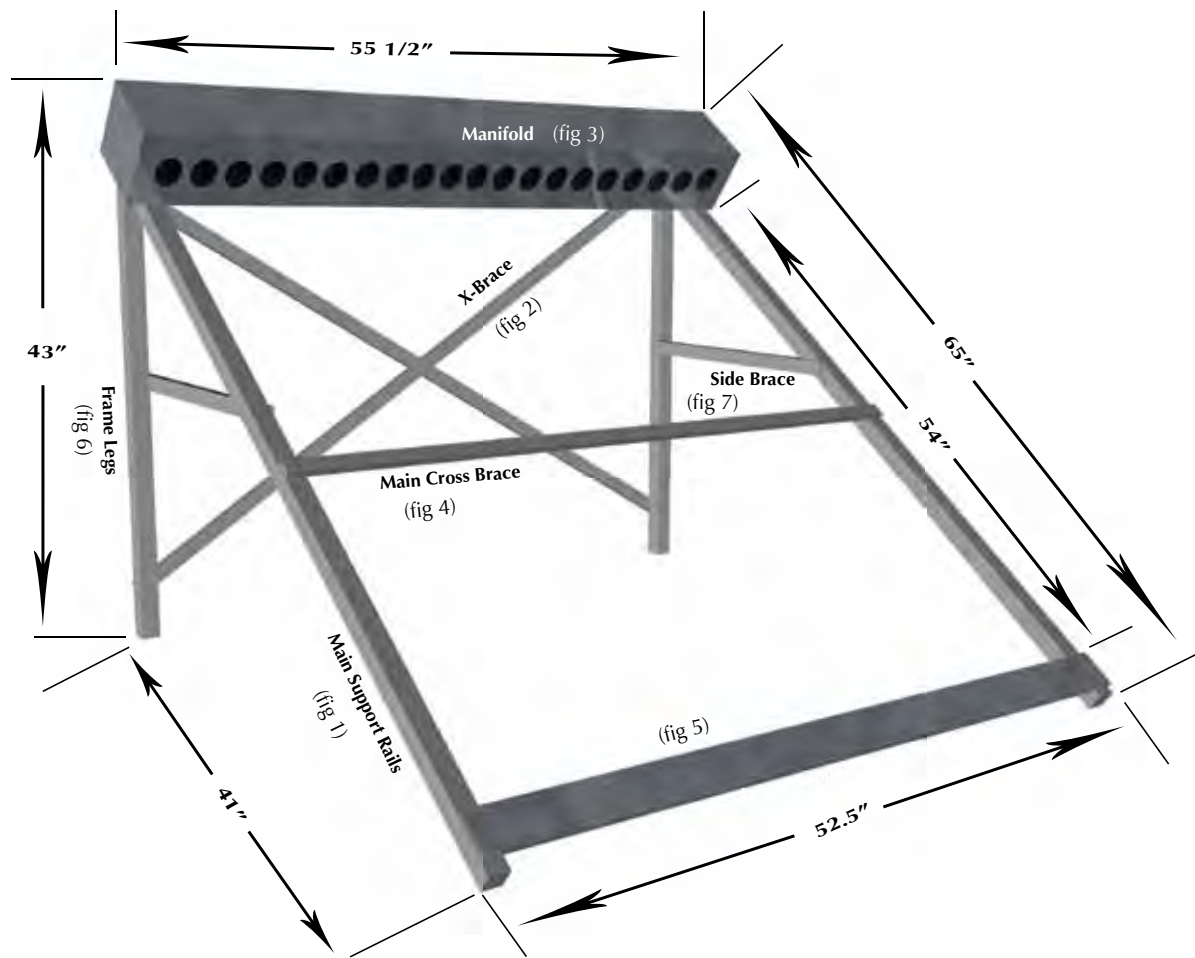
BOX #3 – M Series Vacuum Tubes

20- 47mm glass evacuated collector tubes

Part Dimensions



Frame Labels



Frame Assembly



Step 1

Place the heater manifold on (fig 3) non-scratch surface (cardboard). Place the manifold with the bolts facing up. Remove the nuts from the bolts. Locate the U-channel main support rails (fig 1). Place the rails on the manifold, place the manifold bolts thru the predrilled holes. The rails should extend in the same direction as the 20 tube holes. Fasten the nuts to secure the rails to the manifold.



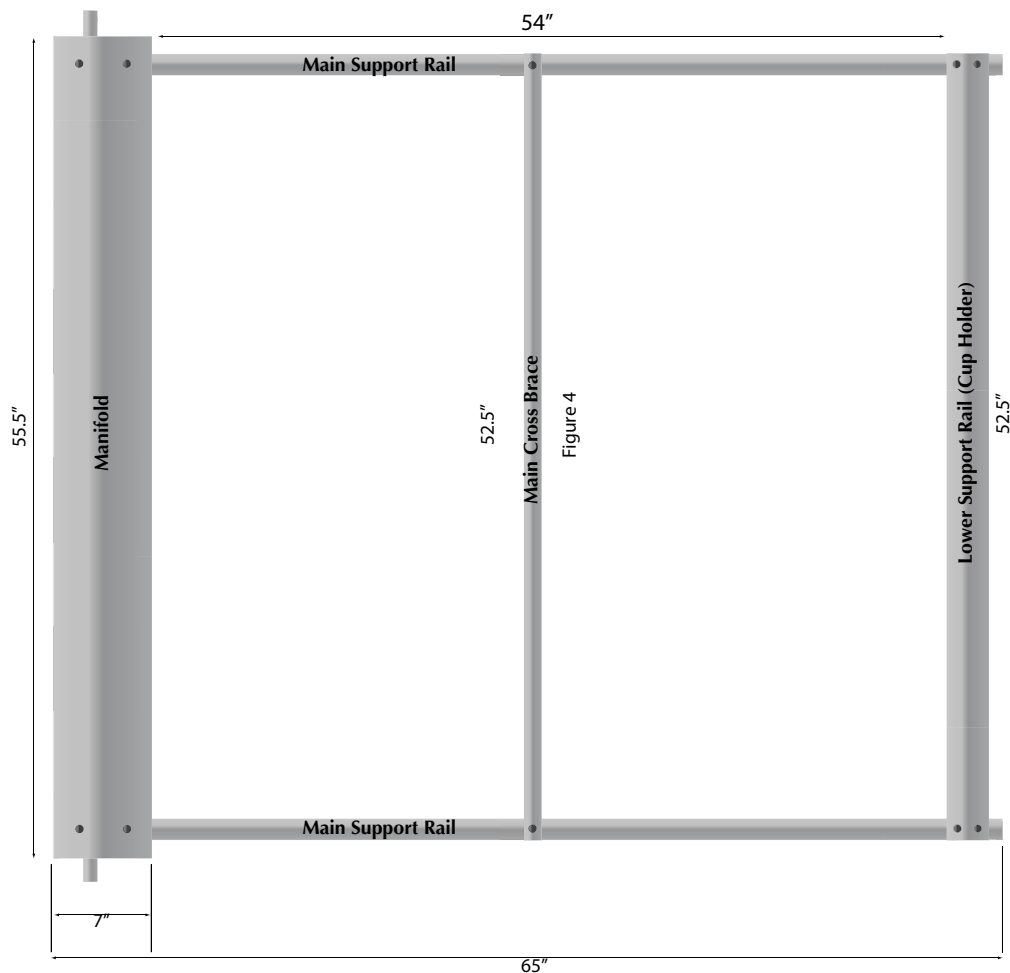
Step 2

Locate and attach the main cross brace. (fig 4) Install the brace halfway down the main support rails, (fig 1) using 2- 5/16 x 2" bolts and nuts.

Locate and attach the front lower support rail. (fig 5) This lower support is installed at the lowest point on the main frame rails. The lower support accepts the black base cups. These cups hold the bottom of the evacuated tubes. The distance between the manifold (fig 1) and lower support rail (fig 5) should be 54". This will ensure proper contact between the tubes and gaskets. The installer may have to drill additional holes to achieve this distance. Attach with 4- 5/16 x 3/4" bolts and nuts.



Attention- The connection between the manifold and main support rails are adjustable. For this reason it may be necessary to raise or lower the lower support rail from its predrilled mounting points. The ideal distance between the top of the lower support rails and the manifold should be 54". With a 5/16" bit, drill new holes that will allow the lower support rail to be mounted in the position that will maximize the evacuated tubes exposure and contact to the manifolds gaskets.





Step 3

Roof Mount only - Locate and install the 4 mounting anchors. Install the 4 mounting anchors at the four corners using 4- 5/16 x 1" Bolts and nuts.

Ground Mount- locate and install the U-channel frame legs (fig 6). One end of each will have 45° degree cut. This end will be used to connect to U-channel main support rails (fig 1). Place the 45° degree cut end inside the U-channel main support. Line up the corresponding holes using a 5/16 x 2" bolt and nut. Connect the main support rail (fig 1) to the frame leg (fig 6) by sliding the bolt thru the outside of the main rail, thru the rear leg and out the main rail.



Step 4

Ground Mount - Locate and install the side braces. (fig 7) Using 4- 5/16 x 1" bolts and nuts. Connect the frame leg to the main support rail. (fig 1)

Locate and install the X cross bracing for the frame legs (fig 2). Using 4- 5/16 x 1" bolts and nuts, connect the X crossbrace to the rear legs in an X pattern. After they have been secured using a 1- 5/16 x 1" bolts and nut, connect the crossbrace in the middle.



Step 5

Ground Mount - Locate and install the 4 L – bracket mounting anchors. Using 5/16 x 1" bolts and nuts secure the mounts to to 2 rear legs (fig 6) and the lowest most point of the main support rails (fig 1).

Step 6

Ensure the main support rails (fig 1) are square and then tighten the manifold bolts. Check all nuts and bolts to ensure that they are securely fastened.

Securing the collector



Caution- Roof mounts must be install by certified roofing professional. The collectors, when full of water weigh 150 lbs each. The roof must be surveyed by a structural engineer to ensure the structures capability to adequately and safely support the collectors. The structural engineer will also determine the fastening method that best serves the installation.

Roof Mounting- The SS20 can be installed onto the roof of a structure in two different configurations.

When access to the exposed roofing rafter structure is available, the collectors can be mounted directly to the roofing structure. Provision must be made with wood blocking where fasteners can not be directly tied to rafters.

Place the collector in the desired location. Pump a large dolup of silicon sealant at the determined mounting location. Using roofing exposure approved screws, fasten the collectors to the roof.



Roof Racking System

Roof has no access to the inside rafter sturcture. This type of installation requires the use of a Quik Foot and uni strut type mounting rack.

Required Quik Ft mounts (BL16)		
# of Collectors SS1	Foot Count	Slick Nut (part #HA20)
1 Collector	4	4
2 Collector	6	6
3 Collector	8	8
4 Collector	10	10
5 Collector	12	12
6 Collector	14	14

Required Uni-Strut (10ft stick, part #HA16)			
# Collectors SS1	Span inches	Stick Count	Splice (part #HA17)
1 Collector	60"	1	0
2 Collector	120"	2	0
3 Collector	180"	3	2
4 Collector	240"	4	2
5 Collector	300"	5	4
6 Collector	360"	6	4

Determine the desired placement of the collectors on the roof. Using a stud finder, determine the location of the rafters and mark the locations.



Use the Quik Foot SS mount. Secure the T bracket to the roof and rafters.



Slide and secure the Quik Foot flashing over the mounting bolt and under the next course of shingles. Attach using quik clips the uni-strut to the Quik Foot.



The collectors can now be secured to the uni-strut.

Plumbing



Caution- All connections must be made in CPVC, Copper, SS tubing or brass. The collector connections will get very hot when the panels are not in use. This will cause connection material that has not been designed for high temperatures to fail, causing potential property damage.



Warning- VENTING MUST BE INSTALLED. Venting allows for expansion when the collectors are not in use and for contraction when the collectors cool. This will prevent the units from causing a vacuum and pulling the tubes into the manifold, causing damage or even breakage.



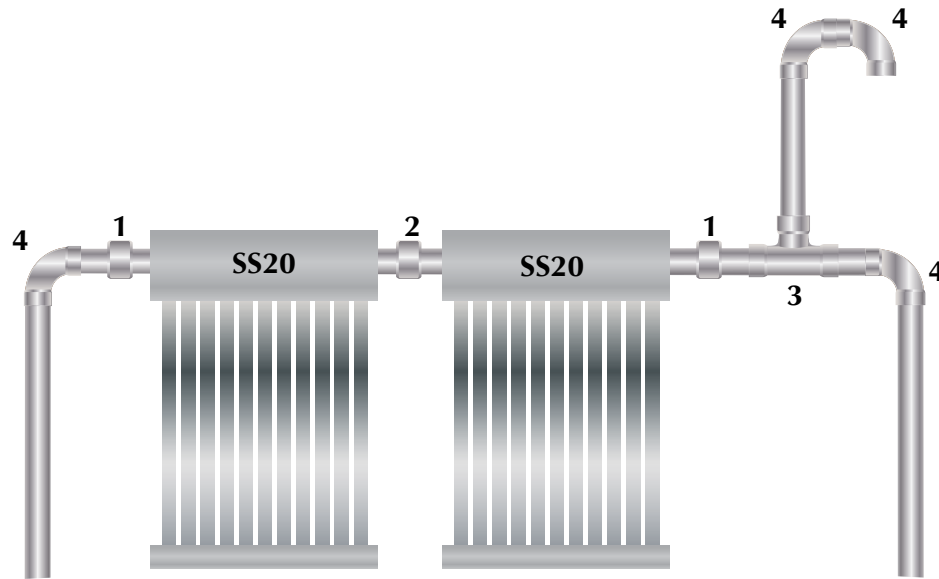
Warning- Collectors must be installed at a minimum of 24" above water line.

Plumbing

Plumbing SS20



Jet#	Description
1 – 5E45	1” CPVC Union SXF
2 – 5E46	1” CPVC Union FXF
3 – 5E33	1” CPVC Tee
4 – 5E28 PV3C	1” CPVC 90° 1” CPVC 20ft Pipe



The SS20 Collectors are designed to operate at very low pressure. To ensure that the collectors do not experience damaging pressure build-ups, venting must be installed.

The collectors are plumbed with 1” threaded connections. It is highly recommended that all connections to the collectors be made with unions. This is good plumbing practice and allows for ease of service if anything ever happens to the collectors.

Venting: A minimum of one vent for every 4-6 collectors is mandatory. Vents are added to the plumbing loop on the outlet side of the last collector. A tee is placed after the union and a piece of pipe is then plumbed straight up. The length of this vent pipe will depend on the back pressure of the spare return line going back to the pool.



Attention- JetSolar recommends Weicon thread sealing cord DF175, this product will ensure leak free installations on all threaded connections.

Recommendations for reducing backpressure and the height of the vent line:

1. After the vent “tee”, plumb the return line to the pool in the largest pipe available. If the pool is plumbed in 1 ½ pipe, plumb the solar outlet in 1 ½ pipe. Increasing the size of this return line will reduce the back pressure.
2. Plumb the solar outlet to a designated return line. This will assist in lowering the height of the vent by not having the additional pressure of having to share the return line.
3. Remove eyeball fittings if possible.
4. **Never plumb the solar outlet before a heat pump or a gas pool heater. Always plumb the return outlet as the last connection before the pool (see plumbing diagram #3)**



Attention- It is normal for some fluid to be discharged from the vent line upon pump start-up.



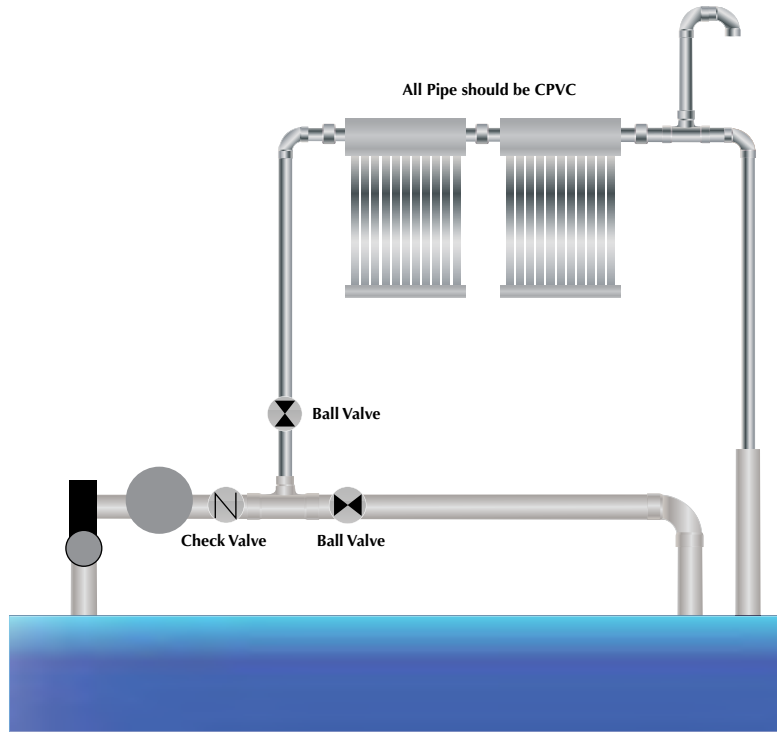
Attention- Pool and spa combinations: the vent height must be checked with the pool running in both modes of operation. Spas cause much more back pressure. The vent line will likely be higher on pools with attached spas to compensate for increased back pressure.

Install a by-pass after the filter. This water will direct some of the water to the solar collectors. The panels operate at the highest efficiency when the water flow is regulated close to 1.5 gallons per minute per collector. This is not an exact number and the performance will not be greatly affected if the flow is slightly higher or lower. The outlet of the collector must first be vented then returned to the pool at the best location with the lowest amount of back pressure. **The most desirable return location is a designated return line at the deepest portion of the pool.**

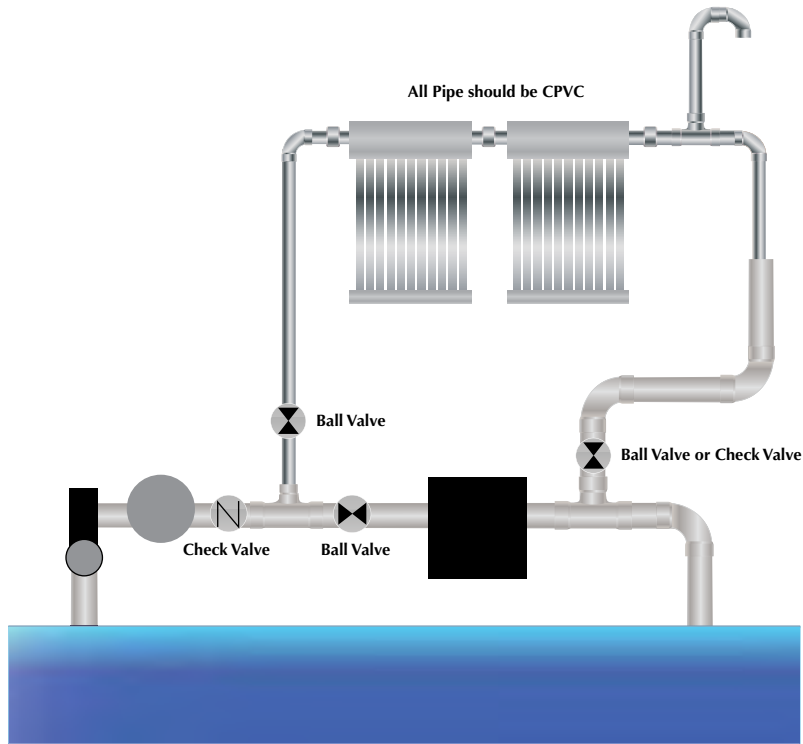


Attention- In some cases if the collectors are mounted on an extremely high roof or are a great distance from the pump, the pump may not be powerful enough to overcome the head pressure. In these rare cases the pump Hp may have to be increased to overcome the head pressure.

Plumbing Diagram #1



Plumbing Diagram # 2



Tip: Three ball valves will provide more flow control than using 3-way valves to divert water to the collectors.

Vacuum Tube Installation

With the frame/manifold assembly complete and fastened to the ground or the roof structure, the tubes are ready to be installed.



Warning – Always wear gloves and eye protection.



Warning –Use extreme caution when working with vacuum tubes, damage can easily occur if not handled with care.

Step 1

Locate black dust seals (rubber rings) x20, black base cups x20 and box of evacuated tubes.

Tip: Dip the open end of the EVT in a bucket of water to lubricate, easing Installation.

Step 2

Slide the black dust seal over the open end of the tube (top) and down approximately 12”

Tip: To help ease install, place black dust seals in warm water prior to install to soften.



Step 3

With black dust seals slid onto tubes, wet upper portion of tube to ease installation. Grasp tube gently, placing one hand against the opening in the heater manifold to help prevent sudden movement of the tube into heater manifold. Gently rotate tube upward into manifold with a slow twisting action.

Step 4

Insert black base cup over tube and fasten cup into the front lower support rail. Cup should secure in the support rail. Lower the tube into base cup, advance threaded portion of the cup until seated against tube to tighten the tube in place.



Filling the System

Once the frames are secured and the tubes are installed, the system is ready to be filled.



Caution- It is advised that the fluid be introduced into the SS20 systems in the morning when no heat is present within the evacuated tubes. For filling during daylight hrs, panels must remain covered from the sun to prevent natural heating.



Caution- Air Temperatures within the tubes can reach 400° F when empty and exposed to sunlight.



Caution- Always exercise caution, safety equipment including gloves and eye protection must be worn when working with evacuated tubes as glass can break etc.



Caution- Installer must ensure proper pump operation/flow before proceeding to fill.



Caution- Once system is filled; heating can only be stopped by covering the surface of the collectors.



Caution- Risk of burning or scalding exists as standing hot water remains in the tubes after many hours of no sun. The tubes will retain extremely high temperatures. Extreme caution should be used when removing tubes.



Danger- Starting system that has had water heating within, without continuous circulation, will discharge gallons of superheated water for a few minutes. Do not allow pool use until this hot water has dissipated.

Step 1

With the pool filter running, slowly send a portion of the filtered water to the collectors. This process will vary depending on the pump size and the number of collectors in the array. Each collector holds 9.5 gallons.

Step 2

Check for and repair any leaks in the system.

Step 3

Once the system is leak free and operating, the vent line can be adjusted. All of the features of the pool must be exercised as to check for different back pressure scenarios.

Examples: Slide feed lines, Spas, water features, waterfalls, cleaners, water jets, return fitting eyeballs, etc.

All of this equipment will cause differing back pressures. The vent line must be adjusted for the highest back pressure combination. This will ensure that there will not be a water loss through the vent line.



Attention- Keep in mind that upon start up of the pump the vent line may spit water. This is due to the system equalizing the back pressure and is normal. Ensure that if hot water is discharged, no person or property will be endangered.

Winterizing

Step 1

Because of the design of the collector, traditional line clearing will not be adequate. Pressurized air should be introduced to clear the lines leading to and from the collectors and the manifold. It may be necessary to disconnect the union and blow the water back to the filter and pool.



Warning- Use extreme caution not to over pressurize the collector. If too much pressure is introduced the tube will be pushed out of the manifold causing damage.



Warning- Use extreme caution when removing and draining the tubes. This water should always be treated like it's hot. Gloves should be worn at all times.



Warning- Hot water will damage or kill plant material. Do not dump hot water on plants.

Step 2

Water will remain in the tubes. This water can be removed by removing the individual tubes and draining them. This water can still be extremely hot and should be disposed of in an area that will not cause damage.

The collectors are capable of boiling the remaining water out of the tubes. Remove the first and last tubes. This will provide adequate venting for the collectors to boil dry. If the unit is installed with unions or flexible connections, it may be possible to up-end the entire unit to drain it. A small amount of residual water in the manifold should not cause any winter freeze damage.



Warning- If the pool is closed at a point of the season when freezing temperatures are common, the water must be removed from all tubes before freezing temperatures or damage will result.

The Manufacturer Warranty Policy

You must obtain a Return Materials Authorization (RMA) number from Customer Support before returning a product. The email address is info@jetsolarpanels.com. Products returned without an RMA number are not processed and will be returned to you.

- Proof of purchase is required to get warranty service.
- Return shipping is prepaid by the customer.
- International customers may be subject to duties, taxes and brokerage fee. Customers are responsible for fees incurred.

Limited Liability Warranty

The Manufacturers products are covered by a limited liability warranty from defects in material and workmanship for a period of 5 years from original purchase date. This warranty does not apply if, in the judgement of the manufacturer, the product fails due to damage from shipment, handling, storage, accident, abuse or misuse, if it has been used or maintained in a manner not conforming to product's instructions, has been modified in any way, or has a defaced or removed serial number. Repair by anyone other than the manufacturer or an approved agent voids this warranty. The maximum liability of the manufacturer is the product purchase price. You can find if your product is covered by the manufacturer warranty by comparing the duration of the warranty against the purchase date.

Warranty Replacement Procedure

Do not ship your defective product to the manufacturer before contacting customer support.

1. Obtain a Return Materials Authorization (RMA) number by contacting customer support.
2. A customer support agent will do troubleshooting to see if the product is defective. If it is deemed defective, the following information is required:
 - Your contact information: name, address, phone, email
 - Product serial number or model number
 - Proof of purchase

3. Customer Service will reply to your email with an RMA number and shipping information.
4. If a return is authorized: Package product securely. Do not include manuals, cables, or mounting brackets. WSE only replaces the defective unit and will not return other accessories. Include your contact information with your name, address, phone number, and RMA number inside the package.
5. Send the product to the RMA fulfillment address given by customer service. Clearly write your RMA number on the outside of the package you are returning. Customers are responsible for the freight charges to JetSolar. We suggest using a carrier that provides tracking information. JetSolar is not responsible for packages lost in transit to JetSolar. The replacement product is shipped by ground with shipping charges prepaid. Expedited shipping is available at extra cost. For status of an already issued RMA, email info@jetsolarpanels.com

What is the Warranty on my Replacement Unit?

Warranty on the replacement unit continues from the original date of purchase and will be extended for the number of whole days that the product has been out of the buyer's hands for warranty repairs.

Shipping Options

Swap Exchange

This option allows you to return the defective unit to the RMA fulfillment center. As soon as the fulfillment center receives the defective product, a replacement unit is shipped out in one business day via ground services.

The following credit cards are accepted:

- MasterCard
- Visa

"Out of Warranty" Products

If your product is not covered under warranty, we offer Repair Services for a fee. The manufacturer warranty only covers failures due to defects in materials or workmanship. Warranty does not apply if, in the judgement of the manufacturer, the product fails due to damage from shipment, handling, storage, accident, abuse or misuse, or damage that is attributable to acts of God (ex. hail damage), or if it has been used or maintained in a manner not conforming to product manual instructions, has been modified in any way, or has had any serial number removed or defaced.

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