



**1<sup>st</sup> SUNFLOWER**  
RENEWABLE ENERGY

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# SFD-SS series Installation Manual

## Pressure Solar Water Heater with Copper Coil

### Contents

1.	SOLAR WATER HEATER SIZE AND WEIGHT .....	3
2.	HOW TO TRANSPORT AND CARRY IT .....	3
3.	INSTALLATION.....	4
1.1	INSTALLATION LOCATION CHOICE .....	4
1.2	UNPACK AND INSPECTION .....	4
1.3	ASSEMBLE THE FRAMES, TANK AND VACUUM TUBES.....	5
	<i>3.3.1 Assemble frames.....</i>	5
3.4	FIX SOLAR WATER SUPPLIER (OPTIONAL ACCESSORY).....	12
	<i>3.4.1 The diagram of the connectors of water supplier.....</i>	12
	<i>3.4.2 Water Supplier Assembly (optional accessory).....</i>	12
3.5	THE WATER INLET AND WATER OUTLET PIPE CHANNEL CONNECTION OF SOLAR WATER HEATER.....	13
	<i>3.5.1 Use the water directly after heating exchange through the water tank. (Suitable for Torrid Zone).....</i>	13
	<i>3.5.2 The connection of solar water heater and Wall-mounted gas water heater.....</i>	13
	<i>3.5.3 The connection of solar water heater with gas heating water tank or electrical heating water tank.....</i>	14
	<i>3.5.4 The connection of solar water heater with the water tank (which has heat exchange connectors).....</i>	14
3.6	TRIAL OPERATION AND TROUBLESHOOT METHODS .....	15
	<i>3.6.1 Trial operation.....</i>	15
	<i>3.6.2 Troubleshoot methods.....</i>	15
	<i>3.6.3 Check the air vent to make sure its fluency.....</i>	15
4.	LIGHTNING PROTECTION.....	15
5.	DIMENSIONS OF PIPE CONNECTIONS.....	16
6.	PRECAUTIONS.....	16
7.	MAX. WORKING PRESSURE.....	16
8.	INSTALLATION ANGLE .....	16
9.	WIND AND SNOW LOAD .....	16
10.	MAINTENANCE REQUIREMENTS.....	17
	10.1 CLEANING.....	17
	10.2 LEAVES.....	17
	10.3 BROKEN TUBE .....	17

# Please begin to assemble after you read over the manual carefully!

## 1. Solar water heater size and weight

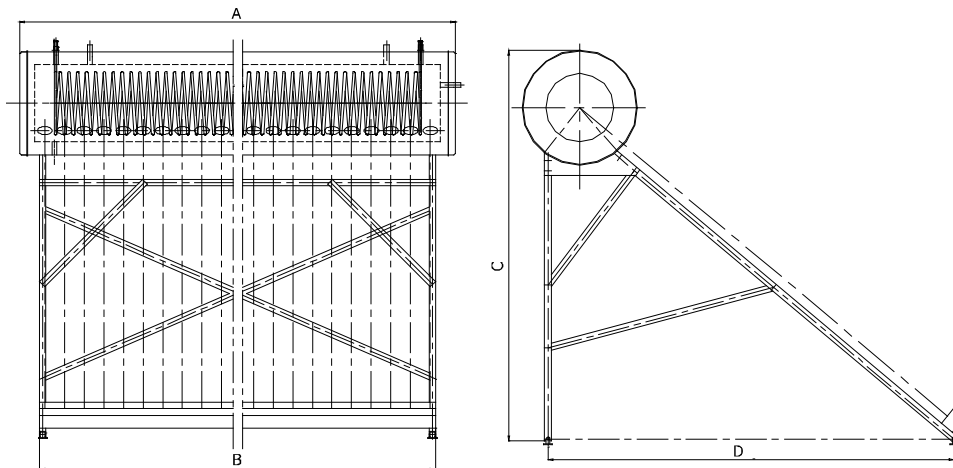


Fig 1.1

Item No.	Specification					Size(mm)			
	Diameter of water tank	Qty. of solar tubes	Diameter of solar tube	Length of solar tube	Weight	A	B	C	D
SFD47155818-SS	Ø 470mm	15pcs	Ø 58mm	1.8M	63KG	1348	1228	1594	1655
SFD47185818-SS	Ø 470mm	18pcs	Ø 58mm	1.8M	74KG	1591	1471	1594	1655
SFD47205818-SS	Ø 470mm	20pcs	Ø 58mm	1.8M	84KG	1753	1633	1594	1655
SFD47245818-SS	Ø 470mm	24pcs	Ø 58mm	1.8M	99KG	2077	1957	1594	1655
SFD47305818-SS	Ø 470mm	30pcs	Ø 58mm	1.8M	118KG	2563	2443	1594	1655

## 2. How to transport and carry it

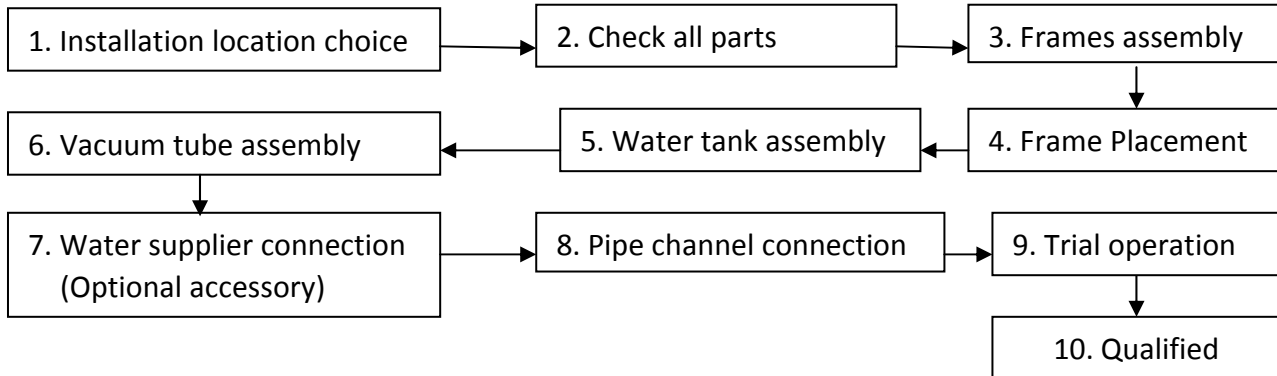
Please carry tank horizontally. It's forbidden to carry it vertically.

Please carry glass tubes carefully and horizontally. It's forbidden to carry it vertically.

If you want to transport your solar water heater in long distance, it's better to put tubes at bottom and make sure it won't move in transportation. To save space, you can put glass tubes on cartons of tanks. And do the best to drive carefully, avoiding bumpy road.

### 3. Installation

#### Installation sequence:



#### 1.1 Installation location choice

The choices of solar water heater installation location have several principles as follows:

- a) Solar water heater needs to face the Sun, make sure without any shadow in front;
- b) Try to use shortest pipe connection, try to reduce the turning, no dead angle;
- c) The installation location needs to bear the gravity of solar water heater, stable placement;
- d) Easy installation and maintenance.

#### 1.2 Unpack and inspection

No	Name	Total quantity				
		SFD47*5818-SS				
		15	18	20	24	30
1	Water tank	1	1	1	1	1
2	Gantry	2	2	3	3	3
3	Decoration ring	15+1	18+1	20+1	24+1	30+1
4	Silicon ring	+1	+1	+1	+1	+1
5	Tube caps	15+1	18+1	20+1	24+1	30+1
6	Diagonal-leg	2	2	3	3	3
7	Stand bar	2	2	3	3	3
8	Tube holder	1	1	1	1	1
9	Long diagonal brace	2	2	3	3	3
10	Short diagonal brace	2	2	4	4	4
11	Horizontal bar	1	1	2	2	2
12	Tie bar	2	2	4	4	4
13	Screw	1 PKG	1 PKG	1 PKG	1 PKG	1 PKG
14	Vacuum Tube	15	18	20	24	30

**Note:** In above form, the number after "+" means the quantity of extra free compensation parts.

## 1.3 Assemble the Frames, Tank and vacuum tubes

### 3.3.1 Assemble frames

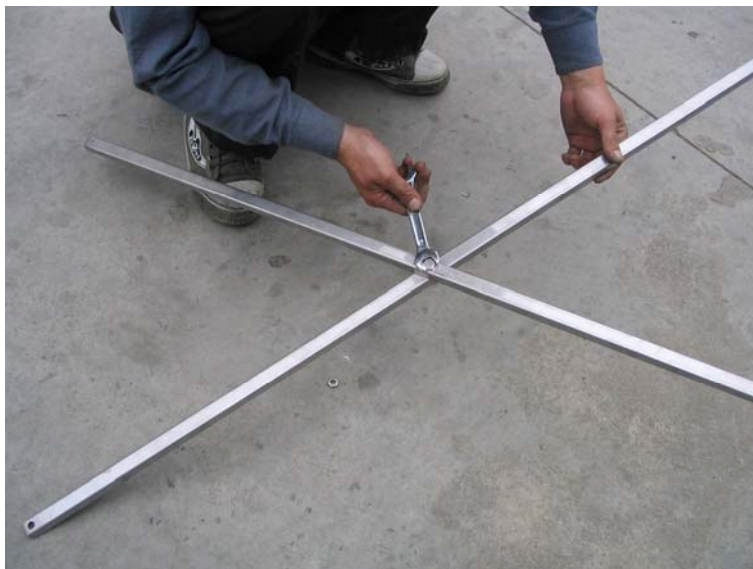
The frame and all fastenings are contained in a long thin carton. Please unpack this carton with cares and lay out the parts. Please collect all the nuts, in fear losing one or some.

Use the pictures on the below to help identify the parts needed for each stage of the assembly.



*Fig 3.1*

Fig 3.1 Spec.: Using a pair of M8×12 bolt connecting with water tank bracket, front leg , rear leg and two haul pole, forming side piece . Two legs frame is 2 pieces, three legs frame is 3 pieces.



*Fig 3.2*

Fig 3.2 Spec.: Join two crossed brace through center hole with a pair of M8×25 bolts, 3 legs frame has two groups of 4 pieces crossed brace.



*Fig 3.3*

Fig 3.3. Spec.: Connect crossbar, positive haul pole and two sides of pieces with a pair of M8×12 bolt. Three legs frame has 3 side pieces and 2 crossbars. Connect end seat and front leg, with a pair of M8×12 bolts.



*Fig 3.4*

Fig 3.4 Spec: Connect foot shim with bolt pairs under the front leg and rear leg.



### 3.3.2 Assemble water cylinder (Water tank)

You are now ready to place the frame in position. If attaching directly to the ground now lower the hot water cylinder on to the cradle at the top of the frame, ensure the bolts from the cylinder are through the slots on the cradle and fit the nuts finger tight. Using a string or straight edge to check the alignment of the tube carriage guides and tube locating holes in the cylinders. Gently turn the cylinder to achieve alignment. If the holes are not aligned the unit may leak or tubes may break when being fitted. Once the cylinder is aligned tighten the bolts to lock it in place and recheck alignment.

Note: Before assembly, please check the water cylinder and there is other thing or not inside it, if yes, please take it out and clean it with water.



*Fig 3.5*

Fig 3.5 Spec. : After confirmation of finishing installing the frames, put the water tank on the frame and tighten the screw cap.

### 3.3.3 Assemble Vacuum Tubes

Carefully unpack the vacuum tube; remember this is glass, unlike the rest of assembly this will break unless handled carefully. Fit a black rubber dust seal to the tubes from the open end with the rounded side facing down. Slide this 200mm down the tube.

Apply a smear of grease to the top 100mm of the open end of the first vacuum glass tube. Using a gentle pressure and twisting motion insert the greased tube into the locating hole until it is well inside the cylinder and the bottom end of the tube is at least 25mm clear of the tube carriage guides. Now using a gentle downward pressure and twisting motion lower the tube until it fits snugly into the carriage guide.

Slide the black rubber dust seal up the tube until it's outside edge fits flush with the cylinder.

Repeat for the rest of the tubes.

#### Details:

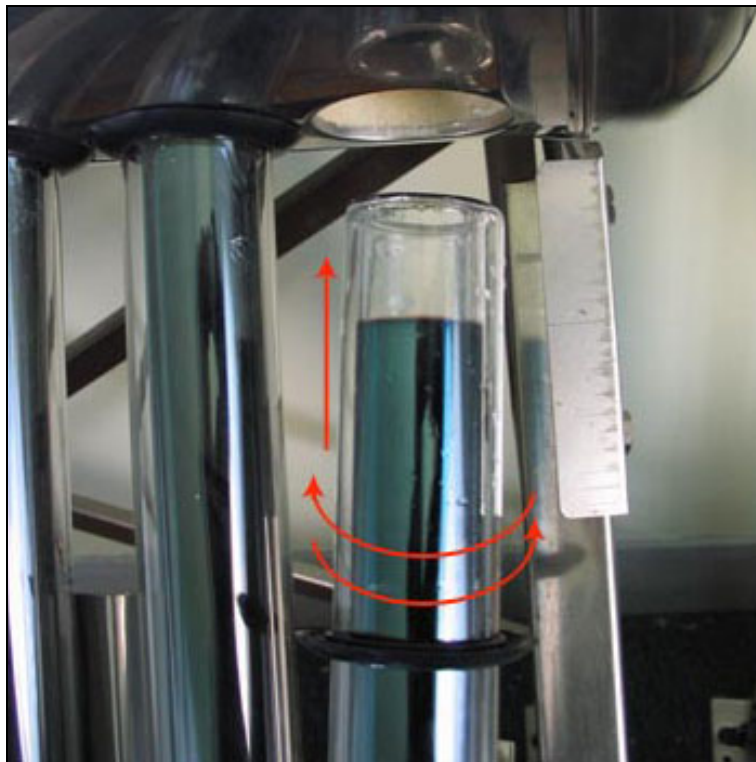
1. Please install the stand frame and the water tank firstly;
2. Add a little of scour (such as washing-up liquid, etc.) into the water. Then the water can be used as lubricant;
3. Put the Ornament ring on the opening part of the SFVA tube. Daub some lubricant referred in the above item on the opening part of the SFVA tube;



*Fig 3.6*

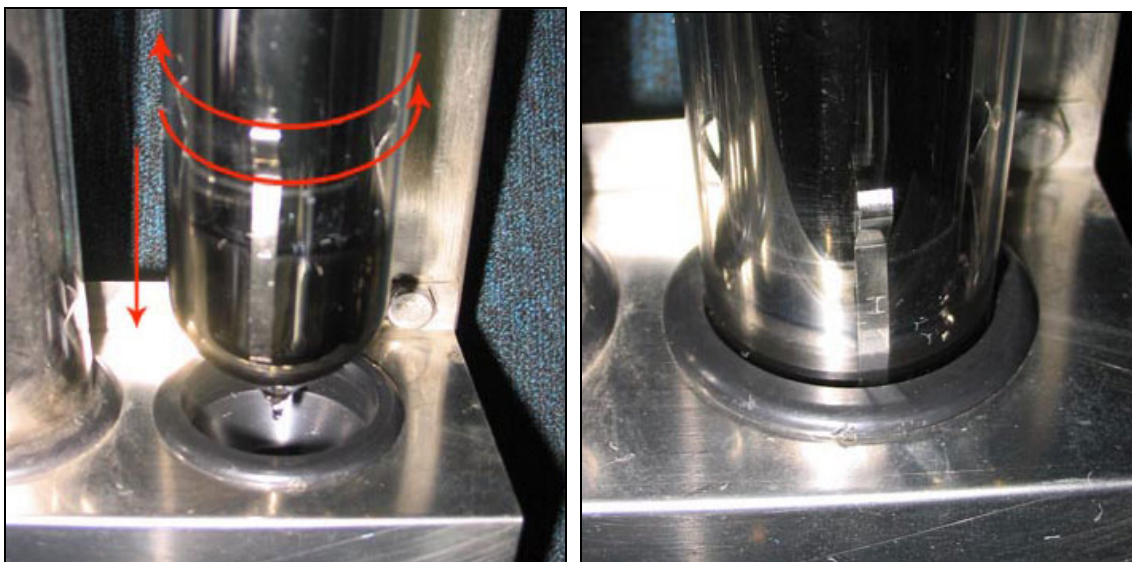
4. Insert SFVA into one of the water tank's holes for evacuated tubes. Please make sure the opening part of the SFVA tube is inserted into the Seal Silicon ring and it's easily to insert if in the way of twisting motion slowly;





*Fig 3.7*

4. After you insert the opening part of the SFVA tube into the holes of the water tank, put the end of the tube into the cup of the frame and make sure the course is twisting motion slowly.



*Fig 3.8*

6. Move the Ornament ring to cling to Water tank. So one of the SFVA is installed.



*Fig 3.8*

7. With the step above, install the other SFVA tubes. Then all the tubes are installed.



*Fig 3.9*

Fig 3.9 Spec : After inserting the tubes, you can rotate the water tank slightly, make sure the tubes are in the middle of the hole center. Thus, you can screw down all the bolts, connect the pipeline, (add the assistant tank if you have bought it), exhaust the lengthen tube, clean the valve, until now we have already finished the installation. When the water through the tank, if it don't leak, means your customer can start to use.

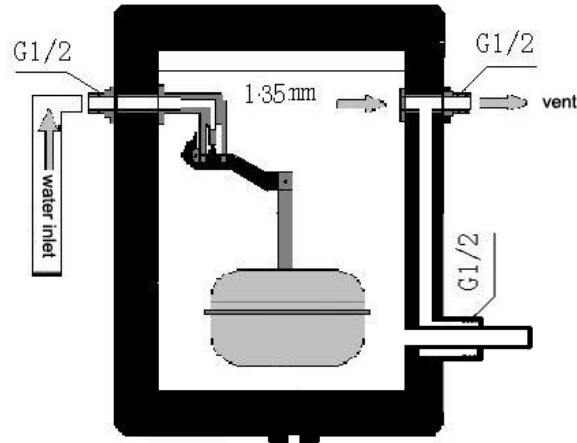


*Fig 3.10*

Fig 3.10 Spec. : The picture above is the whole figure.

### 3.4 Fix solar water supplier (optional accessory)

#### 3.4.1 The diagram of the connectors of water supplier

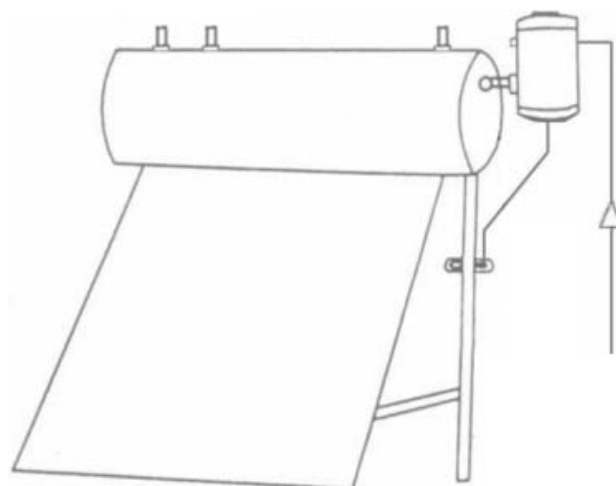


*Fig 3.11*

#### 3.4.2 Water Supplier Assembly (optional accessory)

The connector on the bottom of water supplier is connected to the right connector on the water tank of solar water heater.

The air vent (the left connector) need to be connected with a long pipe, and the length of pipe must higher than the top position of water supplier. The air vent needs to be open all the time.



*Fig 3.10*

### 3.5 The water inlet and water outlet pipe channel connection of solar water heater

3.5.1 Use the water directly after heating exchange through the water tank. (Suitable for Torrid Zone)

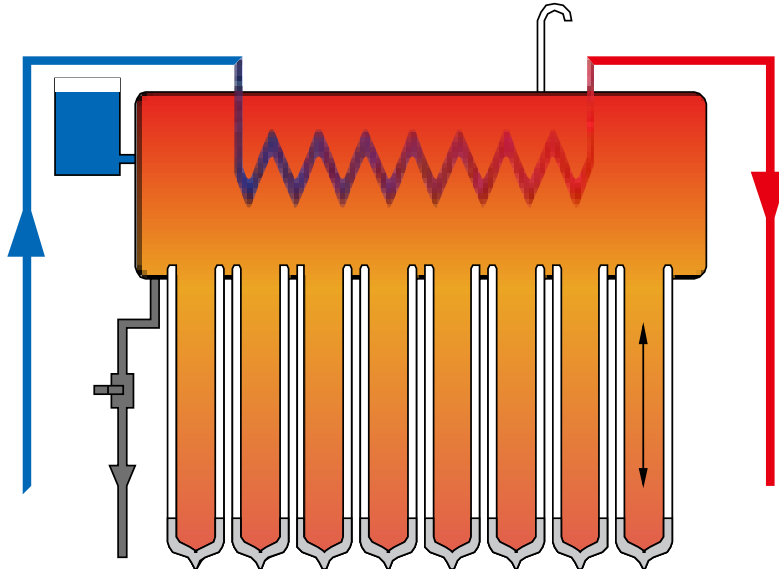


Fig 3.11

3.5.2 The connection of solar water heater and Wall-mounted gas water heater.

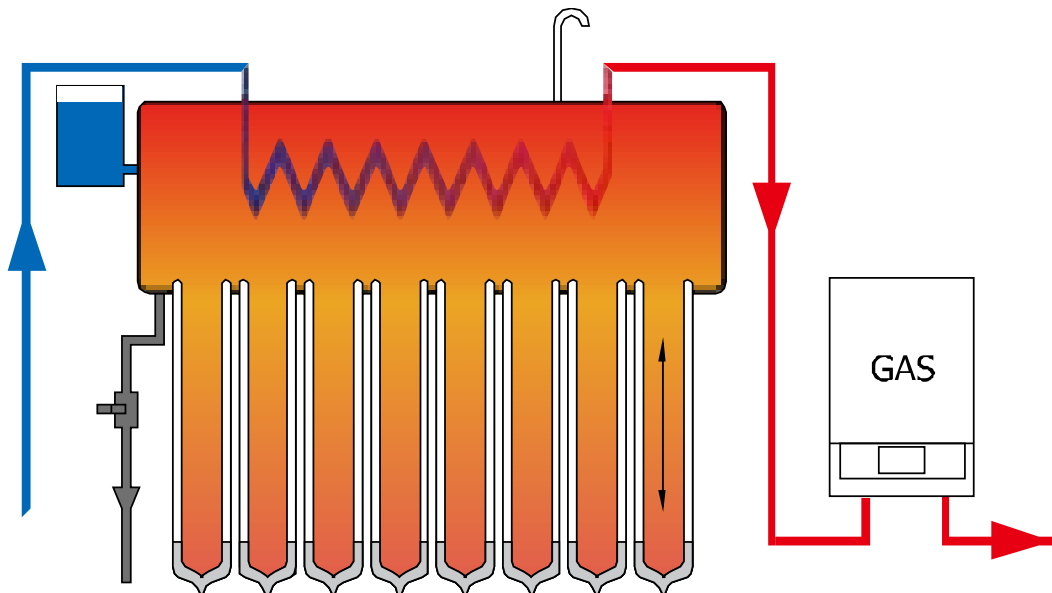
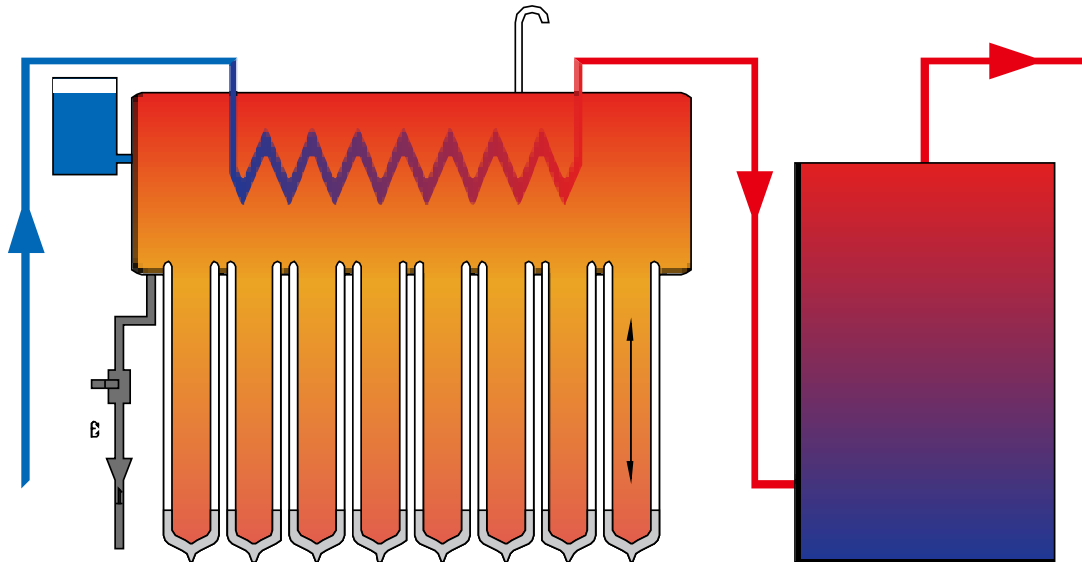


Fig 3.12

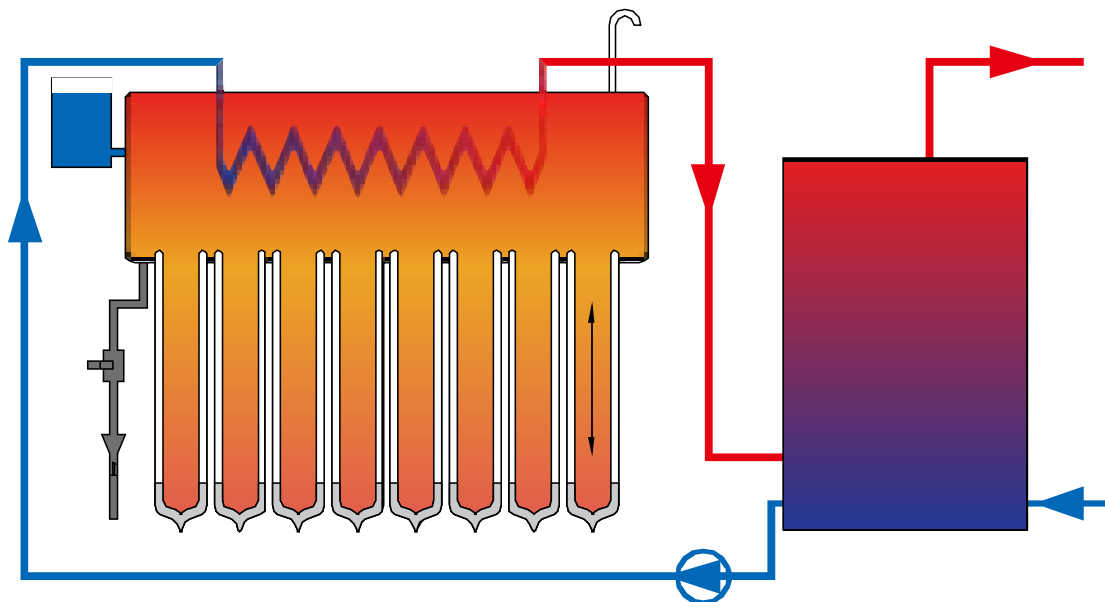


**3.5.3 The connection of solar water heater with gas heating water tank or electrical heating water tank.**



*Fig 3.13*

**3.5.4 The connection of solar water heater with the water tank (which has heat exchange connectors).**



*Fig 3.14*



**Warning:**

- 1) When the sunlight is adequate during the installation, you could full fill the glass tube with water and then insert into the water tank, try to avoid thermal shock, it may lead to the broken of vacuum tube.
- 2) The air vent on the top of water tank needs to keep open. If adopt water supplier, please connect a long pipe to the air vent, and the height must higher than the top position of water supplier.
- 3) Please pay attention to the weight capacity of roof.
- 4) Aerial work, please pay attention to safety.
- 5) If you use electric heater, the person who install the electric heater must have electrician qualification. And you need to use electricity leakage protection plug and should connect with ground wire.
- 6) If you use solar controller, please read the assembly manual of solar controller before you install the solar controller.

### 3.6 Trial operation and troubleshoot methods

#### 3.6.1 Trial operation.

First please confirm whether the vacuum tube is shined by sunlight without water inside, otherwise can't feed the cold water.

**Suggestions:** If the process has to be finished under sunshine, you can cover the inserted tubes by black cloth, etc.

#### 3.6.2 Troubleshoot methods.

Open the cold water inlet, check the pipe channel and connection between vacuum tube and water tank, if find any leakage, it should close the valve immediately, eliminate the leakage.

As for the leakage when insert the vacuum tube, there are normal four points as follow:

- 1) The broken of Silicon ring
- 2) There is adsorption bubble on the Silicon ring
- 3) Silicon ring is not connected with inner tank
- 4) Insert vacuum tubes without any lubricant

#### 3.6.3 Check the air vent to make sure its fluency.

## 4. Lightning protection

The solar water heater should be done lightning protecting to avoid the lightning attacking. The lightning rod is necessary which should be 1.5m higher and 3 m far away from the solar water heater. For any problems that involve plumbing or electrical connections the services of a qualified professional must be employed.

**Warning:** When in thunderstorm weather please don't use solar water heaters.

## 5. Dimensions of pipe connections

All size of the connectors on the solar water heaters are 1/2 inch.

## 6. Precautions

- 1) When using solar water heater in cold climate, please put insulation layer around the pipes which outside the room.
- 2) If you use electric heater, the person who install the electric heater must have electrician qualification. And you need to use electricity leakage protection plug and should connect with ground wire.

## 7. Max. working pressure

This type is non-pressurized type, but the solar water heater could bear the gravity of water inside.

## 8. Installation Angle

It is common for collectors to be installed at an angle that corresponds to the latitude of the location. Installing at an angle less than 20° is not recommended as the heat pipes perform best in the range of 20-70 degree While adhering to this guideline, an angle of latitude +/-10° is acceptable, and will not greatly reduce solar output.

Angles beyond this range may be used, but a decrease in heat output will result. An angle lower than the latitude will enhance summer output, while a greater angle will enhance winter output.

## 9. Wind and snow load

When installing the collector please consider the issue of wind resistance and the resultant stress on the attachment points. the standard frame is designed to withstand wind speeds of up to 100km/h and 30cm snow accumulation without damage. For the areas with possibility for high winds, additional reinforcement of attachment points may be required and can easily be supplied by your local installers.

## **10. Maintenance Requirements**

### **10.1 Cleaning**

Regular rain should keep the evacuated tubes clean, but if particularly dirty they may be washed with a soft cloth and warm, soapy water or glass cleaning solution, If the tubes are not easily and safely accessible, high pressure water spray is also effective.

### **10.2 Leaves**

During autumn, leaves may accumulate between or beneath the tubes. Please remove these leaves regularly to ensure optimal performance and to prevent a fire hazard.(The solar collector will not cause the ignition of flammable materials)

### **10.3 Broken Tube**

When the vacuum tube is broken, please close the valve immediately, please open the valve after replace the vacuum tube, in order to save the water consumption.