



**For our present, For their future.**



# SFH-S1 Series Solar Water Heater

## Assembly Manual

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Thank you for choosing Sunflower solar water heater. You now have a solar heater with the world's best technology. It has superb performance, is safe and reliable.

*To get the greatest benefit from your Sunflower solar water heater, please carefully read the User's Manual all the way through before installing and using your solar water heater. Then proceed with your installation and use it according to this manual. Please do not discard your User's Manual. Keep it for later reference.*

(Note: This manual is exclusively for the Sunflower heat pipe vacuum tube (5818) pressured series solar water heater.)

## 1. Features

### 1). Low heat loss:

The Sunflower solar water heater has excellent heat insulation using imported, high density, high strength polyurethane foam which is foamed in place under high pressure.

### 2). Low heat diffusion

Heat diffusion at all connections is greatly reduced, virtually eliminating heat losses by convection or conduction, resulting in high heating efficacy.

### 3). Connections and Valves

- Connections to the water inlet, outlet, sensor and magnesium rod are all underneath the water tank for easy access. For greater safety, the electrical heater inlet is on the left side to avoid dry burning if not covered by water.
- Uses a small elbow pipe in the water inlet. By doing this, the cold water will not mix with the hot water so quickly, and the cold water will not flow to the hot water outlet.
- *Uses a P/T valve, Air suction valve and Single direction valve to protect the solar heating system.* These valves come with the system. Not all suppliers offer these valves. Refer to Fig 4.2 below.

***Note:** The P/T valve needs to be connected with a pipe and make the pipe outlet face to the ground, if the valve were to open, the pipe directs the water to the ground, not straight out where it might hit someone standing nearby, causing harm and scalding.*

### 4). Easy functional extension:

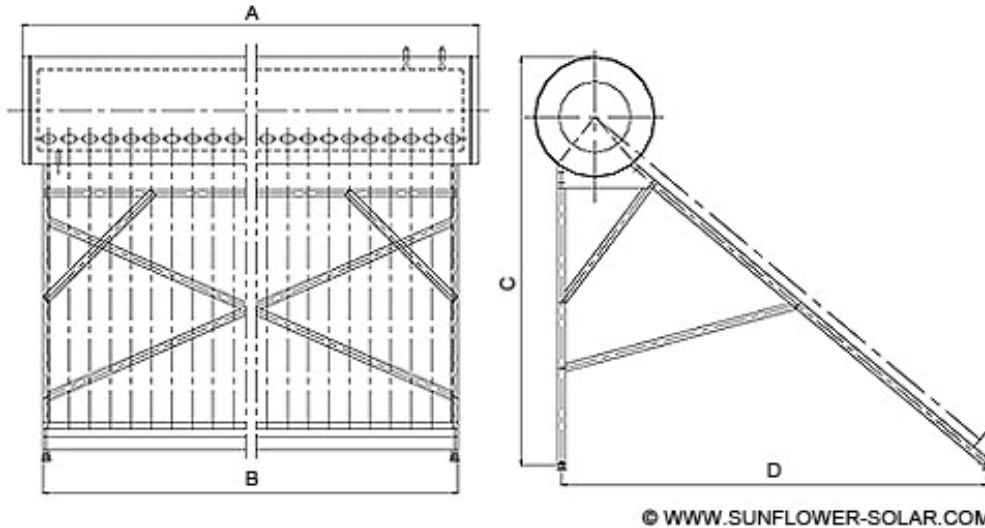
This solar water heater is fitted with a water feed-in connection, overflow connection, connections to level/temperature controls and an electrical element. The user can have a number of options depending on his actual needs.

- Uses a standard plug for the Connections of sensor and electrical element
- The Sensor is an accessory to the level/temperature control which is sold together with the level controller, electrical element and water feed-in valve as accessories.

### 5). The Solar water heater continues to work even if a heat pipe is broken

Because each heat pipe works independently, and is inserted into a water tight fitting on the tank, should one or more tubes become broken, the Sunflower solar water heater continues to operate at a somewhat reduced efficiency until the broken heat pipe(s) can be replaced.

## 2. Solar water heater size and weight



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
SFH47155818-S1	Ø 470mm	15pcs	Ø 58mm	1.8M	110KG	1458	1228	1594	1655
SFH47185818-S1	Ø 470mm	18pcs	Ø 58mm	1.8M	120KG	1701	1471	1594	1655
SFH47205818-S1	Ø 470mm	20pcs	Ø 58mm	1.8M	130KG	1863	1633	1594	1655
SFH47245818-S1	Ø 470mm	24pcs	Ø 58mm	1.8M	150KG	2187	1957	1594	1655
SFH47305818-S1	Ø 470mm	30pcs	Ø 58mm	1.8M	170KG	2673	2443	1594	1655

## 3. How to transport and carry it

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

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

If you want to transport your solar water heaters a long distance, it's better to put the tank on the bottom and make sure it won't move during transportation. To save space, you can put the tube carton on the tank carton, and do your best to drive carefully, avoiding bumpy road.

## 4. Name of the parts and components

The following is a detailed components list for the Sunflower SFH series solar water heaters. If any parts are missing, please contact the company you bought this heater from at once.

#### 4.1 The structure of whole solar water heater

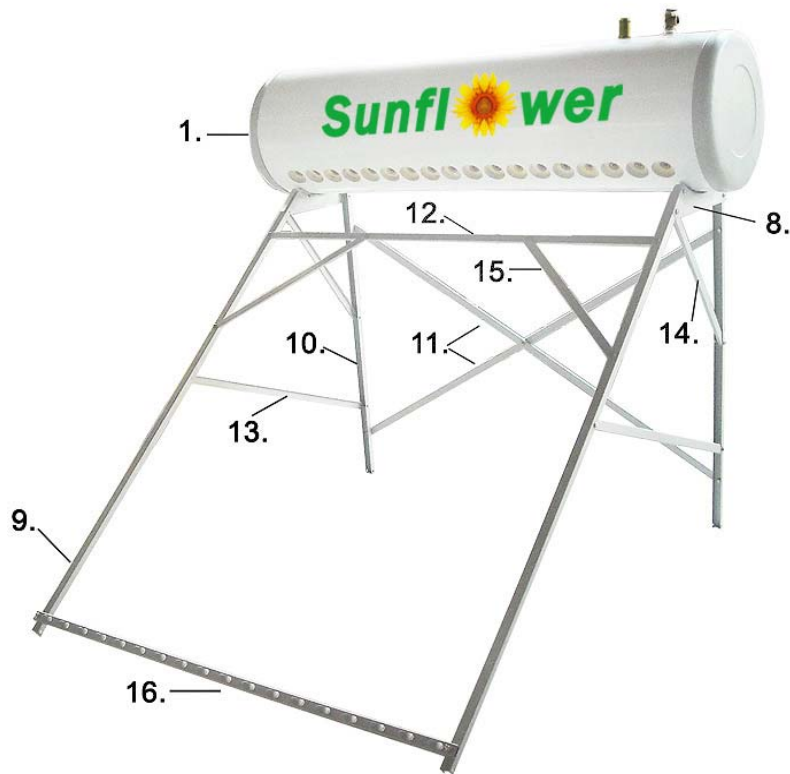
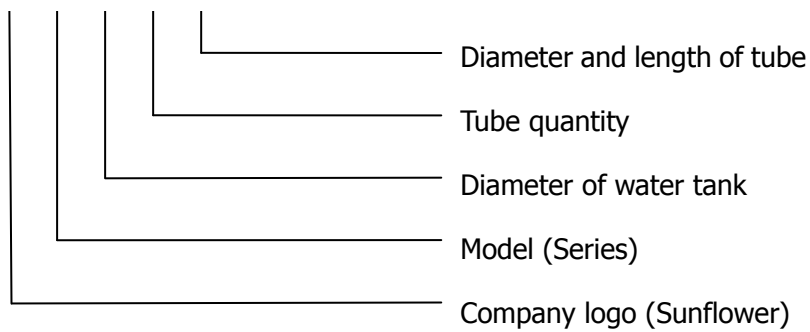


Fig 4.1

No.	Name	Total quantity				
		SFH47*5818				
		15	18	20	24	30
1	Water tank <i>(with P/T valve &amp; air suction valve &amp; Check valve)</i>	1	1	1	1	1
2	Evacuated tube (Φ58mm*1800mm)	15	18	20	24	30
3	Decoration ring for tube	15	18	20	24	30
4	Black silicon tube cup	15+1	18+1	20+1	24+1	30+1
5	Spiral tight clip	15	18	20	24	30
6	Thermal gel	1	1	1	1	1
7	Screw	1 PKG	1 PKG	1 PKG	1 PKG	1 PKG
8	Gantry	2	2	3	3	3
9	Front bar	2	2	3	3	3
10	Standing bar	2	2	3	3	3
11	Cross bar	2	2	4	4	4
12	Horizontal bar	1	1	2	2	2
13	Tie bar-3	2	2	3	3	3
14	Tie bar-2	2	2	3	3	3
15	Tie bar-1 <i>(length is as No.14, but has cutout on one edge)</i>	2	2	4	4	4
16	Tube holder	1	1	1	1	1
17	Foot pad	4	4	6	6	6

SF H 47 \* 5818



#### 4.2 The structure of water tank and connection

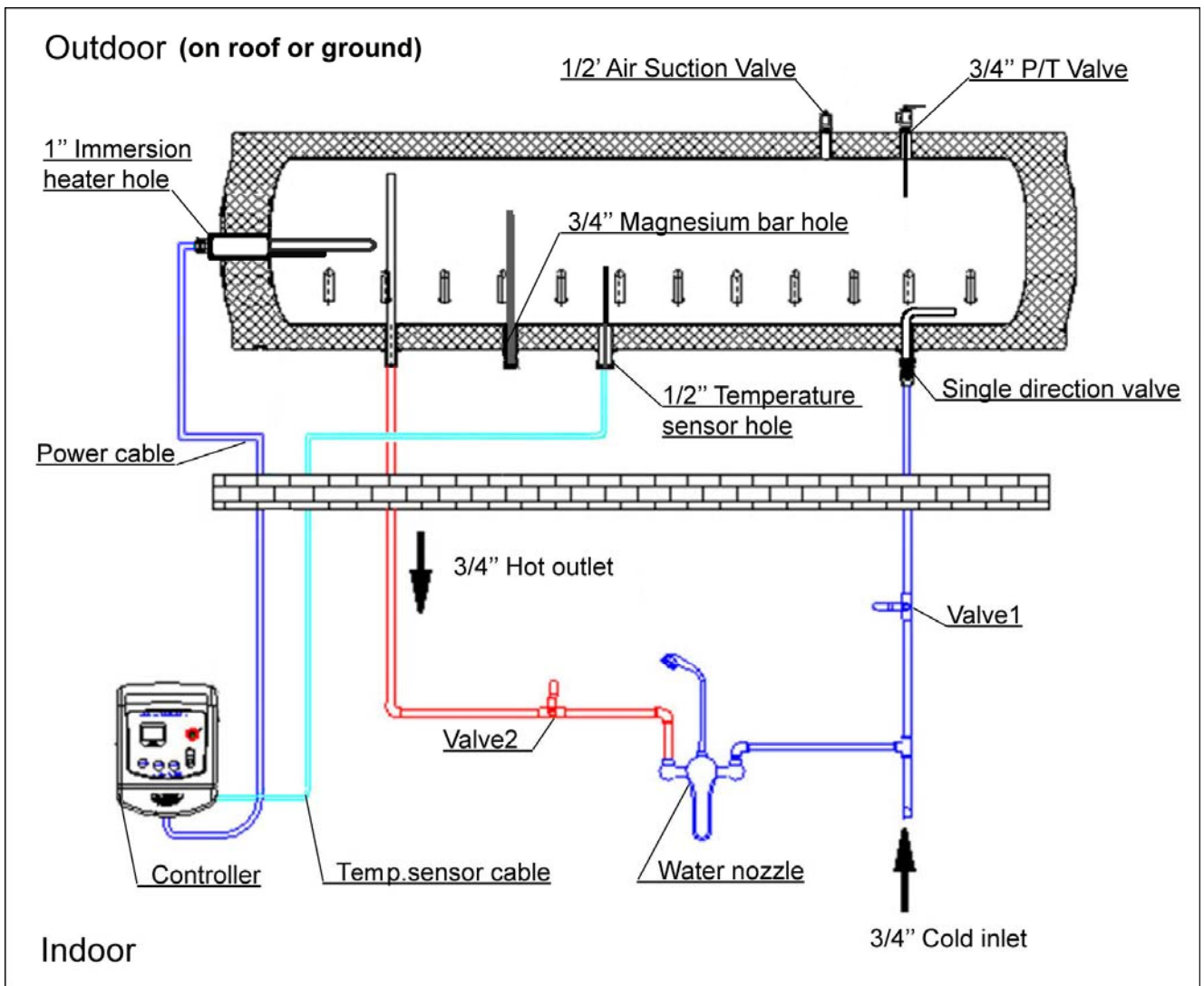


Fig 4.2



## 5. Assembly of the solar water heater

### 5.1 Assemble frames

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

#### 5.1.1 Assemble side parts

Use a pair of M8×12 bolts to connect the gantries, front bar, standing bar and tie bar-2, tiebar-3, forming the side piece (SFH155818-S1 and SFH185818-S1 only has two side pieces). You will need a 13mm socket wrench and a 13mm flat wrench to tighten the bolts.



#### 5.1.2 Assemble the cross bars and connect them

Join two cross braces through their center hole with a pair of M8 × 20 bolts. Connect two teams of cross bars to 3 standing bars.



### 5.1.3 Assemble horizontal bars and tie bar-1

Please assemble them by the following steps (as shown).





#### 5.1.4 Assemble tube holder and foot pad

Join the tube holder to the front bars using M6 X 10 bolts. Join the foot pad to the standing bar and front bar using M6 X 40 bolts.



#### The finished frame



**Assemble the foot pad**, an 11mm socket or wrench is needed

**Our suggestion:** *We suggest setting the entire frame up with each leg / foot resting on a paving stone to keep the foot out of water.*



## 5.2 Assemble the water cylinder (water tank)

Please check the water cylinder and make sure there is nothing inside of it. If there is, please try to take it out. Put the assembled frames on level ground, or install them in their final place of operation, e.g. on the ground or on a roof (*If on roof, aerial work, please pay attention to safety*). Remove the nuts from the screws at the end of water tank.

Then two workers hold onto the two ends of the tank, and put the tank onto the gantry carefully. Please try to let the screws go through the long notch on the gantry. You may need to gently turn the cylinder to achieve it.

Then screw the nuts back onto the screws of the tank so that the tank can be fixed on the frame.

**Note:** *"Do not tighten the bolts completely. Just make them snug. You may need to turn the tank so that the heat pipe tubes line up with the bottom tube holders. Once the tubes are installed, then tighten the bolts completely so the tank is firmly connected to the stand."*



### 5.3. Assemble Vacuum Tubes *(Please wear gloves to protect yourself in case of a broken tube)*

#### 5.3.1 Loosen the screw of the spiral tight clip so that the spiral tight clip can be opened



#### 5.3.2 Insert the glass tubes into the water tank

- 1) Carefully unpack the vacuum tube carton. Please take care during the process of inserting the glass tubes, because they can easily be broken and broken tubes can hurt you. Fit a black decoration ring on a tube from the open end with the round side facing down. Slide this 200mm (about 8 inches) down below the top of tube.



- 2) Daub the thermal silicon grease on the heat exchange end of SFVB solar tube (the copper part), then rotating the pipe, slowly insert the heat exchange end of SFVB solar tube into the water tank



- 3) Fix the bottom end of SFVB solar tube (the Black silicon tube cup is on the end) on the bottom rail by resting it against the U type notch and securing it with the spiral tight clip;



- 4) Tighten the screw and nut of the spiral tight clip so that it can be closed as a ring. Install the spiral tight clip uses a 7mm socket wrench or flat blade screw driver.

**Note:** Don't screw it too tighten in case of tube broken.



- 5) Repeat steps 2) and 3) to insert the rest of the tubes. When all tubes have been installed and you have tightened all bolts, you are finished with the assembly of the whole SFH integrated pressurized solar water heater.

#### 5.4 Install immersion heater and magnesium bar (If you buy them from us)

##### Install the immersion heater

Use a wrench to remove the threaded plug in the immersion heater opening. Wrap the heater pipe threads with at least 2 or 3 windings of Teflon tape. Insert the immersion heater into the hole, being careful not to damage the threads. Hand tightens until snug. Later, after there is water pressure, check for leaks. If need be, using a wrench, tighten the immersion heater another 1/4 turn or until the leak stops, again being careful not to damage the threads or break the immersion heater. If you cannot stop the leak, turn off the water pressure, drain the tank, remove the heater and try the whole procedure again, this time using more windings of Teflon. *(Note: The immersion heater is in the left end so it doesn't burn up because of a low water level. If you use the immersion heater, the person who installs the electric heater must be a qualified electrician. You need to use an electricity leakage protection plug and it should be grounded.)*



##### Install magnesium bar by the same method



#### 5.5 Install controller (If you buy it from us)

Please install controller according to the manual of controller you've bought. *(The person who installs the controller must be a qualified electrician).*



## 5.6 Install the single direction valve

This valve is added especially for our customers, because not many manufacturers add this valve. Before you install it please wrap Teflon tape and tighten it with wrench. It could protect the water tank and pipe line if the cold water inlet valve is turn off or city water supply is cut off suddenly, because it keeps hot solar heated water from backing up into your house plumbing through the cold water line.

*Note: For each connector, customers yourselves need to wrap Teflon tape on it to prevent leakage, and make sure that each one is tighten before adding water into the water tank.*

## 5.7 Check and Inspection

After you finish the assembly of the solar water heater, please check whether every part is ok, after inspection, please tighten every bolt. Before you turn on water inlet valve, please make sure that every connector is wrapped with Teflon tap and it is tighten. If any leakage, please turn off the water inlet valve and drain the water, wrap more Teflon tap on the leakage connector then install and tighten with wrench.

## 6 Lightning protection

The solar water heater should have lightning protection to avoid lightening damage. A lightning rod is necessary which should be 1.5m higher and 3 m farther 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.*

## 7 Precautions

- 1) When installing your solar water heater in a cold climate where freezing is possible, please put an insulation layer around the pipes which are outside the building. You may want to add additional protection in the form of a thermostatically controlled heat tape.
- 2) If you use the optional electric immersion heater, the person who installs the electric heater must be a qualified electrician. You need to use an electricity leakage protection plug and everything should be grounded.

## 8 Max. working pressure

This is a pressurized type solar water heater. The maximum working pressure is 6 bar (87PSI).

## 9 Installation angle

It is common for solar water heaters to be installed at an angle that is similar to the latitude of your location. Installing it with a tilt angle (as measured from horizontal) less than 20° is not recommended as the heat pipes perform best in the range of 20-70 degrees. While adhering to this guideline, an angle of your latitude +/-10° is acceptable, and will not greatly reduce the solar heater output.

Angles out of this range can also be used, but a decrease of heat output will result. When the angle is lower than the latitude, it will increase summer output, while a higher angle will enhance winter output.

## 10 Wind resistance and snow accumulation

When installing the solar water heater, please consider the issue of wind resistance and the resultant stress on the fixed points. The standard frame is designed to withstand wind speeds of up to 100km/h (62 mph) and 30cm (about 11.8 inches) of snow accumulation without damage. For areas with the possibility for high winds, additional reinforcement of attachment points (e.g. into roof rafters, or ground anchors) may be required and can easily be supplied by your local installers.

## 11 Maintenance Requirements

### 11.1 Cleaning

Regularly raining could keep the heat pipe vacuum tube clean, but if it is particularly dirty then it may need to be cleaned with a soft cloth and warm, soapy water or other glass cleaning solutions. If the tubes are not easily and safely accessible, a water spray from a garden hose may also be used.

### 11.2 Leaves

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

### 11.3 Broken Tube

If one heat pipe vacuum tube is broken, please don't worry, the system will still work. You just need to replace the broken tube. It is very easy. Follow the instructions in step 5.3.2.