

For our present, For their future.



SFB series Installation Manual

SFB series Installation Manual

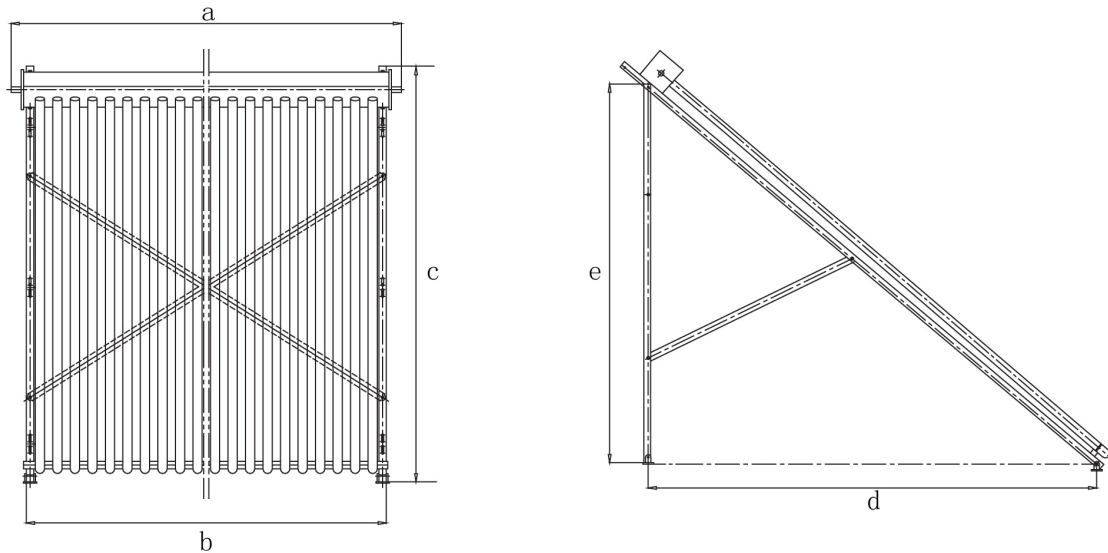
All-glass Evacuated Tubular Solar Collector with Heat Pipe

Contents

1. Solar collector size and weight:	3
2. How to transport and carry it?	3
3. Installation	3
3.1 Unpack and inspection	4
3.2 Fix the Frames and Manifold Box:	5
3.3 Fix solar collector on your sloping roof	5
3.3.1 Sloping roof	6
3.3.2 Flat roof	9
3.4 Install the tubes	11
4. Lightning protection	13
5. How to connect couple of collectors?	14
6. Connection of the collector field to the heat transfer circuit	14
7. Dimensions of pipe connections	18
8. Heat Transfer Media	18
9. Precautions	18
10. Max. working pressure	18
11. Pressure Drop	19
12. Installation Angle	19
13. Wind and snow load	19
14. Maintenance Requirements	19
14.1 Cleaning	19
14.2 Leaves	19
14.3 Broken Tube	20

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

1. Solar collector size and weight:



Item No.	Specification			Weight Kg	size(mm)				
	Qty. of solar tubes	Diameter of solar tube	Length of solar tube		a	b	c	d	e
SFB105818	10pcs	Ø 58mm	1.8M	36	895	775	1970	1500	1200
SFB125818	12pcs	Ø 58mm	1.8M	43	1045	925	1970	1500	1200
SFB155818	15pcs	Ø 58mm	1.8M	54	1270	1150	1970	1500	1200
SFB185818	18pcs	Ø 58mm	1.8M	65	1495	1375	1970	1500	1200
SFB205818	20pcs	Ø 58mm	1.8M	72	1645	1525	1970	1500	1200
SFB225818	22pcs	Ø 58mm	1.8M	80	1795	1675	1970	1500	1200
SFB245818	24pcs	Ø 58mm	1.8M	87	1915	1825	1970	1500	1200
SFB305818	30pcs	Ø 58mm	1.8M	108	2395	2275	1970	1500	1200

2. How to transport and carry it?

The solar tube should be fixed during transportation to avoid displacement caused by vibration and bumps.

The solar tube should be especially careful during the transportation, especially when it is put down, it is strictly forbidden to lose and shake.

3. Installation

3.1 Unpack and inspection

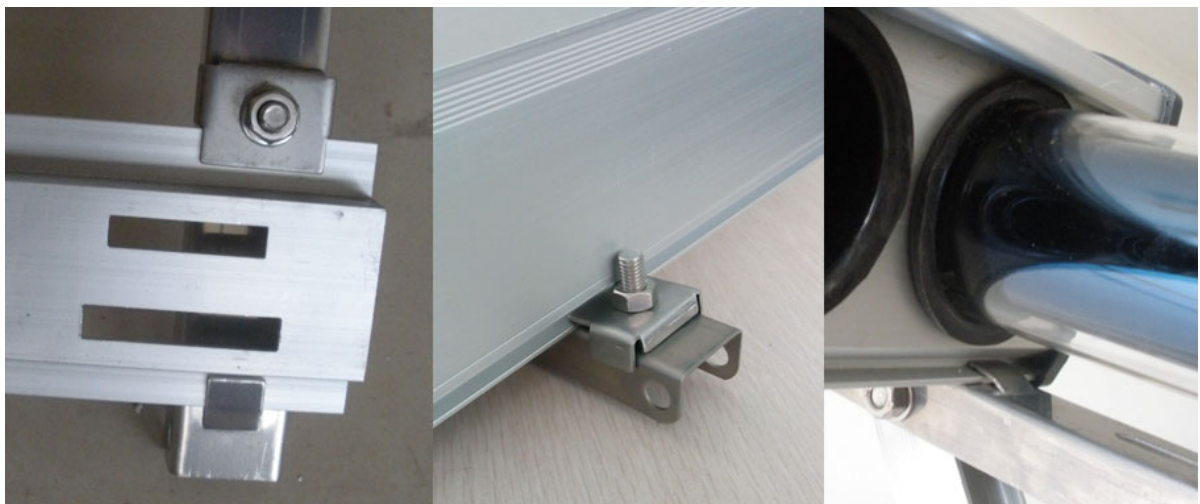
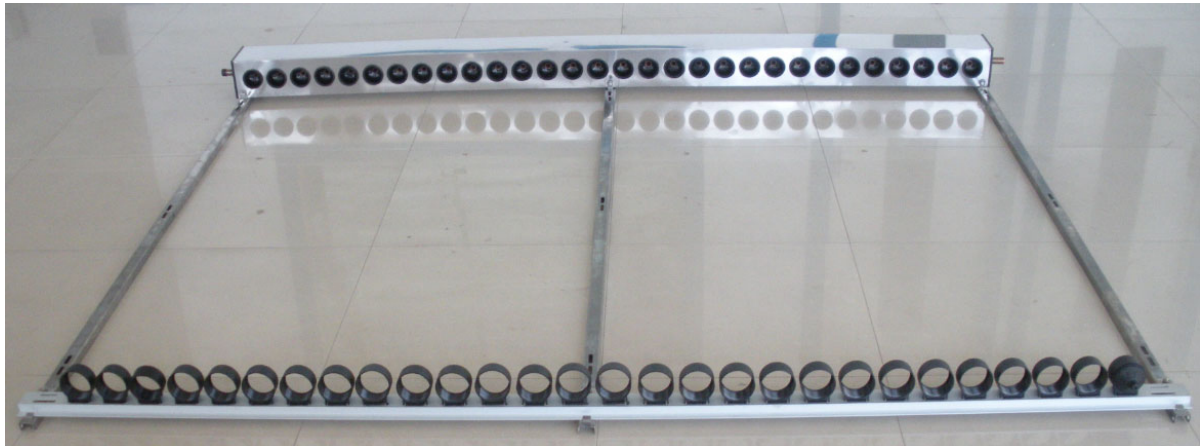
No	Name	Total quantity							
		SFB105818	SFB125818	SFB155818	SFB185818	SFB205818	SFB225818	SFB245818	SFB305818
1	Manifold box	1	1	1	1	1	1	1	1
2	Foreleg	2	2	2	2	2	2	3	3
3	Tubes holder	1	1	1	1	1	1	1	1
4	Tube cover	10	12	15	18	20	22	24	30
5	Screw bag	1	1	1	1	1	1	1	1
6	Thermal silicon grease	1	1	1	1	1	1	1	1
7	Instruction manual	1	1	1	1	1	1	1	1
8	Heat Pipe	10	12	15	18	20	22	24	30

Standing frame (optional accessory)

No.	Name	Total quantity							
		SFB105818	SFB125818	SFB155818	SFB185818	SFB205818	SFB225818	SFB245818	SFB305818
1	Rear bar	2	2	2	2	2	2	3	3
2	Cross bar	2	2	2	2	2	2	4	4
3	Side bar	2	2	2	2	2	2	3	3
4	Foot pad	4	4	4	4	4	4	6	6
5	Screw bag	1	1	1	1	1	1	1	1



3.2 Fix the Frames and Manifold Box:



3.3 Fix solar collector on your sloping roof

3.3.1 Sloping roof

If your roof is sloping, mounting straps will be a useful accessory. You can buy it from us. Or if you can made it by the similar shape or function, it's also ok but please make sure it is strong enough. Our mounting straps are made of SUS304, thickness 1mm.



Fig 3.8

Dimension of mounting straps

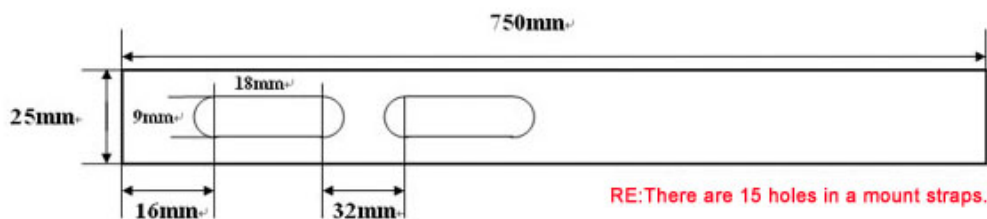


Fig 3.9

Installation steps:

- Select a suitable location on the roof for the collector. In the northern hemisphere, the collector should face due south, at an angle to the ground equal to the latitude. For example, latitude of 49 degrees would use a collector angle of about 49 degrees, plus 10 degrees to give best heating in winter.
- Put solar collector on the roof to choose some points to fix screws. These screws is used to fix the mount straps on the roof. Remove roof tiles at the corners of an area large enough to fit the collector.
- Bend mounting straps according to the height of tiles and the location of long-round hole on vertical. Make the bended mounting straps through the gap of two tiles, and fix it on roof by screws. The fix all mounting straps in this way. After that, put solar collector on the roof and adjust the location so that you can fix vertical bar with the bended mount straps by screws. Fix solar collector on mounting straps. (Fig 3.10~3.13).

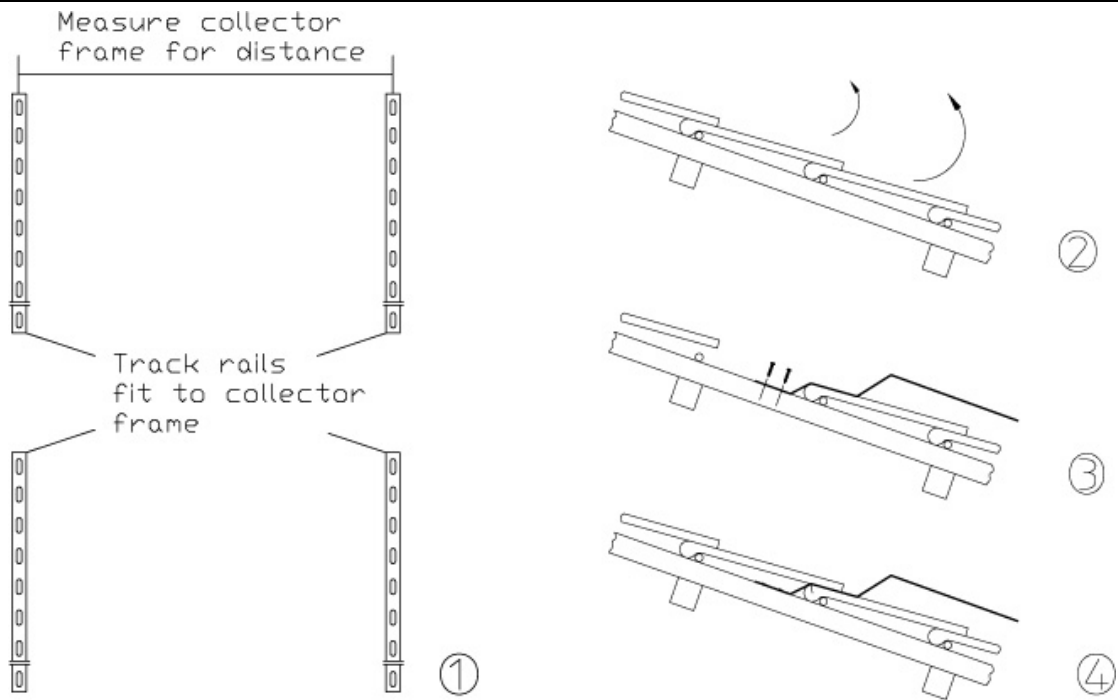


Fig 3.10

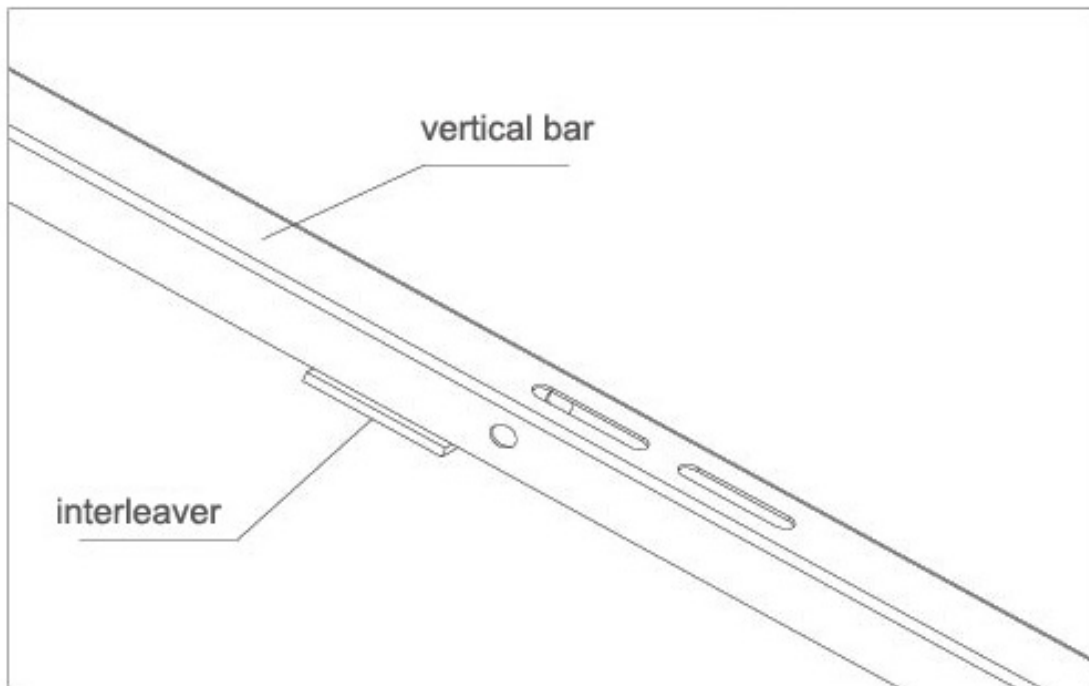


Fig 3.11

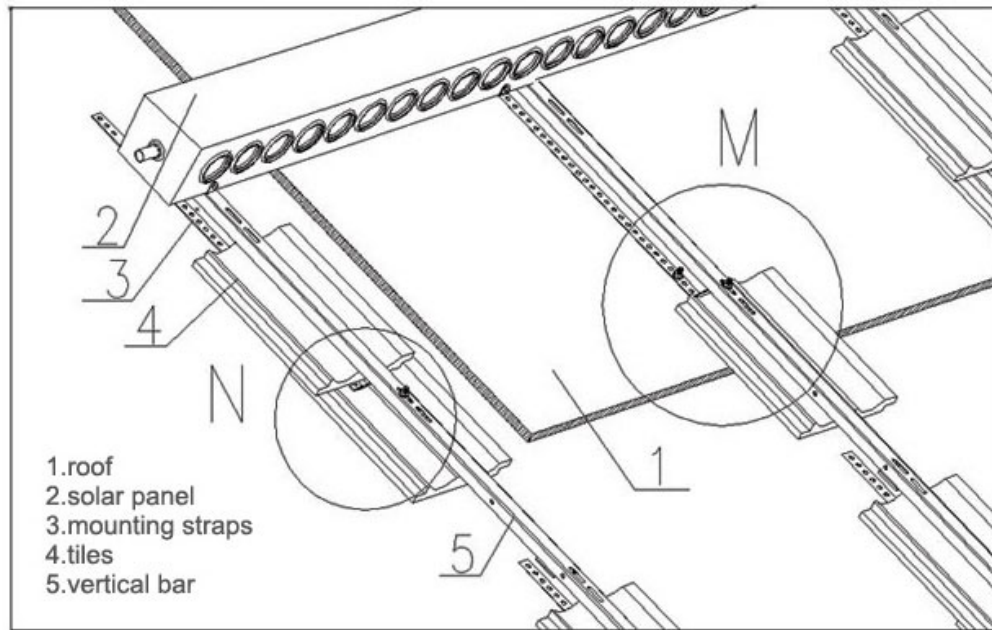
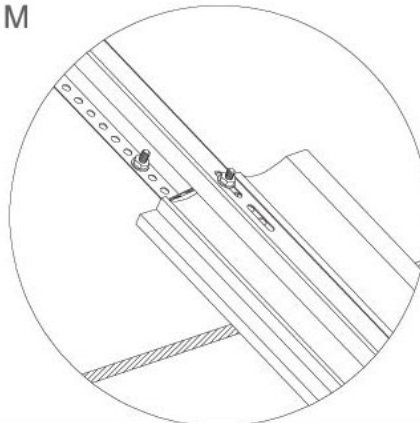


Fig 3.12

big picture for point M



big picture for point N

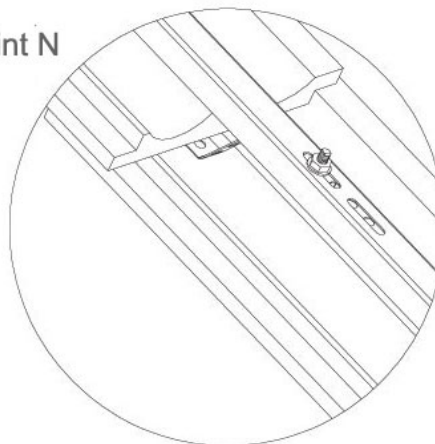


Fig 3.13

3.3.2 Flat roof

If your roof is flat, you will need a standing frame. Our standing frame is 40°. After install cross bar and connect the standing bar to vertical bar, the collector with standing frame is finished.





Fig 3.14

The fix the feet of collector on the roof after insert all tubes.

3.4 Install the tubes

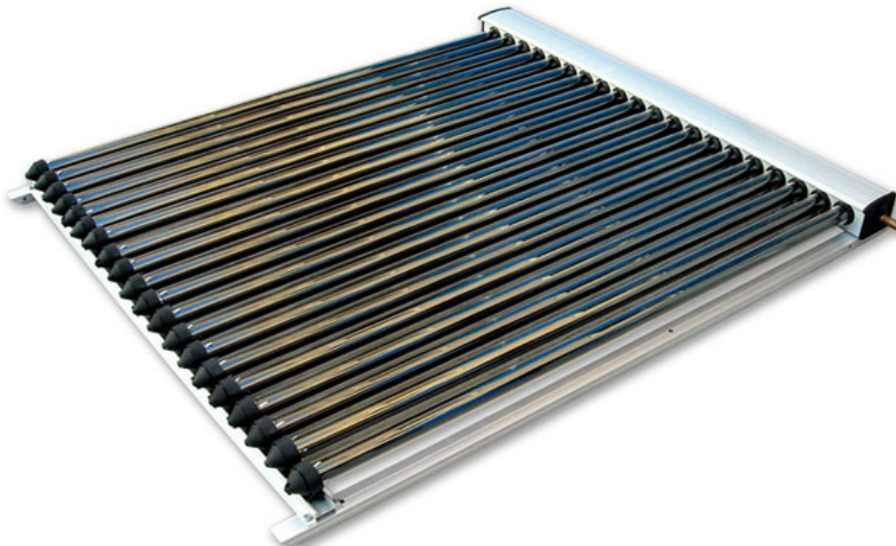
- Unscrew the black cups from the bottom rings and clip the rings on the bottom rail, spacing them out evenly.
- Place the silver end of the evacuated tube through the bottom ring, then slide the copper pipe (covered in the thermal paste) into the slot in the manifold. These can sometimes be a little stiff. Repeat until all your solar tubes are in place.
- Screw the black cup you removed back into it bottom rings, over the silver ends of the solar tubes until tight. This will hold all the tubes in place. See pics below for greater detail.





Fig 3.15

- d) Repeat above process to insert all the tubes. Check all screws and nuts, and make sure all of them are fixed well. Adjust the distance between two tubes and let all tubes to be vertical with manifold. After you finished all of these works, the collector looks like :



Warning:

If you assemble solar collectors under strong sunshine, or the ambient temperature is high, it's forbidden to touch the two copper pipes' ends by hand directly. Because once tubes are exposed under sunshine, they begin to work. The heat will be transferred to the top of heat pipes in seconds. Therefore, the two ends of copper pipes are very hot after you finished the assembly. Touch it directly will scald skin! You also can cover a blanket to tubes to avoid it.



Fig 3.16

Suggestions:

1. The assembly process is best to be finished at in the shade.
2. If the process has to be finished under sunshine, you can cover the inserted tubes by black cloth etc.

4. Lightning protection

The collectors 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 collectors. For any problems that involve plumbing or electrical connections the services of a qualified professional must be employed.

5. How to connect couple of collectors?

We suggest you use the corrugated connection pipe to connect every two solar collectors, which is very convenient and completely fit two solar collectors. Please see the following picture.

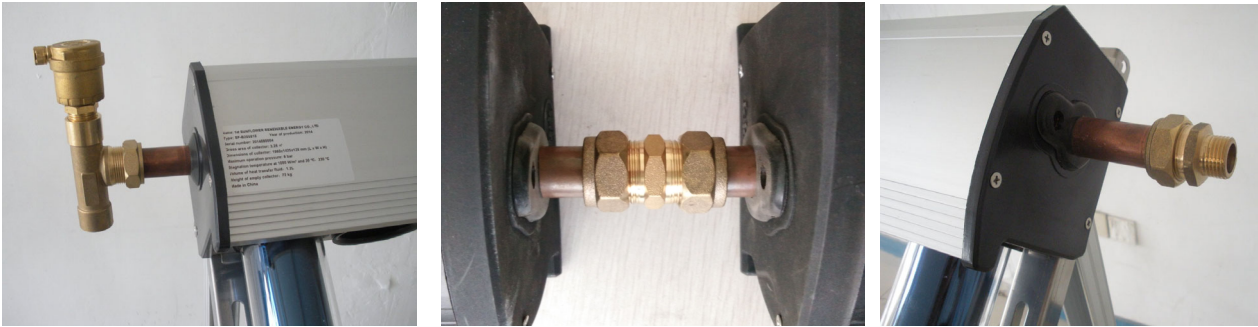


Fig 5.1

6. Connection of the collector field to the heat transfer circuit

There're many kinds of heat transfer circulation requirements in actual installation. Anyway, the following drawing shows the basic situation.

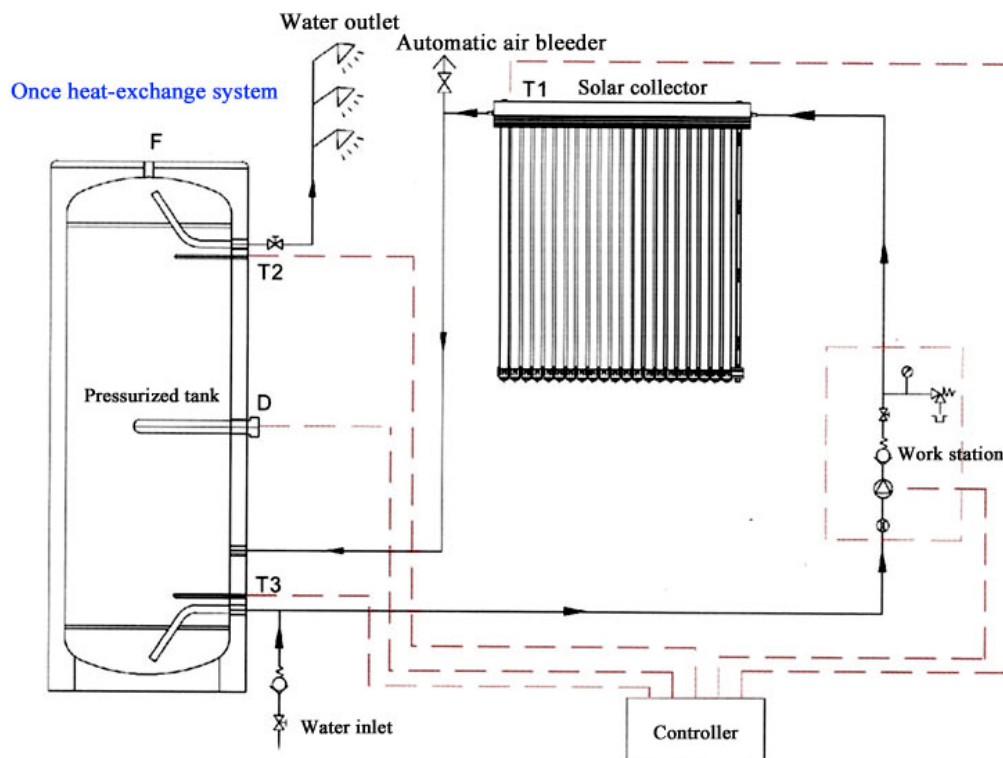


Fig 6.1



Twice heat-exchange system (Single copper coil)

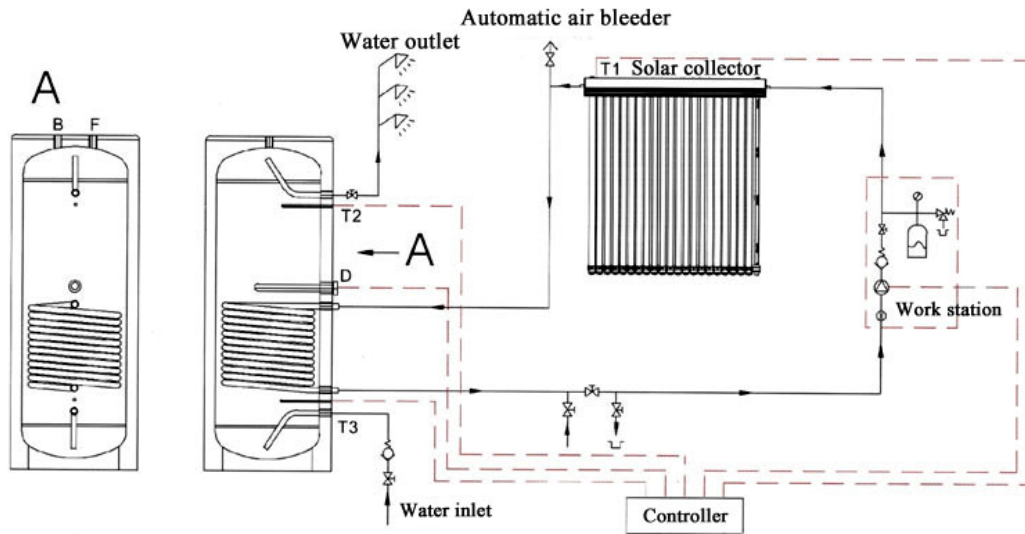
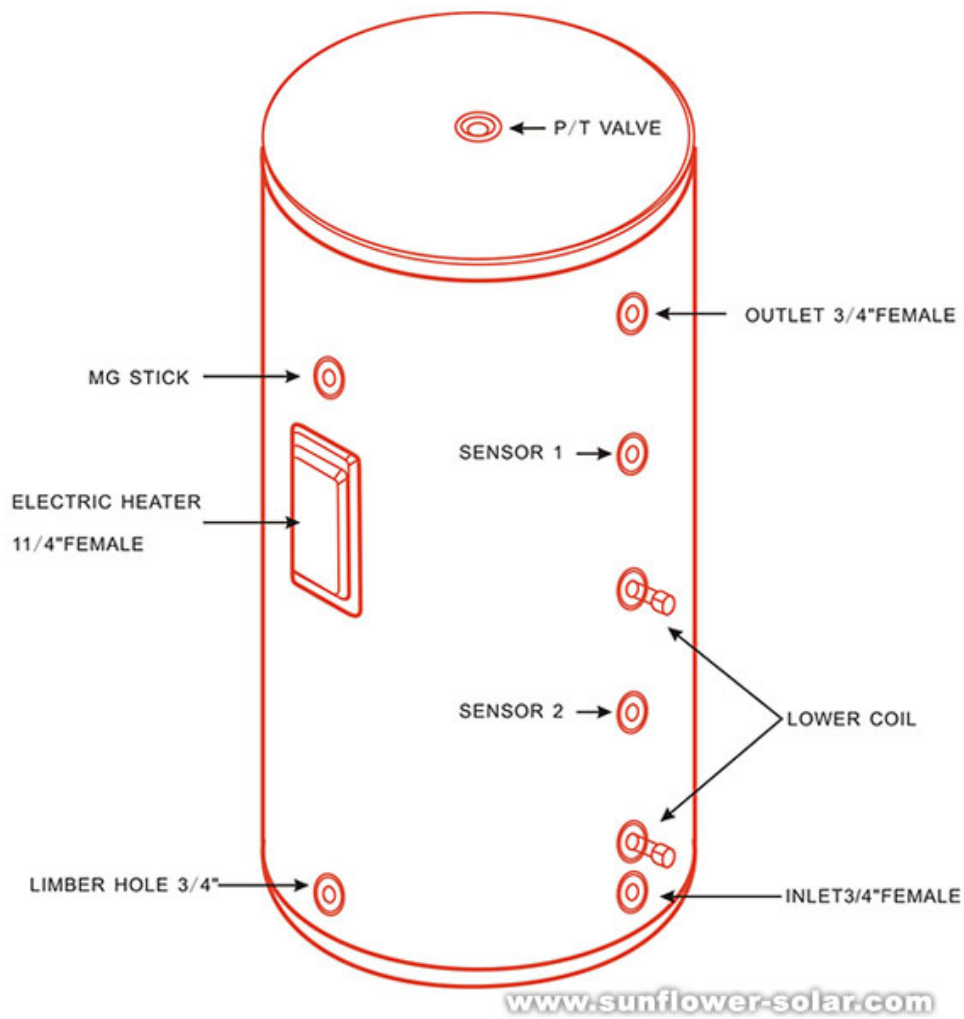


Fig 6.2





Twice heat-exchange system (Double copper coil)

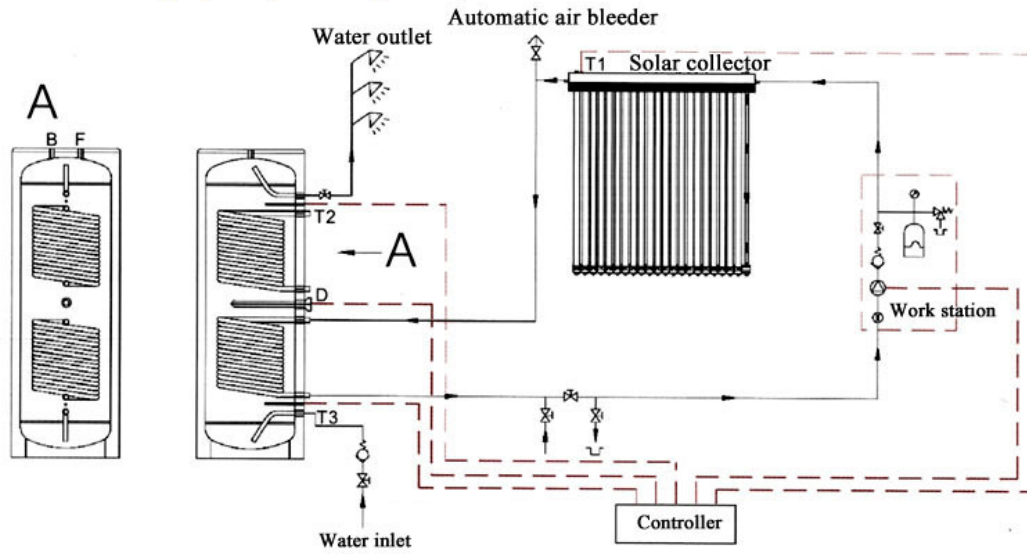
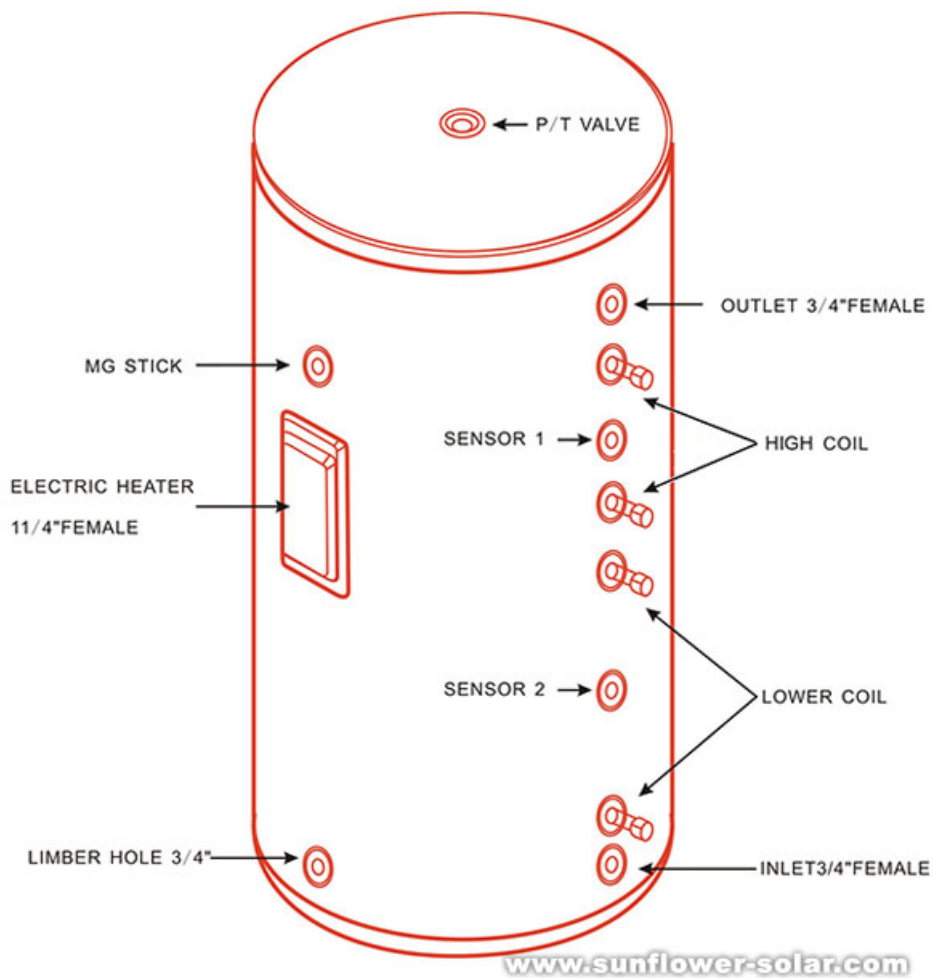


Fig 6.3





01 INLET.JPG



02 OUT LET.JPG



03 PT VALVE.JPG



04 MG STICK.JPG



05 SENSOR.JPG



06 OUTFALL.JPG



07 CYCLE INLET.JPG



08 CYCLE OUTLET.JPG

7. Dimensions of pipe connections

- For solar collector arrays up to 20m², please use DN15 pipe for installation
- For solar collector arrays from 20m² to 50m², please use DN20 pipe for installation.

8. Heat Transfer Media

Any kind of liquid may be heated by the heat exchanger. In areas where chloride ion concentration is greater than 40 ppm a heat exchanger must be used in hot water storage tank. The solar system should be filled with distilled or de-chlorinated water, or another clean fluid such as glycol.

9. Precautions

Note: In order to avoid jamming the digital flow meter and in result to display no flow on solar station, the filter (A) must be installed on the return and flow pipeline of solar station.

All devices connected to the controller must conform to the technical specification of the controller. Assembly, Installation and maintenance work may only be performed by properly qualified and authorized personnel with a generally recognized qualification.

The solar station must be installed indoors, prior to installation, remove sealing caps from solar station.

The maximum distance between solar station and water tank is 300mm, keep top edges of solar station and top edges of storage tank.

Pre-setting, installing and adjusting the expansion tank as per the installation and operation instruction for "expansion tank ", the corrugated connection pipe for the expansion tank does not need thermal insulation.

Safety valve: Risk of scalding from hot steam with discharge from the safety valve due to heating and excess pressure in the hydraulic pipes. Drain off discharge from the safety valve using a copper pipe correctly and in an eco-friendly way, according to valid technical regulations and load codes, do not allow solar fluid to leak into the environment.

Be careful of scald from hot fluid. Maximum temperature of collectors during filling/leak check or installation/maintenance work should be below 70°C, allow collectors to cool down if necessary.

10. Max. working pressure

Regardless of the installation configuration, pressure release values, expansion vessels and/or other pressure control devices must be installed. The solar loop should be designed to operate

at no more than 800kPa (PRV may be 850kPa). (800kPa = 8bar = 116psi) For installation where mains pressure water is used, the system should ideally be designed to operate at a pressure of <500kPa, achieved by use of a pressure limiting/reduction valve.

11. Pressure Drop

$\Delta p = 0.2 \text{ Kpa}$

12. 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 $\pm 10^\circ$ 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.

13. 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 120km/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.

14. Maintenance Requirements

14.1 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.

14.2 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)

14.3 Broken Tube

If a tube is broken it should be replaced as soon as possible to maintain maximum collector performance. The system will still operate normally even with a tube broken. Any broken glass should be cleared away to prevent injury.

The steps to replace broken tubes please refer to *SFVB TUBE ASSEMBLE MANUAL*.