
# SPLIT SOLAR WATER HEATER

# ( YYJ-S01 SERIES )

# INSTALLATION MANUAL

DIN Geprüft

TÜVRheinland®
Precisely Right.

CE

ISO9001

# Thanks for choosing EJAI SOLAR product

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# 1. Important Information

## 1.1 Local Standards

Installation must be completed in accordance with the relevant local standards and regulations.

## 1.2 Qualified Installer

Installation must be completed by qualified plumbing professionals.

## 1.3 Pressure and Temperature Control and Relief

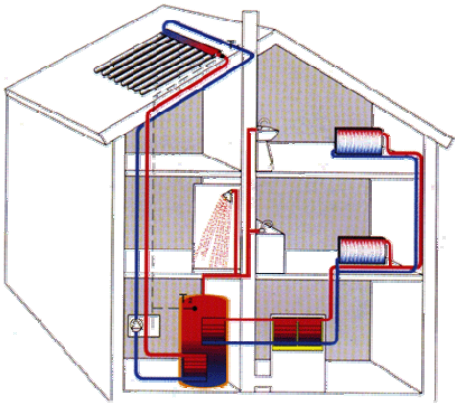
Solar loop should be designed for normal operaton at ＜600kpa via use of a pressure limiting (pressure reduction) valve on the mains cold supply line. System design must provide mean for allowing pressure release at no more than 800kpa (113psi) and hot water dumping from the solar loop or storage tank once the temperature reaches 99℃ (210℉). It is recommended that the lever on the pressure and temperature relief valve (PTRV) be checked once every 6 months to ensure reliable operation. It is important to raise and lower the lever gently.

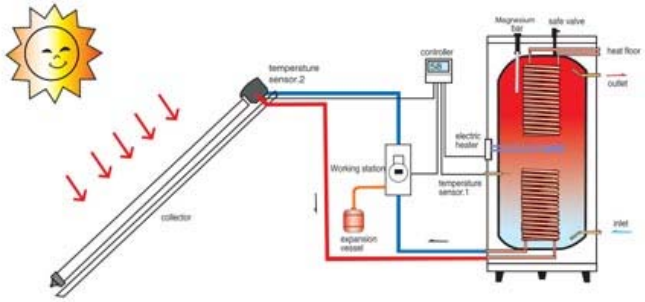
## 1.4 Hail Resistance

The glass evacuated tubes are surprisingly strong and able to handle significant impact stresses once installed. Testing and impact stress modeling proves that the tubes are able to withstand impact from hail up to 25mm/1'' in diameter when installed at angle of 40'' or greater. The ability of the evacuated tubes to withstand impact from hail is greater influenced by the angle of impact and so instanlling the collectors at low angles do reduce their impact resistance. However, even when laying flat, impact by hail up to 20mm/3/4'' in size will not cause breakage.
It is recommended that in areas prone to large hail (＞20mm 3/4'' the solar collector should be installed at an angle of 40'' or greater to provide optimum protection. As many resident areas in the world fall within the latitude of +30-70°this angle is generally a common installation one.

## 1.5 System Design and Installation

Please read all installation instruction carefully before starting system design or installation. The system configuration may need to be customized to suit the specific requirements of the installation. Please ensure that any system designs to be suitable for certain installation.





## 2. Unpack and inspection

### 2.1. Tube Inspection

Open the tube carton which contains the evacuated tubes with heat pipes to check and make sure the evacuated tubes are all intact and the bottom of each tube is still in silver color. Do not expose the tubes to sunlight until installed otherwise the inner tube and heat transfer fin will become very hot. The outer glass surface will not become hot.

### 2.2 Frame Inspection

Unpack the carton which packed with frame kit and manifold. If a flat roof frame or tile roof frame is being used those componenst is packed separately in the same carton. It might be necessary to purchase bolts or other fasteners to suit the installation surface.

### 2.3 Tank Inspection (This item only happen if you buy full system from us)

Open the tank carton which contains tank to make sure there is no visible damage

### 2.4 Working station Inspection (This item only happen if you buy full system from us)

Open the carton which contains working station to check the pressure gauge and controller. It must be intact.

## 3. Plumbing

### 3.1 Plumbing Connection

Once the frame has been mounted and the manifold has been attached to the frame then the manifold header can be connected to the plumbing system.

### 3.2 Choice of Piping Material

12mm OD and 15 OD copper copper piping is generally used for most solar collector installations. As the flow rate is slow so large diameter pipe is unnecessary and will only increase system costs and heat loss. Ejai solar collectors come standard with two flexible SS pipes (not in all market). They are designed for connection to the manifold as they are easy to bend and pass through the roof. The end of the flexible pipe is either 1/2'' for 3/4 BSP thread and so can accept standard male BSP thread fittings for connection to copper pipe.

### 3.3 Pressure Levels

Regardless of installation configuration, pressure release value,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 maybe 850 Kpa). (800Kpa = 8 bar = 116psi). For installation where mains pressure water is used the system should ideally be designed to operate at a pressure of ＜600kPA achieved by use of pressure limitation/reduction value.

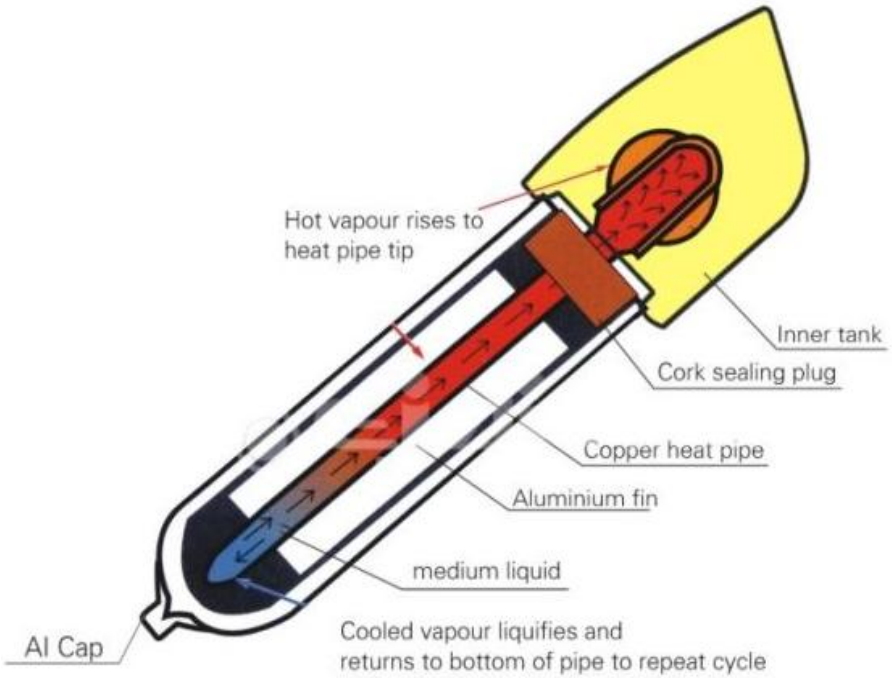
### 3.4 Temperature Sensor Insertion

The solar controller's temperature sensor should be coated with a thick layer of thermal paste and inserted into the sensor port to the full depth. If the fit is too loose, slide a piece of copper plate or wire in beside the sensor, seal the sensor port opeining with silicone sealant to prevent water ingress. Ensure that sensors used on the collector are high temperature rated (up to 250℃/486℉) in particular the cable.

## 4. Stagnation and Overheating

Stagnation refers to the condition that occures when the pump stops running due to pump failure, power blackout, or as a result of a high tank temperature protection feature build into the controller,which turns the pump off. If a PTRV is installed on the collector, steam will form in the header. Eventually some steam may feed back to the storage tank via the return line. The PTRV on the tank will open to release pressure or heat as required. Under such conditions the manfold will normally reach a maximum temperature of around 230 ℃ /446℉. Generally the heat returning from the collector in the form of steam is not enough to affect a continued increase in tank temperature (ie.Heat input <tank heat losses). Under normal use stagnation should rarely occur as a result of pump stoppage,since power blackouts normally happen during storms and not clear sunny weather. High tan ktemperature protection should only occure when hot water is not used for several days(when on holiday), and only during strong periods of sunlight(summer). If leaving the house for a extended period of time (more than 2-3 days) it is advisable to cover the collector panel or design the system with a heat dissipation device or alternative use for the heat. Thus preventing overheating of the system and collector stagnation. Stagnation of the solar collector will NOT damage the solar collector,however insulation used on the piping close to the manifold inlet and outlet should be able to withstand temperature of up to 230℃ /446 ℉(Eg. Glass wool or mineral wool – with an exterior wrap of aluminum foil thus protection against the elements.)

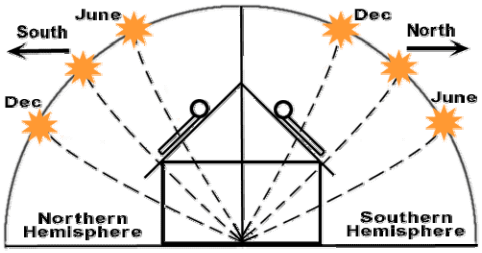
## 5. Working principle of heat pipe vacuum tube solar collector




The Heat pipe series solar collector are always connected with exisiting heating supply device. The selective coating on the inner cover of the evacuated tubes converts solar energy into heat energy and transfers heat to the heat pipes by aluminum fins. The liquid inside of the heat pipe changes into vapour which rises to the condenser. The heat ehn passes through the heat exchanger and the vapour becomes liquid returning to the base of the heat pipe. The het conducts to the heat transfer liquid ( anti-freezing liquid or water ) via a copper pipe. This transference of heat into the liquid creates a continuous circulation as long as the collecto is heated by the sun.

# 6. Collector installation

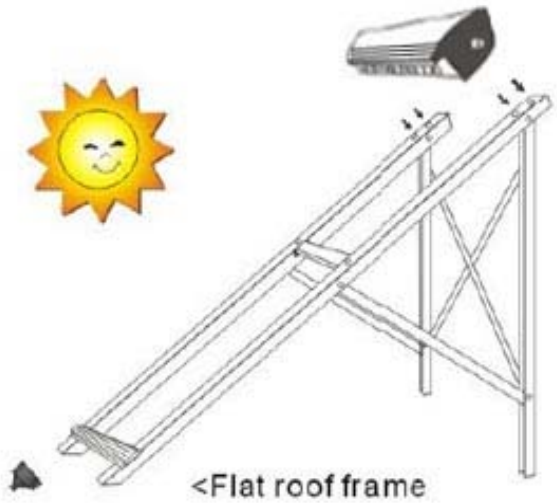
## 6.1 Installation Direction of collector



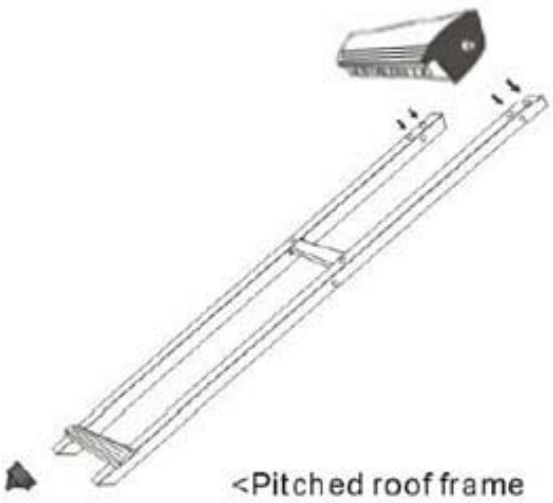

The Collector should be installed to face the equator.To install the collector in the correct direction with right angle ensures the heat output of the collector. And a deviation of 10° is acceptable.

## 6.2 Installation Angle of Collector

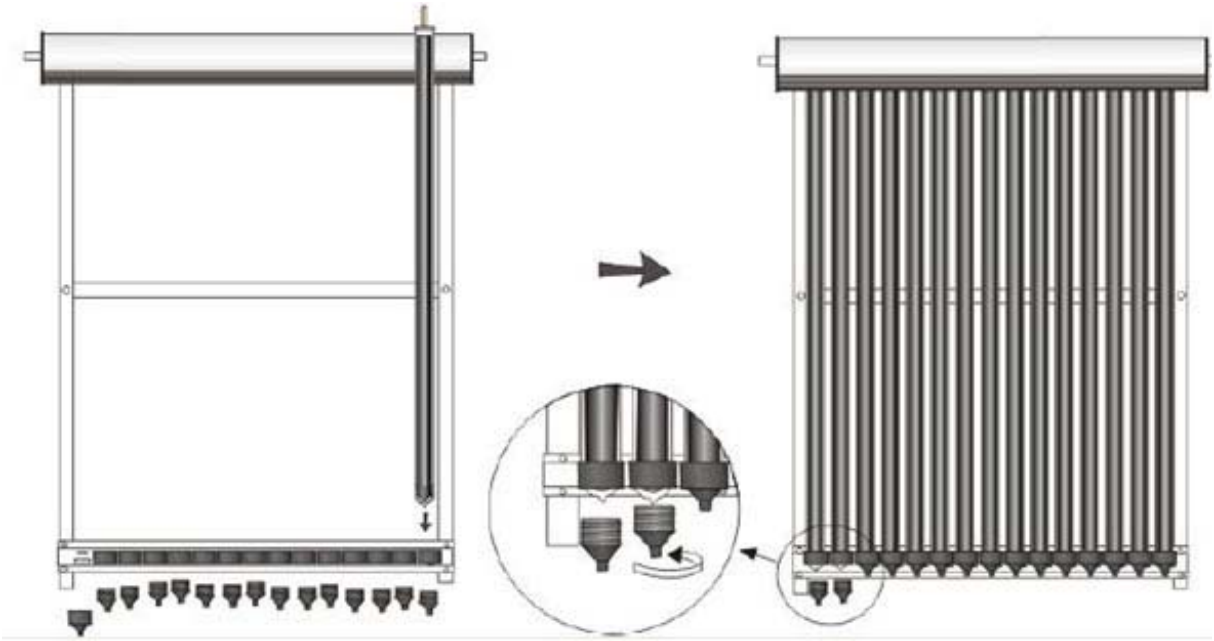
It is recommended to install the collector at an angle that corresponds to the latitude of the location. Installing at an angle less than 30° is not recommended. Because the heat pipe works best between the degree of 30°-70°. According to this an angle of latitude +/- 10° is acceptable. An angle beyond this scope will decrease the output of the heat. The following is the pictures for installation.

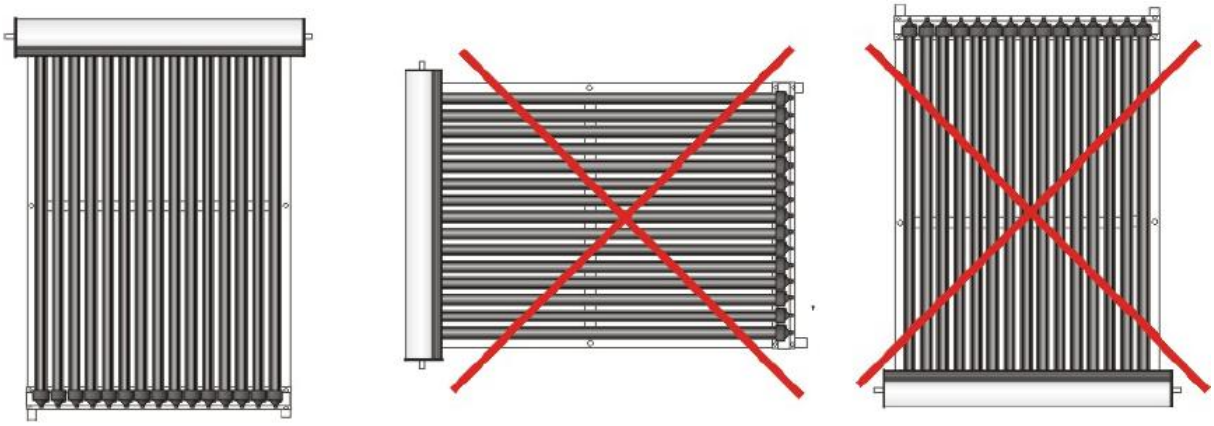


<Flat roof frame



<Pitched roof frame





## 6.3 Installation Steps:

**STEP1:** Install the tailed support on the tailed track and then screw off the cap from the tailed support.

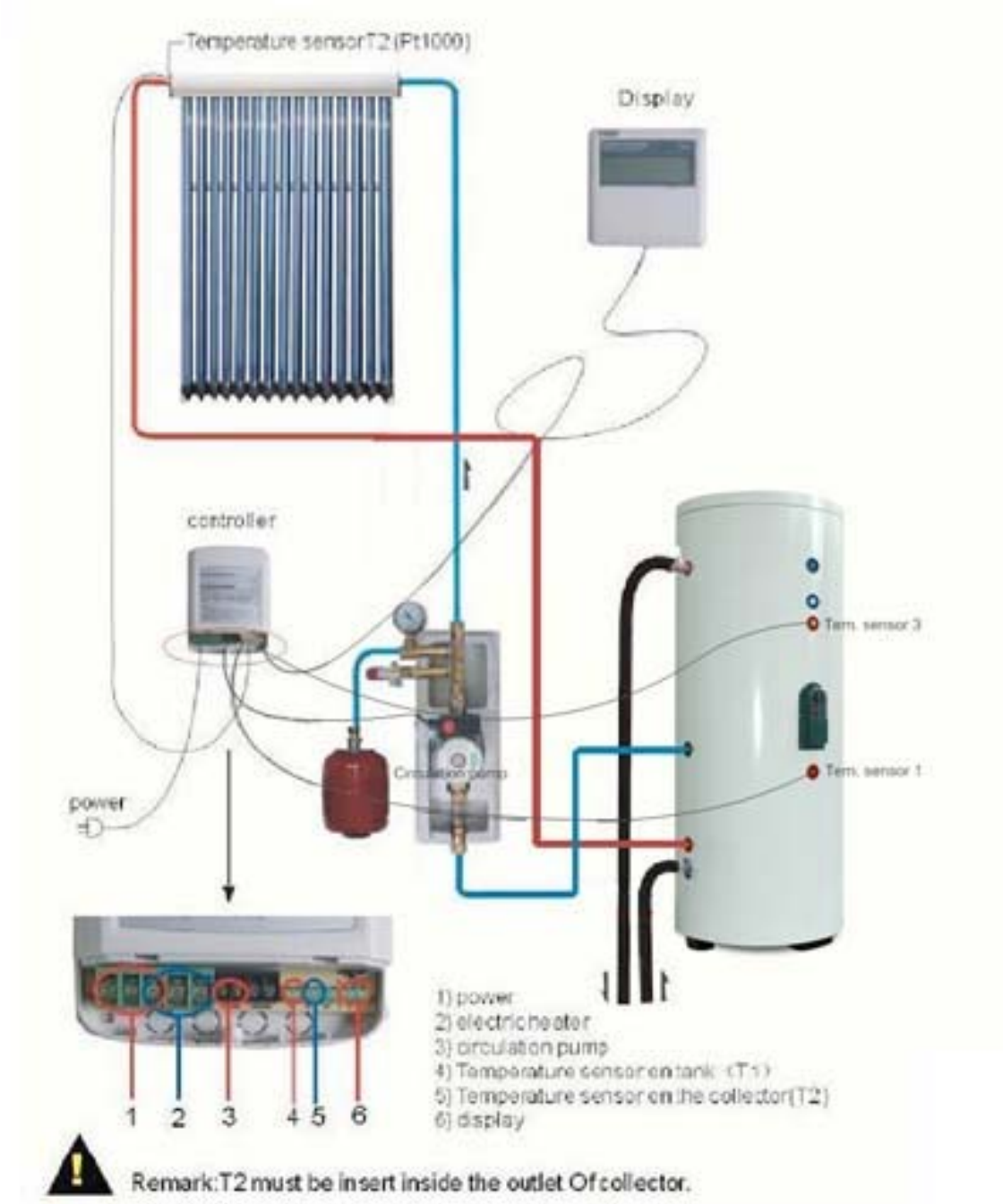
**STEP2:** Put the Anti-dust rubber ring on thevacuum tube (lubricate the vacuum tube by mild dish washing liquid or water would be much easier when put the Anti-dust rubber ring on the vacuum tube). Coat the condenser end with heat paste grase.

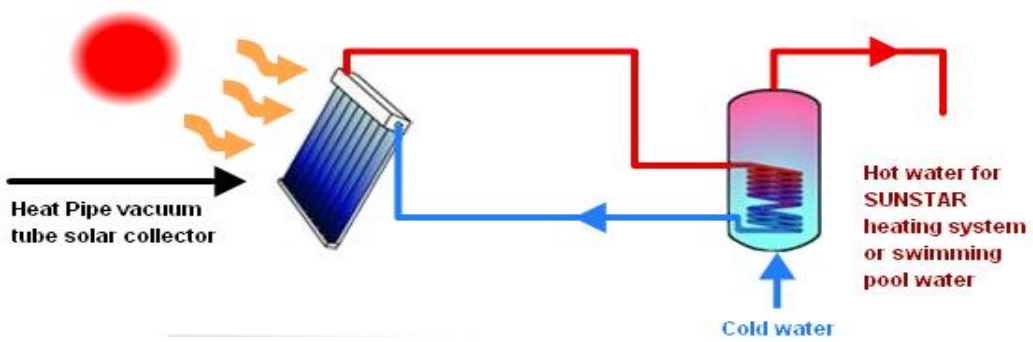
**STEP3:** Insert the vacuum tube into the tailed support. Please be careful and do not let the vacuum tube on the ground otherwise it might be broken.

**STEP4:** Insert the vacuum tube into the manifold.

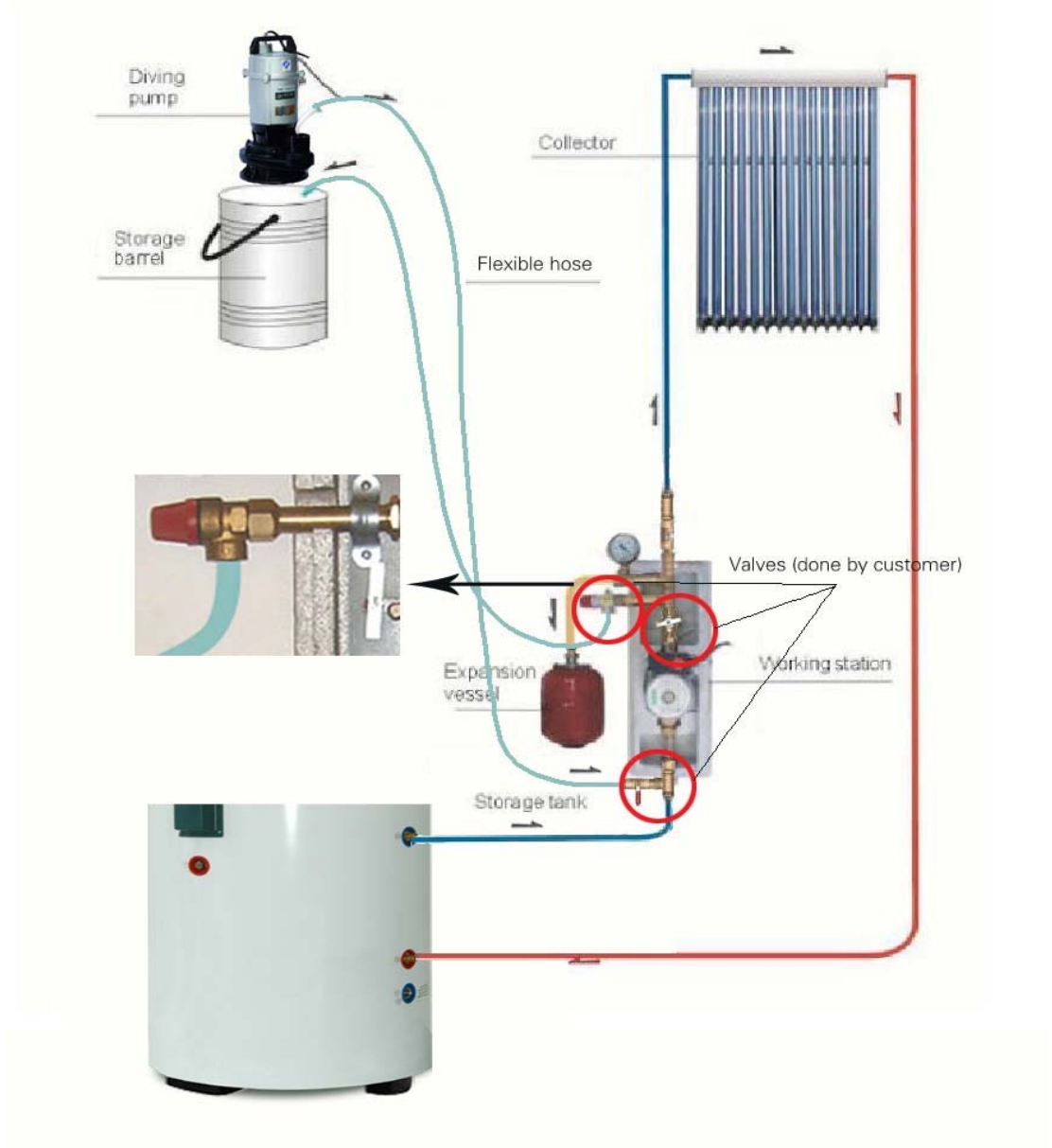
**STEP5:** Screw the jacket on the tailed support.

## 7. Circuit Installation Illustration



## 8. Liquid filling illustration




Medium Liquid = 56% Pure water + 44%Original Anti-freezing Liquid

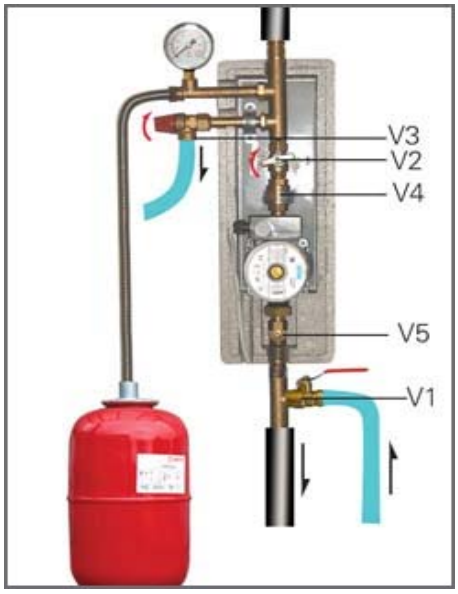
Pure water :56%

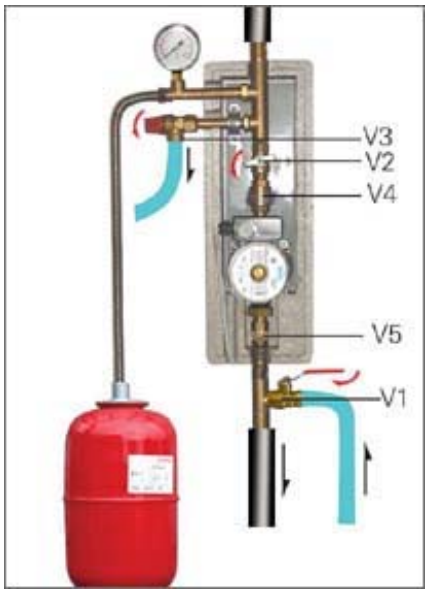
Diving Pump

Using diving pump filling medium liquid

Original anti-freezing liquid:44% + 56% pure water

## 8.1 Liquid filling Steps :



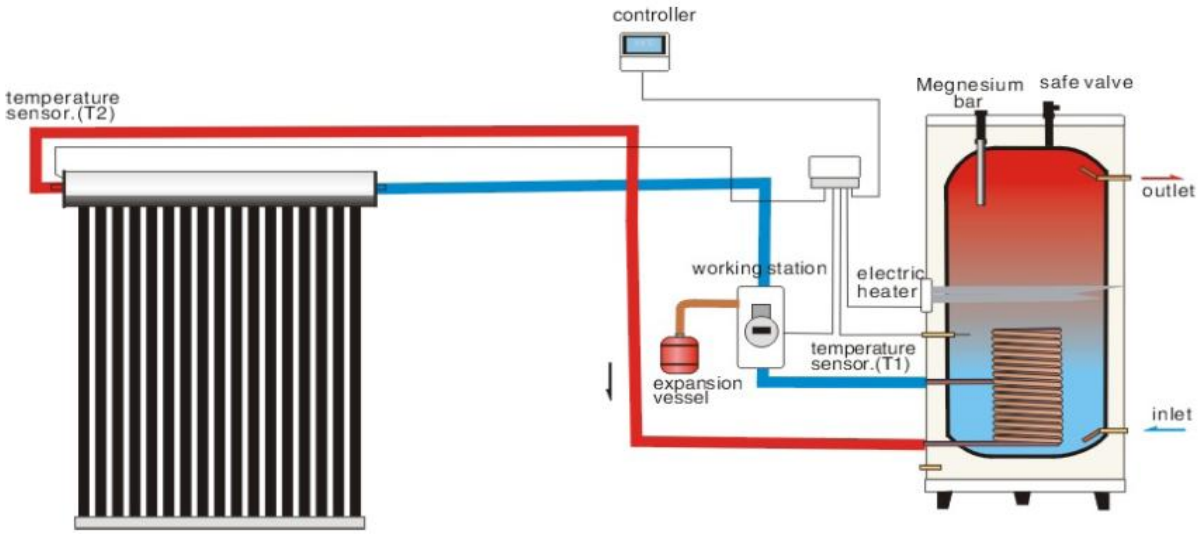

**STEP1**: Open V1, V3 , close V2 and then start the diving pump to filling the medium liquid from V1 until the liquid flow out from V2 . Let the circulation last for 1 minute until exhaust all the air from the pipeline.

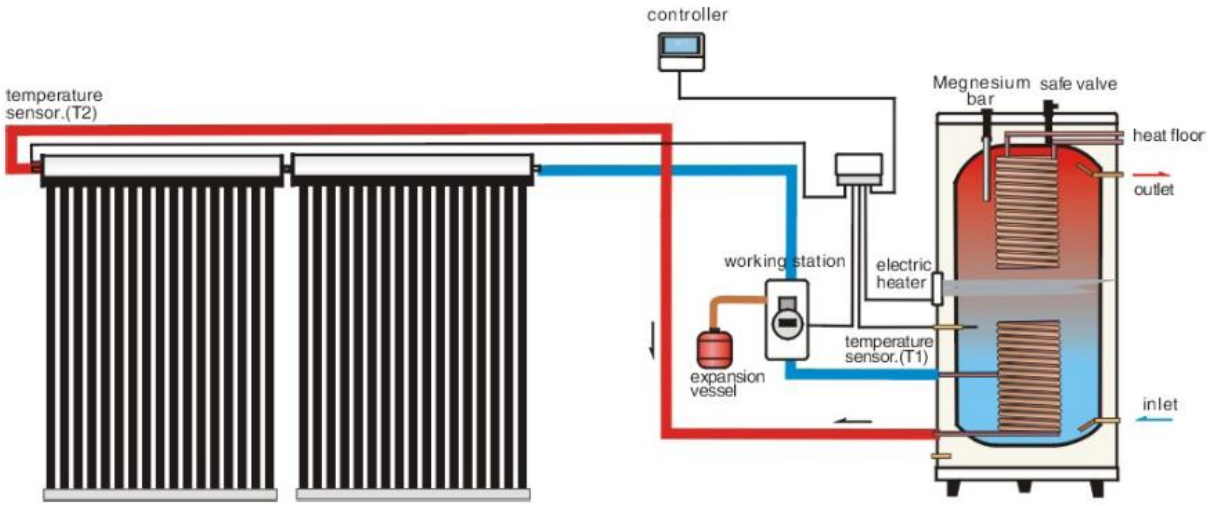
**STEP2:** Close V3 and Open V2

**STEP3:** Continue to filling the medium liquid from V1 until the pressure gauge shows the pressure to 2 bars or 3 bars and then close V1 and take off the diving pump.

**STEP4:** Starting the system check the flowing meter (V5) to see if there is any air inside the pipeline. If there is air inside the pipeline then loosen (for 1-2 circles) the switch (located in the middle of the pump) in anti-clockwise direction. After all the air in the pipeline is exhausted tight the switch.

## 9. Illustration for the full system






## 10. Water tank Location:

The water storage tank should be placed as close as possible to the collector to avoid long pipe connections (considering the heat loss through the pipe).

## 11 Insulation of the pipe

The pipes running to and from the collector are recommended to be heavily insulated. And regular checking of this insulation material (foam or other related material) is necessary. Here we recommended to use UV stabilized foam (or metallic wrap) as insulated material. The following is an example of the insulated pipe by foam .