



SunMaxx Solar

Solar Hot Water Systems

Flat Plate Solar Collector Installation, Operation & Maintenance Manual

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1. Safety Instructions

1.1 Installation & Transportation

Solar Collectors must be secured during transportation. It is imperative that each collector be secured from falling out of the packaging, and that they be secured from scratching each other, as this may damage the collectors and lessen their performance. You should always follow these simple precautions:

- Use of a carryin strap is recommended
- Do not lift the collector by the connection ports or header tube
- Avoid impacts and vibration on the collector as much as possible
- Please lift the collector by the lifting lugs (if included)

1.2 On Roof Operation

Please follow these safety and operational guidelines when installing SunMaxx FP Flat Plate Solar Collectors:

- Included Mounting Hardware is intended for flush mount installations only
- Additional Mounting Hardware will be necessary for low-pitch and tilt mount installations
- Remember that you will be penetrating the existing roof and/or roof covering
- Every precaution should be taken to ensure the protection of the entire installation crew
- You should familiarize yourself with local laws and regulations before beginning your installation

* Additional cautionary note: you should not fill your SunMaxx Flat Plate Solar Collectors when the sun is out, as scalding can occur from steam being released from the system. If, however, you must fill the collectors while the sun is out, please cover the them.

1.3 Lightning Protection

SunMaxx-FP Flat Plate Solar Collectors should be electrically connected to each other, and to the building's earth ground. An authorized lightning specialist should be consulted to examine the installation and installation site.

2. Installation

2.1 Preparation for Installation

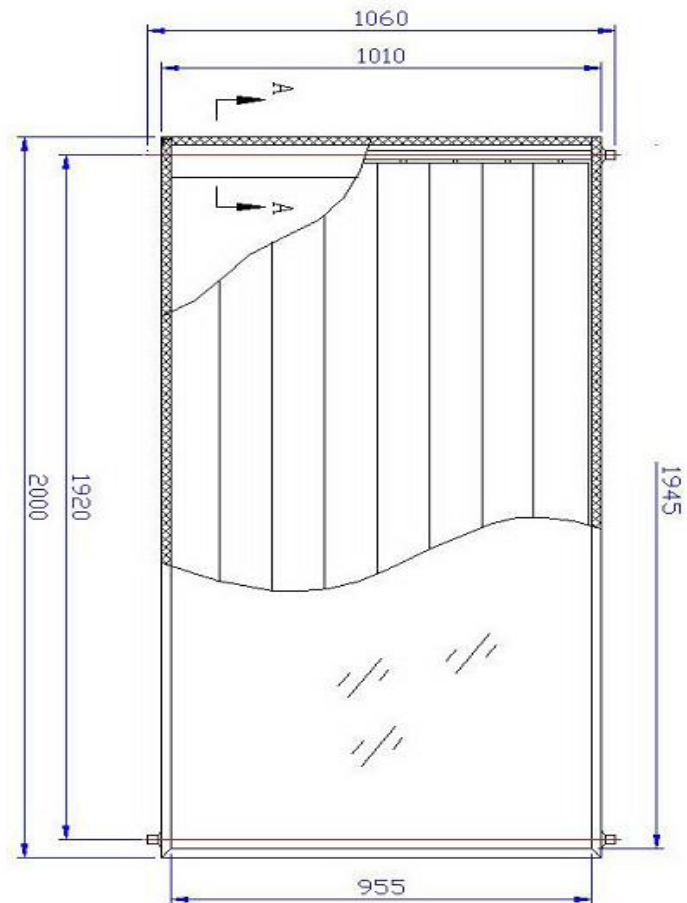
You should store your SunMaxx Flat Plate Solar Collectors in a warm, dry place prior to installation. You should also ensure that the storage area is free from exposure to sunlight exposure, or you could burn out the collectors while they are inactive.

Your installation will require the following tools:

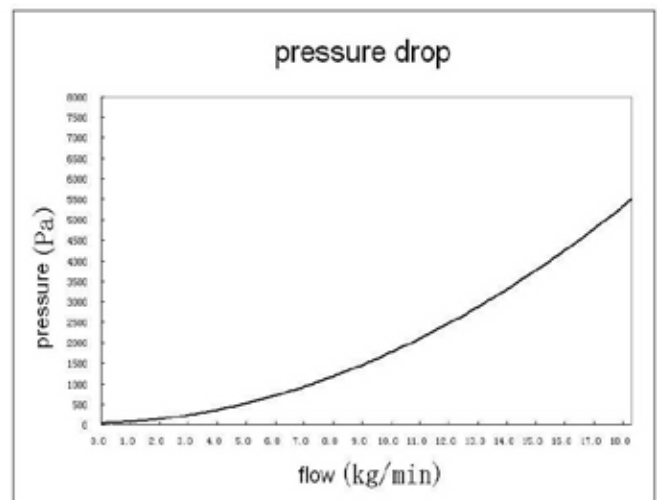
- Power Drill (cordless)
- Spanner(s)
- Screwdrivers
- Wrenches/sockets
- Standard Plumbing Tools

2.2 Collector Specifications & Diagram

Dimensions (in)	39.76 x 78.74 x 3.74
Gross Area	21.74 sq ft
Aperture Area	20.13 sq ft
Absorber Area	19.27 sq ft
Empty Weight	79.37 lbs
Filled Weight	82.90 lbs
Header Tube Diameter	.867 in
Maximum Pressure	1.0 MPa
Proper Collector Angle	15 to 75 degrees
Suggested Flow Rate	0.005 - 0.010 G/s
Optimum Flow Rate	0.0095 G/s
Pressure Drop	See Chart at Right



pressure drop:
 flow: 3.6 g/min
 ΔP : 31 Pa
 fluid: water
 temperature: 25 °C

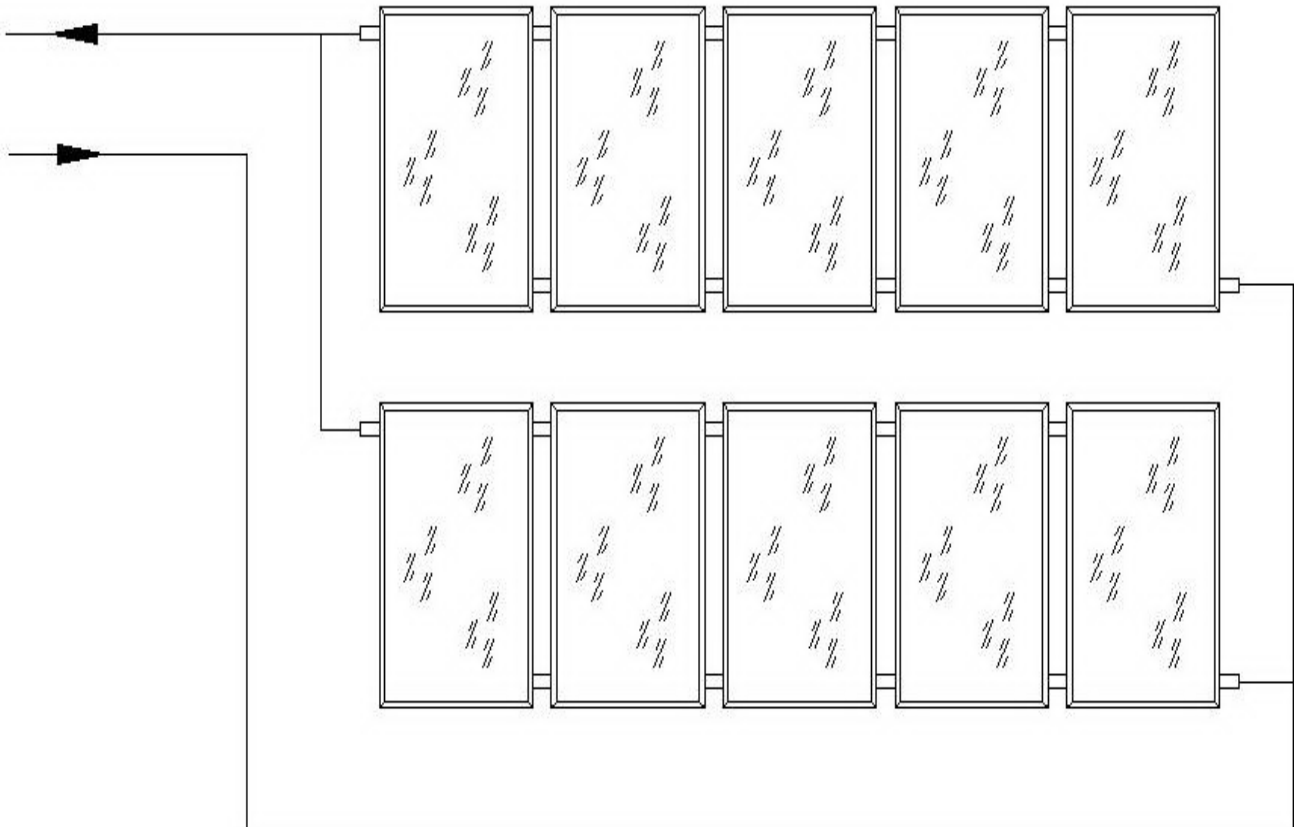


2.3 Collector Array Layout & Design

The illustration below shows how to layout SunMaxx Flat Plate Solar Collectors for proper installation.

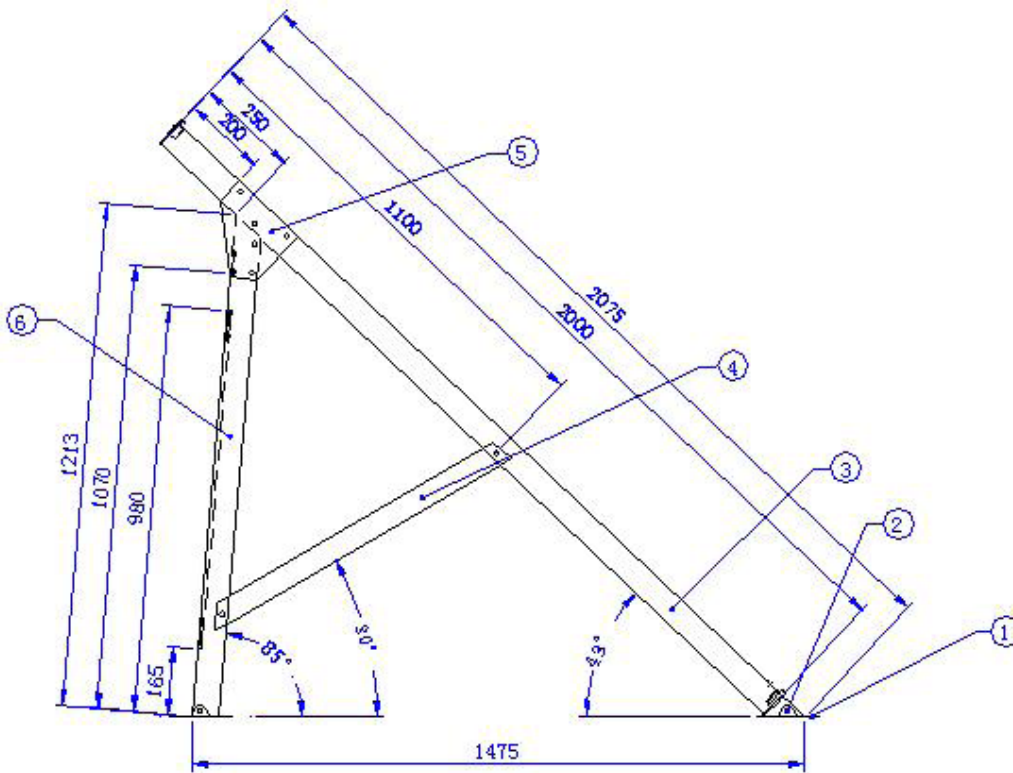
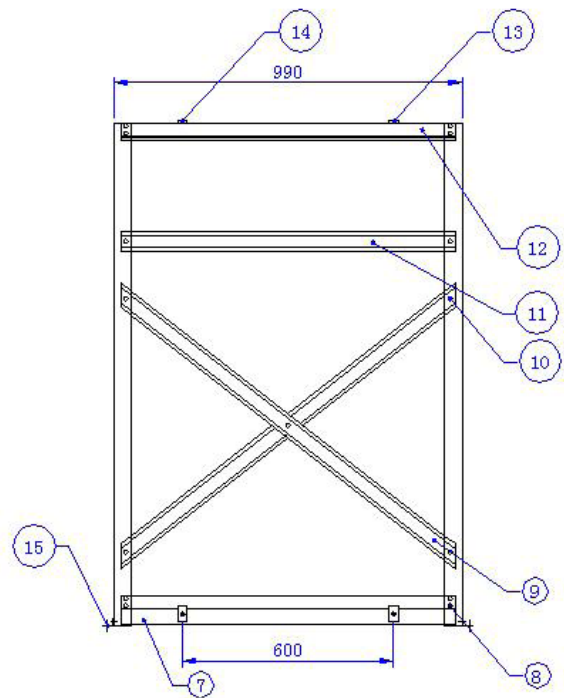
Please use the following guidelines when designing and installing your solar collector array:

- Collectors must be laid vertical
- Header area **MUST** be at the top of the collector
- A maximum of six (6) solar collectors may be connected in series
 - * If groups in parallel contain different numbers of collectors, pressure loss may occur
- If pressure loss occurs, or if collectors must be arranged in groups of different numbers, a professional system designer should be consulted.



2.4 Mounting Hardware

01. Legs	09. Side Pole
02. Screw	10. Screw
03. Main Pole	11. Back Pole
04. Side Pole	12. Upper Pole
05. Connecting Plate	13. "L" Console
06. Back Pole	14. Screw
07. Lower Pole	15. Expansion Screw
08. Screw	



2.5 Planning for Installation

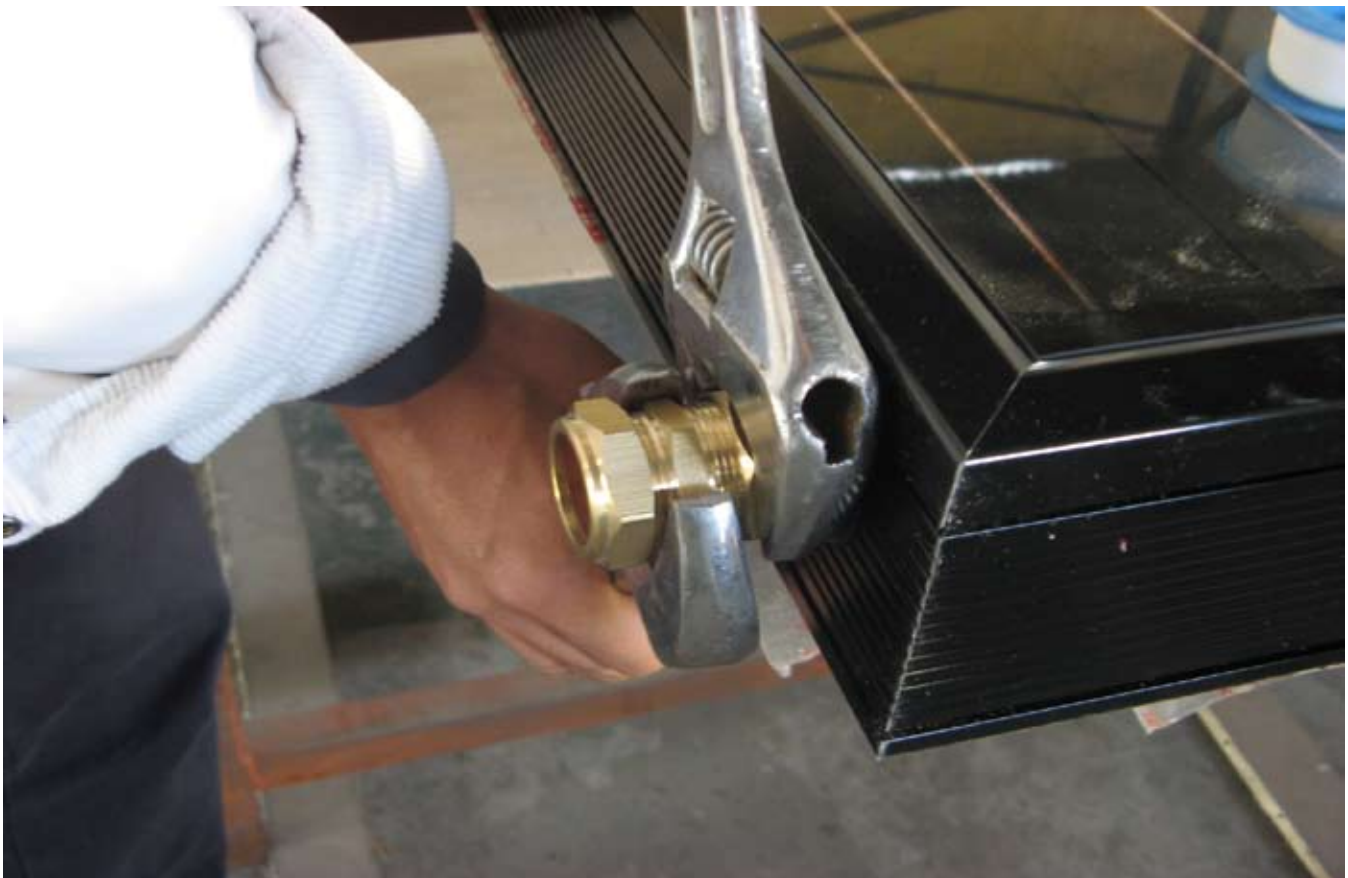
Before installing your SunMaxx Flat Plate Solar Collectors, you should familiarize yourself with the collector, mounting hardware, roof condition and local ordinances and regulations regarding the installation of solar thermal systems. Additionally, you should pay extra attention to the following concerns:

- Check the load carrying capacity of the roof
 - Ensure that the roof can handle the weight load of the solar collector(s)
 - Take into account the local snow and wind loads that are likely to impact the solar collector(s)
- Check Roof Structure
 - Ensure that there is adequate roof space for solar collectors
 - Ensure that the roof coverings and under structure can handle the penetrations needed for installation
 - Always seal your roof penetrations to protect against snow, rain, and any leakage

3. Operational Notes

3.1 Connecting the Solar Collectors

Avoid applying extra torque to the Header as you install the connectors. Always use a spanner to fix the header and then install the connectors.



3.2 Circulator Fluid

The fluid that circulates through your solar collectors is known as the HTF or Heat Transfer Fluid. Your HTF can be either water (potable water in an open loop system) or a water-glycol solution. A water glycol solution can protect flat plates from freezing in temperatures far below zero if need be.

SunMaxx recommends DOW Frost Glycol, though any food-grade propylene glycol will suffice. Use the chart below to determine the amount of glycol that should be used in your solar collector loop to provide adequate freeze and burst protection.

Percent (volume) Glycol Concentration Required

Temperature (F)	Freeze Protection	Burst Protection
20	18%	12%
10	29%	20%
0	36%	24%
-10	42%	28%
-20	46%	30%
-30	50%	33%
-40	54%	35%
-50	57%	35%
-60	60%	35%

3.3 Overheating

If your Solar Collector is stagnating for extended periods, you should cover the collector to prevent overheating and damage. Typically, a standard tarp or canvas boat cover will suffice for covering your solar collectors.

Additionally, if your system is sized to produce radiant heating in the winter time, and provides excess heat in the summer, it is recommended that a heat dissipation (dump) unit is installed in the system. The most common heat dump is to use the excess heat from your solar collectors to provide heating for a pool or hot tub. However, a standard heat dump can also be designed and installed on the system.

3.4 Operational Pressure

Your SunMaxx Flat Plate Solar Collector is designed to operate at a working pressure of 1.0 MPa (Maximum).

3.5 Insulating & Piping

In order to get the maximum efficiency out of your SunMaxx Solar Collector, and your entire solar hot water system, your exterior piping should be kept to a minimum, and what is there should be well insulated using pipe insulation and heat wrap.

Because of the high temperatures that can come out of the solar collector, it is recommended that all piping on the HOT side of your solar loop be copper (pex may burst under extreme temperatures).

3.6 Wind and Snow Load

The wind and snow loads for your location should be taken into account when installing your SunMaxx Solar Collectors, and when calculating the overall weight of the solar collector array that will be placed on the roof.



4. Maintenance Notes

The following checks and maintenance should be performed on your SunMaxx Solar Collector regularly (as listed) in order to ensure proper performance and extended reliability in the system:

- Check Frost Protection (Glycol Solution) Every 2 Years
- Check for corrosion of Solar Collector Parts Every 2 Years
- Check for damage, contamination and leakage Every Year

Please use the SunMaxx Solar Hot Water Maintenance record included with your SunMaxx Welcome Package to track your maintenance on the solar collector and solar hot water system.