MeriSolar

Integrated Pressurized and Non-pressurized
Solar Water Heaters

Operation and Installation Manual

Thank you for purchasing a MeriSolar Solar Water Heater.

This quality product uses:

- a stainless steel tank,
- integrated evacuated solar tubes with heat pipes,
- and electric boost for no solar conditions.

Please take time to read this manual and familiarize yourself with the function of this product.

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1. Notice

1.1 The information in this manual is subject to change without notification. Additional pages may be inserted in future editions. The user is asked to excuse any technical inaccuracies or typographical errors in the present edition. They will not affect the performance of the product or any statutory warranties.

1.2 The series number can be found on packaging, user manual and the storage tank. If there is no series number or the series number is damaged, this product may not be genuine and will not be covered under warranty. Please contact the supplier for more details.

1.3 Please ensure that cold water is not pumped or supplied into an empty tank when the collector area has been exposed to direct sunlight for more than 15 minutes. The solar tubes will become extremely hot and this may result in cracked tubes. Before filling for the first time after installation or if refilling after maintenance, ensure the collector are covered so they don't overheat. Breakage due to incorrect installation or filling of the tank are not covered by warranty.

1.4 The evacuated glass solar collector tubes can stand temperatures as low as -50°C when there is no water inside. If using this unit in alpine areas prone to long periods of freezing temperatures, we recommend using all the water in the tank every two days if there is no direct sunlight to stop the tank water from freezing.

1.5 Installation needs to be done by a qualified plumber to ensure all local laws and standards are met. Warranty may be void if incorrectly installed.

1.6 The system should be mounted facing north or as close as practical to north. If there is no northern roof available, then the preference is west for domestic installations and east for commercial or day time use of hot water.

1.7 All exposed piping should be insulated properly to prevent heat loss and provide freeze protection. In the areas with ambient temperature under -5° Celsius electric heating wire can be used to avoid frozen pipes.

1.8 Any modifications to the components will void the warranty.

2. General

2.1 The MeriSolar solar hot water system

The core of these systems is the evacuated tubes. They collect solar energy all day which heats a special internal coating and around 97% of the heat is retained to create hot water. The heat transfers to copper pipes which in turn pass the heat to water in the collector tank. In an integrated system, the water is heated directly and stored without the need for a pump, making it more efficient and generally cheaper to install and operate.

2.2 Evacuated tube technology

Evacuated tubes offer the most efficient way to heat water, especially in southern Australia and cooler climates. Traditional flat plate solar collectors lose much of their heat to the cold air during the cooler days and nights. Evacuated tubes act like double glazed windows to prevent the heat escaping from the internal collector surface. Also, by having a tube rather than a flat plate, the sun can heat the absorber surface at the optimum angle from early morning to late afternoon, not just in the middle of the day. This increases the overall sunlight able to be collected and turned into hot water.

The evacuated tubes are more resilient to hail and dirt as it glances or rolls off the curved surface rather than hitting or sticking to a flat surface.

The vacuum also allows the solar system to operate at below freezing temperatures. Many flat plate solar collectors have to pump hot water through the collector to stop it from freezing and cracking as temperatures approach zero, using more energy in the pump and losing much of the hot water gained during the day.

Solar cannot totally replace the need for gas or electric heating as there are sometimes days when there is little sunlight. Although the heat output of the solar collector is reduced on days when there is little sunlight it will still be able to provide heating. If it is a heavily clouded day or raining, then more electric boosting may be required to maintain water at the required temperature. This system will be automated so you don't have to worry about running out of hot water on a rainy day. When averaged over a year, a correctly sized solar system can provide 60%-70% of a household's hot water needs. Providing more than this is unadvisable, as too much heat will be produced in the summer months.

2.3 Water Heating

Water heating is traditionally done with an insulated metal tank full of water with an electric heating element or gas burner. Depending on the thermostat setting the water is heated to around 60°-70° Celsius. In order to kill Legionella bacteria, it is an Australian standards requirement that the hot water in the storage tank be heated up to at least 60° Celsius at least once every 24 hours, either while in the storage tank with solar, electric element boost or gas boost. The electric element on the tank must not be turned off. Any instruction to a home owner to turn off the electric element is in direct contradiction with national and state regulations.

In order to prevent scalding due to excessively hot water most new houses have a tempering valve installed. A tempering valve is an important safety device as it controls the temperature of the water supplied to the hot water taps to no greater than 50° Celsius. If a tempering valve is not installed in the home the plumber should advise that a tempering valve be installed and/or install one.

2.4 Electric Boosting

If your system is electric boosted, the electric element will turn on automatically in order to boost the water temperature to ensure ample hot water for morning and evening showers. The electric boost is controlled by a timer which should be set by the qualified installer. Under no circumstances should the thermostat setting be reduced below 60° Celsius. Changes to the thermostat setting may only be completed by an authorised person.

2.5 Maintenance

Under normal circumstances no maintenance of the system is required. Due to the shape of the tubes regular rainfall and wind should keep the tubes clean. If the tubes are particularly dirty they may be washed. A cloth and warm, soapy water is acceptable for cleaning the tubes but this should only be done if the solar collector is in a position which doesn't require climbing onto the roof or the use of a stepladder. If the tubes are not easily and safely accessible, a high-pressure spray can also be effective to clean the system.

Leaves may also gather beneath or in between the tubes. Leaves should be removed to ensure optimal performance but this should only be done if the solar collector is in a position which does not require climbing onto the roof, the use of a stepladder.

2.6 Evacuated Tubes

MeriSolar solar water heaters are evacuated glass tube solar domestic water systems combined with heat pipes. The selective coating in the inner cover of the evacuated tubes ensures high energy absorption and low heat radiance losses, which converts solar energy into heat energy and transfers to the heat pipe. The liquid in the heat pipe changes into vapour, which rises to the condenser. The heat conducts to the water inside the tank and the vapour cools to become liquid, returning to the base of the heat pipe. This continuous circulation transfers heat from the heat pipe to the cold water in the tank as long as sun is heating the collectors. Hot water is obtained by injecting cold water from the bottom of the tank.

affects the heat exchanging efficiency of your system. It is important to check the water quality in your local area.

3. Important

3.1 Standards

Installation must be completed in accordance with the requirements of AS/NZS 3500.4 (AS/NZS3500.4.2). "National Plumbing and Drainage Code Hot Water Supply Systems – Acceptable Solutions"), or in New Zealand, Clause G12 of the New Zealand Building Code, as well as any relevant local standards and regulations.

3.2 Authorised Person/s

Installation must be completed by a qualified tradesperson who holds all relevant industry licenses and/or certificates required for the work completed during the installation process.

3.3 Safety

At all times the qualified tradesperson installing the solar system must adhere to occupational health and safety guidelines as outlined by Workcare, and other relevant industry associations. The qualified tradesperson installing the solar system is responsible at all times for their own safety. Under no circumstances should any person attempt to install a solar water heating system without reading and understanding this operation and installation manual.

3.4 Roof & Structural Integrity

Please refer to the specifications for weight and refer to wind loading for frame. High winds will cause vertical and horizontal loads on the frame. When installing in a high wind region, please ensure that the frame structure is able to withstand such forces. A solar system should not be installed on a roof that is not capable of withstanding the forces from weight and wind load.

3.5 Water Quality

The stainless steel tank in your Solar system is susceptible to damage from poor quality water. "Hard water" can cause scaling in the tank which

If in doubt, contact your local water authority or have a water test completed. Where the water quality exceeds the following dissolved solids, hardness and chloride measure the Solar water heater should not be installed. Failure to meet this measure may result in your warranty being void.

Total dissolved solids: 600mg/litre or ppm
Total hardness: 200mg/litre or ppm
Chloride: 250mg/litre or ppm

Installation of a quality water softener / filter that improves water quality may be appropriate. Please consult a manufacturer or distributer of water filters to determine the correct product. The use of a filter that does not improve water quality within the standards set may result in your warranty being void.

3.6 Installation Preparation

Before departing for installation check to ensure there are no breakages to the evacuated tubes. All required tools, safety equipment and the installation manual should be taken to the installation site. It is recommended to take a digital camera to the installation site to take photos of the installation during and once completed.

When loading boxes please take care and do not stack boxes more than 3 layers high. Ensure that all boxes are strapped down in order to prevent movement.
MeriSolar does not warrant the Solar tube or heat pipes against failure as a result of damage incurred due to transport or installation.

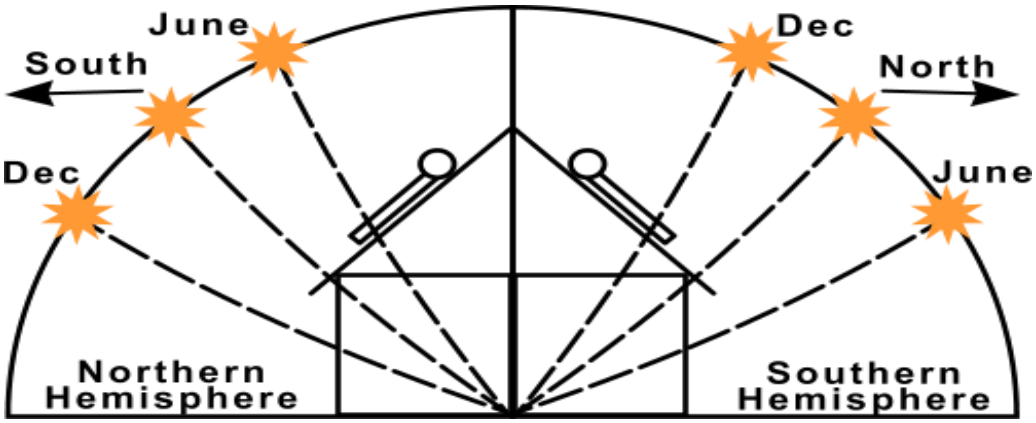
Take time to familiarize yourself with the components supplied, the components that should be supplied for your solar water heater are listed herein. It is recommended to lay out all the components in a

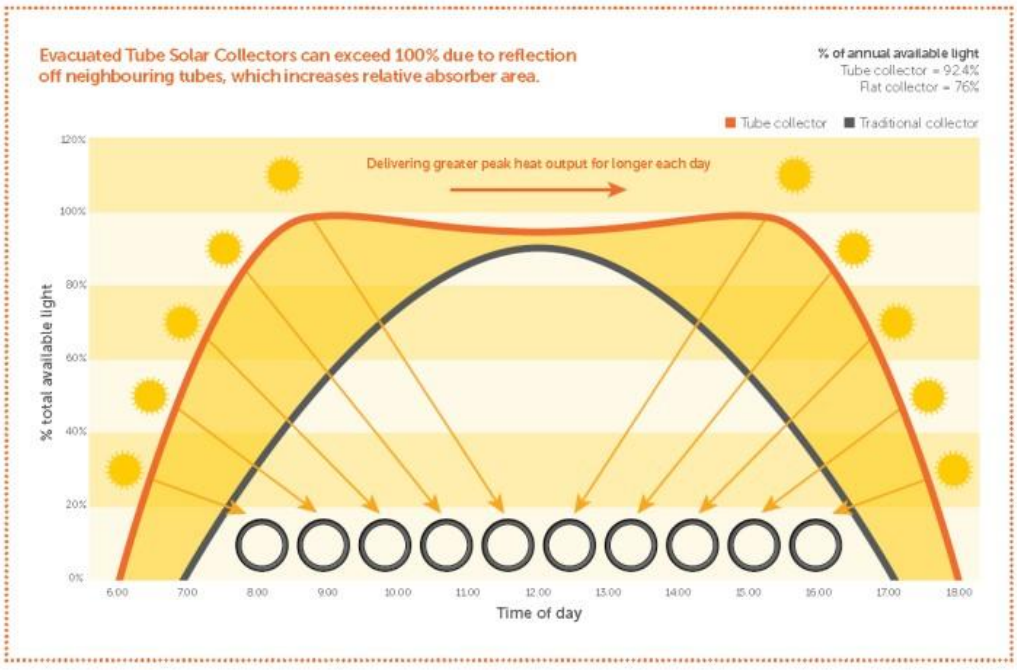
dummy assembly to ensure you are familiar with how they will all fit together. If any components are missing, or you require additional components, please contact your supplier who should have spares parts in stock.

4. Installation

4.1 Deciding the Direction and Angle of Installation

The water heater should be installed at a minimum of 20° angle to ensure optimal heat pipe operation. The angle and direction of installation is of great importance as it will affect the efficiency of the solar water heater. to receive the maximum amount of sunlight each day and throughout the year, In Australia, in the Southern Hemisphere the solar water heater should face north. see diagram below.

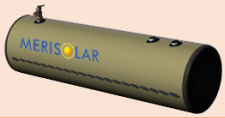




The angle at which you mount the water heater should roughly correspond to the latitude of your location. For example, Melbourne, Australia has a latitude of 37° South the collector should therefore face north at a 37° angle. You do not have to be too careful about mounting the collector at the exact angle suggested. If your roof angle is within 10°+/ of the desired angle you can mount the solar collector flush against the roof surface as it will not result in a great reduction in efficiency. The cost/benefits should be taken into consideration as to whether it is warranted to gain the precise angle. Refer to angle/efficiency chart above.

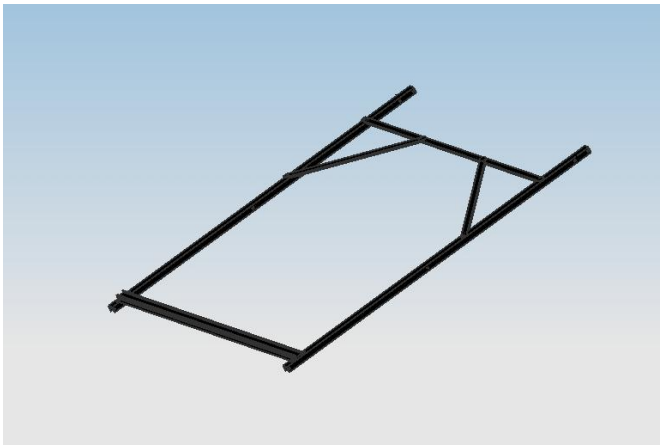
Please note: For the MeriSolar solar water heater, optimal heat pipe performance is at an angle between 20-70 Although your location may have a latitude of less than 20°, this installation guideline should be adhered to.

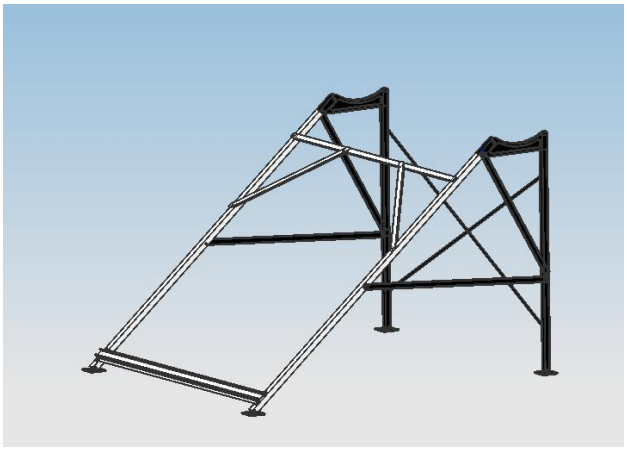
Part	Description	COMPONENTS	Dimensions	Quantity

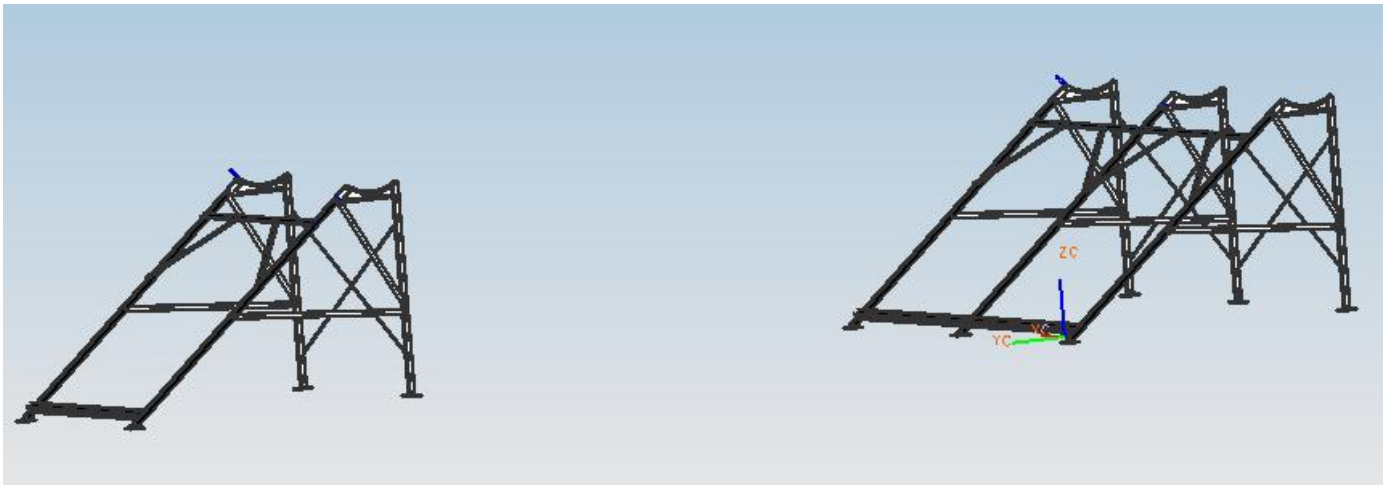
				Flat Roof Mount – 30° Frame		Pitched Roof Mount	
	frame Part 1			2	3		
	frame Part 2			-	-	2	3
	frame Part 3			2	3		
	frame Part 4			2	4		
	frame Part 5			2			
	frame Part 6			1			
	frame Part 7			2			
	Bottom Cross bar			1	-		
	Bottom Cross bar			-	1		
	Tank Bracket		430 X 100 X 25	2	3		
	Mounting Foot		85 X 85 X 25	4	6		
	Tube Cup		Ø58mm	15	20		
	Evacuated Heat Pipe Solar Tube		Ø58mm 1800mm	15	20		
	Integrated Tank		Ø 500mm 1640mm	1	-		
	Integrated Tank		Ø 500mm 2120mm	-	1		
	Bolt		M8 16mm				
	Bolt		M6 25mm				
	Bolt		M6 45mm				

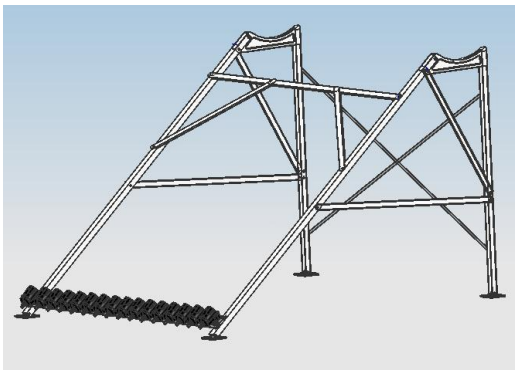
4.2 Components

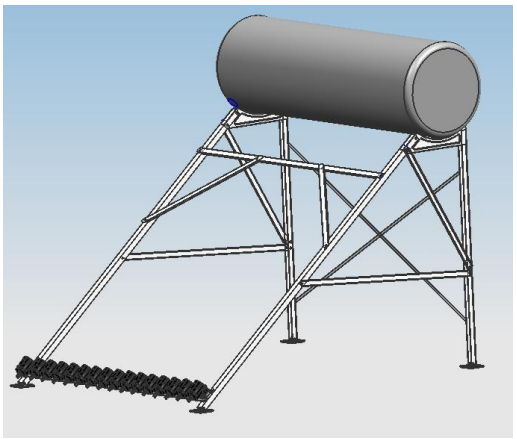
4.3 Mounting Assembly - Flat Roof

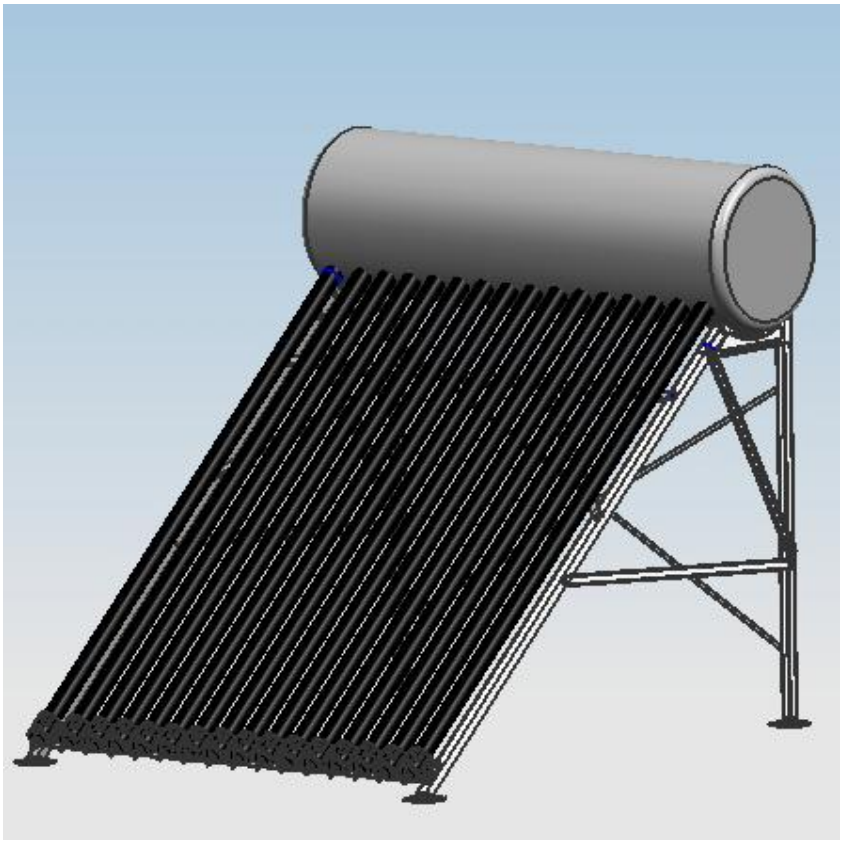




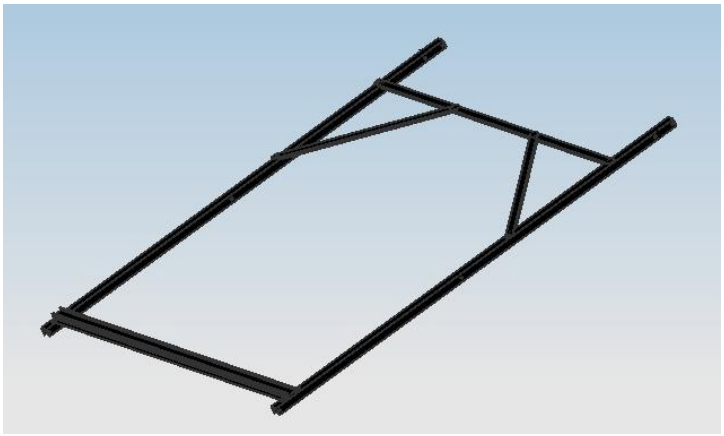


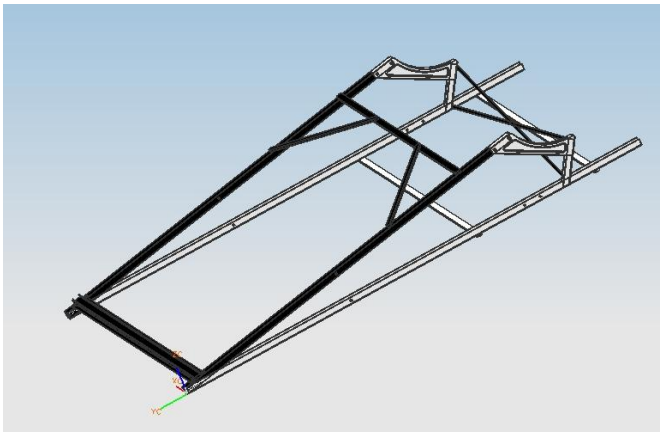


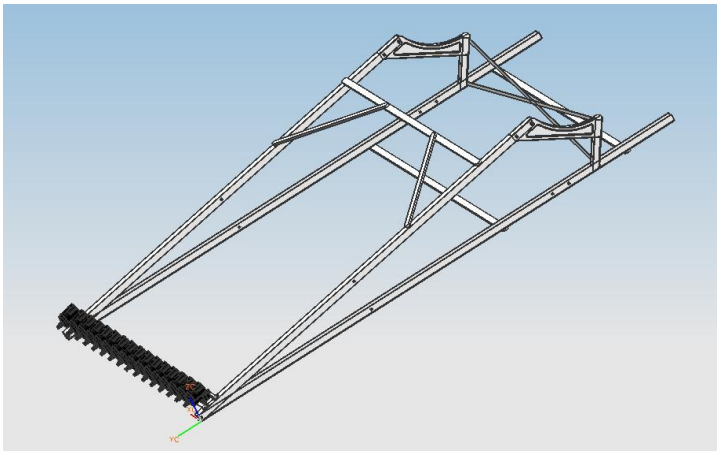


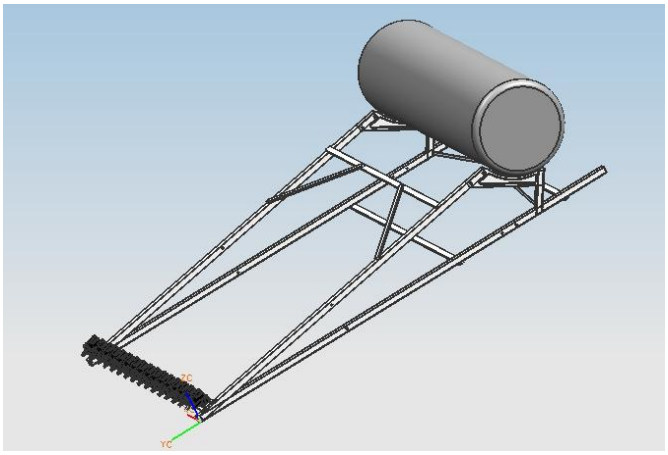


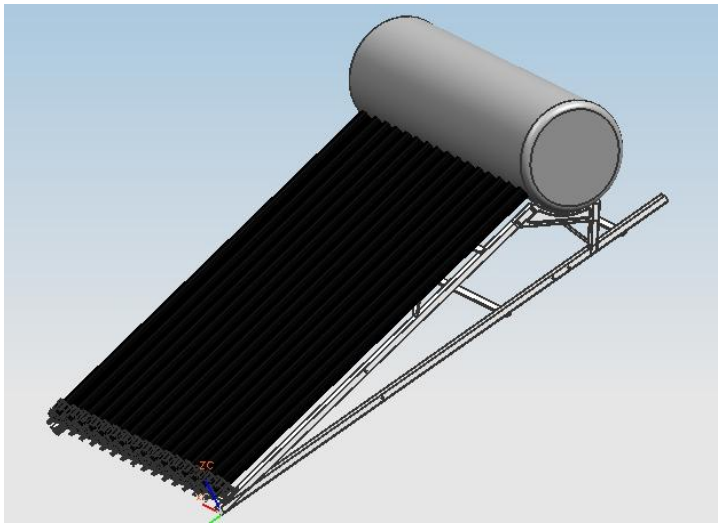
4.4 Mounting Assembly - Sloping Roof



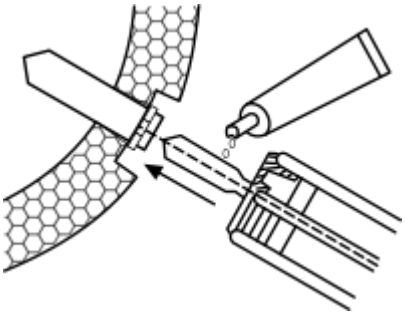






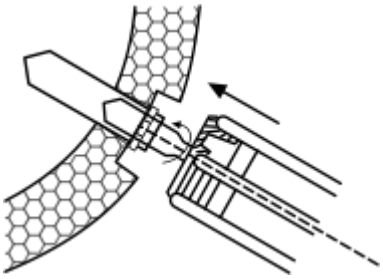


4.5 Evacuated Tube



Apply and smear a small amount of heat conduction silicone grease onto the copper heat pipe and carefully insert the heat pipe into the tank.

CAUTION: The temperature of heat pipe can reach 200° Celsius, Contact can cause serious burning. Do not remove and/or expose the tubes to sunlight until ready to install



Reset the vacuum tube with cup holder into the clamp and ensure the tube and the heat pipe is secured into the tank.

CAUTION: DO NOT over tighten as this may break the glass tube.

5. Warranty

5.1 Warranty Conditions

1. 3-years warranty for the integrated water tank, based on the condition that the water quality in the tank complies with the specification herein in section 3.6. MeriSolar will offer a replacement water tank if the tank leaks or fails to work during 3 years of usage, valid from date of installation.

2. MeriSolar will replace failed solar tube heat pipes during 3-years of usage valid from date of installation.

3. 1-year of warranty for the MeriSolar workstation and electric element. MeriSolar will replace a workstation or electric element if the workstation or electric element fails to work during 1-year usage valid from date of installation.

4. The MeriSolar solar water heaters must be installed and operated in accordance with the installation and operation instructions provided, local authorities and all relevant statutory requirements must be adhered to, ref. to AS3000, AS3500.4 etc.

5. Installation must be done by qualified plumber / electrician to ensure all local laws and standards are met. Warranty may be void if installed incorrectly

6. The series number can be found on packaging, user manual and the storage tank. If there is no series number or the series number is damaged, this product may not be genuine and will not be covered under warranty. Please contact the supplier for more details.

7. This warranty applies only to those components provided as part of the MeriSolar solar water heater and not for any electrical or plumbing parts provided by the installer.

8. Should any part of the MeriSolar solar water heating system be replaced during the warranty period, the balance of the original warranty will continue to remain effective.

9. Any modifications to the MeriSolar solar water heater components will void the warranty.

10. Proof of purchase dated as of installation is required for any warranty claim.

5.2 Warranty Exclusions

1. Consequential losses resulting from fault limited to the extent allowable by law including, economic loss, injury to persons, pain and suffering, damage to property or any other damages resulting from a manufacturing fault or defect.

2. Breakage or any damage to the MeriSolar solar water heater due to impact by any object.

3. If the solar collector is left dry (no liquid circulation) and exposed to daily sunlight (i.e. not covered) for a period exceeding 14 consecutive days.

4. The effects of sediment or sludge due to the connection to a water supply from sources such as bore water, dam water, spring water or river water.

5. Any serial tags / stickers on any of the MeriSolar solar water heater components are removed or defaced.

6. The MeriSolar solar water heater is relocated from its original point of installation.

7. Damage incurred due to transport or installation.

6. Technical Specifications – integrated pressure direct solar water heaters - integrated vented coil type solar water heaters

MODELS	SP500-1800/58-15 , -18, -20, -24, -30	
storage tank volume	130lt, 150lt, 165lt, 200lt, 250lt,300lt,400lt.	200L
Number of tubes	15 , 18 , 20 , 24 , 30	20
Storage tank material	Outer shell: SUS304-0.4 mm thick	Outer shell: SUS304-0.4 mm thick
Insulation	Inner cylinder: SUS316ss, 2.0mm thick	
	Polyurethane foam with thickness of 52.5 mm	
Reflector	Corrugated type	
Frame	SUS304-1.5 mm thick	
Tank Side Cover	SUS304-0.5 mm	
Max. working pressure	0.6 Mpa	
Absorb area (m^2)		1.52
Tank Net Weight (kg)	38	50
Total Weight (Empty)	98	119
Total Weight (Full)	250	322
Collector Frame Angle Standard Fixed	30 º / 40º	30 º / 40º
Dimensions (mm) L x W x H	1830 x 1450 x 1630	1830 x 1850 x 1630
Inlet/outlet connections	3/4"	3/4"
electric booster	2.4kW	2.4kW
Heat Loss (W/m°C)	≤0.85	≤0.85

For service and warranty
please contact your installer or supplier