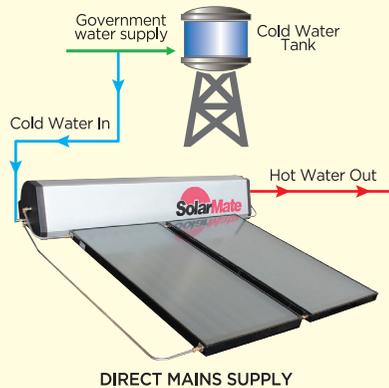


5.2 DIRECT MAINS SUPPLY

Due to the designs of some houses, it may not be possible to locate the SolarMate system onto the roof at a position lower than the main cold water tank. In such cases, it is preferable to use direct mains water supply to the solar water tank. The actual location of the SolarMate system on the roof is not critical so long as its orientation is right. Generally, it is better to install the SolarMate system higher on the pitched roof.

The main advantage of using direct mains supply is that the hot-water pressure at the outlet point (kitchen or bathroom) is much higher compared to that of gravity feed system.

If the incoming mains supply pressure is higher than 4 bar, it's recommended to install a pressure limiting valve rated at 350kPa so as water pressure will not exceed working pressure of the system.



DIRECT MAINS SUPPLY

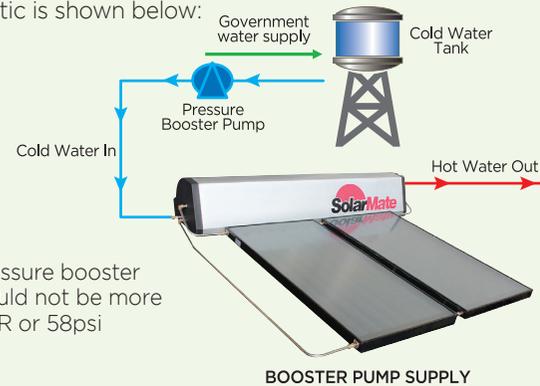
NOTE:

The SolarMate system is tested to a maximum pressure of 1050kpa (150psi). In normal use, the recommended working pressure should be about 400kPa (58psi). A pressure/temp relief valve is incorporated onto the hot water storage tank and is set at 850kPa (120psi).

5.3 PUMPED SUPPLY

As an alternative to the direct mains supply, a pumped supply can be used. For domestic uses, a 3/4" connection booster pump is usually installed. The pressure booster pump will supply water from cold water tank into SolarMate system whenever there is usage of hot water. Pump will continue running until the solar water tank is filled up to the regulated pressure. The other aspects of installation is the same as the Direct Mains Supply as outlined in 5.2 above.

A schematic is shown below:



BOOSTER PUMP SUPPLY

NOTE: Pressure booster pump should not be more than 4 BAR or 58psi

6 IMMERSION HEATER

A 3kW immersion heater is fitted to the SolarMate solar water tank. This heater is compatible with 240VAC/50Hz single phase power supply and has a thermostat with a temperature range of 0-55°C. Power supply to immersion heater must be protected by a 15 amps overload fuse as a safety precaution.

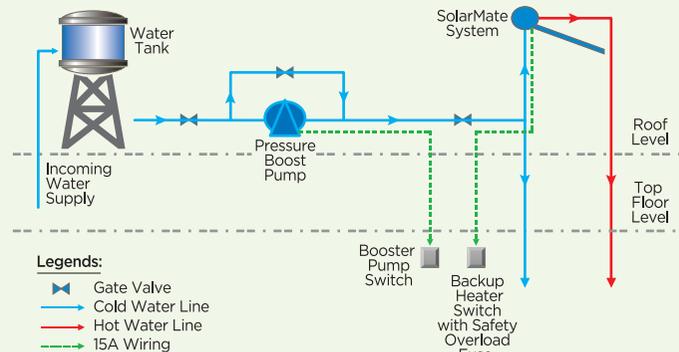
The immersion heater shall maintain water temperature in the solar water tank at 55 deg C when it is switched on. The Immersion heater is only switched on for about 30 minutes to warm-up enough water for use during prolonged bad weather and or when excessive hot water is used. Remember to switch off the supply to immersion heater before use for safety purposes.

7 MAINTENANCE

There is very little maintenance required on the SolarMate system apart from cleaning of the glass and flushing on solar panels. This should be done at about 24 months interval or more regularly if area is dusty.

8 The SolarMate system is protected by a 1/2 safety pressure temperature relief valve set at 850kPa (120psi). Should pressure built-up inside tank exceeds this value, the valve will purge out excess pressure.

Schematic Diagram for Solar Water Heater and Booster Pump



Legends:

- Gate Valve
- Cold Water Line
- Hot Water Line
- 15A Wiring

*Take note that SolarMate will cover wiring, cold water inlet and hot water outlet of SolarMate up to 3 meter each only.

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Installation Instruction for SolarMate Hot Water System

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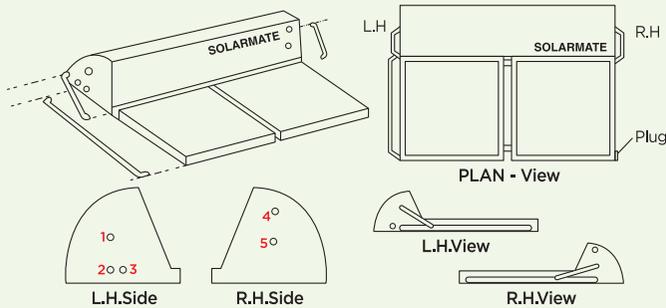
1 GENERAL

Solarmate Solar Water Heater Model

| Series | Classic | Ruby | Sapphire | Apollo |
|-------------------------|---------|---------|----------|----------|
| Capacity | | | | |
| 40 gallons (180 litres) | SMC-180 | SMR-180 | SMS-180 | SMHP-180 |
| 66 gallons (300 litres) | SMC-300 | SMR-300 | SMS-300 | SMHP-300 |

2 CONNECTIONS

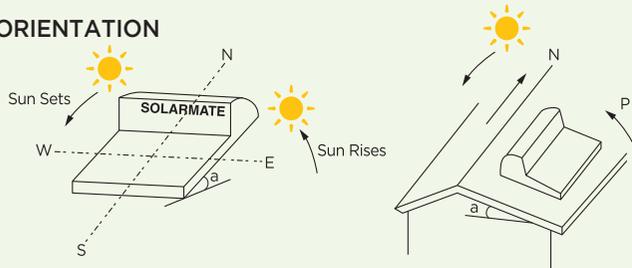
For the above models, external connecting pipes (copper or s/steel) are provided together with fittings, to join the solar panels to the storage tank. All the externally threaded connections on the storage tank are clearly labeled. Follow the diagrams illustrated below, to join the solar panel(s) to storage tank. Brass couplings are provided to join the solar panels for the SM-300 Model.



LEGEND

1 - From panel (1/2") 2 - Cold in (1/2") 3 - To panel (1/2")
4 - Hot out (1/2") 5 - From panel (1/2")

3 ORIENTATION



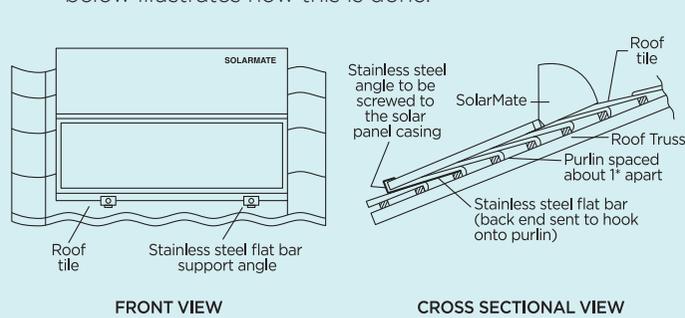
Ideally, the position of the solar panels should lie along the N-S axis, as shown in the diagram above. If the orientation of the house is not ideal, locate the best orientation using a hand-held compass. For houses whose axis is along the N-S direction, the solar panels should be installed such that it receives the morning sun as shown in the illustration. The duration of solar radiation received by solar panels depends on the pitch 'a' of the house. It is preferable that the solar panels receive solar radiation from morning about 8am till at least 2pm or 3pm in the afternoon.

The peak solar radiation (i.e. highest heat intensity) occurs between 12pm to about 2pm in the afternoon.

4 INSTALLATION ONTO ROOF

4.1 Tiled Roof

For tiled roof, stainless steel angle support frame is used to hold the SolarMate system onto roof. The diagram below illustrates how this is done.



Details of dimension, sizes and number of stainless steel flat bar support angle straps required for SolarMate are as shown for the 2 models:

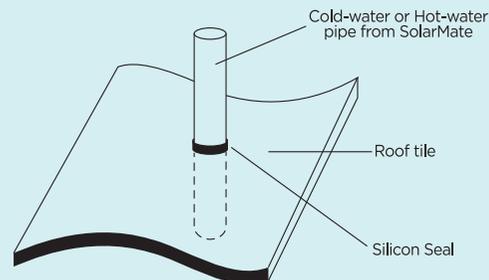
| Models | Number (n) Required |
|--------|---------------------|
| SM-180 | 2 |
| SM-300 | 4 |

The stainless steel angle is screwed onto the solar panel casing, the back portion is hooked onto roof purlin and either bolted or nailed.

NOTE:

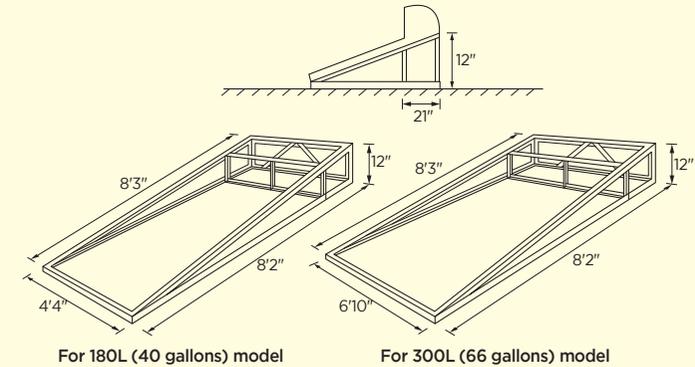
In order to prevent the roof tiles from being crushed under the weight of the SolarMate system, it is important that the tiles rest onto purlin evenly and flush, after the stainless steel support angles are in position.

In case the cold-water supply pipe or the hot-water outlet pipe for the solar water tank have to come up from the ceiling below, the tiles through which the pipes protrude must be carefully chipped in the centre to allow pipes to penetrate. Thereafter silicone seal should be applied to the pipe circumference to prevent rain-water from seeping into ceiling.



4.2 Flat Roof

In the case of a flat roof, aluminium angle frame support should be used to support the SolarMate system. Details of frame support are as shown.

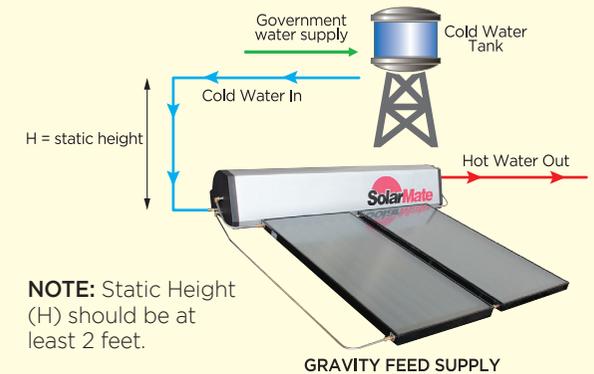


Material : 1 1/2" x 1 1/2" x 3mm Aluminium Angle

5 DIFFERENT COLD WATER SUPPLY SYSTEMS

In general, the cold water supply to the solar water tank can be one of the three following systems:

- Gravity feed from main cold water tank which must be higher than the solar water tank;
- Direct mains water supply to solar water tank;
- Pumped supply to solar water tank



NOTE: Static Height (H) should be at least 2 feet.

5.1 Gravity Feed Supply

This system is used in cases where the SolarMate system can be located on the roof at a position which is lower than the main cold water tank. The inlet pressure to the SolarMate system will be the static head difference (H) between the cold water tank and the solar water tank. A schematic arrangement for this is illustrated above: The vent pipe can be vertical or connected back to the cold water tank. Either way, the vent pipe must be higher than the cold water supply tank to avoid overflow.