Apricus Solar Hot Water
Owner's Manual

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Chapter 1: The Basics

How Solar Works

Apricus believe in informing the homeowner about the basic operation of the solar water heating system. By gaining a basic understanding of your solar system you can develop realistic expectations about the operation of the system, develop habits which maximize energy savings and most importantly, ensure safe and reliable operation.

An Apricus solar system, captures solar energy directly and converts it to heat for use in your home.

1. The evacuated tubes ensure maximum absorption of the sun's energy and convert it to usable heat.

2. The heat inside the evacuated tube is carried via copper heat pipes to the insulated manifold (head of collector), this contains a copper heat exchanger.

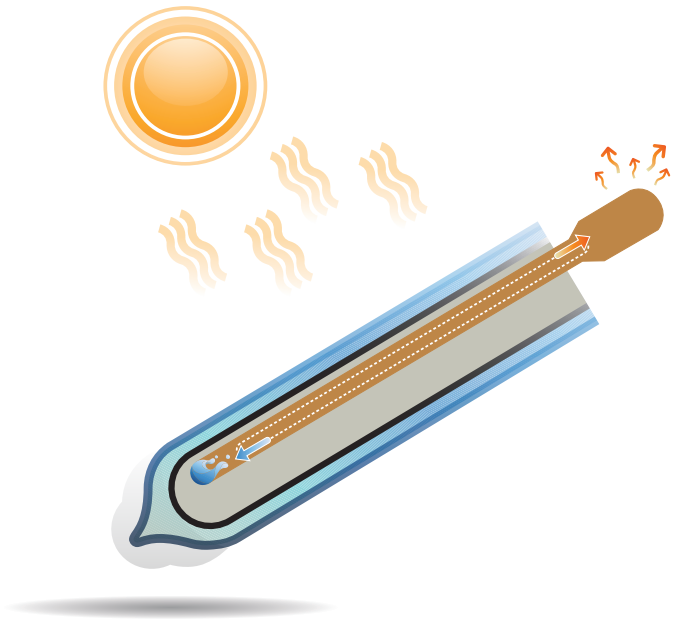
3. A controller measures the temperature of the water in the manifold and compares it to that in the bottom of the storage tank. If the manifold temperature is higher, the controller switches on a circulation pump which brings the solar heated water back down to the storage tank.

The Evacuated Tube

1. Sunlight strikes the dark absorber coating inside the evacuated tube

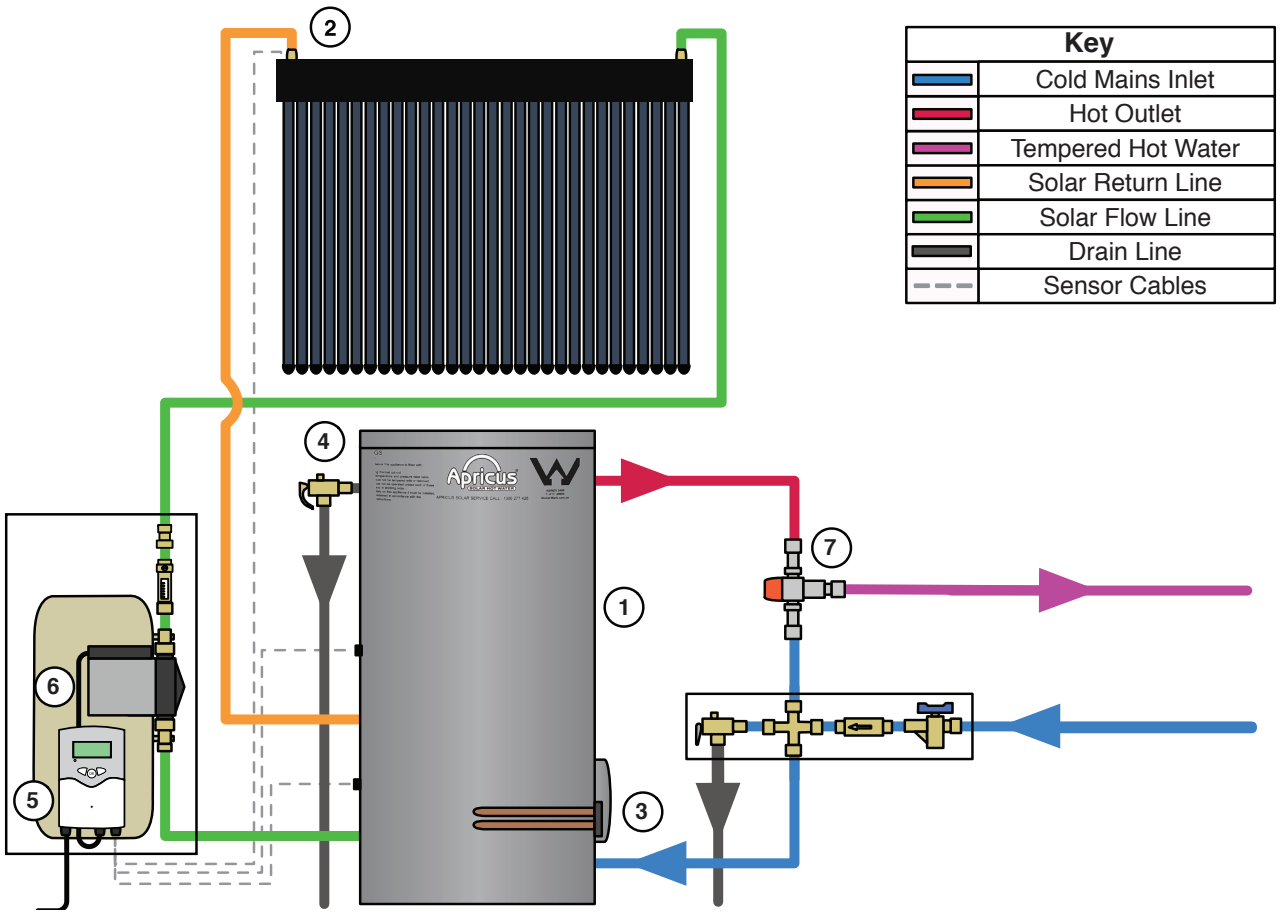
2. The heat pipe transfers the heat up to the copper header pipe location in the insulated manifold box

3. The vacuum in the tube acts the same as a thermos flask, keeping the heat inside and ensuring it is delivered to the water, not lost to the air. Though the glass may be cool to the touch, inside, the system may be reaching temperatures up to 100.



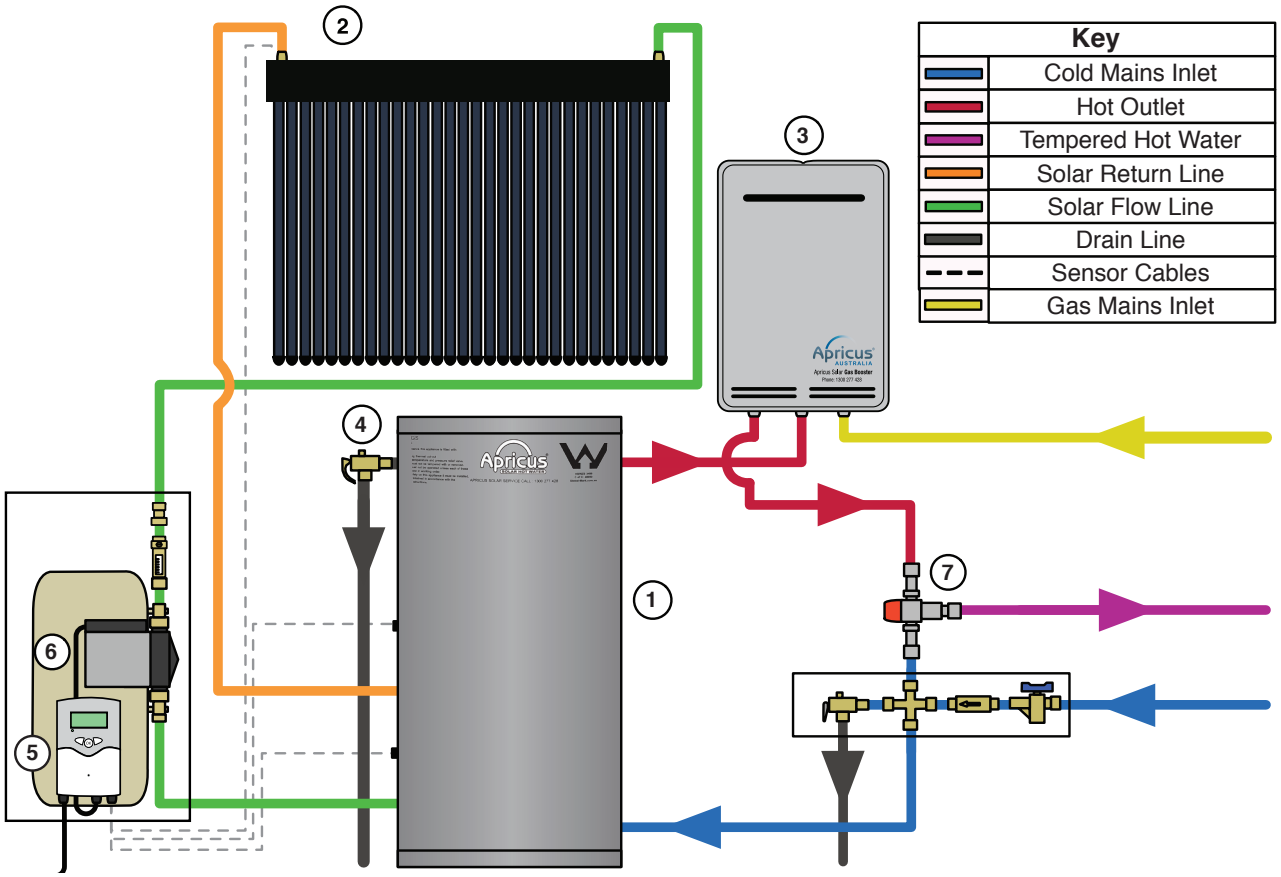
Chapter 2: System Compnents

Apricus Australia – Electric Boosted System



	Component	Function
1	Tank	Stores hot water for when you need it
2	Evacuated tubes	Solar energy collection
3	Electric Element	Provides a backup energy source for cloudy days and legionella protection
4	PTRV	Pressure Temperature Relief Valve
5	Controller	Monitors temperatures and controls the system
6	Circulation Pump	Circulates water from the tank to the manifold
7	Tempering Valve	Tempers the hot water down to a safe outlet temperature

Apricus Australia – Gas Boosted System



	Component	Function
1	Tank	Stores hot water for when you need it
2	Evacuated tubes	Solar energy collection
3	Gas Booster	Provides a backup energy source for cloudy days and legionella protection
4	PTRV	Pressure Temperature Relief Valve
5	Controller	Monitors temperatures and controls the system
6	Circulation Pump	Circulates water from the tank to the manifold
7	Tempering Valve	Tempers the hot water down to a safe outlet temperature

Chapter 3: Performance

The solar hot water system will begin acting immediately to reduce your energy costs. System performance is dependent on the available sunlight that falls directly onto the collector. This means that during the months of winter when the sun is in the sky for fewer house the solar contribution will fall. Conversely, the performance of the solar hot water system will increase significantly during summer to off-set the greater majority of your hot water usages all year round.

Chapter 4: System Operation

Pump Operation

The Apricus solar hot water system is powered by a small circulation pump, installed beside the tank, which consumes less power than a small lightbulb. It turns on and off at varying intervals which are determined by the controller and its temperature sensors. When the temperature difference between the tank and the roof are at just the right temperatures the pump will extract the optimum amount of energy from the collector and transfer it into your hot water tank.

On cold nights the circulation pump may turn on to cycle water from the hot water tank into the collector to prevent the components on your roof from freezing.

Auxiliary Boosting Operation

The auxiliary boost acts as a back up to ensure you always have hot water ready to go, so even when the sun is hiding you and your family are still able to have a hot shower. Secondly, it provides protection against the growth of legionella bacteria that can lead to legionnaire's disease. The temperature requirements and frequencies of heating are below:

Type of Apricus system installed	Minimum heat requirements
Bottom element electric boosted system	Once per week to 60ºC for 32 minutes
Middle element electric boosted system	Once per day to 60ºC
Gas boosted system	Minimum 55ºC each time water is used

Electric element tanks have an element inside them at either the bottom, or the middle of the tank. This element operates just like a normal electric hot water system, only the amount of work is greatly reduced due to the solar input from your collectors.

Gas boosters; are located after the hot water storage tank. For an Apricus gas booster, if the incoming water temperature is less than 55°C, the booster will activate and heat water to 70°C. If the incoming water is greater than 55°C the booster will not start and water will flow directly to the outlets. Under normal operations the gas booster may fire-up on the first instance because there may be cold water in the pipes between the storage tank and itself.

Chapter 5: Important Features & Characteristics

Pressure Temperature Relief Valve (PTRV)

A PTRV is installed on the hot water storage tank to relieve pressure, and excessive temperatures in the system. The PTRV discharges 3-6% of the water heaters capacity during normal heating cycles with a hot water system.

Expansion Control Valve (ECV)

An ECV is installed on the cold water inlet of some water heaters to relieve pressure within the system. The ECV may discharge a small quantity of water instead of the PTRV to conserve hot water within the storage tank, as the discharged water from the ECV is much cooler than the PTRV.

System Frost Protection

The controller has a safety mechanism that operates the circulation pump when the temperature in the collector falls below 4ºC. Cycling water from the tank increase the temperature of the collectors to prevent the water from freezing in the collectors.

Holiday Mode

If you are going away for a long period of time your system is capable of protecting itself with the existing safety devices (i.e. Expansion Control Valve, Pressure Temperature Relief Valve, Frost Protection mechanism). If your system is electric boosted you may want to switch off you element at the switchboard to save energy, whilst leaving the controller turned on.

Shutdown Mode

During the months of summer you may experience days of hot weather and your solar hot water system has the potential to generate more hot water than you would be using. When this is the case, the controller will detect that your storage tank is full of hot water and request the system to shutdown. During these times the circulation pump will be inactive until you use a substantial amount of hot water from the storage tank.

Chapter 6: Solving Problems

You may encounter abnormal characteristics with your solar hot water system and you'd like to understand the issue before calling your local plumber/installer.

A Running Pressure Temperature Relief Valve (PTRV)

The PTRV relieves 3-6% of the water heaters capacity during normal heating cycles with a hot water system. If the storage tank is discharging more than a bucket full of water in 24 hours, it may be due to the incoming water pressure being too high. Request for your plumber/installer to fit a pressure limiting valve.

A Dribbling Pressure Temperature Relief Valve (PTRV)

There could be some debris or thread seal tape trapped in the valve mechanism. You can try lifting the valve gently and try to dislodge anything that could be causing that valve not to be re-seating properly.

My Solar Collectors Are Not Working

You may find that the circulation pump is not operating even when the sun is shining. This may be because:

• The pump is waiting for the right temperature in the collectors to turn on

• Your storage tank is already full of hot water

• Your collector is at a very high temperature

If you are still finding that your circulation pump is not operating to collect heat from the collectors over a number of days, there may be a problem with your system.

Our Water Is Not Hot Enough

This may be caused by high hot water usages or low solar gain from the sun. Ensure that the auxiliary heating device is operational to provide you with hot water during these situations.

We Don't Have Enough Hot Water

Solar collectors work based on weather, when the sun is not shinning as bright in the sky your system will require the auxiliary heater to operate to provide the hot water. Installing a solar hot water system doesn't mean you get more hot water; it harnesses the sun's energy to offset as of the load from your conventional heat source (electricity/gas) as possible.

You may be using more hot water than you realise. Look more closely into how you are using hot water around the home. Adjusting your hot water usage patterns to maximize the energy that your system can generate during the day will benefit your energy bills.

IF YOU HAVE READ ALL THE INFORMATION WITHIN THIS MANUAL AND STILL BELIEVE THAT YOU NEED ASSISTANCE, CALL APRICUS AUSTRALIA'S AFTERSALES TEAM.

Chapter 7: System Maintenance

Collectors

The evacuated tubes do not usually require cleaning as regular rain and wind should keep the tubes clean. You can check the vacuum of the evacuated tubes if you feel that your system is not performing to its upmost efficiency. This can be observed at the base of the tube at the rubber cap; if you see a white milky consistency the tube has lost its vacuum will require a replacement.

Storage Tank

Glass lined/Vitreous enamel storage tanks are fitted with a sacrificial magnesium anode to provide corrosion protection for the storage tank from the stored water. It is recommended that the anode be inspected at least every three years, and service as required. Stainless steel storage tanks do not contain a sacrificial anode.

Pressure Temperature Relief Valve (PTRV)

The PTRV is located near the top of your hot water storage tank. It is deigned to release pressure and high temperature water during normal heating cycles. The lever on the PTRV should be fully lifted for a few seconds, and placed back in its original position once every 6 months. This will prevent any debris or scale build up in the valve.

Gas Booster (Gas Boosted Systems Only)

The gas booster should be kept free of insect infestations. Maintain all plant growth around the gas booster to ensure it does not effect the operation of the unit by blocking or interfering with air intake or flue terminal. NOTE: Do not spray chemical insecticides directly into or onto the unit.

Plumbing & Fittings

The system can be visually inspected for leaks around the brass fittings and around the storage tank. Ensure that there is no pooling of water around the circulation pump and controller.

Chapter 8: General Information

Warranty/Service Call

If you have an issue with your Apricus solar hot water system please contact our head office on:

1300 APRICUS (1300 277 428)

System Registry

Registering your Apricus solar hot water system will ensure that your details are placed on our computer system streamlining any future after-sales/service requirements. You can register your Apricus Australia solar hot water system on-line at: **www.apricus.com.au**

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