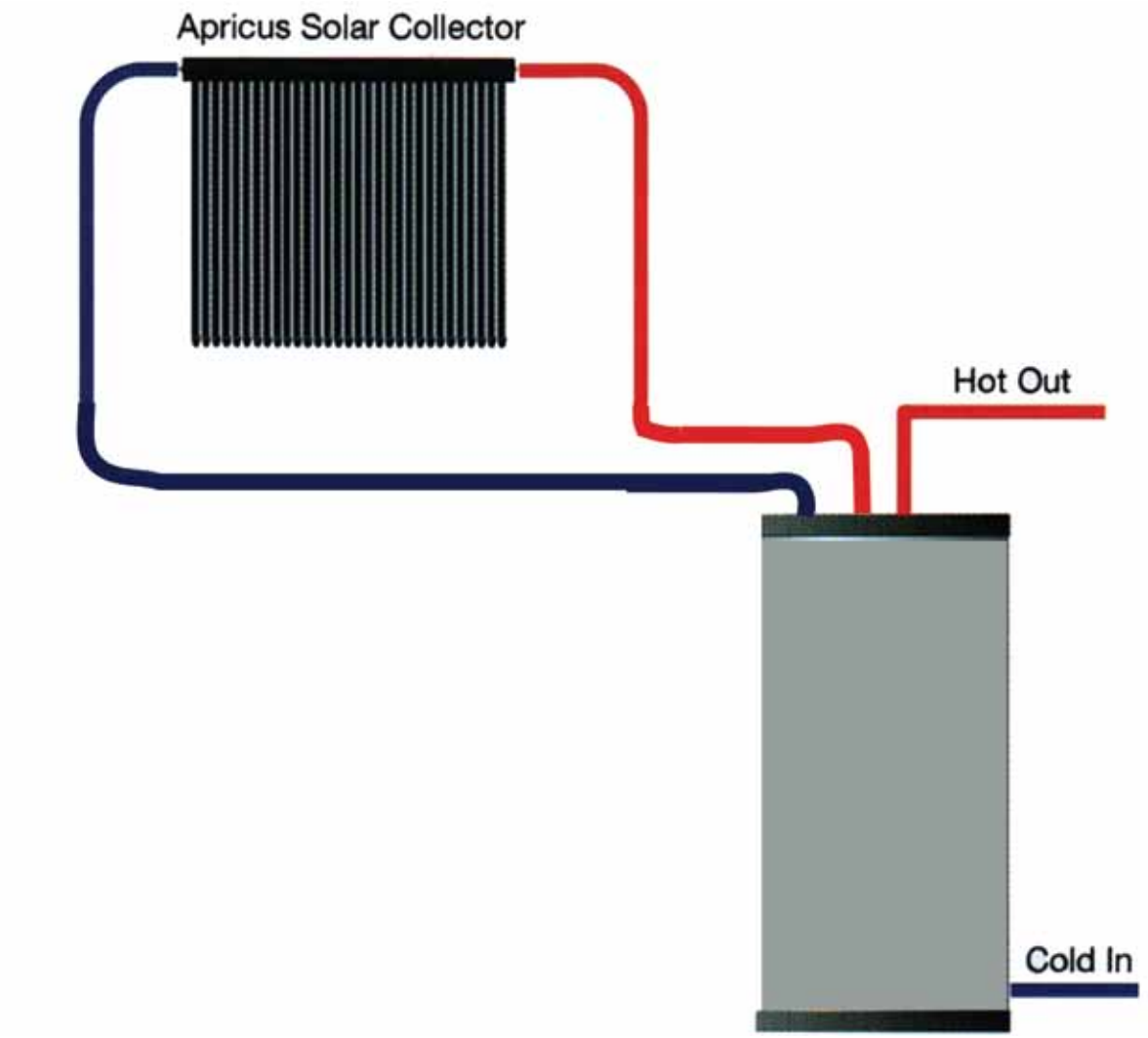
Homeowner's Manual for **Apricus Solar Water Heating System**

Models AP-10, AP-20 and AP-30

The solar energy system described by this manual, when properly installed and maintained, meets the minimum standards established by the Florida Solar Energy Center, in accordance with Section 377.705, Florida Statutes. This certification does not imply endorsement or warranty of this product by the Florida Solar Energy Center or the State of Florida.

How does it work?

Solar hot water works by pre-heating water using energy from the sun, then enters your storage tank ready for use.



System Operation

1. Fluid inside the evacuated collector tubes is heated with energy from the sun then transferred to the manifold box.
2. Cold water from the tank circulates through the system and is heated in the manifold box.
3. The newly heated water circulates back into your hot water tank.
4. A backup (electric) ensures you will always have hot water when solar cannot provide 100% of your daily usage.

Major Component Functions

Collector

Apricus Collectors utilize evacuated tube technology to convert sunlight into usable heat. Regardless of the outside temperature, the vacuum space within the tube provides excellent insulation. Fluid within the tube turns to vapor when heated and is transferred up the tube to the manifold box where it interfaces with circulating water from the tank. The newly heated water goes back to the tank for storage and use.

Tank

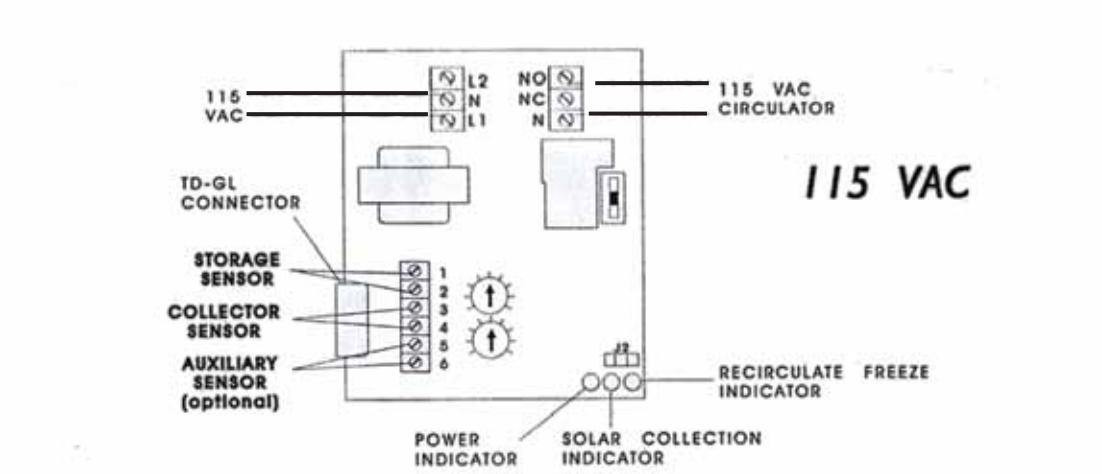
The Storage Tank takes cold water in, then sends it into the system to circulate up to the Collector for heating. The Storage Tank then receives the hot water from the Collector and stores it.

Pump

The pump provides flow to the system to circulate water. It should be installed on the Supply Line, pumping cold water to the collector and away from the tank. This will limit the pump's exposure to high temperatures.

Controller

The primary purpose of the Apricus controller is to regulate the operation of the controller circulation pump. Many additional functions are also available, including regulating tank temperature and providing freeze protection.



Operation

The GL-30 test switch should be left in the "AUTO" position in which case operation is completely automatic with no operator intervention required. The "Power" indicator should always be on, the "solar" #1 indicator will show when the system is collection solar heat and the "freeze" #2 indicator will show when the system is recirculating to protect from freezing.

To test the system, push the sets switch to "ON" and verify that the "solar" #1 indicator is lit and that the pump or blower connected to the control output is on. Move the switch to "OFF" and verify that the "Solar" #1 indicator is off and that the pup or blower is off.

Sensors

The Apricus Solar Water Heating System has temperature sensors in the system that provide information to the Controller. A Sensor on the Collector is placed at the hottest points of the unit. A sensor is also located at the bottom of the tank.

Temperature/pressure relief valves

Each system is equipped with Temperature/pressure relief valves. The pressure relief valve discharge ratings are based on manufacturer suggestions as well as local codes and regulations.

⚠ WARNING

Failure to safely control system pressure levels could result in the dangerous rupture or explosion of system components. This may cause serious scalding injury and damage.

Isolation Valves

Isolation valves are installed on the piping that connects the Collector and the Tank. Piping must allow the collectors to be isolated from the water heating system and allow the collector loop to be drained without affecting the operation of the water heating system. A pressure relief valve must be installed between the isolation valves and the collector to prevent dangerous build up of pressure.

⚠ WARNING

When isolating any section of pipe it is essential that pressure be released by opening a drain valve or loosening a fitting. Failure to release pressure on an isolated section of pipe, especially if that includes a solar collector, could result in dangerously high pressures and temperatures.

Freeze Prevention

In regions of the country where temperatures can fall below 23 °F freeze protection measures must be taken in order to prevent rupture of piping and substantial property damage. In regions not falling below 23 °F, simple low temp controller based freeze protection is used (i.e. pup circulates if the manifold temperature approaches freezing).

Evacuated tubes are not susceptible to damage in cold weather, and Apricus heat pipes are protected against damage that could result from the freezing of the water inside.

Operating Instructions

To Turn Your System On

Make sure your cold-water valve is open to the tank. There are two (2) isolation valves on your system. One is on the feed line (sending water up to the collector) and the other is on the return line (returning heated water to your tank). Make sure both of these are vertical so that as the water fills the collector it will also be allowed to return to your tank. Make sure your Goldline Auto Control is plugged in and that your auto controller is in the automatic position. Plug in your 220-volt tank plug for backup. Your system is ready for operation.

Freeze Protection

When the air temperature drops below 40 °F a sensor on the collector turns the circulation pump on allowing the water to circulate to prevent freezing.

Option: When you know the temperature is going to drop below 30°, you can drain the collector as described below.

To Drain and Shut Down Your System

If you plan to leave the house water on, but want to isolate/drain the solar collector (i.e. when you know temperature is going to drop below 30°), unplug the 110-volt auto-controller and shut off the 220-volt breaker. Close the isolation valves (turn horizontal) and attach a hose to the drain valves above the tank and drain both sides. Leave the isolation valves closed and do NOT plug in the auto controller. Turn the 220-volt breaker back on to use your electric backup to heat your water.

To completely drain the tank, follow the collector isolation directions above. Close the cold-water isolation valve to stop water from entering the tank. Attach a hose to the drain valve at the bottom of the tank and drain. **Caution: This water is extremely hot!!**

When leaving the home for prolonged periods, you may want to shut off the main water to the house. Unplug the Goldline Auto Control system from the 110-volt outlet. Make sure your 220-volt breaker is off to your tank. This is all you need to do.

Maintenance

The solar collector is virtually maintenance free. Other system components such as the pump requires periodic inspection.

⚠ WARNING

Apart from maintenance specifically outlined as "HOMEOWNER", any maintenance or repair MUST ONLY be performed by Authorized Persons. At no time should any inspection or maintenance be performed by the homeowner, if it involves climbing on the roof or any potentially unsafe behavior. The solar collector warranty will be void, if non-Authorized Persons attempt to maintain or repair the solar collector or associated system components. The solar system operates at high pressure and high temperature and can cause damage to property and severe personal injury, if not correctly operated and maintained.

Periodic inspections by an Apricus Authorized Person is recommended to ensure optimum system operation.

The following basic maintenance or inspection MAY be completed by the HOMEOWNER

Cleaning (HOMEOWNER)

In most cases, periodic rain will keep the evacuated tubes clean. If particularly dirty, they may be washed from a safe location with a high-pressure water spray. If the collectors are located where they are easily and safely accessible, a soft cloth and warm, sopy water or glass cleaning solution may be used.

If leaves or needles from trees accumulate between or beneath the tubes, they should be removed to ensure optimal performance and to prevent accumultation of ignitable material (if in high fire risk area). The solar collector will NOT cause the ignition of flammable materials. Such cleaning may only be completed by the homeowner if the tubes are easily and safely accessible.

⚠ WARNING

The following maintenance may ONLY be completed by Authorized Persons

Broken Tube

If a tube breaks, it should be replaced as soon as possible to maintain maximum collector performance.

Maintenance Plan

It is recommended that as a minimum the following maintenance plan is followed:

Component	Time Frequency
Insulation	3 years
Controller	3 years
Pump operation	3 years
Solar Collector	3 years

Contact Advance Solar and Spa (239) 939-9447 to schedule an Inspection.

Direct Open Loop Schematic with Parts List

1. Solar Collector
2. Air Vent
3. Pressure Relief Valve
4. Collector Sensor
5. Differential Temp. Control
6. Zone Valve
7. Circulation Pump
8. Drain Valves
9. Collector Isolation Valves
10. Solar Tank
11. Tank Senor
12. Cold Water Suply Valve

For all major component replacements contact

Advance Solar And Spa
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