



SOLAR WATER HEATER

USA
OWNER'S MANUAL

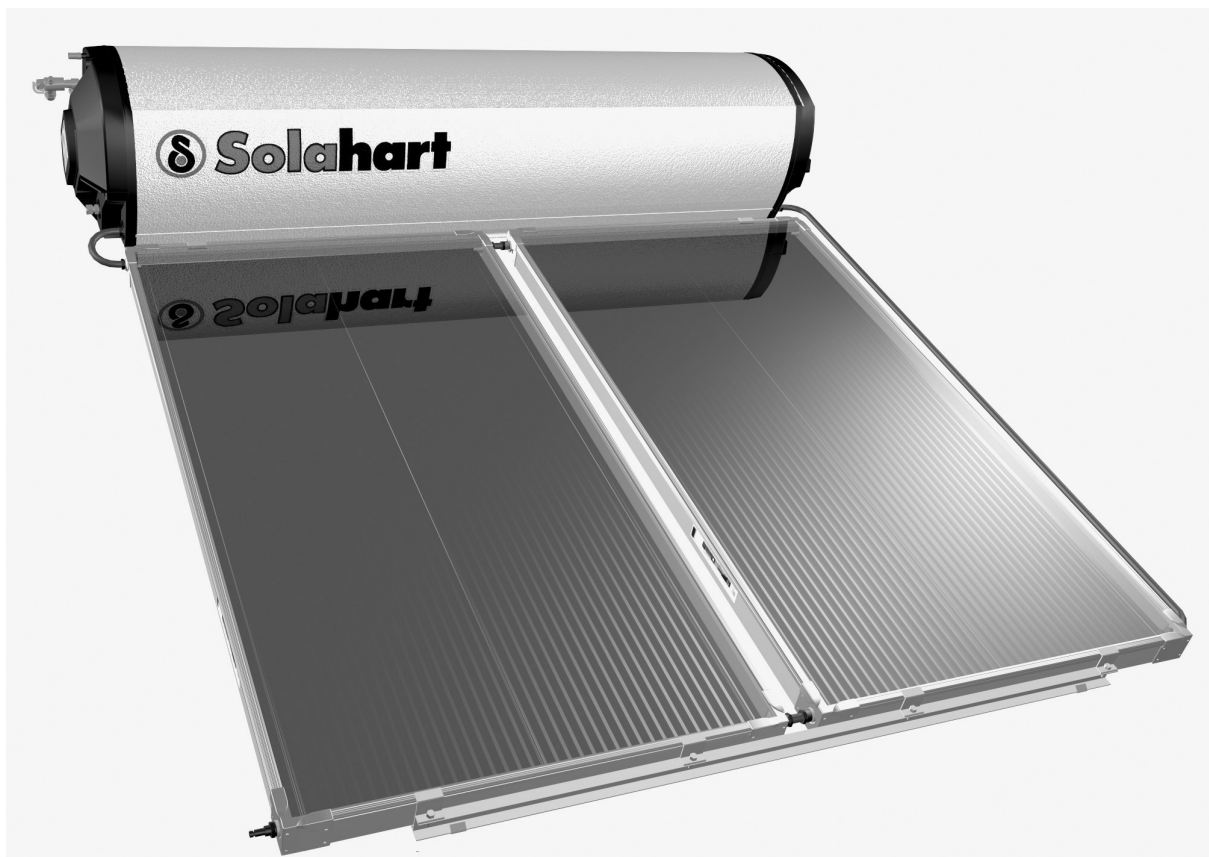


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INTRODUCTION

Congratulations on choosing a Solahart solar water heating system. It is one of the most effective and trouble-free systems available today. In addition to reducing your water-heating bills, it will help preserve precious natural resources by using free energy from the sun.

As with an electric or gas water heater, your Solahart system operates automatically to ensure you will always have an ample supply of hot water. However, there are simple steps you can take to increase both its efficiency and service life.

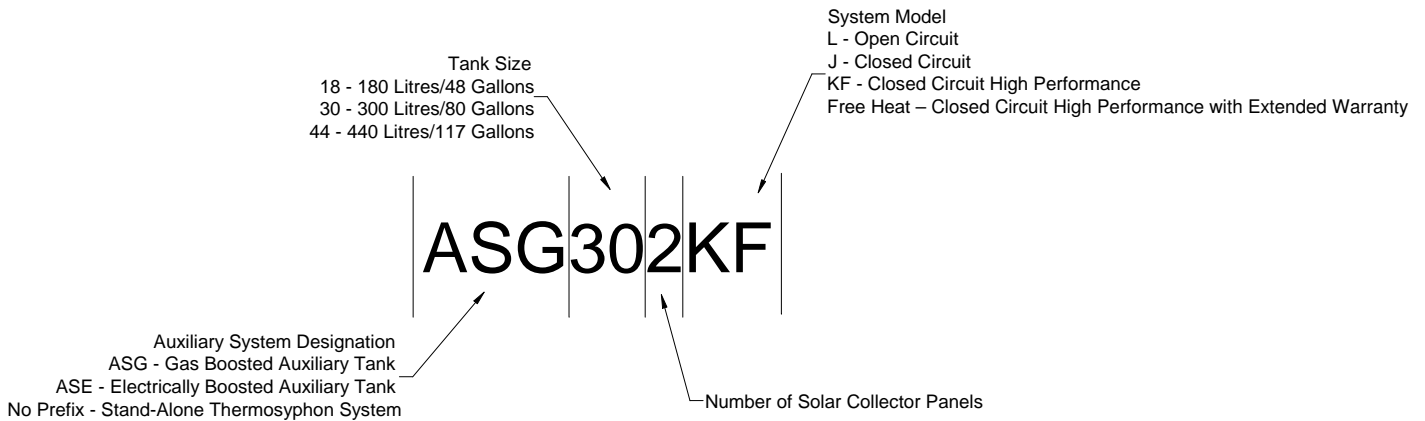
This manual will help you get the most out of your Solahart system. Please read it carefully when the installation is complete, and review it from time to time to refresh your memory about the service requirements and safety measures.

The Operation section of the manual contains important information regarding Solahart system procedures as well as safety measures pertaining to the system. It is important that you follow these guidelines to ensure safe, efficient and trouble-free operation.

While the system requires very little maintenance, there will be a periodic need for some upkeep. The Maintenance section outlines those requirements for service, which you may do yourself, as well as those procedures best performed by a qualified Solahart technician.

The Troubleshooting section contains steps you can take if the system is not performing, as it should.

To assist with your understanding your Solahart system, Solahart water heater models are designated using the convention shown below:



YOUR SOLAHART SYSTEM

The solar energy system described by this manual, when properly installed and maintained, meets the minimum standards established by the Solar Rating and Certification Corporation (SRCC). This certification does not imply endorsement or warranty of this product by the SRCC.

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.

Your Solahart system is one of the most efficient yet simple and trouble free water-heating systems in the world. In addition, it includes the most comprehensive array of safety features in the industry.

The components of the system include a water storage tank, solar collector panels, and a network of pipes and valves.

In locations which are subject to temperatures below 41°F a mixture of specially developed Hartgard fluid and water circulates through the solar collector panels. This fluid is heated by the sun, then circulated through a jacket surrounding the water storage tank and heating the potable (drinking) water inside the storage tank contains. Hartgard is a non-toxic, food-grade liquid, which provides freeze protection for the closed loop heat transfer circuit. It is colored blue to differentiate the closed circuit fluid from the potable water supply.

This circulation of the Hartgard fluid is accomplished naturally, without the need for pumps, sensors or any moving parts. No moving parts mean fewer potential problems. These solar water heaters are referred to as closed circuit systems and identified by the text J, KF or Free Heat after the size detail in the model number. e.g. 302J, AS302KF or 302Free Heat etc.

Hartgard - Material Safety Data and First Aid Advice

Service Temperature Range	-40°F to 300°F
Viscosity	approx 0.00145 Ns/m ²
Freezing Point	-50°F
Boiling Point	212°F
Flash Point	218°F
Auto Ignition Temperature	> 750°F
Specific Heat	4190 J/kg/°C
Vapour Pressure	0.22 mm Hg @20°C
Fluid Colour	Light Blue
pH Mixed	7 - 9
In case of eye contact	Irrigate with water for 5 minutes
In case of skin contact	Wash with flowing water or shower
Inhalation	No adverse effects
Ingestion	No adverse effects
Advice to Doctor	Treatment based on judgement of doctor in response to patient reaction
Disposal of fluid	Re-process or burn in an approved incinerator in accordance with State/Local Government requirements

In locations that are not subject to temperatures below 41°F the fluid within the solar collector circuit is potable water. These solar water heaters are referred to as open circuit systems and identified by the letter L after the size detail in the model number. e.g. 302L or AS302L etc

Solahart L model systems (open circuit) operate in a similar manner to the closed circuit systems. Potable water is circulated through from the storage tank through the collector(s) back to the storage tank. L model systems are not suitable for locations where the air temperature can fall below 41°F. Freeze tolerance limits are based upon an assumed set of environmental conditions.

Your hot water is stored in a steel tank lined with two coats of Primaglaze® vitreous enamel (glass) and thickly insulated to help maintain the water temperature throughout the day and night.

To ensure your hot water supply is never depleted, the Solahart system is equipped with a backup heater or heating element. On the few days a year when there may be insufficient solar energy you are still assured of all the hot water you will need.

While your Solahart system is one of the most efficient water heaters available, there are two simple steps you can take to increase your water-heating cost savings.

Keep Backup Heater use to a Minimum

You can save the most money on your water-heating bills by using the backup heater on your system as little as possible. If the sun shines brightly between 10 am and 3 pm, enough heat will normally be generated to keep the water hot throughout the rest of the day and night.

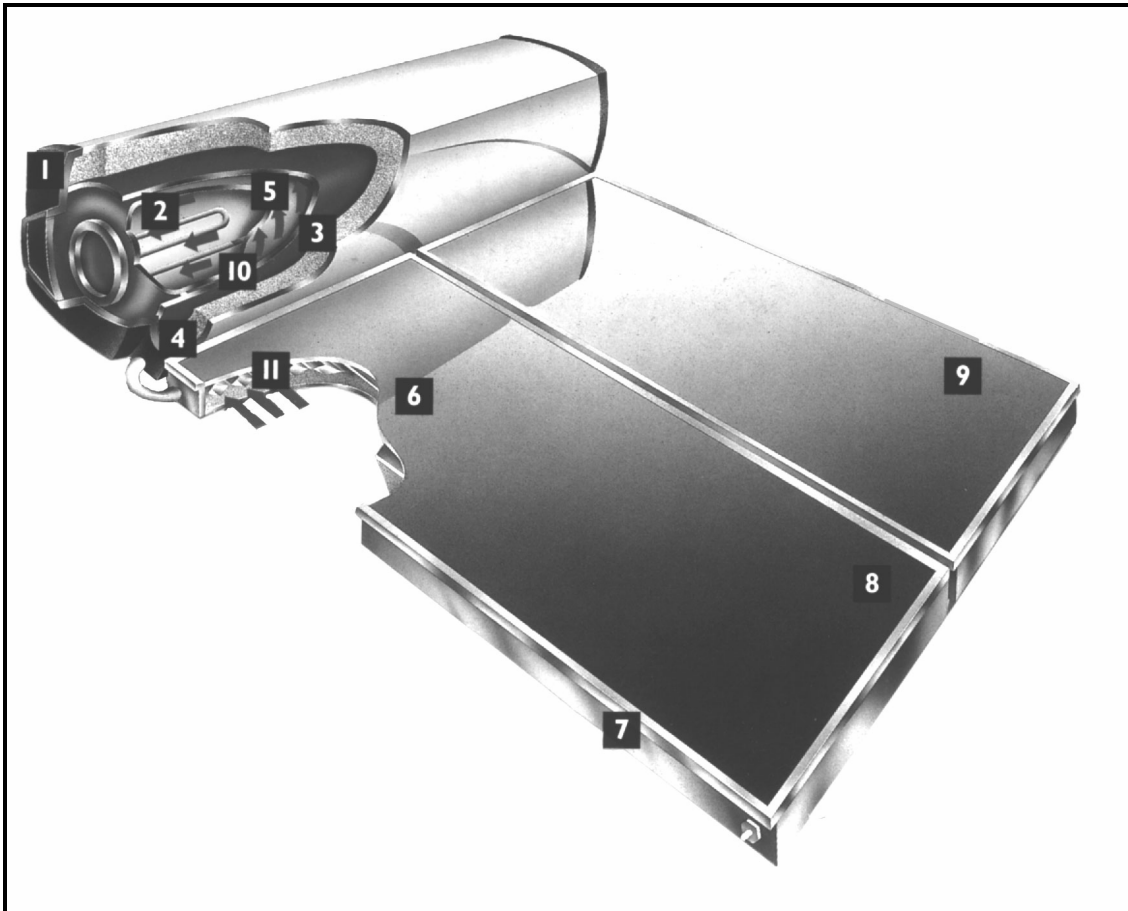
Use Hot Water during Daylight Hours

Whenever possible, schedule heavy hot water use, such as dish washing, laundry and showers, in the middle of the day. If hot water usage occurs while the sun is up, the fresh (cold) water added to the storage tank is heated more quickly by the Solahart system.

When water is used late in the day or after sunset, the fresh water entering the tank will be heated by the element so you and your family will have hot water in the morning.

SOLAHART SYSTEM FEATURES

(Typical for Closed Circuit Systems)



Feature

- 1 Stylish Slimline Design**
The lines are enhanced with Solahart's distinctive trim.
- 2 Hot Water All Year**
For those few days of the year when there's insufficient solar energy, a highly efficient booster maintains water temperature.
- 3 Hot Water Technology**
The major technical advantage of Solahart is the use of a sealed jacket around the storage cylinder. This allows the closed circuit fluid to flow from the solar absorber panels around the outside of the storage cylinder and transfer its heat into the water stored in the cylinder. The result - hot water free from the sun ready and waiting for use.
- 4 High Density Insulation**
The cylinder is insulated in its tough aluminium case by pressure injected CFC free high-density polyurethane foam. Your water stays hotter - longer.
- 5 Superior Protection**
The storage cylinder is protected from the harshest water with not one, but two coats of Primaglaze vitreous enamel plus a sacrificial anode. A major breakthrough in corrosion control.
- 6 Corrosion Protection**
The closed circuit system also eliminates the risk of the collector plate corroding or clogging from the inside.

Feature

- 7 Looks Better - Lasts Longer**
Proven premium quality Aluminium used for Solahart's collector casing looks better, lasts longer.
- 8 Proven Performance**
Maximum absorption of solar energy is achieved by the large collectors designed to trap more heat and transfer it efficiently.
- 9 Solar Glass**
Superior quality Solar Glass is tougher, providing better performance, protection and appearance.
- 10 Freeze Protection**
Solahart's closed circuit technology is all the protection you need to prevent freezing in cold climate areas.
- 11 Exclusive Multi-Flow Absorber**
Greatly increases heat transmission to transfer fluid.

OPERATION

Once your Solahart system has been installed and tested by the technician, it operates automatically and requires little attention. However, there are several precautions you should be aware of to ensure your complete satisfaction with the system, and some steps you must take if you are going to be away from home for a long time, and when the seasons change.

Vacations or Brief Absences

If you are going to be away from home for an extended period, two weeks or more - you may deactivate the Solahart system so that it does not continue to heat the water tank while hot water is not being used in the house.

CAUTION

DEACTIVATING AND REACTIVATING THE SYSTEM REQUIRES THAT YOU ACCESS THE SYSTEM ON YOUR ROOF. USE EXTREME CAUTION WHEN CLIMBING ON A LADDER AND WALKING ON THE ROOF.

Deactivating the System

If you choose not to perform the procedures listed below, call your authorised Solahart technician to deactivate and reactivate your system.

Deactivating the system is easy and requires just a few steps.

1. Turn **OFF** power to the Solahart system at the main solar breaker switch near the main power breaker box.
2. Cover the collectors with cardboard or other sturdy light-blocking material. Tie or tape the material securely so it will not blow off.

When you return, simply reverse the procedures to reactivate the system.

1. Uncover the collectors carefully to avoid scratching the surfaces.
2. Turn **ON** power to the Solahart system at the main solar breaker switch near the main power breaker box.

NOTES

- 1 IF THE SOLAHART SYSTEM IS YOUR ONLY SOURCE OF HOT WATER, BE SURE YOU TURN ON POWER TO THE BACKUP AT THE CIRCUIT.
- 2 IT REQUIRES APPROXIMATELY 4 HOURS TO HEAT A TANK OF COLD WATER USING THE BACKUP HEATER. A WARM TANK WILL HEAT IN LESS TIME. AS WITH ANY OTHER HOT WATER SYSTEM, GAS, ELECTRIC OR SOLAR, YOU SHOULD NOT DRINK WATER DIRECTLY FROM THE FAUCET.

Severe Cold Weather, Snow or Extended Absences

If the collectors are likely to be covered with snow for an extended time, or if the system will not be used for one month or longer, the tank should be drained to prevent freezing or stagnant water. Call your local Solahart dealer and arrange for a service technician to perform this operation.

Hydrogen Gas Dispersal

Hydrogen gas can form in any hot water system if it has not been used for an extended period - generally two weeks or more. To prevent the risk of injury in this situation, open a hot water faucet and allow the water to run into a sink or drain for several minutes before using any electrical appliance or allowing an open flame or smoking near any hot water outlet.

If hydrogen gas is present it will often produce an unusual sound similar to air escaping from the pipe as the water begins to flow. After a few minutes, any gas will be dissipated and the hazardous condition will be eliminated.

WARNING

DO NOT USE AN ELECTRICAL APPLIANCE OR PERMIT SMOKING OR OPEN FLAMES NEAR ANY HOT WATER TOP UNTIL THE SYSTEM HAS BEEN PURGED OF HYDROGEN GAS.

PERFORMANCE EXPECTATION FROM THE SYSTEM

The overall performance and power cost savings that you will obtain from your Solahart water heater will depend on your hot water usage pattern and the usage of your backup heating element or backup heater.

Performance Example

With a two panel, 300-litre Solahart hot water heater, on a clear day, the collectors will raise the tank temperature to approximately one and a half times the daily maximum temperature in winter and twice the daily maximum temperature in summer.

For example on a clear 60°F winter day the tank temperature can reach temperatures 90°F. It will be necessary to use the booster to raise the water temperature above 90°F. On a clear 90°F summer day the tank temperature can reach 180°F.

Minimum Air Temperature

Solahart L Model systems must not be installed in areas where the outside air temperature can fall below 41°F continuously for more than 18 hours. Where outside air temperature falls lower than 41°F Solahart closed circuit models must be installed. The collector closed circuit fluid is freeze protected to -40°F.

If the outside air temperature is to fall below 32°F for more than 4 hours on the Solahart closed circuit models, it is suggested that all potable water plumbing is installed with heat trace and insulated to protect against pipe freezing. In the event of a power failure, open a hot water faucet and allow a slow trickle of water to flow until power is restored.

Please contact your service technician for assistance and advice with protection against pipe freezing.

WARNING

FREEZE TOLERANCE LIMITS ARE BASED UPON AN ASSUMED SET OF ENVIRONMENTAL CONDITIONS.

WARNING

EXTENDED PERIODS OF COLD WEATHER, INCLUDING AMBIENT AIR TEMPERATURES ABOVE THE LIMITS SPECIFIED ABOVE, MAY CAUSE FREEZING IN EXPOSED PARTS OF THE SYSTEM. IT IS THE OWNER'S RESPONSIBILITY TO PROTECT THE SYSTEM IN ACCORDANCE WITH THESE INSTRUCTIONS IF THE AIR TEMPERATURE IS ANTICIPATED TO APPROACH THE SPECIFIED LIMITS.

WARNING

HEAT TRACE WILL NOT PROTECT AGAINST PIPE FREEZING IN THE EVENT OF POWER LOSS.

HAZARDS AND SAFETY PRECAUTIONS

IMPORTANT SAFETY INSTRUCTIONS

1. **WARNING** – When using electrical appliances, basic safety precautions to reduce the risk of fire, electric shock, or injury to persons should be followed, including:
2. **READ ALL INSTRUCTIONS BEFORE USING THIS WATER HEATER.**
3. The Water Heater must be grounded. Connect only to properly grounded outlet.
4. Install or locate this water heater only in accordance with the provided installation instructions.
5. Use this water heater only for its intended use as described in this manual.
6. Do not use an extension cord set with this water heater. If no receptacle is available adjacent to the water heater, contact a qualified electrician to have one properly installed.
7. As with any appliance, close supervision is necessary when used by children.
8. Do not operate this water heater if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped.
9. This water heater should be serviced only by qualified service personnel. Contact the nearest authorised service facility for examination, repair or adjustment.

SAVE THESE INSTRUCTIONS

For safe installation and operation of the system, review the following hazards and follow all precautions.

▲ WARNING - HAZARD: Excessive Pressures and Temperatures

To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes but not less than a combination temperature and pressure relief valve. The valve must be certified by a nationally recognised testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shut Off Devices for Hot Water Supply Systems, ANSI Z21.22.

This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure of the water heater. Install the valve into an opening marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve will exit within 6 inches above, or at any distance below the structural floor, and cannot contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

▲ WARNING - HAZARD: Thermal Expansion

When a water heater is installed in a closed water supply system, such as one having a back-flow preventer in the cold water supply, means shall be provided to control thermal expansion. Contact the water supplier or local plumbing inspector for information regarding the control of this situation.

⚠ WARNING - HAZARD: Electrical Shock

1. Disconnect all power sources before starting installation, maintenance or troubleshooting.
2. Verify all electrical supply to the residence is switched **OFF**.
3. If power is needed later for maintenance the technician will place highly visible tape or tags on all appropriate locations to warn of LIVE electricity.

⚠ WARNING - HAZARD: Burns from Hot Water and Steam

1. Use extreme care when opening relief valves, charging closed circuit, and filling Storage tank.
2. The electrical booster thermostat has been factory set at 122°F (50°C) or lower to reduce the risk of scald injury. Adjusting the thermostat to a higher setting is not recommended as hotter water increases the risk of scald injury.
3. Should the thermostat require adjustment to meet your demands this can be achieved by rotating the adjustment screw on the thermostat to the desired temperature as indicated on the thermostat label. This operation must only be conducted when all electrical supply to the residence is switched **OFF**.
4. Solar collectors can heat the water in the storage tank to temperatures that are higher than the thermostat setting.

⚠ WARNING - HAZARD: Heights

Use extreme care to avoid falling while on a ladder or the roof. If a roof section does not appear to be solid under foot, do not subject it to any added weight until it is adequately reinforced.

MAINTENANCE

All Solahart models should be serviced at least every five years by a Solahart technician to ensure efficient operation. A Major service is necessary only once every five years in areas where municipal water is used as the cold water supply. Where untested well water is used as the cold water supply, more frequent servicing may be required.

Major service includes checking and replacing if necessary all water supply valves and electrical components, replacing the Anode, replacing the pressure/temperature relief valve, checking the fluid in the closed circuit and replacing if necessary.

Free Heat models require Anode replacement every 10 years.

NOTE

A QUALIFIED SOLAHART TECHNICIAN MUST PERFORM THE SERVICE.

Cleaning the Collectors

During extended periods without rain, the collector glass should be cleaned periodically to remove accumulated dust and dirt. Hose them off from ground level early in the morning or late in the evening when they are not hot. It is not necessary to dry the collector glass.

Tree Trimming

Do not let trees shade the solar collectors during periods of maximum solar contribution (10 am and 3 pm). Keep trees trimmed back to ensure your solar water heating system is operating at maximum efficiency.

Report System Problems Immediately

For any problems you encounter other than detailed in the trouble shooting section, call your local authorised Solahart technician from whom you purchased the system (see contact details below), or contact your Solahart representative.

Solahart Industries Pty Ltd
c/o Rheem Manufacturing Company
101 Bell Road,
Montgomery, AL 36117
Phone 1-800-432-8373
Fax (334) 260-1323
Email TechServ@rheem.com

Local Solahart Technician Contact Details

Technician Name:.....
Phone :.....
Fax:.....
Email:.....

Solahart System Details

Model Number:.....
Serial Number:.....
Installation Date:.....

TROUBLE SHOOTING

Your Solahart system is one of the most reliable solar water heating systems on the market. However, should you experience a problem with its operation the information in this section will help you identify the cause and solution.

This section contains three possible symptoms and a number of possible causes for each symptom. It then lists corrective actions you can take. If the corrective actions do not cure the problem, contact the Solahart dealer.

Before Calling for Service

Should the Solahart system not provide hot water on cloudy days, please read 'Insufficient Hot Water' below before making a service call.

Insufficient Hot Water

Possible Cause	Corrective Action
Solar circuit breaker tripped	Reset circuit breaker
Collectors shaded during daylight hours	Clear obstructions

Hot Water Discharging From Drain Line

Possible Cause	Corrective Action
System oversized for customer requirements	Fit a Solahart Heat Dissipater Unit / Fit a Hartstat system to closed circuit installations / cover a solar collector / contact Solahart Dealer

Gas Discharge from Hot Water Faucet

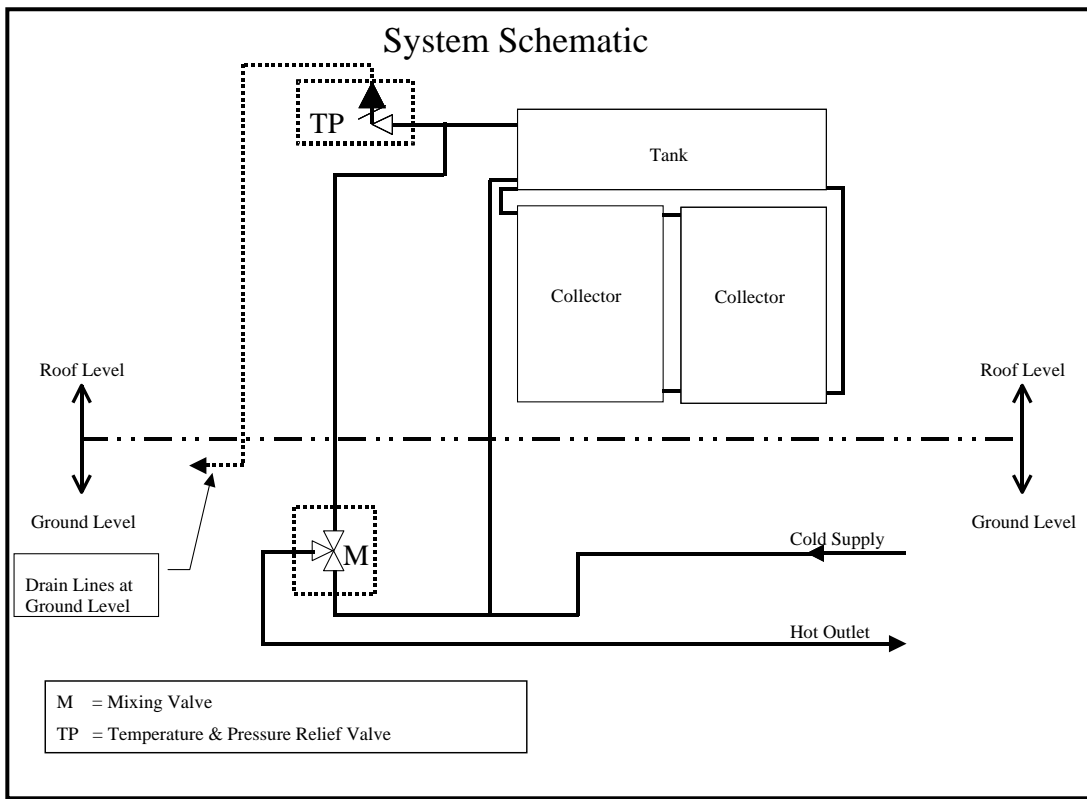
Possible Cause	Corrective Action
System operating but hot water not being used	Run faucet to allow gas to escape

NOTE

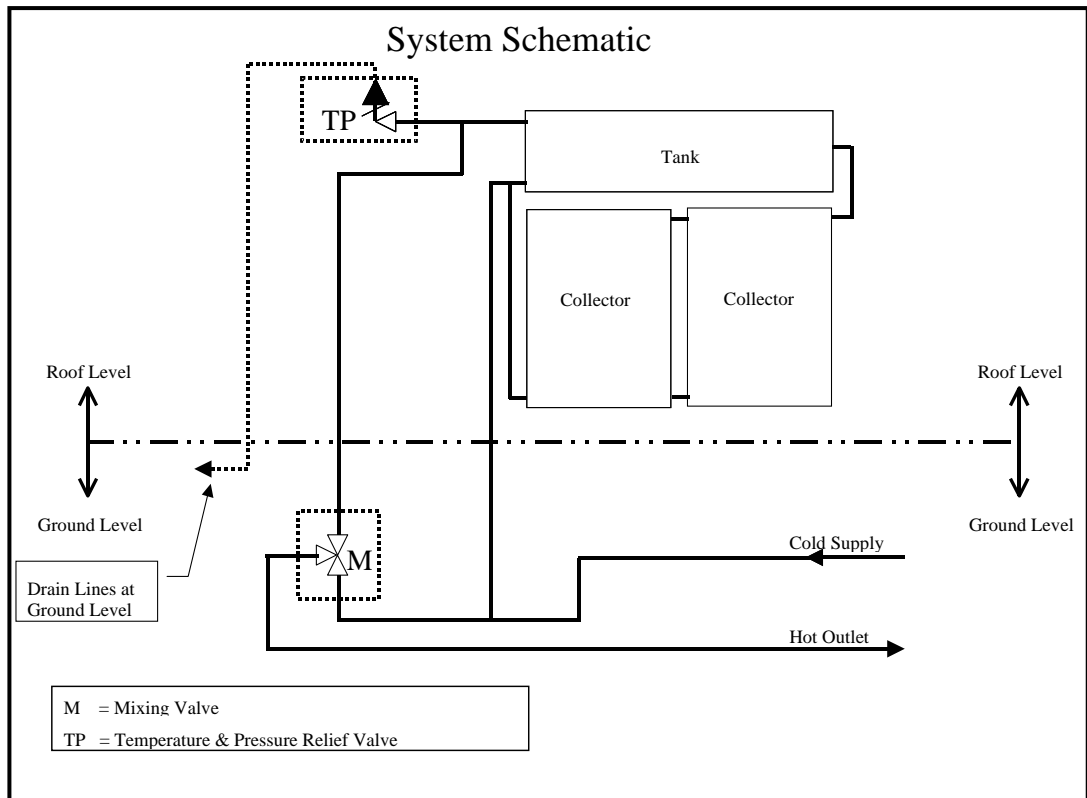
IN NORMAL OPERATION, SMALL AMOUNTS OF BOTH COLD AND HOT WATER CAN BE DISCHARGED FROM THE DRAIN LINES EVERY DAY DURING THE HEATING CYCLE DUE TO PRESSURE VARIATIONS.

PLUMBING SCHEMATIC FOR SOLE SOURCE HEATER

Typical for J, KF & Free Heat Model systems

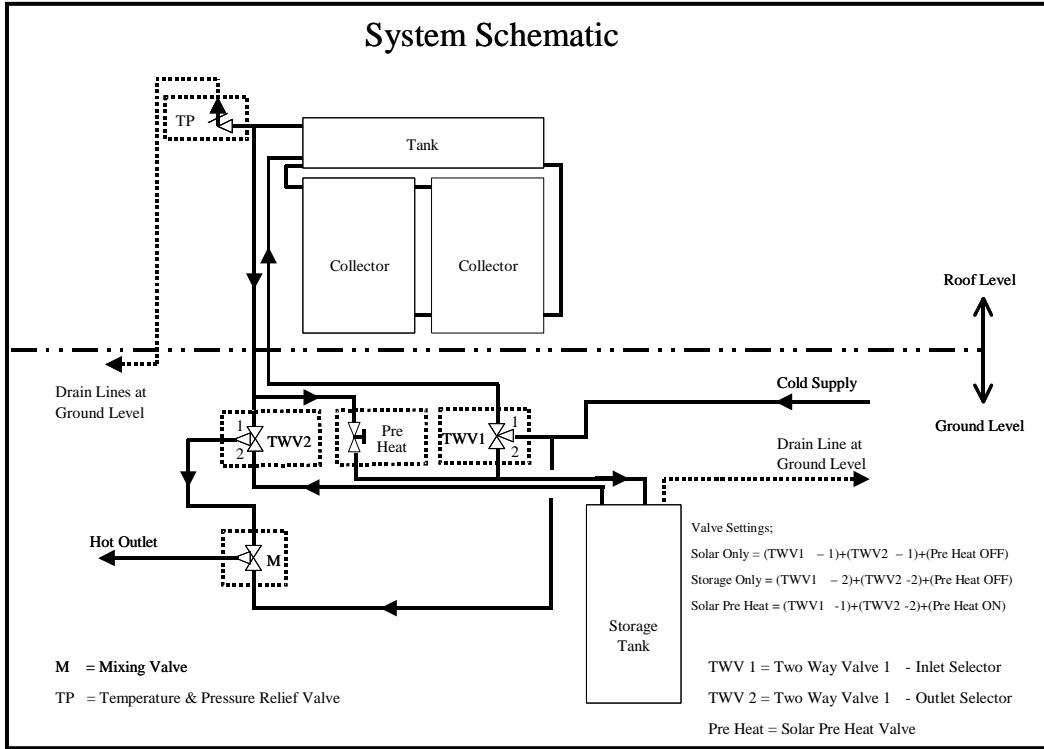


Typical for L Model systems

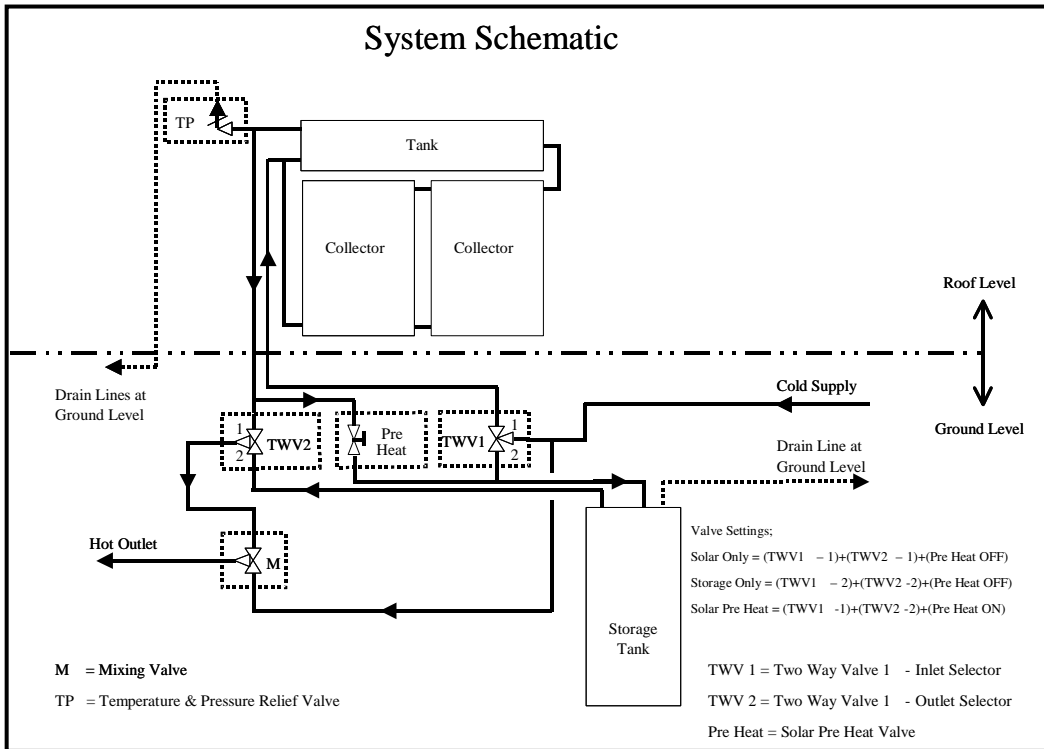


PLUMBING SCHEMATIC FOR PRE HEATER

Typical for J, KF & Free Heat Model system


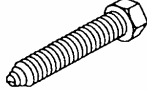



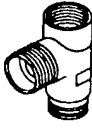



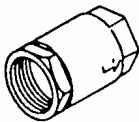



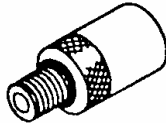



Typical for L Model systems



System Parts Identification List

NOTE: FOR REFERENCE ONLY. PARTS MAY VARY DEPENDING ON PARTS KIT PURCHASED.

<p>Storage tank</p> 	<p>Lag Bolt (5/16" x 1 3/4")</p> 
<p>Solar collector</p> 	<p>Tempering Valve</p> 
<p>Collector Nut</p> 	<p>3/4" Tee Adaptor</p> 
<p>Collector Plug</p> 	<p>3/4" TP Valve</p> 
<p>3/4" Tail Plug</p> 	<p>3/4" Check Valve</p> 
<p>3/4" Union</p> 	<p>3/4" Cold Water Expansion Valve</p> 
<p>3/4" Union Nut</p> 	<p>Jacket Relief Valve (including "O" ring)</p> 
<p>18 mm Union Cone</p> 	<p>Collector Union</p> 