# RESIDENTIAL SOLAR WATER HEATER AUDIT CHECKLIST

Your solar water heating system has received an SRP Audit. Any issues that were found during this audit are identified with a checkmark on the checklist below. The results of this audit are shared with the SRP Account Holder and their Installation Contractor. SRP recommends working with your contractor to resolve the identified issues. All issues must be resolved before your application can be processed for payment.

**Application Data** **AUDITOR:**_____ **AUDIT # 1 2 3 4 ___**

| | | |
|---|---|---|
| Customer (Name/Number): | | Date: |
| Address (Street/City): | | |
| Dealer: | Installing Contractor | |
| Equipment Manufacturer: | OG-300 Model: | Incentive: 100% 80% |

**Installation Data**

| | | | |
|---|---|---|---|
| Solar Tank Manufacturer (Elect, Gas): | | Model: | Gallons: |
| Secondary Tank (Elect, Gas): | | Model: | Gallons: |
| Refract Rating: | Interior Water Temp: | Tilt: | Azimuth: |

**PERFORMANCE ISSUES** **PASS** ☐ **NOT PASS** ☐

| | | |
|---|---|---|
| ☐ | 1 System not operational | |
| ☐ | 2 All components are not new | |
| ☐ | 3 Piping is not supported | |
| ☐ | 4 Piping or fittings are not adequate | (Collet Clips, UV Caps) |
| ☐ | 5 Piping or tank is not properly insulated | (Attic, Roof, Tank) |
| ☐ | 6 Expansion tank not installed correctly | |
| ☐ | 7 Collector/piping not appropriately pitched | (Collector, Pipe) |
| ☐ | 8 Valves not properly installed | (Tempering, Pressure Relief, Isolation, Drain/Fill) |
| ☐ | 9 Valves not properly labled | (Tempering, Pressure Relief, Isolation, Drain/Fill) |
| ☐ | 10 Fluids not properly labeled | |
| ☐ | 11 Sensor/PV wire issues | (Missing, Not Properly Installed) |
| ☐ | 12 Sensor and gauges issues | (Missing, Not Properly Installed) |
| ☐ | 13 If PV powered, high temperature shutoff function is not installed | |
| ☐ | 14 Collector(s) are shaded | |
| ☐ | 15 Collector mounting issues | (Panel Orientation, Brackets, Tie Down) |
| ☐ | 16 Roof penetrations are not sealed | |
| ☐ | 17 Other_____ | |

**APPLICATION ISSUES** **PASS** ☐ **NOT PASS** ☐

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|---|---|---|
| ☐ | 18 Model not consistent with SRP Application | (Power Source, #/Size of Collectors, Tank Size) |
| ☐ | 19 Collector azimuth does not match application | |
| ☐ | 20 Collector tilt does not match application | |

Details on the program requirements are available online at srpnet.com/SWHcontractor.
For questions regarding your SRP Audit, please contact SRP at SolarSWH@srpnet.com or (602) 236-4662.

9/15/2011

| | Source | Support |
|---|---|---|
| 1. System Operation | SRCC | 6.4.1 Operating Indicators-"Systems shall include means for an observer to determine readily that the system is operating properly and providing solar heated water". |
| 2. All New Components | SRP | Includes: tank, collector, plumbing, pumps, and controls must be new. |
| 3. Piping Support | IPC 2006 | 308.5 Interval of Support- "Pipe shall be supported in accordance with Table 308.5<br>• Copper/copper-alloy tubing, 1 ½ inch diameter and smaller. Maximum horizontal hanger/anchor spacing (feet) is 6 ft.<br>• Cross-linked polyethylene (PEX). Maximum horizontal hanger/anchor spacing (feet) is 2.67 ft (32 inches). |
| 4. Piping and Fittings | USEC 2009 | 313.2 Alignment-"Piping shall be supported in such a manner as to maintain its alignment and prevent sagging. [UPC:314.4] |
| | UPC 2000 | 316.1.5 Flexible Compression Factory Fabricated Joints- "When pipe is joined by means of flexible compression joints, such joints shall conform to approved standards and shall not be considered as slip joints". |
| 5. Piping Insulation | SRCC | 6.1.1.3 Thermal Expansion- "The system design components and subassemblies shall include adequate provisions for the thermal contraction and expansion of heat transfer fluids, thermal storage fluids and system components that will occur over the design temperature range". |
| | SRCC | Section 6.1.6.3- "All interconnecting hot water piping and the final 1.5 meters (5.0 feet) of metallic cold water supply pipe leading to the system, or to the length of piping which is accessible if less than 1.5 meters, shall be insulated with R-2.6 ˚F-ft2-hr/BTU or greater insulation." "All exterior piping insulation shall be protected from UV and moisture damage". |
| 6. Expansion Tank | USEC 2009 | Section 802.3 Installation- Insulation shall be finished with a jacket or facing with the laps sealed with adhesives or staples so as to secure the insulation on the pipe. Insulation exposed to the weather shall be weather proofed in accordance with standard practices acceptable to the Authority Having Jurisdiction. In lieu of jackets, molded insulation shall be permitted to be secured with sixteen (16) gauge galvanized wire ties not exceeding nine (9) inches (229 mm) on center." |
| | USEC 2009 | Section 602.1 General- Hot water-heating systems shall be provided with an air expansion tank securely fastened to the structure. Supports shall be adequate to carry twice the weight of the tank filled with water without placing any strain on connecting piping. |
| 7. Collector and Piping Pitch | SRCC | Section 6.2.5 Freeze Protection-"Protection from freeze damage under the most severe environmental conditions that can be expected in actual use shall be provided for all system components containing heat transfer liquids…Pipe slope for gravity draining shall have a minimum 2 cm vertical drop for each meter of horizontal length (1/4 inch per foot). This also applies to any header pipes or absorber plate riser tubes internal to the collector". |
| 8 (a). Temperature and Pressure Relief Valve | IPC 2006 | Section 504.4 Relief valve- "All storage water heaters operating above atmospheric pressure shall be provide with an approved, self-closing (levered) pressure relief valve and temperature relief valve or combination thereof. The relief valve shall conform to ANSI Z21.22…"<br>Section 504.6 Requirements for discharge piping- "The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:<br>• Serve a single relief device and shall not connect to piping serving any other relief device or equipment.<br>• Not terminate more than 6 inches (152mm) above the floor or waste receptor. |
| 8 (b). Pressure Relief Valve | SRCC | 6.3.16 Pressure Relief-"Each portion of the system where excessive pressures can develop shall have a pressure relief device to ensure that no section can be valved off or otherwise isolated from a relief device…" |

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| 8 (c). Tempering Valve | USEC 2009 | 408.4 Interior Relief Valves- "Relief valves located inside a building shall be provided with a drain, not smaller than the relief valve outlet, of galvanized steel, hard-drawn copper piping and fittings, CPVC, or listed relief valve drain tube and fittings and shall extend from the valve to the outside of the building with the end of the pope not exceeding two (2) feet (610 mm) nor less than six (6) inches above the ground or the flood level of the area receiving the discharge and pointing downward…" |
| | SRCC | 6.1.5.6 Temperature Control-"The system shall be equipped with a means for automatically limiting the temperature of the hot water at the fixtures to a selectable temperature. The range of selectability shall be at least 10˚C (18˚F) and shall include a set point of 50˚C (122˚F)". |
| 9. Isolation Valve Label | SRCC | 6.1.1.2 Solar Loop Isolation-"…All isolation valves shall be labeled with their normal operating position indicated". |
| 10. Fluid Label | SRCC | 6.3.7 Fluid Safety Labeling-"Labels shall mark all drain and fill valves in the SWH system. Each label shall identify the fluid in that loop…The label shall include a warning that fluid may be discharged at high temperature and/or pressure. The label shall contain the following warning: 'No other fluid shall be used that would change the original classification of this system. Unauthorized alterations to this system could result in a hazardous heath condition.'" |
| 11. Sensor Wire/PV Wire | SRCC | 6.5.18 Control Sensor Installation-"Control sensors and the means for transmitting sensor outputs to control devices shall be protected from environmental influence such as wind, moisture, temperature or other factors which may alter their intended sensing function". |
| 12. Sensor and Gauges | SRCC | 6.1.1.1 Operating Limits- "Means shall be provided to protect the solar Water Heater system within the design limits of temperature and pressure".<br>6.4.1 Operating Indicators- "The Solar Water Heating system shall include means for an observer to determine readily that the system is operating properly and providing solar heated water". |
| 13. High Temperature Shutoff | SRCC | 6.3.5 High Temperature Control-"Means shall be provided to limit tank temperatures to a value not to exceed the tank supplier's specified high temperature limit". |
| 14. Collector Shading | SRCC | 6.5.13 Shading of Collector-"The location of the orientation of the collector shall be such that it is not shaded by external obstructions or mutual shadowing more than the specified period allowed in the design". |
| 15. Collector Brackets | USEC 2009 | 702.2 Orientation- "Collectors shall be located in accordance with the manufacturer's installation instructions to optimize the sun's energy, consistent with the intended purpose of the system". |
| | SRCC | 6.5.8 Structural Supports-"Neither wind loading (including uplift) nor the additional weight of filled collectors shall exceed the live or dead load ratings of the building, roof, roof anchorage, foundation or soil…". |
| 16. Roof Penetration | SRCC | 6.5.5 Building Penetrations-"Penetrations of the building through which piping or wiring is passed shall not reduce or impair the function of the enclosure…Required roof penetrations shall be make in accordance with applicable codes and also by practices recommended by the National Roofing Contractors Association". |
| 18. System consistent with SRP Application | SRP | Solar Water Heater (SWH) system including storage tank, solar collectors, and components match the SWH application. |
| 19/20. Collector Placement | SRP | Collector(s) are substantially unshaded between 9am and 3pm year-round. The collector(s) shall not receive less than 80% annual solar access as determined by a Solmetric SunEye ™. |
| | SRCC | 6.5.12 Tilt and Azimuth-"The collector shall be installed on a mount capable of maintaining tilt and azimuth to design conditions". |

**References:**


International Plumbing Code, "The 2006 International Plumbing Code"
SRCC Document OG-300, "Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems", June 2008
Uniform Plumbing Code, "Uniform Plumbing Code 200 Edition", October 1999
Uniform Solar Energy Code, "The 2009 edition of the Uniform Solar Energy Code, An American National Standard, IAPMO/ANSI USEC 1-2009