

**Project Information**

Verifier	<input type="checkbox"/> Energy Trust <input type="checkbox"/> Trade Ally*	Verification Date(s) 1 <sup>st</sup> :                      2 <sup>nd</sup> :	Time of Measurement
System Owner	<input type="checkbox"/> Form 224S <input type="checkbox"/> Form 224C	Trade Ally Contractor	
Site Address		City	Zip
Ambient Temperature (°F)	Solar Radiation (W/m <sup>2</sup> )	Water Temperature (°F)	

\*Solar Trade Ally that has qualified for Random Verification status shall complete the 1<sup>st</sup> installation checklist column and sign below.

**Installation Checklist** (Requirement numbers refer to sections of the [Solar Pool Heating Installation Requirements.](#))

Verification 1 <sup>st</sup> 2 <sup>nd</sup>	2.1	General
<input type="checkbox"/> <input type="checkbox"/>	2.1.1	Backup pool heater is either: a) electric and served by <input type="checkbox"/> PGE or <input type="checkbox"/> Pacific Power, or b) gas and served by <input type="checkbox"/> NW Natural or <input type="checkbox"/> Cascade Natural Gas ( <i>select one</i> ). <input type="checkbox"/> System is replacing a pool heater and customer is served by one of the utilities above ( <i>check all that apply</i> ).
<input type="checkbox"/> <input type="checkbox"/>	2.1.2	Installation is of industry standard and workmanlike quality.
<input type="checkbox"/> <input type="checkbox"/>	2.1.3	Collectors are optimized for performance without sacrificing aesthetics.
<input type="checkbox"/> <input type="checkbox"/>	2.1.4	Installation is consistent with plumbing diagram.
<input type="checkbox"/> <input type="checkbox"/>	2.1.5	Installation is consistent with manufacturers' instructions.
<input type="checkbox"/> <input type="checkbox"/>	2.1.6	Jurisdictional inspection(s) have been passed: Permit # _____ Date _____
	<b>2.2</b>	<b>Materials</b>
<input type="checkbox"/> <input type="checkbox"/>	2.2.1	Materials used outdoors are UV-resistant and listed for outdoor locations.
<input type="checkbox"/> <input type="checkbox"/>	2.2.2	Materials are designed to withstand the temperatures to which they are exposed.
<input type="checkbox"/> <input type="checkbox"/>	2.2.3	Dissimilar metals that have galvanic action are isolated.
<input type="checkbox"/> <input type="checkbox"/>	2.2.4	Aluminum is not placed in direct contact with concrete.
<input type="checkbox"/> <input type="checkbox"/>	2.2.5	Stainless steel fasteners are used to secure collectors, high quality fasteners are used throughout.
<input type="checkbox"/> <input type="checkbox"/>	2.2.6	Structural members are made of approved materials.
	<b>2.3</b>	<b>Equipment and Installation</b>
<input type="checkbox"/> <input type="checkbox"/>	2.3.1	All installed system components are new.
<input type="checkbox"/> <input type="checkbox"/>	2.3.2	Solar collectors are copolymer plastic, are SRCC 0G-100 of FSEC certified, and have a 10 year warranty.
<input type="checkbox"/> <input type="checkbox"/>	2.3.3	<input type="checkbox"/> Swimming pool is equipped with a pool cover or <input type="checkbox"/> has a net collector area to pool surface area ratio of 0.6 for small seasonal pools or 0.75 for all other pools.
<input type="checkbox"/> <input type="checkbox"/>	2.3.4	System components are protected from weather or rated for outdoor exposure.
<input type="checkbox"/> <input type="checkbox"/>	2.3.5	Monitoring devices are installed in easily visible locations.
<input type="checkbox"/> <input type="checkbox"/>	2.3.6	Any building insulation disturbed due to system installation is restored to previous condition.
<input type="checkbox"/> <input type="checkbox"/>	2.3.7	Penetrations to building shell are sealed and fire resistance maintained.
	<b>2.4</b>	<b>Collector Mounting</b>
<input type="checkbox"/> <input type="checkbox"/>	2.4.1	Roof has 10 or more years useful life remaining (if roof-mounted).
<input type="checkbox"/> <input type="checkbox"/>	2.4.2	Roof is capable of handling additional load (if roof-mounted).
<input type="checkbox"/> <input type="checkbox"/>	2.4.3	Mounting is designed and installed to meet local codes.
<input type="checkbox"/> <input type="checkbox"/>	2.4.4	All roof penetrations are flashed and sealed appropriately.
<input type="checkbox"/> <input type="checkbox"/>	2.4.5	Collector headers are horizontal or slightly tilted toward inlet (1/8" per foot).
<input type="checkbox"/> <input type="checkbox"/>	2.4.6	Collector rows are each plumbed so that pool water enters lower corner and exits opposite upper corner.
<input type="checkbox"/> <input type="checkbox"/>	2.4.7	Rows of collectors are plumbed in parallel and the plumbing from all rows returns to the highest point.

<input type="checkbox"/>	<input type="checkbox"/>	2.4.8	Multiple rows of collectors with dissimilar numbers of collectors in each row are plumbed with balancing valves on the inlet piping and thermometers on the outlet plumbing and the system flow rate is balanced.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.9	Multiple rows of collectors mounted in saw tooth configuration are plumbed in parallel and system flow is balanced.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.10	Collector mounting is per manufacturer(s) specifications.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.11	Collectors using protruding flange connection shall have flashing between each flange and roof surface.
		<b>2.5</b>	<b>Solar Access</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.5.1	Solar resource is documented with an Energy Trust approved tool from location where shading is most significant.
<input type="checkbox"/>	<input type="checkbox"/>	2.5.2	TSRF is 75% or greater at all points on the collectors (can be measured seasonally for season use pool).
		<b>2.6</b>	<b>Plumbing</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.6.1	Piping is schedule 40 PVC with minimum diameter of 1.5" (≤ 40 gpm) or 2" (≤ 80 gpm).
<input type="checkbox"/>	<input type="checkbox"/>	2.6.2	System flow rate is compatible with total number and size of collector panels.
<input type="checkbox"/>	<input type="checkbox"/>	2.6.3	Piping runs are adequately supported.
<input type="checkbox"/>	<input type="checkbox"/>	2.6.4	Dielectric unions are used between dissimilar metals.
		<b>2.7</b>	<b>Valves, Controls and Instrumentation</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.7.1	Isolation ball valve and check valve are installed, enabling bypass of solar system.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.2	Drain valves are installed at the lowest point in the system on the collector inlet and outlet piping, allowing system to be drained prior to freezing conditions.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.3	Vacuum relief valve is installed on the upper collector header for each row of collectors.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.4	Motorized three-way valve is installed after the pool filter in the supply piping to the collectors, powered by a differential temperature controller.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.5	Check valve is installed between filter and three-way valve.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.6	Controller is set for desired pool temperature, mounted in a readily accessible location and is hard-wired or plugged into nearest outlet. If using an outlet, plug is labeled per program specifications.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.7	Sensors are placed correctly and attached securely.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.8	Sensors wires have good connections and are protected from weather and high temps.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.9	Flow verification provided by: flow meter or flow confirmation method with laminated instructions.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.10	A thermometer is installed in the return line from the collectors and prior to the backup pool heater.
		<b>4.0</b>	<b>System Documentation</b>
<input type="checkbox"/>	<input type="checkbox"/>	4.1.1	For Form 224C systems, all valves, gauges and instruments are labeled per program specifications.
<input type="checkbox"/>	<input type="checkbox"/>	4.2.1	Customer Manual is provided and includes: <input type="checkbox"/> Operation & Maintenance Instructions, <input type="checkbox"/> As-built Plumbing Diagram, <input type="checkbox"/> Mechanical Design, <input type="checkbox"/> Contractor Warranty, <input type="checkbox"/> Manufacturers' Warranties, <input type="checkbox"/> Signed Form 224S or 224C, <input type="checkbox"/> Permit(s), <input type="checkbox"/> Parts and Source List, <input type="checkbox"/> Data Sheets for Pump, Valves, and Controller.
			<b>Owner Education</b>
<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> Owner understands basic system operation. <input type="checkbox"/> Owner can accurately read flow meter and thermometer. <input type="checkbox"/> Owner understands required maintenance. <input type="checkbox"/> Owner knows who to call in the case of an emergency. <input type="checkbox"/> Owner understands proper start-up, shut-down and freeze protection procedure.

**Trade Ally Self-Verification Signature** (For Solar Trade Allies on Random Verification status. See [Program Guide](#))

I certify that the system listed on this **Form 234—Solar Pool Heating Installation Checklist** was installed as indicated on the Incentive Application and that the system complies with the requirements listed in the [Solar Pool Heating Installation Requirements](#). Should a subsequent random verification of the system identify a Program violation, I understand that I will be required to remedy the violation within thirty (30) days of the random verification report. If I do not cure the violation, I will be required to refund to Energy Trust an amount equal to the incentive funds paid by Energy Trust for this system.

Trade Ally Name	Trade Ally Representative Signature	Date
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