SOLAR RATING & CERTIFICATION CORPORATION™

An ICC Evaluation Service Program

OG-300 Solar Water Heating System Certification

No./30004307

Issued: January 07, 2020

Expiration Date: October 01, 2026

www.solar-rating.org | **(800) 423-6587** | **(562) 699-0543**

CERTIFICATION HOLDER:	**EVALUATION SUBJECT**	
SunEarth, Inc. 8425 Almeria Avenue Fontana, CA 92335 USA **www.sunearthinc.com**	**BRAND:**	Cascade 2
	MODEL:	C2-40T-50-TLG
	TYPE:	Pumped, Indirect, Drainback

PRODUCT CERTIFICATION SYSTEM:

The ICC-SRCC OG-300 system certification program includes evaluation and performance ratings for solar water heating systems as established in the *ICC-SRCC Rules for Solar Heating & Cooling Product Listing Reports*. The program also includes periodic factory inspections and surveillance of the manufacturer's quality management system.

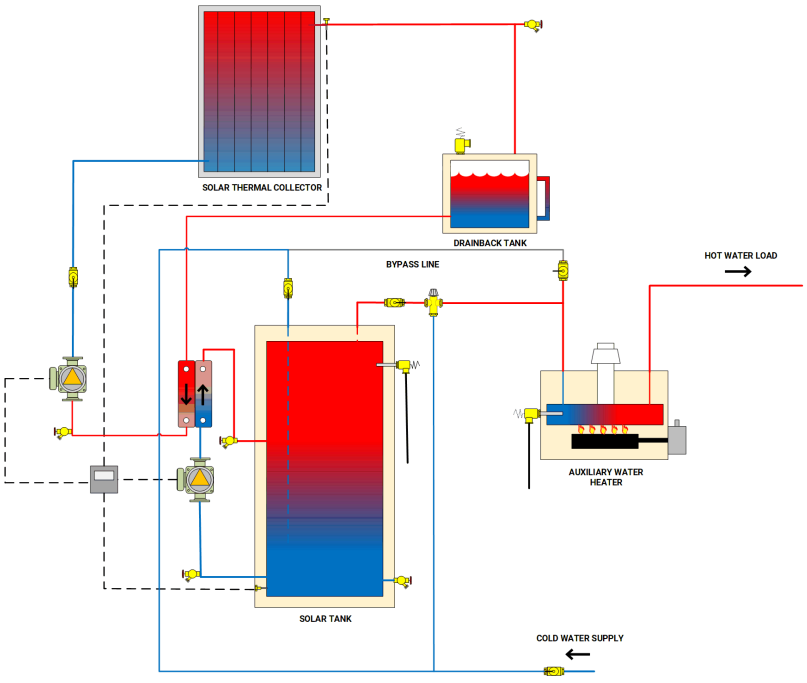
COMPLIANCE WITH THE FOLLOWING STANDARD(S): *ICC 900/SRCC 300 – 2020, Solar Thermal System Standard*
ENERGY STAR® Residential Water Heater Specification (v.5)

SOLAR UNIFORM ENERGY FACTOR (SUEF): 5.2, Medium Draw Profile

The Solar Uniform Energy Factor (SUEF) is determined through computer modeling per the specification established in *ICC 900/SRCC 300, Appendix B*.

INSTALLATION:

The solar water heating system must be installed in accordance with the manufacturer's published installation instructions. Installation must conform to the requirements of the applicable code and is subject to approval by the code official having jurisdiction. This certification is valid only for a system with the components configured as shown in the schematic below:



COMPONENT IDENTIFICATION			
	Thermostatic Mixing Valve		Isolation Valve
	Pressure/Temp Valve		Pressure Relief Valve
	Drain Valve		Temperature Sensor
	Pump		Controller

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PARTS LIST:

Part	Quantity	Evaluated Component
Collector	1	SunEarth TRB-40 (OG-100 #10001803)
Solar Tank	1	AO Smith ProLine ENS-50 (189 L volume)
Drainback Tank	1	SunEarth DBT 10 SS (38 L volume)
Auxiliary Water Heater	1	Generic Gas Tankless Water Heater

IDENTIFICATION:

Certified systems must be identified with the OG-300 certification mark below in accordance with the *Rules for Certification Mark and Certificate Use* and labeled in with the information below per *ICC 900/SRCC 300*:

1. Manufacturer's name and model number.
2. OG-300 system certification number
3. OG-100 collector certification number(s) and quantity.
4. Heat transfer fluid and concentration range.
5. Storage and expansion tank volumes.
6. Relief valve specification and setpoint.
7. Maximum water supply pressure.
8. Maximum solar loop pressure.
9. Flow rate range (where a flow meter is installed).
10. Backup energy rating. For electrical, phase/volts/amps. For gas, minimum pressure.
11. Installation date field (to be entered by the installer in the field).

CONDITIONS:

The certified solar water heating system must comply with the following conditions:

1. Systems must be installed and operated in accordance with the manufacturer's instructions and local codes.
2. Systems must include all components installed in the configuration shown in the schematic in the OG-300 certification document.
3. Systems must use one of the OG-100 certified solar collector options from the list above. Where more than one collector is installed in a system, all collectors must be the same model.
4. Systems must utilize heat transfer fluids approved by the manufacturer.
5. Certifications are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use.
6. There is no warranty by ICC-SRCC express or implied, as to any finding or other matter in this certification, or as to any product covered by the certification.

REGIONAL RATINGS:

Thermal performance ratings are provided for the system based on computer modeling to standard OG-300 rating conditions and a hot water load of 64.3 gallons (243.3 L) per day at a setpoint of 125°F (52°C) for comparison. Performance is given using the following values:

Annual Solar Fraction (SF_A): The portion of the total conventional hot water heating load (including tank standby losses) provided by solar energy averaged over one year.

Annual Energy Savings (AES): The projected energy savings over a period of one year for the system compared to a baseline tank-type water heater using the same fuel source.

Results are given for several climate zones throughout Nort America. Climate zones are as established in *ANSI/ASHRAE 169, Climatic Data for Building Design Standard.* Actual thermal performance and energy savings for an installed system will vary with local conditions, installation details and hot water usage.

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UNITED STATES OF AMERICA

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in the United States corresponding to climate zones as established in ASHRAE 169 is provided below. Ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for the specific locations listed below. Ratings for locations in California and Hawaii are provided on separate state maps on the following pages.

USA			
Location	**Climate Zone (ASHRAE 169)**	**Annual Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
AK – Anchorage	7	0.45	3580
AZ - Phoenix	2B	0.87	4740
CO – Denver	5B	0.73	5020
FL – Tampa	2A	0.82	4370
GA - Atlanta	3A	0.73	4500
MA – Boston	5A	0.63	4310
MO – St. Louis	4A	0.67	4380
MT - Helena	6B	0.61	4530
TX – Dallas-Fort Worth	3A	0.77	4480
WA - Seattle	4C	0.57	3860
WI - Milwaukee	6A	0.60	4310

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STATE OF CALIFORNIA

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in the state of California corresponding to building climate zones as established by the California Energy Commission (CEC) is provided below. Ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for the specific locations listed below.

State of California			
Location*	**Climate Zone (ASHRAE 169)**	**Annual Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
CCZ 1- Arcata	7	0.61	4180
CCZ 2 – Santa Rosa	6B	0.74	4750
CCZ 3 - Oakland	3C	0.74	4810
CCZ 4 – Sunnyvale	4C	0.77	4870
CCZ 5 – Santa Maria	5C	0.78	5070
CCZ 6 – Los Angeles	3B	0.81	4810
CCZ 7 – San Diego	3B	0.80	4800
CCZ 8 – El Toro	3B	0.82	4940
CCZ 9 – Burbank	3B	0.80	4900
CCZ 10 – Riverside	3B	0.82	4910
CCZ 11 – Red Bluff	3B	0.75	4530
CCZ 12 – Sacramento	3B	0.76	4680
CCZ 13 - Fresno	3B	0.78	4730
CCZ 14 – China Lake	3B	0.85	4920
CCZ 15 – El Centro	3B	0.88	4620
CCZ 16 – Mt. Shasta	7	0.70	4770

* California Building Climate Zones and representative cities are established by the California Energy Commission for use in the CA Title 24 Energy Efficiency Standards

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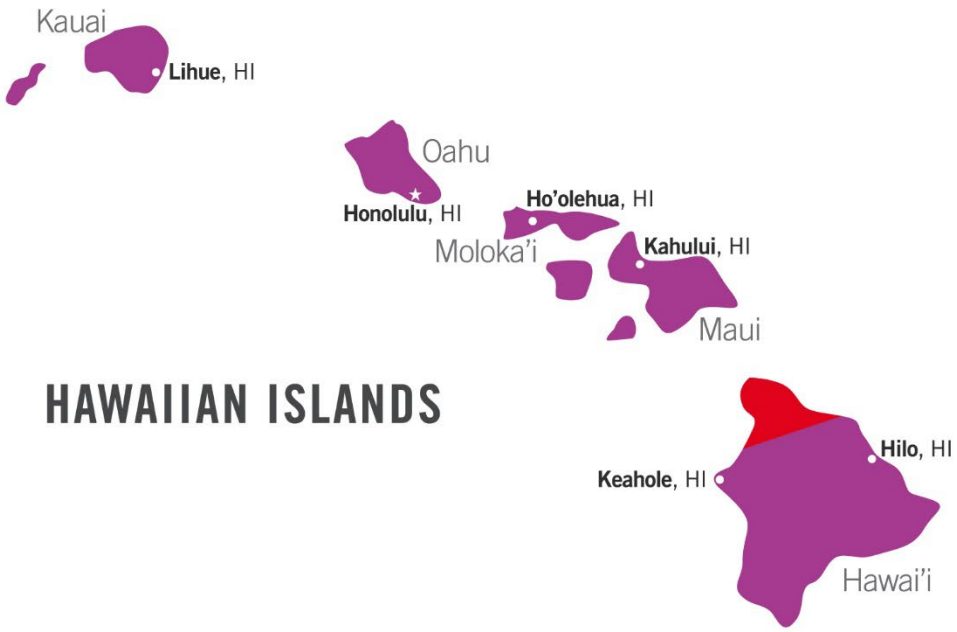
HAWAIIAN ISLANDS

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in the Hawaiian Islands corresponding to climate zones as established in ASHRAE 169 is provided below. Ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for the specific locations listed below.



State of Hawaii				
Location		**Climate Zone (ASHRAE 169)**	**Annual Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
Hilo	Hawaii Island	1	0.79	4080
Honolulu	Oahu Island	1	0.86	4290
Kahului	Maui Island	1	0.86	4260
Keahole	Hawaii Island	1	0.85	4460
Lihue	Kaua'i Island	1	0.84	4260
Ho'olehua	Moloka'i Island	1	0.87	4300

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CANADA

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in Canada corresponding to climate zones as established in ASHRAE 169 is provided below. Ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for the specific locations listed below. OG-30 annual ratings are based on a 243 L (64.3 gal) per day hot water load.

Canada			
Location	**Climate Zone (ASHRAE 169)**	**Annual Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
AB - Edmonton	5	0.59	4620
NS - Halifax	7A	0.55	3970
ON – Toronto	7A	0.60	4320
QC – Quebec City	5	0.57	4350
MB – Winnipeg	7A	0.58	4600
AB - Calgary	7A	0.61	4730
BC - Vancouver	7	0.57	3980

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CENTRAL AMERICA AND CARIBBEAN REGION

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in Central America and the Caribbean region corresponding to climate zones as established in ASHRAE 169 is provided below. Ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for the specific locations listed below.

Central America & Caribbean Region			
Location	**Climate Zone (ASHRAE 169)**	**Annual Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
Barbados – Christ Church	1	0.91	4390
Costa Rica – San Jose	1	0.85	5810
Jamaica - Kingston	1	0.91	4430
Mexico - Monterrey	2	0.71	4100
Mexico – Mexico City	2	0.74	5040
Belize – Belize City	1	0.85	4120
Puerto Rico – San Juan	1	0.87	4240

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