SOLAR RATING & CERTIFICATION CORPORATION™

An ICC Evaluation Service Program

OG-300 Solar Water Heating System Certification

No./30004374

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CERTIFICATION HOLDER:	EVALUATION SUBJECT	
Sensible Technologies, Inc. 4723 Tidewater Avenue #C Oakland, CA 94601 USA www.sensibletechnologies.net	**BRAND:**	SETS
	MODEL:	SETS 1-Tank-80
	TYPE:	PV Water Heater

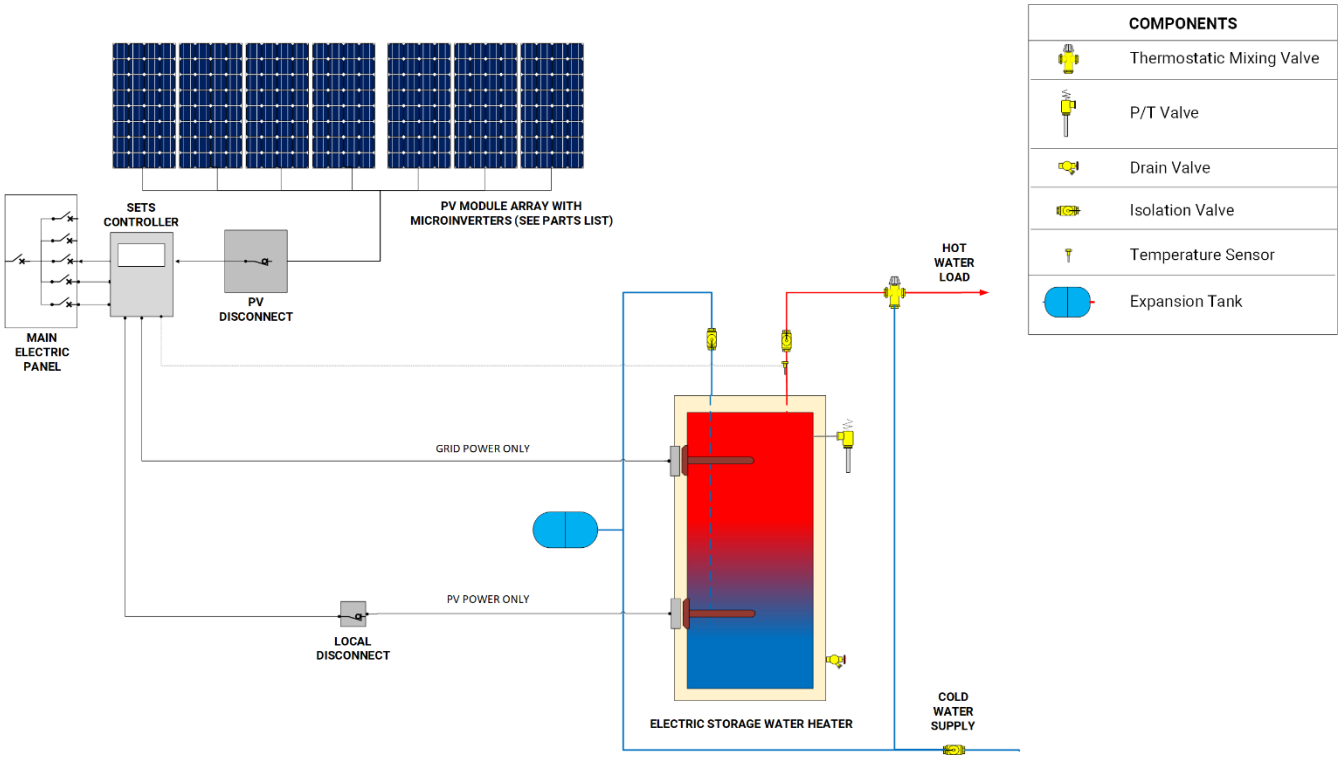
PRODUCT CERTIFICATION SYSTEM:

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*

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 composed of the components configured as shown in the schematic below:



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PARTS LIST: The following components were used for the purposes of determining OG-300 ratings given below.

Part	Quantity	Evaluated Component
PV Modules	8	SunPower SPR-X21-350-BLK-E-AC
Inverter(s)	8	Enphase IQ7XS-96-x-AMC-US microinverters
Controller	1	Sensible Technologies SETS Controller
Backup Water Heater	1	Generic Electric Storage Water Heater – 80 gal (303 L)
Heating Elements	2	Generic resistance heating elements, each 3kW rated.

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 specified, installed and operated in accordance with the manufacturer's instructions and local codes.
2. Systems must include components installed in the configuration shown in the schematic in the OG-300 certification document. PV modules, inverters and backup water heater may differ from those evaluated in this certification per the ICC 900/SRCC 300 standard, provided that all conditions of this certification are met and in accordance with manufacturers' specifications and local codes. OG-300 performance ratings are only given and valid for the specific components listed above.
3. Systems must use PV modules listed to UL 1703 or UL 61730. Systems must use microinverters listed to UL 1741. PV modules and microinverters must be specified and installed per the component manufacturers' and SETS controller manufacturer's instructions.
4. Electric backup water heater must be listed to UL 174, UL 1453 or UL 60335-2-40 and specified, installed per the water heater manufacturer and SETS controller manufacturer's instructions.
5. Systems are only approved for use heating potable water.
6. Certification does not address the electrical safety of the system, wiring or components.
7. 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.
8. 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. Lower PV element setpoint is 140°F (60°C) and upper grid element setpoint is 120°F (49°C). 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. Ratings do not address energy production in excess of that used for water heating per the standard OG-300 rating conditions.

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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	0.40	2110
AZ - Phoenix	2B	0.84	2860
CO – Denver	5B	0.74	3360
FL – Tampa	2A	0.82	2690
GA - Atlanta	3A	0.72	2850
MA – Boston	5A	0.64	2860
MO – St. Louis	4A	0.68	2860
MT - Helena	6B	0.66	3220
TX – Dallas-Fort Worth	3A	0.76	2800
WA - Seattle	4C	0.54	2420
WI - Milwaukee	6A	0.62	2920

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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	2705
CCZ 2 – Santa Rosa	6B	0.69	2941
CCZ 3 - Oakland	3C	0.72	3079
CCZ 4 – Sunnyvale	4C	0.77	3194
CCZ 5 – Santa Maria	5C	0.77	3263
CCZ 6 – Los Angeles	3B	0.81	3119
CCZ 7 – San Diego	3B	0.80	3087
CCZ 8 – El Toro	3B	0.81	3170
CCZ 9 – Burbank	3B	0.77	3033
CCZ 10 – Riverside	3B	0.80	3082
CCZ 11 – Red Bluff	3B	0.72	2798
CCZ 12 – Sacramento	3B	0.73	2906
CCZ 13 - Fresno	3B	0.75	2919
CCZ 14 – China Lake	3B	0.85	3135
CCZ 15 – El Centro	3B	0.85	2767
CCZ 16 – Mt. Shasta	7	0.70	3116

* 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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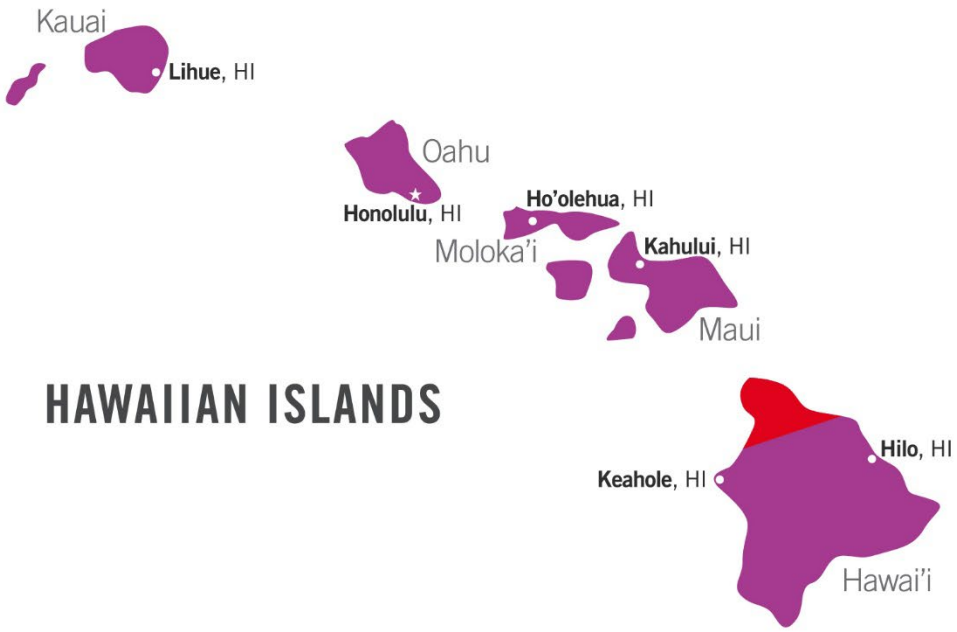
HAWAIIAN ISLANDS

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	0.82	2610
Honolulu	Oahu Island	1	0.88	2670
Kahului	Maui Island	1	0.86	2600
Keahole	Hawaii Island	1	0.87	2800
Lihue	Kaua'i Island	1	0.86	2690
Ho'olehua	Moloka'i Island	1	0.88	2670

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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 - Calgary	7A	0.63	3230
AB - Edmonton	5	0.62	3250
BC - Vancouver	7	0.55	2510
MB – Winnipeg	7A	0.61	3240
NS - Halifax	7A	0.59	2800
ON – Toronto	7A	0.60	2840
QC – Quebec City	5	0.59	2990

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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	2660
Belize – Belize City	1	0.91	2630
Costa Rica – San Jose	1	0.85	3780
Jamaica - Kingston	1	0.91	2630
Mexico – Mexico City	2	0.73	2630
Mexico - Monterrey	2	0.78	3500
Puerto Rico – San Juan	1	0.90	2610

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