SOLAR RATING & CERTIFICATION CORPORATION

An ICC Evaluation Service Program

OG-300 Solar Water Heating System Certification

No./30004353

Issued:January 28, 2021

This certification is subject to renewal:November 01, 2022

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

CERTIFICATION HOLDER:	**EVALUATION SUBJECT**	
Dimas SA	**BRAND:**	Aria
2nd KLM Argos-Nafplion	**MODEL:**	Aria 300-4 EL
Argos, 21200 Greece	**TYPE:**	Thermosiphon, Direct
www.dimas-solar.gr		

PRODUCT CERTIFICATION SYSTEM:

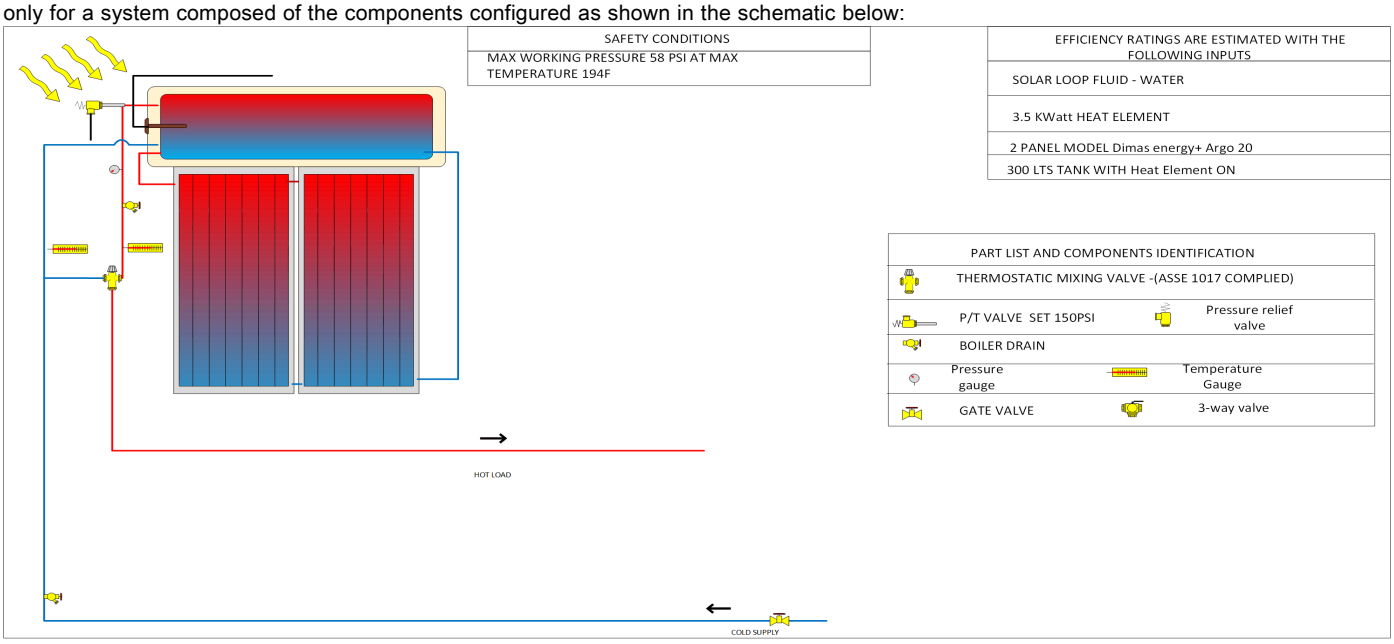
The ICC-SRCC OG-300 product certification system includes evaluation and development of performance ratings for the solar water heating system in accordance with the SRCC OG-300 Operating Guidelines for Certifying Solar Water Heating Systems, as established in the ICC-SRCC Rules for Solar Heating & Cooling Product Listing Reports. The system also involves factory inspections and surveillance of the supplier's quality system.

COMPLIANCE WITH THE FOLLOWING STANDARD(S): ICC 900/SRCC Standard 300-2020

ENERGY STAR ® certified

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:



PARTS LIST:

Part	Quantity	Evaluated Component
Collector Option 1	2	Dimas SA Model ENERGY+ARGO 20 (OG-100 2010019E)
Solar Tank	1	Dimas Solar Model ECO 300 (300 L volume)

IDENTIFICATION:

Certified systems must be identified with the OG-300 certification mark below in accordance with the Rules for Certification Mark and Certificate Use.

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 code.
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.

RATINGS:

Annual 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 per day (243.4 litres per day) at a setpoint of 125 F (51.7 C) for relative comparison. Performance is rated using the following values:

- Solar Fraction (SF): The portion of the total conventional hot water heating load (including tank standby losses) provided by solar energy over a defined period of time.
- Solar Energy Factor (SEF): The energy delivered to the fluid by the system divided by the total electrical and/or gas energy input to the system over a defined period of time.
- 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.

NOTE: Actual thermal performance and energy savings will vary with local conditions, installation details and hot water usage.
Annual rating results are provided for representative locations in various climate zones, as defined by the ASHRAE 169 standard. Color coding of climate zones is consistent across the maps, with the exception of California. There the climate zones are as defined by the CA Energy Commission for use in CA Title 24.

UNITED STATES OF AMERICA

OG-300 SOLAR ENERGY FACTOR RATING

Solar Energy Factor (SEF) for the system is provided below for standardized solar irradiance and hot water draws over a single 24-hour period.

SOLAR ENERGY FACTOR (SEF):	3.10

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

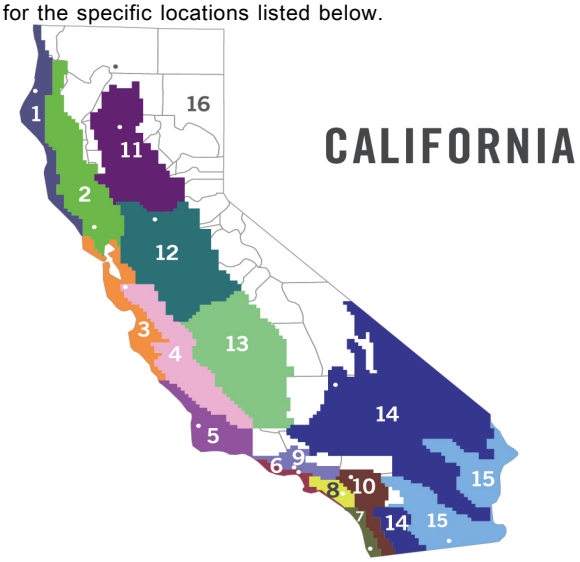
USA			
Location	**Climate Zone (ASHRAE 169)***	**Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
AK - Anchorage	7	0.19	1030
AZ - Phoenix	2B	0.93	3290
CO - Denver	5B	0.66	3060
FL - Tampa	2A	0.87	2970
GA - Atlanta	3A	0.70	2840
MA - Boston	5A	0.50	2300
MO - St Louis	4A	0.58	2520
MT - Helena	6B	0.46	2320
TX - Dallas-Fort Worth	3A	0.76	2900
WA - Seattle	4C	0.41	1870
WI - Milwaukee	6A	0.45	2160

*Climate zones are as established in ANSI/ASHRAE 169, Climatic Data for Building Design Standards.

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.



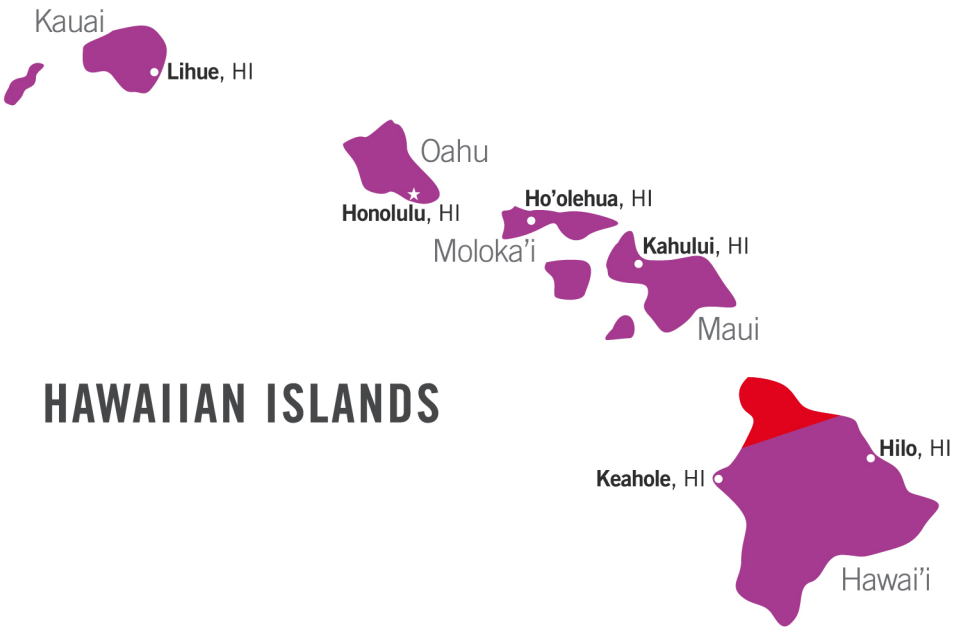
California			
Location	**CA Climate Zone****	**Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
CA - Climate Zone 1	7	0.48	2210
CA - Climate Zone 2	6B	0.70	2990
CA - Climate Zone 3	3C	0.72	3080
CA - Climate Zone 4	4C	0.75	3170
CA - Climate Zone 5	5C	0.78	3380
CA - Climate Zone 6	3B	0.83	3240
CA - Climate Zone 7	3B	0.82	3250
CA - Climate Zone 8	3B	0.85	3380
CA - Climate Zone 9	3B	0.82	3330
CA - Climate Zone 10	3B	0.86	3370
CA - Climate Zone 11	3B	0.71	2830
CA - Climate Zone 12	3B	0.73	2980
CA - Climate Zone 13	3B	0.77	3060
CA - Climate Zone 14	3B	0.88	3310
CA - Climate Zone 15	3B	0.94	3190
CA - Climate Zone 16	7	0.62	2850

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

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.



Hawaii			
Location	**Climate Zone (ASHRAE 169)***	**Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
HI - Hilo	1	0.80	2650
HI - Honolulu	1	0.95	3000
HI - Kahului, Maui Island	1	0.93	2950
HI - Keahole, Hawaii Island	1	0.94	3170
HI - Lihue, Kauai Island	1	0.90	2960
HI - Ho'olehua, Molokai Island	1	0.94	3010

*Climate zones are as established in ANSI/ASHRAE 169, Climatic Data for Building Design Standards.

CANADA

CANADA SINGLE DAY RATING

The Canada Single Day Rating below provides annual estimated energy savings determined using computer modeling based on the standard day specified in the CAN/CSA F379 SERIES-09 (R2013) standard for a 300 litre/day hot water draw.
Baseline energy savings for single-tank electric and gas tank-type water heaters (with no solar input) are -1.11 and -4.83 GJ/year, respectively. Negative values are indicative of the difference between the energy input to the water heater and the energy delivered to the load, or the sum of the parasitic and standby losses. Therefore, a SWH system with a rating of zero is one where the solar energy input to the system offsets all of the standby and parasitic losses. If the solar contribution in a single-tank system is smaller than the parasitic and stand-by losses, the system will have a negative rating.

ESTIMATED ENERGY SAVINGS (GJ/year for 300 L/day (80 gal/day) hot water load):	None

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. The local annual ratings are provided for a 243 L/day (64.3 gal/day) hot water load.

Canada			
Location	**Climate Zone (ASHRAE 169)***	**Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
Edmonton, Alberta	5	0.40	2160
Halifax Nova Scotia, Canada	7A	0.36	1760
Thunder Bay, Ontario, Canada		0.45	2210
Quebec City, Quebec	5	0.39	2030
Winnipeg, Manitoba	7A	0.40	2140
Calgary, Alberta	7A	0.45	2380
Vancouver, British Columbia	7	0.42	1950

*Climate zones are as established in ANSI/ASHRAE 169, Climatic Data for Building Design Standards.

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.

Carribean and Central America			
Location	**Climate Zone (ASHRAE 169)***	**Solar Fraction (SF_A)**	**Annual Energy Savings (kWh)**
Barbados - Christ Church	1	1	3080
Costa Rica - San Jose	1	0.91	4150
Jamaica - Kingston	1	1	3090
Mexico - Monterrey	2	0.66	2520
MEX - Mexico City	2	0.69	3150
BLZ - Belize	1	0.92	2830
PR - San Juan	1	0.97	3000

*Climate zones are as established in ANSI/ASHRAE 169, Climatic Data for Building Design Standards.

OG-300 SOLAR UNIFORM ENERGY FACTOR (SUEF):

OG-300 No. 30004353

BRAND: ARIA

MODEL: ARIA 300-4 EL

The 2020 Solar Uniform Energy Factor Specification is now used in the ENERGY STAR® Program Requirements Product Specification for Residential Water Heaters, Version 4.0 . It replaces an outdated metric called the Solar Energy Factor (SEF) that was used by the ENERGY STAR program in previous specifications. Solar Uniform Energy Factor (SUEF) for the system is provided below for standardized solar irradiance and hot water draws over a single 24-hurs period.

SOLAR UNIFORM ENERGY FACTOR (SUEF)
U.S. DOE Uniform Energy Factor Draw Patterns**
Medium- Usage – 55 Gallons per Day – SUEF 99

** Draw patterns specified in 10 CFR 430, Subpart B, Appendix E, *Uniform Test Method for Measuring the Energy Consumption of Water Heaters*

The specification defines the conditions, assumptions, and methodologies to be used to determine a Uniform Energy Factor for domestic water heaters directly utilizing solar energy. It was published as an appendix within the ICC 900/SRCC 300-2020, Solar Water Heating Standard. The U.S. Department of Energy created the Uniform Energy Factor (UEF) metric to quantify the energy efficiency of water heaters in 2014.

PUERTO RICO SUPPLEMENT TO OG-300 No. 30004353

BRAND: Aria

MODEL: Aria 300-4 EL

COMPLIANCE WITH THE STANDARD: ENERGY STAR ®

OG-300 LOCAL ANNUAL SOLAR WATER HEATING SYSTEM PERFORMANCE

System performance at several geographic locations in Puerto Rico is provided below. All are located within Climate Zone 1, as established in ASHRAE 169. Annual solar fraction (SF) ratings are determined using weather data, solar irradiance and water supply temperature over a period of one year for each specific location.

Since domestic water consumption in the region has been shown to be significantly less than the average consumption in the continental U.S.*, SF ratings are provided for several draw patterns in addition to the standard SRCC OG-300 draw pattern. The additional draw patterns are established by the U.S. Department of Energy in 10 CFR 430, Subpart B, Appendix E, *Uniform Test Method for Measuring the Energy Consumption of Water Heaters.* The total quantity of hot water each day is provided for each draw pattern in units of gallons per day (gpd).

PUERTO RICO SUPPLEMENTAL RATINGS – WITH ELECTRIC BACKUP					
	Annual Solar Fraction (SF_A)				
	SRCC OG-300 Draw Pattern	U.S. DOE Uniform Energy Factor Draw Patterns**			
		Very Small	Low	Medium	High
Location	**64 gpd**	**10 gpd**	**38 gpd**	**55 gpd**	**84 gpd**
San Juan, PR	97%	100%	100%	100%	97%
Aguadilla-Borinquen, PR	98%	99%	100%	100%	98%
Mercedita, PR	97%	100%	100%	100%	98%
Roosevelt Roads NAS, PR	97%	100%	100%	100%	97%
Charlotte Amalie AP USVI	97%	99%	100%	100%	98%

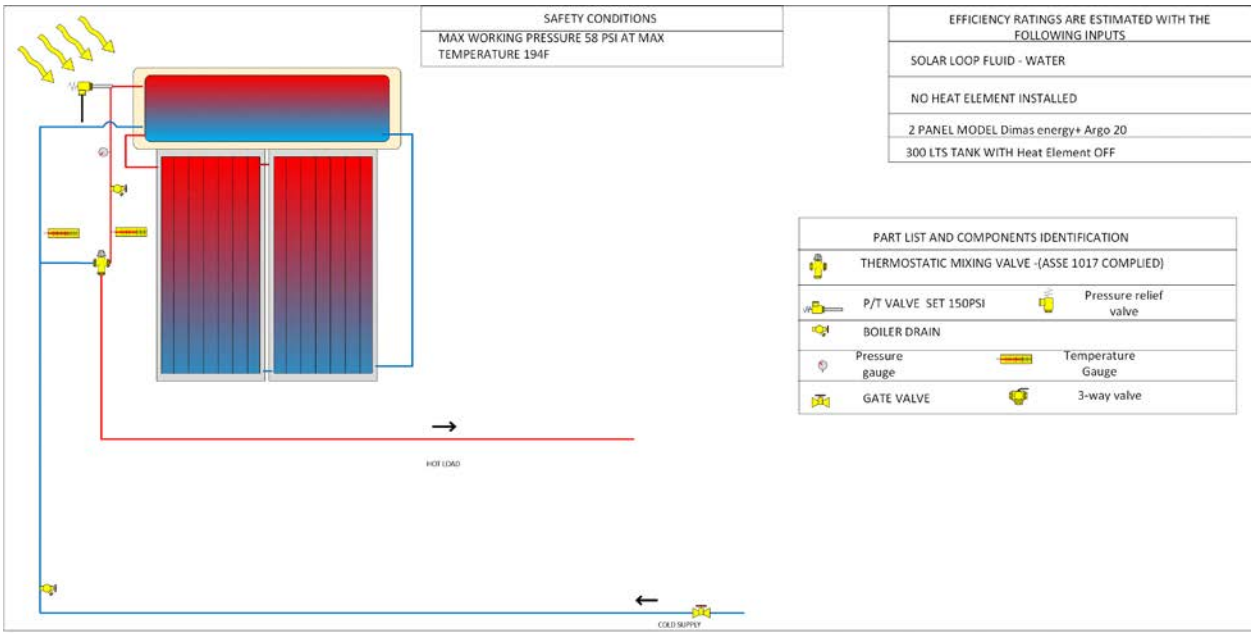
* *Molina-Rivera, W.L., Estimated water use in Puerto Rico, 2010: U.S. Geological Survey Open-File Report 2014–1117, 35 p., http://dx.doi.org/10.3133/ofr20141117*

** Draw patterns specified in 10 CFR 430, Subpart B, Appendix E, *Uniform Test Method for Measuring the Energy Consumption of Water Heaters*

The performance ratings derived from the U.S. DOE draw patterns are not suitable for comparison with the standard OG-300 ratings in other locations and should only be used for the locations listed below. The anticipated hot water load for each specific installation should be used to select the draw pattern and associated performance ratings.

OPTIONAL CONFIGURATION: SOLAR-ONLY (NO BACKUP HEATER)

The certified system is designed to be installed in a second, optional configuration without the backup electric heater as shown below. This configuration may only be used where appropriate for the application and where permitted. For this configuration, solar energy is the only energy source used to heat the water, therefore the Annual Solar Fraction (SF_A) is 100% in all locations.



The Solar Fraction rating does not show how well the solar-only system is sized to meet the hot water demand. The Average Annual Estimated Energy Delivered value given below describes the typical amount of energy delivered by the solar-only hot water system over a year. This value is estimated for several standard hot water loads using typical local weather data. The Annual Energy Demand is also provided for comparison. It is the total energy required to fully satisfy each draw pattern over one year. Actual performance will vary with use, installation and weather.

PUERTO RICO AVERAGE ANNUAL CAPACITY - SOLAR-ONLY CONFIGURATION				
Standard Hot Water Load	**Daily Hot Water Consumption (gallons)**	**Annual Energy Demand (kWh)**	**Average Annual Energy Delivered by Solar Water Heater (kWh)**	**Fraction of Load Satisfied (%)**
SRCC OG-300	64	2,667	2,618	98%
DOE Very Small	10	415	411	99%
DOE Low	38	1,576	1,617	103%
DOE Medium	55	2,281	2,342	103%
DOE High	84	3,484	3,574	103%

CAUTION – SOLAR WATER HEATING SYSTEMS WITHOUT A BACKUP HEATER MAY BE UNABLE TO MEET HOT WATER LOADS UNDER CERTAIN WEATHER AND USAGE CONDITIONS. THEY SHOULD NOT BE INSTALLED WHERE PROHIBITED BY LOCAL CODES.