



# CERTIFICATE OF CONFORMITY

Certificate No SKM 10068

*DQS Hellas grants the present certificate to the enterprise:*

**SONNE AKTION LTD**  
39 Chalkidikis, 14451 Metamorfosi

*for the product:*

**Flat plate Solar Collector type:**  
**ATLAS OL CA150, ATLAS OL CA160, ATLAS OL CA200, ATLAS OL CA230, ATLAS OL CA230HOR**

*which is produced in conformity with the normative document:*

**EN 12975-1:2011**  
**ISO 9806:2013**



*at the following location:*

**68 Km N.R. Athens - Lamia**  
**32009 Schimatari Viotias**

*The present certificate is granted in accordance with:*

- *the DQS Hellas General Rules for the Certification of Products,*
- *the Specific Rule for Certification EKIII.001 «Specific Rule for Certification of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot Water»,*

*and is ruled by the terms of the relevant contract between DQS Hellas and the enterprise.*

*Date of issue:* 2022-12-20  
*Date of valid:* 2024-09-10

**Panagiotis Giannoutsos**  
Director of Certification

**Dr. Emmanuel Deliyannakis**  
Managing Director



Products Certification  
Cert. No 735

Accredited Body: 2, Kalavriton Street, 14564 Kifissia - Athens, Greece

EKIII-08 - 15/12/2014



# CERTIFICATION LICENCE TO USE KEYMARK

Certificate No SKM 10068

*DQS Hellas grants the present certificate to the enterprise:*

**SONNE AKTION LTD**  
39 Chalkidikis, 14451 Metamorfosi

*for the product:*

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- *the DQS Hellas General Rules for the Certification of Products,*
- *the Specific Rule for Certification EKIII.001 «Specific Rule for Certification of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot Water»,*
- *the Specific CEN Keymark Scheme Rules for Solar Thermal Products,*

*and is ruled by the terms of the relevant contract between DQS Hellas and the enterprise.*

*Date of issue:* 2022-12-20

*Date of valid:* 2024-09-10

**Panagiotis Giannoutsos**  
*Director of Product Certification*

**Dr. Emmanuel Dellyannakis**  
*Managing Director*



Annex to Solar Keymark Certificate					Licence Number		SKM 10068							
					Date issued		2022-12-20							
					Issued by		DQS Hellas							
Licence holder		SONNE AKTION LTD			Country		Acountry							
Brand (optional)		Phaethon			Web		http://www.company.domain							
Street, Number		68 Km N.R. Athens - Lamia			E-mail		info@info.info							
Postcode, City		32009 Schimatari Viotias			Tel		+30 22620 59260							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m <sup>2</sup> , Gd = 150 W/m <sup>2</sup> & u = 1.3 m/s $\theta_m - \theta_a$									
					0 K	10 K	30 K	50 K	70 K	83 K				
					W	W	W	W	W	W				
ATLAS OL CA150					1.50	1,500	998	76	963	910	782	627	443	306
ATLAS OL CA160					1.60	1,570	1,020	75	1,027	970	834	669	473	327
ATLAS OL CA200					1.99	1,965	1,015	75	1,278	1,207	1,038	832	588	406
ATLAS OL CA230					2.30	1,970	1,170	75	1,477	1,395	1,199	961	680	469
ATLAS OL CA230HOR					2.30	1,170	1,970	75	1,477	1,395	1,199	961	680	469
Power output per m <sup>2</sup> gross area					642	606	521	418	296	204				
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A <sub>G</sub> )		$\eta_0, b$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>2</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K)	-			
Test results		0.664	3.32	0.023	0.000	0.00	11,390	0.000	0.00	0.0E+00	0.78			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>tr,cos</sub>	0.99	0.97	0.94	0.88	0.80	0.69	0.53	0.31	0.00			
Longitudinal		K <sub>tr,cos</sub>	0.99	0.97	0.94	0.88	0.80	0.69	0.53	0.31	0.00			
Heat transfer medium for testing		Water												
Flow rate for testing (per gross area, A <sub>G</sub> )		dm/dt	0.022	kg/(sm <sup>2</sup> )										
Maximum temperature difference during thermal performance test		( $\theta_m - \theta_a$ ) <sub>max</sub>	53.3	K										
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\theta_a = 30$ °C)		$\theta_{stg}$	172.5	°C										
Maximum operating temperature		$\theta_{max,op}$	100	°C										
Maximum operating pressure		$p_{max,op}$	1000	kPa										
Testing laboratory		NCSR "DEMOKRITOS"					www.solar.demokritos.gr							
Test report(s)		4236 DE1 4237 DQ1 4239 DE1 4365 DE1					Dated		10/10/18 29/10/18 22/10/18 17/10/22					
Comments of testing laboratory		Ver. 6.2 (13.01.2022)												
		N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Tel: +210 9503815 - Fax: +210 9944500 P.O. BOX 60037, 15210 Ag. Paraskevi, Greece												
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +30 210 6233493-4 , Fax: +30 210 6233495, http://www.dqs.gr, e-mail: i.alexidou@dqs.gr														

Annex to Solar Keymark Certificate				Licence Number		SKM 10068											
Supplementary Information				Issued		2022-12-20											
<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>																	
Standard Locations		Athens		Davos		Stockholm		Würzburg									
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C				
ATLAS OL CA150		1,380	888	475	1,005	608	294	748	433	209	811	460	220				
ATLAS OL CA160		1,472	947	507	1,071	649	313	798	462	223	865	491	234				
ATLAS OL CA200		1,830	1,178	630	1,333	807	390	993	574	278	1,076	611	291				
ATLAS OL CA230		2,116	1,361	728	1,540	932	450	1,148	664	321	1,244	706	337				
ATLAS OL CA230HOR		2,116	1,361	728	1,540	932	450	1,148	664	321	1,244	706	337				
Gross Thermal Yield per m <sup>2</sup> gross area		920	592	317	670	405	196	499	289	140	541	307	146				
Annual efficiency, $\eta_a$		52%	34%	18%	41%	25%	12%	43%	25%	12%	43%	25%	12%				
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)															
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>						
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C						
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°						
The collector is operated at constant temperature $\vartheta_m$ (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.2 (13.01.2022). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>																	
<b>Additional Information</b>																	
Collector heat transfer medium										Water-Glycole							
The collector is deemed to be suitable for roof integration										No							
The collector was tested successfully under the following conditions:																	
Climate class (A+, A, B or C)										A		--					
G (W/m <sup>2</sup> ) >		1000		$\vartheta_a$ (°C) >		20		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		600							
Maximum tested positive load										2400		Pa					
Maximum tested negative load										2400		Pa					
Hail resistance using steel ball (maximum drop height)										2		m					
<b>Additional collector attribute(s)</b>																	
Using external power source(s) for normal operation										No		Active or passive measure(s) for self-protection				No	
Co-generating thermal and electrical power										No		Façade collector(s)				No	
<b>Energy Labelling Information</b>						<b>Additional Informative Technical Data</b>											
Reference Area, A <sub>sol</sub> (m <sup>2</sup> )						Hydraulic Designation Code				Aperture Area, A <sub>a</sub> (m <sup>2</sup> )							
ATLAS OL CA150						1.50				7-V-1234S-A:14.1,1435-C:20.6,1050-D				1.44			
ATLAS OL CA160						1.60				7-V-1234S-A:14.1,1455-C:20.6,1067-D				1.53			
ATLAS OL CA200						1.99				7-V-1234S-A:14.1,1855-C:20.6,1016-D				1.93			
ATLAS OL CA230						2.30				9-V-1234S-A:14.1,1855-C:20.6,1216-D				2.24			
ATLAS OL CA230HOR						2.30				15-V-1234S-A:14.1,1049-C:20.6,2045-D				2.24			
Data required for CDR (EU) No 811/2013 - Reference Area						Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>											
Collector efficiency ( $\eta_{col}$ )						47%				Zero-loss efficiency ( $\eta_0$ )				0.64		--	
Remark: Collector efficiency ( $\eta_{col}$ ) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.						First-order coefficient (a <sub>1</sub> )				3.32				W/(m <sup>2</sup> K)			
						Second-order coefficient (a <sub>2</sub> )				0.023				W/(m <sup>2</sup> K <sup>2</sup> )			
						Incidence angle modifier IAM (50°)				0.78				--			
						Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.											
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +30 210 6233493-4 , Fax: +30 210 6233495, <a href="http://www.dqs.gr">http://www.dqs.gr</a> , e-mail: <a href="mailto:i.alexiou@dqs.gr">i.alexiou@dqs.gr</a>																	