


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results

Licence Number	SKM 9987/1
Date issued	2015-12-24
Issued by	DQS Hellas

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Collector Type	Flat plate collector, glazed
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Collector name	Gross area (A_g) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector $G_b = 850 \text{ W/m}^2$; $G_d = 150 \text{ W/m}^2$ $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	134 K
					W	W	W	W	W	W
PRISMA 200	1.90	1,960	970	80	1,226	1,158	1,000	810	588	0
PRISMA 240	2.37	1,960	1,210	80	1,529	1,445	1,248	1,011	734	0
PRISMA 280	2.37	1,210	1,960	80	1,529	1,445	1,248	1,011	734	0

Power output per m² gross area	645	610	527	427	310	0
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Performance parameters test method	Steady state - outdoor					
Performance parameters (related to AG)	$\eta_{0,hem}$	a1	a2			
Units	-	W/(m ² K)	W/(m ² K ²)			
Test results	0.645	3.320	0.021			

Incidence angle modifier test method	Steady state - outdoor									
Bi-directional incidence angle modifiers	No									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{BT, coll}$					0.84				0.00
Longitudinal	$K_{BL, coll}$					0.84				0.00

Heat transfer medium for testing	Water		
Flow rate for testing (per gross area, A_g)	dm/dt	0.020	kg/(sm ²)
Maximum temperature difference for thermal performance calculations	$(\vartheta_m - \vartheta_a)_{max}$	50	K
Standard stagnation temperature ($G = 1000 \text{ W/m}^2$; $\vartheta_a = 30 \text{ }^\circ\text{C}$)	ϑ_{str}	194.4	°C
Effective thermal capacity, incl. fluid (per gross area, A_g)	C/m^2	12.14	kJ/(Km ²)
Maximum operating temperature	$\vartheta_{max, op}$	200	°C
Maximum operating pressure	$P_{max, op}$	1000	kPa

Testing laboratory	NCSR "DEMOKRITOS"	www.solar.demokritos.gr
Test report(s)	4168DE1 4169DE1 4169DQ1	Dated 17/11/2015 16/12/2015 12/1/2016

Comments of testing laboratory	Datasheet version: 5.01, 2016-03-01
<i>Example comment</i>	Thermal performance parameters are given for the PV-module working with max. electrical power output ('MPP mode')



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SKM 9987/1
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
PRISMA 200		1,778	1,162	648	1,311	817	415	966	575	291	1,049	612	305
PRISMA 240		2,217	1,450	808	1,635	1,019	518	1,205	717	363	1,308	764	380
PRISMA 280		2,217	1,450	808	1,635	1,019	518	1,205	717	363	1,308	764	380
Annual output per m ² gross area		936	612	341	690	430	218	509	302	153	552	322	160
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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 ϑ_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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

Additional Information

Collector heat transfer medium	Water-Glycole
Hybrid Thermal and Photo Voltaic collector	No
The collector is deemed to be suitable for roof integration	No
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:	
Climate class (A, B or C)	C
Maximum tested positive load	2400 Pa
Maximum tested negative load	2400 Pa
Hail resistance using steel ball (maximum drop height)	2 m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
PRISMA 200	1.90	Collector efficiency (η_{col})	48 %
PRISMA 240	2.37	Remark: Collector efficiency (η_{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 ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.	
PRISMA 280	2.37		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.645
		First-order coefficient (a_1)	3.32 W/(m ² K)
		Second-order coefficient (a_2)	0.021 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.84
Remark: The data given in this section are related to collector reference area (A_{sol}) 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.			