


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2698 F							
					Date issued		2018-06-27							
					Issued by		DIN CERTCO							
Licence holder	DIMAS SA Solar Energy Systems				Country	Greece								
Brand (optional)	-				Web	http://dimas-solar.gr/								
Street, Number	2nd km Argos - Nafplion				E-mail	info@dimas-solar.gr								
Postcode, City	21200, Argos				Tel	+30 +27510-29110 /-20920								
Collector Type					Flat plate collector, glazed									
Collector name	Gross area (A_G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ; u = 3 m/s ̑ _m - ̑ _a									
					0 K W	10 K W	30 K W	50 K W	70 K W	103 K W				
NAVI+EVO 15	1.55	1 531	1 011	95	1 108	1 057	940	804	650	354				
NAVI+EVO 20	2.05	2 031	1 011	95	1 466	1 398	1 243	1 063	859	469				
NAVI+EVO 25	2.52	2 031	1 241	95	1 802	1 718	1 528	1 307	1 056	576				
Power output per m² gross area					715	682	606	519	419	229				
Performance parameters test method					Quasi dynamic									
Performance parameters (related to A_G)					̑ _{0,b}	c ₁	c ₂	c ₃	c ₄	c ₆	K _d			
Units					-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results					0.718	3.178	0.015	0.000	0.000	0.000	0.973			
Incidence angle modifier test method					Quasi dynamic - outdoor									
Bi-directional incidence angle modifiers					No									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{̑T, coll}	1.00	0.99	0.98	0.96	0.93	0.87	0.76	0.40	0.00
Longitudinal					K _{̑L, coll}	1.00	0.99	0.98	0.96	0.93	0.87	0.76	0.40	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					(̑ _m -̑ _a) _{max}	103		K						
Standard stagnation temperature (G = 1000 W/m²; ̑_a = 30 °C)					̑ _{stg}	187		°C						
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	13.18		kJ/(Km ²)						
Maximum operating temperature					̑ _{max, op}	n/a		°C						
Maximum operating pressure					p _{max, op}	1000		kPa						
Testing laboratory					TZS, ITW University Stuttgart									
Test report(s)					www.itw.uni-stuttgart.de									
					Dated		27.06.2018							
							27.06.2018							
							27.06.2018							
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01									
This data sheet replaces the data sheet issued 25.04.2018 Documented performance parameters are taken from 15COL1313/1 (NAVI+EVO 25) The collector types were changed from NAVI+ to NAVI+EVO The max. tested positiv load was corrected from 3000 Pa to 2000 Pa					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)									
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2698 F
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

Standard Locations Collector name	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
NAVI+EVO 15		1 798	1 297	845	1 372	948	585	1 011	664	396	1 103	722	424
NAVI+EVO 20		2 377	1 716	1 118	1 815	1 254	774	1 337	878	524	1 459	955	561
NAVI+EVO 25		2 922	2 109	1 374	2 231	1 541	951	1 643	1 080	644	1 794	1 174	689
Annual output per m ² gross area		1 160	837	545	885	612	377	652	428	256	712	466	273
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)	B	--
Maximum tested positive load	2000	Pa
Maximum tested negative load	2000	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}	
NAVI+EVO 15	1.55	Collector efficiency (η_{col})	56 %
NAVI+EVO 20	2.05	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.	
NAVI+EVO 25	2.52		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.715 --
		First-order coefficient (a_1)	3.18 W/(m ² K)
		Second-order coefficient (a_2)	0.015 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.93 --
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.			