


Annex to Solar Keymark Certificate					Licence Number		011-7S1491 F							
					Date issued		2024-07-02							
					Issued by		DINCERTCO							
Licence holder		DIMAS SA			Country		Greece							
Brand (optional)					Web		http://www.dimas-solar.gr							
Street, Number		2ND KM ARGOS-NAFPLIO			E-mail		info@dimas-solar.gr							
Postcode, City		21200, ARGOS			Tel		+30 27510 20920							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	112 K				
					m ²	mm	mm	mm	mm	mm	mm			
					W	W	W	W	W	W				
ENERGY+EVO 15					1.51	1 503	1 007	85	1 071	1 020	906	780	640	303
ENERGY+EVO 17					1.68	1 420	1 183	85	1 192	1 135	1 009	868	712	337
ENERGY+EVO 19					1.96	1 503	1 305	85	1 391	1 324	1 177	1 012	831	394
ENERGY+EVO 20					2.02	2 006	1 007	85	1 433	1 364	1 213	1 043	856	406
ENERGY+EVO 23					2.24	1 893	1 183	85	1 589	1 513	1 345	1 157	950	450
ENERGY+EVO 25					2.52	2 006	1 257	85	1 788	1 702	1 513	1 302	1 068	506
ENERGY+EVO 27					2.67	2 261	1 183	85	1 894	1 803	1 603	1 379	1 132	536
ENERGY+EVO 29					2.92	2 006	1 457	85	2 072	1 972	1 753	1 508	1 238	586
ENERGY+EVO 15 H					1.51	1 007	1 503	85	1 071	1 020	906	780	640	303
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Power output per m² gross area					710	675	600	517	424	201				
Performance parameters test method		Quasi dynamic												
Performance parameters (related to A_G)		η_0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0.715	3.31	0.011	0.000	0.00	13 920	0.000	0.00	0.0	0.95			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{θT, coll}	1.00	1.00	1.00	0.99	0.97	0.90	0.69	0.35	0.00			
Longitudinal		K _{θL, coll}	1.00	1.00	1.00	0.99	0.97	0.90	0.69	0.35	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 during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$		82	K						
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)					ϑ_{stg}		230	°C						
Maximum operating temperature					$\vartheta_{max, op}$		-	°C						
Maximum operating pressure					p _{max, op}		1000	kPa						
Testing laboratory		Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)					http://www.igte.uni-stuttgart.de							
Test report(s)		21COL1631Q/1 21COL1632/1 22COL1644 /1					Dated		02.07.2024 02.07.2024 02.07.2024					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Documented performance parameters are taken from 22COL1644/1 (ENERGY+EVO 15 H). This data sheet replaces the SK data sheet dated December 15, 2021. Reason for the replacement: Additional (ENERGY+EVO H) collectors have been included in the data sheet.					 TzS Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70560 Stuttgart (Vaihingen)									
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Supplementary Information		Issued		2024-07-02										
Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m														
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg			
	ϑ_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	
ENERGY+EVO 15		1 746	1 260	838	1 335	935	601	978	649	400	1 067	703	428	
ENERGY+EVO 17		1 943	1 402	932	1 485	1 040	668	1 088	722	445	1 187	783	476	
ENERGY+EVO 19		2 267	1 635	1 088	1 733	1 214	780	1 269	842	519	1 385	913	555	
ENERGY+EVO 20		2 336	1 685	1 121	1 786	1 251	803	1 308	868	535	1 427	941	572	
ENERGY+EVO 23		2 591	1 869	1 243	1 981	1 387	891	1 451	962	593	1 582	1 043	634	
ENERGY+EVO 25		2 914	2 103	1 398	2 228	1 560	1 002	1 632	1 082	667	1 780	1 174	713	
ENERGY+EVO 27		3 088	2 228	1 481	2 361	1 653	1 062	1 729	1 147	707	1 886	1 244	756	
ENERGY+EVO 29		3 377	2 436	1 620	2 582	1 808	1 161	1 891	1 254	773	2 063	1 360	827	
ENERGY+EVO 15 H		1 746	1 260	838	1 335	935	601	978	649	400	1 067	703	428	
ENERGY+EVO 17 H		1 943	1 402	932	1 485	1 040	668	1 088	722	445	1 187	783	476	
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ENERGY+EVO 27 H		3 088	2 228	1 481	2 361	1 653	1 062	1 729	1 147	707	1 886	1 244	756	
ENERGY+EVO 29 H		3 377	2 436	1 620	2 582	1 808	1 161	1 891	1 254	773	2 063	1 360	827	
Gross Thermal Yield per m ² gross area		1 156	834	555	884	619	398	648	430	265	706	466	283	
Annual efficiency, η_a		66%	47%	31%	54%	38%	24%	56%	37%	23%	57%	37%	23%	
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)													
Annual irradiation on collector plane	1765 kWh/m ²			1630 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. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/														
Additional Information														
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 ²) >	1000			ϑ_a (°C) >			20			H _x (MJ/m ²) >			600	
Maximum tested positive load							2750			Pa				
Maximum tested negative load							2400			Pa				
Hail resistance using steel ball (maximum drop height)							2			m				
Additional collector attribute(s)														
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							
Energy Labelling Information						Additional Informative Technical Data								
	Reference Area, A _{sol} (m ²)			Hydraulic Designation Code			Aperture Area, A _a (m ²)							
ENERGY+EVO 15	1.51			8-V-1234S-7.2,1383-20.6,1060-D			1.36							
ENERGY+EVO 17	1.68			10-V-1234S-7.2,1303-20.6,1240-D			1.52							
ENERGY+EVO 19	1.96			11-V-1234S-7.2,1383-20.6,1370-D			1.79							
ENERGY+EVO 20	2.02			8-V-1234S-7.2,1888-20.6,1060-D			1.83							
ENERGY+EVO 23	2.24			10-V-1234S-7.2,1773-20.6,1240-D			2.05							
ENERGY+EVO 25	2.52			11-V-1234S-7.2,1888-20.6,1310-D			2.32							
ENERGY+EVO 27	2.67			10-V-1234S-7.2,2143-20.6,1240-D			2.46							
ENERGY+EVO 29	2.67			12-V-1234S-7.2,1888-20.6,1510-D			2.71							
ENERGY+EVO 15 H	1.51			13-V-1234S-7.2,897-20.6,1566-D			1.36							
ENERGY+EVO 17 H	1.68			12-V-1234S-7.2,1072-20.6,1490-D			1.52							
ENERGY+EVO 19 H	1.96			13-V-1234S-7.2,1191-20.6,1568-D			1.79							
ENERGY+EVO 20 H	2.02			17-V-1234S-7.2,897-20.6,2080-D			1.83							
ENERGY+EVO 23 H	2.24			16-V-1234S-7.2,1072-20.6,1960-D			2.05							
ENERGY+EVO 25 H	2.52			17-V-1234S-7.2,1147-20.6,2070-D			2.32							
ENERGY+EVO 27 H	2.67			19-V-1234S-7.2,1072-20.6,2330-D			2.46							
ENERGY+EVO 29 H	2.67			17-V-1234S-7.2,1350-20.6,2070-D			2.71							
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}						Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}								
Collector efficiency (η_{col})	56%			Zero-loss efficiency (η_0)			0.71			--				
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 9806:2017.						First-order coefficient (a_1)			3.31			W/(m ² K)		
						Second-order coefficient (a_2)			0.011			W/(m ² K ²)		
						Incidence angle modifier IAM (50°)			0.98			--		
						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.								
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