



Annex to Solar Keymark Certificate					Licence Number		SKM 10093.2					
					Date issued		2020-09-10					
					Issued by		DQS Hellas					
Licence holder		CICERO HELLAS S.A.			Country		Greece					
Brand (optional)		CALPAK			Web		www.calpak.gr					
Street, Number		9, Sygrou Ave.			E-mail		export@calpak.gr					
Postcode, City		11743, 'Athens			Tel		30 2109247250 / 2109231616					
Collector Type					Flat plate collector							
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 = 1.3 m/s $\vartheta_m - \vartheta_a$							
					0 K W	10 K W	30 K W	50 K W	70 K W	85 K W		
PRISMA 2.0	2.01	1,625	1,235	85	1,524	1,459	1,296	1,090	841	624		
PRISMA 2.5	2.50	2,020	1,235	85	1,905	1,823	1,620	1,363	1,052	780		
Power output per m ² gross area					762	729	648	545	421	312		
Performance parameters test method		Steady state - outdoor										
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		0.777	2.99	0.027	0.000	0.00	0	0.000	0.00	0.0E+00	0.87	
Incidence angle modifier test method		Steady state - outdoor										
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal		K _{θT, coll}	1.00	1.00	0.98	0.96	0.91	0.82	0.68	0.43	0.00	
Longitudinal		K _{θL, coll}	1.00	1.00	0.98	0.96	0.91	0.82	0.68	0.43	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}	55.14	K					
Standard stagnation temperature (G = 1000 W/m ² ; ϑ_a = 30 °C)					ϑ_{stg}	180	°C					
Maximum operating temperature					$\vartheta_{max, op}$	-	°C					
Maximum operating pressure					p _{max, op}	1000	kPa					
Testing laboratory		NCSR Demokritos / Solar & other Energy System				www.solar.demokritos.gr						
Test report(s)		4272 DE1 4273 DE1 4274 DQ1				Dated		20/07/20 20/07/20 06/08/20				
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26							
					N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Tel: +210 6503815 - Fax: +210 6544592 P.O. BOX 60037, 15310 Ag. Paraskevi, Greece							
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +301 6233493-4 , Fax: +301 6233495, http://www.dqshellas.gr, e-mail: ioannisalexiou@dqshellas.gr												

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Supplementary Information										Issued					2020-09-10				
Annual collector output in kWh/collector at mean fluid temperature ϑ_m																			
Standard Locations		Athens			Davos			Stockholm			Würzburg								
Collector name	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						
PRISMA 2.0		2,393	1,723	1,068	1,845	1,248	714	1,355	878	492	1,470	947	522						
PRISMA 2.5		2,991	2,154	1,335	2,306	1,560	893	1,694	1,097	615	1,837	1,184	652						
Annual output per m ² gross area		1,197	862	534	923	624	357	677	439	246	735	474	261						
Annual efficiency, η_a		68%	49%	30%	57%	38%	22%	58%	38%	21%	59%	38%	21%						
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. 6.1 (September 2019). 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								3000		Pa									
Maximum tested negative load								3000		Pa									
Hail resistance using steel ball (maximum drop height)										2		m							
Additional collector attribute(s)																			
Using external power source(s) for normal operation										Active or passive measure(s) for self-protection									
Co-generating thermal and electrical power										Façade collector(s)									
Energy Labelling Information					Additional Informative Technical Data														
	Reference Area, A _{sol} (m ²)				Hydraulic Designation Code				Aperture Area, A _a (m ²)										
PRISMA 2.0	2.01				12-VH-1234S-A:7.2,1525-				1.91										
PRISMA 2.5	2.50				12-VH-1234S-A:7.2,1920-				2.39										
Data required for CDR (EU) No 811/2013 - Reference Area					Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}														
Collector efficiency (η_{col})					60%				Zero-loss efficiency (η_0)				0.76		--				
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)				2.99		W/(m ² K)				
									Second-order coefficient (a ₂)				0.027		W/(m ² K ²)				
									Incidence angle modifier IAM (50°)				0.91		--				
									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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