


Annex to Solar Keymark Certificate						Licence Number		011-7S2933 F																			
						Date issued		2019-09-09																			
						Issued by		DIN CERTCO																			
Licence holder			PRESTIGIO ENERGY SRL			Country		Italy																			
Brand (optional)						Web		www.prestigioenergy.it																			
Street, Number			Viale Regione Siciliana SNC			E-mail		info@prestigioenergy.it																			
Postcode, City			91020 PETROSINO (TP)			Tel		+39 342-9755012																			
Collector Type						Flat plate collector																					
Collector name						Power output per collector																					
						$G_b = 850 \text{ W/m}^2, G_d = 150 \text{ W/m}^2 \text{ \& } u = 1.3 \text{ m/s}$																					
						$\vartheta_m - \vartheta_a$																					
						0 K		10 K		30 K		50 K		70 K		116 K											
						W		W		W		W		W		W											
PE-200						103		2.02		2 006		1 007		1.83		1 460		1 391		1 242		1 077		896		418	
PE-230						103		2.24		1 893		1 183		2.03		1 618		1 543		1 377		1 194		993		463	
PE-250						103		2.52		2 006		1 257		2.33		1 821		1 735		1 550		1 344		1 118		521	
PE-290						103		2.92		2 006		1 457		2.71		2 110		2 011		1 796		1 557		1 295		604	
Power output per m² gross area						723		689		615		533		444		207											
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						0.727		3.29		0.010		0.000		0.00		10 165		0.000		0.00		0.0E+00		0.96			
Incidence angle modifier test method						Quasi dynamic - outdoor																					
Incidence angle modifier						Angle		10°		20°		30°		40°		50°		60°		70°		80°		90°			
Transversal						$K_{\theta T, coll}$		1.00		0.99		0.98		0.97		0.94		0.89		0.79		0.47		0.00			
Longitudinal						$K_{\theta L, coll}$		1.00		0.99		0.98		0.97		0.94		0.89		0.79		0.47		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						$(\vartheta_m - \vartheta_a)_{max}$		86		K																	
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)						ϑ_{stg}		185		°C																	
Maximum operating temperature						$\vartheta_{max, op}$		n.a.		°C																	
Maximum operating pressure						$p_{max, op}$		1600		kPa																	
Testing laboratory						TZS, ITW University Stuttgart						www.itw.uni-stuttgart.de															
Test report(s)						10COL931/3OEM09 10COL932Q/4OEM09 10COL932/3OEM09						Dated		17.07.2019 17.07.2019 17.07.2019													
Comments of testing laboratory						This data sheet replaces the data sheet issued on 17.07.2019 The gross area from PE-250 was corrected from 2.54 m ² to 2.52 m ² Documented performance parameters are taken from 10COL931/3OEM09 (PE-200)						Datashet version: 6.0, 2018-10-30															
						 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)																					
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Supplementary Information							Issued			2019-09-09			
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
PE-200		2 367	1 721	1 161	1 811	1 278	833	1 332	890	557	1 452	967	595
PE-230		2 625	1 908	1 288	2 008	1 417	923	1 477	987	618	1 610	1 072	660
PE-250		2 953	2 147	1 449	2 259	1 595	1 039	1 662	1 110	695	1 811	1 206	743
PE-290		3 422	2 488	1 679	2 618	1 848	1 203	1 925	1 287	805	2 099	1 398	860
Annual output per m ² gross area		1 172	852	575	896	633	412	659	441	276	719	479	295
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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													
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)							B			--			
G (W/m ²) >		900		ϑ_a (°C) >		15		H _x (MJ/m ²) >		540			
Maximum tested positive load							3000			Pa			
Maximum tested negative load							2000			Pa			
Hail resistance using steel ball (maximum drop height)							n.a.			m			
Additional collector attribute(s)													
<input type="checkbox"/> Using external power source(s) for normal operation				<input type="checkbox"/> Active or passive measure(s) for self-protection									
<input type="checkbox"/> Co-generating thermal and electrical power				<input type="checkbox"/> Wind and/or infrared sensitive collector(s) (WISC)									
<input type="checkbox"/> Façade collector(s)													
Energy Labelling Information													
	Reference Area, A _{sol} (m ²)				Hydraulic Designation Code								
PE-200	2.02				9-V-1234S-A:7.2,1894-C:20.6,1060-D								
PE-230	2.24				10-V-1234S-A:7.2,1779-C:20.6,1240-D								
PE-250	2.52				11-V-1234S-A:7.2,1894-C:20.6,1310-D								
PE-290	2.92				12-V-1234S-A:7.2,1894-C:20.6,1510-D								
Data required for CDR (EU) No 811/2013 - Reference Area A _{sol}													
Collector efficiency (η_{col})		58%				Zero-loss efficiency (η_0)			0.72		--		
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)			3.29			W/(m ² K)					
		Second-order coefficient (a ₂)			0.010			W/(m ² K ²)					
		Incidence angle modifier IAM (50°)			0.94			--					
		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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