



Keymark Certificate



078/000401

AENOR certifies that the organization

CLIMER TECHNOLOGY S.L.L.

registered office Ctra N.331 Córdoba-Málaga km 77 14900 Lucena (Córdoba - España)

supplies **Solar collectors**

in compliance with UNE-EN 12975-1:2006+A1:2011 (EN 12975-1:2006+A1:2010)

Trade Mark PSUNPRO2000, PSUNPRO2500

Technical information Specified in Annexes to the Certificate

Production site PARQUE TECNOLÓGICO DE ANDALUCÍA, AVENIDA JUAN LÓPEZ DE PEÑALVER, 3 29590 CAMPANILLAS (Malaga - España)

Certification scheme In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.

First issued on 2022-10-19

Validity date 2027-10-19

Rafael GARCÍA MEIRO
Chief Executive Officer





Annex to Solar Keymark Certificate					Licence Number		078/000401							
					Date issued		2022-10-19							
					Issued by		AENOR							
Licence holder		CLIMER TECHNOLOGY S.L.L.			Country		SPAIN							
Brand (optional)					Web		www.climertechnology.com							
Street, Number		CTRA N331 Córdoba-Málaga KM 77			E-mail		climer@climer.es							
Postcode, City		14900, Lucena Córdoba			Tel		+34 957 89 00 46							
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	105 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
PSUNPRO2000					1,97	2056	957	70	1466	1399	1256	1098	926	592
PSUNPRO2500					2,48	2055	1205	70	1845	1761	1581	1382	1166	745
Power output per m² gross area					744	710	637	557	470	300				
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 ² K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0,746	3,28	0,009	0,000	0,00	12.850	0,000	0,00	0,0E+00	0,98			
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	0,98	0,95	0,89	0,76	0,45	0,23	0,00			
Longitudinal		K _{θL, coll}	1,00	1,00	0,98	0,95	0,89	0,76	0,45	0,23	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					$(\vartheta_m - \vartheta_a)_{max}$		75	K						
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)					ϑ_{stg}		208	°C						
Maximum operating temperature					$\vartheta_{max, op}$		200	°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)		17COL1398OEM02, 17COL1398QOEM02 17COL1399OEM02, 17COL1399QOEM02					Dated		12.10.2022, 12.10.2022 12.10.2022, 12.10.2022					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Documented performance parameters are taken from 17COL1399OEM02 (PSUNPRO2500)														
<p>AENOR INTERNACIONAL, S.A.U. - Génova, 6. - 28004 - Madrid, España - Tel. 91 432 60 00 - www.aenor.com</p> <p>Product certification body accredited by ENAC, number 1/C-PR271</p>														



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000401
	Issued	2022-10-19

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m													
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
PSUNPRO2000		2.347	1.724	1.184	1.810	1.296	870	1.321	898	578	1.444	976	620
PSUNPRO2500		2.955	2.170	1.491	2.279	1.632	1.095	1.663	1.130	728	1.818	1.228	781
Gross Thermal Yield per m ² gross area		1.192	875	601	919	658	442	671	456	294	733	495	315
Annual efficiency, η_a		68%	50%	34%	56%	40%	27%	58%	39%	25%	59%	40%	25%
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)			B
G (W/m ²) >	900	ϑ_a (°C) >	15
			H_x (MJ/m ²) >
Maximum tested positive load			3000
Maximum tested negative load			2500
Hail resistance using steel ball (maximum drop height)			2
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)
PSUNPRO2000	1,97	8-V-1234S-A:8,1903-C:18,1023-D	1,88
PSUNPRO2500	2,48	10-V-1234S-A:8,1903-C:18,1273-D	2,39

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})	60%	Zero-loss efficiency (η_0)	0,74
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)	3,28
		Second-order coefficient (a_2)	0,009
		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.	