


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2795 F				
					Date issued		2017-10-04				
					Issued by		DIN CERTCO				
Licence holder	Climer Technology S.L.L.				Country	Spain					
Brand (optional)	-				Web	www.climer.es					
Street, Number	P.E. principe Felipe C/Huesca, 08 APDO C 749				E-mail	climer@climer.es					
Postcode, City	14900 Lucena, (Córdoba)				Tel	+34	957 89 00 46				
Collector Type					Flat plate collector, unglazed						
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 m/s ϑ _m - ϑ _a						
					0 K W	10 K W	30 K W	50 K W	70 K W	56 K W	
Solar Panel PES000001	1.36	1 700	800	20	1 102	875	422	0	0	0	
Power output per m² gross area					811	644	310	0	0	0	
Performance parameters test method		Quasi dynamic									
Performance parameters (related to A_G)		η _{0,b}	c1	c2	c3	c4	c6	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results		0.931	12.480	0.000	4.198	0.915	0.029	1.000			
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 _{θT, coll}	1.00	1.00	1.00	1.00	1.00	0.97	0.88	0.44	0.00
Longitudinal		K _{θL, coll}	1.00	1.00	1.00	1.00	1.00	0.97	0.88	0.44	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					(ϑ _m -ϑ _a) _{max}	56	K				
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ _{stg}	71	°C				
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	8.194	kJ/(Km ²)				
Maximum operating temperature					ϑ _{max, op}	70	°C				
Maximum operating pressure					p _{max, op}	1000	kPa				
Testing laboratory	TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de						
Test report(s)	17COL1391 17COL1391Q				Dated	21.09.2017 21.09.2017					
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01						
Documented performance parameters are taken from 17COL1391.					 Forschungs- und Testzentrum für Solaranlagen <small>Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70569 Stuttgart (Vaihingen)</small>						
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de											

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2795 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	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
Collector name													
Solar Panel PES000001		1 391	168	4	591	42		525	55	0	619	79	2
Annual output per m ² gross area		1 023	123	3	434	31		386	41	0	455	58	2
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	2400	Pa
Maximum tested negative load	2400	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}	
Solar Panel PES000001	1.36	Collector efficiency (η_{col})	0 %
		<i>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/m², 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.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.931 --
		First-order coefficient (a_1)	25.07 W/(m ² K)
		Second-order coefficient (a_2)	0.000 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1.00 --
		<i>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.</i>	