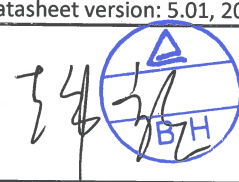




Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2089 F							
					Date issued		2017-07-18							
					Issued by		DIN CERTCO							
Licence holder		Apricus Solar Co., Ltd.			Country		China							
Brand (optional)		Apricus			Web		www.apricus.com							
Street, Number		No.19, Pusi Rd, Pukou New&High Tech Development Zone			E-mail		jasmine@apricus.com							
Postcode, City		210061, Nanjing			Tel		+86 (0)25 58649129 / 58648103							
Collector Type					Flat plate collector, glazed									
Collector name					Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector $G_b = 850 \text{ W/m}^2; G_d = 150 \text{ W/m}^2$ $\vartheta_m - \vartheta_a$					
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	77 K
FPC-A26					2.43	1 984	1 224	80	1 786	1 669	1 420	1 152	864	759
FPC-A32					2.99	2 444	1 223	80	2 198	2 054	1 747	1 417	1 063	934
Power output per m ² gross area									735	687	584	474	356	312
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to AG)					η_0, h_{em}	a1	a2							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0.735	4.719	0.010							
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					$K_{\theta T, coll}$	1.00	0.98	0.96	0.92	0.85	0.74	0.50	0.00	0.00
Longitudinal					$K_{\theta L, coll}$	1.00	0.98	0.96	0.92	0.85	0.74	0.50	0.00	0.00
Heat transfer medium for testing					Water-Glycole									
Flow rate for testing (per gross area, A_G)					dm/dt		0.020	kg/(sm ²)						
Maximum temperature difference for thermal performance calculations					$(\vartheta_m - \vartheta_a)_{max}$		77	K						
Standard stagnation temperature ($G = 1000 \text{ W/m}^2; \vartheta_a = 30 \text{ }^\circ\text{C}$)					ϑ_{stg}		163	°C						
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m^2		5.1	kJ/(Km ²)						
Maximum operating temperature					$\vartheta_{max, op}$		100	°C						
Maximum operating pressure					$p_{max, op}$		800	kPa						
Testing laboratory					TUV Rheinland (Shanghai) Co., Ltd.			www.tuv.com						
Test report(s)					154035430_EN_P_A26_Report_Gao 154027362_EN_A32_Report_Gao			Dated		13/5/2014 13/5/2014				
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01									
														
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2089 F
	Issued	2017-07-18

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

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
FPC-A26		2 600	1 622	911	1 855	1 139	608	1 376	794	416	1 498	845	434
FPC-A32		3 199	1 996	1 121	2 282	1 401	748	1 693	977	512	1 843	1 040	534
Annual output per m ² gross area		1 070	668	375	763	469	250	566	327	171	616	348	179
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)	C --
Maximum tested positive load	2400 Pa
Maximum tested negative load	- Pa
Hail resistance using steel ball (maximum drop height)	1.2 m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
FPC-A26	2.43	Collector efficiency (η_{col})	53	%
FPC-A32	2.99	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 9806:2013.		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0.735	--
		First-order coefficient (a_1)	4.72	W/(m ² K)
		Second-order coefficient (a_2)	0.010	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.85	--
		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.		