
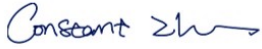


Annex to Solar Keymark Certificate					Licence Number		011-7S3196 R							
					Date issued		2023-08-01							
					Issued by		DIN CERTCO							
Licence holder		Jiaxing JinYi Solar Energy Technology Co., Ltd.			Country	China								
Brand (optional)		JinYi			Web	http://www.jinyi-solar.com								
Street, Number		Caozhuang Industrial Park, Daqiao Town			E-mail	info@jinyi-solar.com								
Postcode, City		314022, Jiaxing City, Zhejiang Province			Tel	+86 573-82848871								
Collector Type					Evacuated tubular collector									
Collector name					Gross area (A <sub>G</sub> ) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Power output per collector G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s ϑ <sub>m</sub> - ϑ <sub>a</sub>					
									0 K W	10 K W	30 K W	50 K W	70 K W	83 K W
Max CPC8					1.77	1 925	920	160	961	931	857	763	649	564
Max CPC9					1.99	1 925	1 030	160	1 080	1 047	963	857	729	634
Max CPC10					2.20	1 925	1 140	160	1 194	1 157	1 065	948	806	701
Max CPC12					2.62	1 925	1 360	160	1 422	1 378	1 268	1 129	960	835
Max CPC14					3.05	1 925	1 580	160	1 655	1 604	1 476	1 314	1 118	972
Max CPC15					3.26	1 925	1 690	160	1 769	1 715	1 578	1 405	1 195	1 039
Max CPC16					3.47	1 925	1 800	160	1 883	1 825	1 679	1 495	1 272	1 106
Max CPC18					3.89	1 925	2 020	160	2 111	2 046	1 883	1 676	1 426	1 239
Max CPC20					4.32	1 925	2 240	160	2 345	2 272	2 091	1 861	1 583	1 376
Max CPC22					4.74	1 925	2 460	160	2 573	2 493	2 294	2 042	1 737	1 510
Max CPC24					5.15	1 925	2 680	160	2 795	2 709	2 493	2 219	1 887	1 641
Power output per m <sup>2</sup> gross area									543	526	484	431	366	319
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A <sub>G</sub> )		η <sub>0</sub> , b	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	a <sub>4</sub>	a <sub>5</sub>	a <sub>6</sub>	a <sub>7</sub>	a <sub>8</sub>	K <sub>d</sub>			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0.547	1.54	0.014	0.000	0.00	7 040	0.000	0.00	0.0E+00	0.95			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>GT, coll</sub>	1.00	1.00	1.01	1.03	1.08	1.14	0.97	0.55	0.00			
Longitudinal		K <sub>GL, coll</sub>	1.00	1.00	0.99	0.97	0.92	0.84	0.69	0.44	0.00			
Heat transfer medium for testing		Water												
Flow rate for testing (per gross area, A <sub>G</sub> )		dm/dt	0.020		kg/(sm <sup>2</sup> )									
Maximum temperature difference during thermal performance test		(ϑ <sub>m</sub> -ϑ <sub>a</sub> ) <sub>max</sub>	53		K									
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; ϑ <sub>a</sub> = 30 °C)		ϑ <sub>stg</sub>	260		°C									
Maximum operating temperature		ϑ <sub>max, op</sub>	120		°C									
Maximum operating pressure		p <sub>max, op</sub>	1000		kPa									
Testing laboratory		TÜV Rheinland (Guangdong) Ltd.			http://www.tuv.com									
Test report(s)		CN23EU8T 001 CN2359VB 001			Dated		2023-08-01 2023-08-01							
Comments of testing laboratory		Ver. 6.2 (13.01.2022)												
Above thermal performance parameters come from subtype Max CPC8.		 Precisely Right. 												
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Supplementary Information		Issued		2023-08-01										
<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>														
Standard Locations		Athens		Davos		Stockholm		Würzburg						
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	
Max CPC8		1 630	1 302	947	1 318	1 002	691	964	709	476	1 042	768	508	
Max CPC9		1 832	1 464	1 065	1 481	1 126	777	1 084	797	535	1 171	864	571	
Max CPC10		2 026	1 618	1 178	1 638	1 245	859	1 198	882	592	1 295	955	632	
Max CPC12		2 413	1 927	1 402	1 950	1 483	1 023	1 427	1 050	705	1 542	1 138	752	
Max CPC14		2 809	2 243	1 633	2 270	1 726	1 191	1 661	1 222	820	1 795	1 324	876	
Max CPC15		3 002	2 398	1 745	2 427	1 845	1 273	1 775	1 306	877	1 919	1 415	936	
Max CPC16		3 195	2 552	1 857	2 583	1 964	1 355	1 890	1 390	933	2 042	1 507	996	
Max CPC18		3 582	2 861	2 082	2 896	2 202	1 519	2 118	1 559	1 046	2 290	1 689	1 117	
Max CPC20		3 978	3 177	2 312	3 216	2 445	1 686	2 352	1 731	1 162	2 543	1 876	1 240	
Max CPC22		4 365	3 486	2 537	3 529	2 683	1 850	2 581	1 899	1 275	2 790	2 058	1 361	
Max CPC24		4 742	3 788	2 757	3 834	2 915	2 010	2 804	2 064	1 385	3 031	2 236	1 479	
Gross Thermal Yield per m <sup>2</sup> gross area		921	735	535	744	566	390	545	401	269	589	434	287	
Annual efficiency, $\eta_a$		52%	42%	30%	46%	35%	24%	47%	34%	23%	47%	35%	23%	
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>			
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 $\vartheta_m$ (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 <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>														
<b>Additional Information</b>														
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 <sup>2</sup> ) >		900		$\vartheta_a$ (°C) >		15		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		540				
Maximum tested positive load										1700		Pa		
Maximum tested negative load										1600		Pa		
Hail resistance using steel ball (maximum drop height)										0.6		m		
<b>Additional collector attribute(s)</b>														
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
<b>Energy Labelling Information</b>							<b>Additional Informative Technical Data</b>							
		Reference Area, A <sub>sol</sub> (m <sup>2</sup> )			Hydraulic Designation Code			Aperture Area, A <sub>a</sub> (m <sup>2</sup> )						
Max CPC8		1.77			1-H-12S-C:20,1008-D			1.50						
Max CPC9		1.99			1-H-12S-C:20,1118-D			1.54						
Max CPC10		2.20			1-H-12S-C:20,1228-D			1.88						
Max CPC12		2.62			1-H-12S-C:20,1448-D			2.25						
Max CPC14		3.05			1-H-12S-C:20,1668-D			2.62						
Max CPC15		3.26			1-H-12S-C:20,1778-D			2.81						
Max CPC16		3.47			1-H-12S-C:20,1888-D			3.00						
Max CPC18		3.89			1-H-12S-C:20,2108-D			3.37						
Max CPC20		4.32			1-H-12S-C:20,2328-D			3.75						
Max CPC22		4.74			1-H-12S-C:20,2548-D			4.12						
Max CPC24		5.15			1-H-12S-C:20,2768-D			4.49						
<b>Data required for CDR (EU) No 811/2013 - Reference Area A<sub>sol</sub></b>							<b>Data required for CDR (EU) No 812/2013 - Reference Area A<sub>sol</sub></b>							
Collector efficiency ( $\eta_{col}$ )		46%					Zero-loss efficiency ( $\eta_0$ )		0.54		--			
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		First-order coefficient (a <sub>1</sub> )		1.54		W/(m <sup>2</sup> K)								
		Second-order coefficient (a <sub>2</sub> )		0.014		W/(m <sup>2</sup> K <sup>2</sup> )								
		Incidence angle modifier IAM (50°)		0.99		--								
Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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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