

Annex to Solar Keymark Certificate					Licence Number		011-7S3096R				
					Date issued		2021-12-20				
					Issued by		DIN CERTCO				
Licence holder		Zhejiang shentai solar energy co.,ltd			Country		China				
Brand (optional)		Suntask			Web		www.suntasksolar.com				
Street, Number		199 lianhong road,yuanhua industry zone			E-mail		info@suntasksolar.com				
Postcode, City		314416, Haining			Tel		+86 573-87861111				
Collector Type					Evacuated tubular collector						
Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector						
					G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s						
					$\vartheta_m - \vartheta_a$						
	m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	111 K	
					W	W	W	W	W	W	
SUC-8X	1.74	1,917	910	135	976	950	893	826	749	561	
SUC-9X	1.96	1,917	1,020	135	1,093	1,065	1,001	926	839	629	
SUC-10X	2.17	1,917	1,130	135	1,211	1,180	1,109	1,025	930	697	
SUC-12X	2.59	1,917	1,350	135	1,447	1,410	1,325	1,225	1,111	833	
SUC-14X	3.01	1,917	1,570	135	1,683	1,640	1,541	1,425	1,292	969	
SUC-15X	3.22	1,917	1,680	135	1,801	1,755	1,649	1,524	1,382	1,037	
SUC-16X	3.43	1,917	1,790	135	1,919	1,870	1,757	1,624	1,473	1,104	
SUC-18X	3.85	1,917	2,010	135	2,155	2,099	1,972	1,824	1,654	1,240	
SUC-20X	4.27	1,917	2,230	135	2,391	2,329	2,188	2,023	1,835	1,376	
Power output per m² gross area					559	545	512	473	429	322	
Performance parameters test method		Steady state - outdoor									
Performance parameters (related to A_G)		η₀, b	a₁	a₂	a₃	a₄	a₅	a₆	a₇	a₈	K_d
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		0.561	1.368	0.007	0.000	0.000	9,346	0.000	0.000	0.000	0.979
Incidence angle modifier test method		Steady state - outdoor									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K_{θT, coll}	1.04	1.09	1.13	1.22	1.31	0.98	0.66	0.33	0.00
Longitudinal		K_{θL, coll}	1.00	0.99	0.97	0.94	0.88	0.78	0.63	0.38	0.00
Heat transfer medium for testing					Water						
Flow rate for testing (per gross area, A_G)					dm/dt		0.020		kg/(sm²)		
Maximum temperature difference during thermal performance test					($\vartheta_m - \vartheta_a$)_{max}		80.75		K		
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ_{stg}		240		°C		
Maximum operating temperature					$\vartheta_{max, op}$		240		°C		
Maximum operating pressure					p_{max, op}		1000		kPa		
Testing laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch				http://www.intertek.com					
Test report(s)		180710029GZU-002				Dated		2021-12-15			
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26						
Above efficiency parameters come from test type SUC-8X.											
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Supplementary Information

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Annual collector output 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
SUC-8X		1,737	1,471	1,196	1,455	1,201	958	1,051	843	655	1,130	907	697
SUC-9X		1,947	1,648	1,341	1,630	1,347	1,074	1,179	945	734	1,266	1,016	781
SUC-10X		2,157	1,826	1,485	1,806	1,492	1,190	1,306	1,047	813	1,403	1,126	866
SUC-12X		2,577	2,182	1,775	2,158	1,782	1,422	1,560	1,251	971	1,676	1,345	1,034
SUC-14X		2,997	2,537	2,064	2,510	2,073	1,653	1,814	1,455	1,129	1,949	1,564	1,203
SUC-15X		3,208	2,715	2,208	2,685	2,218	1,769	1,941	1,557	1,209	2,086	1,674	1,287
SUC-16X		3,418	2,893	2,353	2,861	2,363	1,885	2,068	1,659	1,288	2,222	1,783	1,371
SUC-18X		3,838	3,248	2,642	3,213	2,654	2,117	2,322	1,862	1,446	2,496	2,002	1,540
SUC-20X		4,258	3,604	2,931	3,565	2,944	2,348	2,577	2,066	1,604	2,769	2,222	1,709
Annual output per m ² gross area		996	843	686	834	689	549	603	483	375	648	520	400
Annual efficiency, η_a		56%	48%	39%	51%	42%	34%	52%	41%	32%	52%	42%	32%
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. 6.1 (September 2019). 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) >
		540
Maximum tested positive load	900	Pa
Maximum tested negative load	900	Pa
Hail resistance using steel ball (maximum drop height)	0.6	m

Additional collector attribute(s)

☐ Using external power source(s) for normal operation	☐ Active or passive measure(s) for self-protection
☐ Co-generating thermal and electrical power	☐ Façade collector(s)

Energy Labelling Information	Additional Informative Technical Data
Reference Area, A_{sol} (m ²)	Hydraulic Designation Code
Aperture Area, A_a (m ²)	
SUC-8X	12-V-1122S-A:8,1726-C:20,985-D
SUC-9X	12-V-1122S-A:8,1726-C:20,1095-D
SUC-10X	12-V-1122S-A:8,1726-C:20,1205-D
SUC-12X	12-V-1122S-A:8,1726-C:20,1425-D
SUC-14X	12-V-1122S-A:8,1726-C:20,1645-D
SUC-15X	12-V-1122S-A:8,1726-C:20,1755-D
SUC-16X	12-V-1122S-A:8,1726-C:20,1865-D
SUC-18X	12-V-1122S-A:8,1726-C:20,2085-D
SUC-20X	12-V-1122S-A:8,1726-C:20,2305-D

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}

Collector efficiency (η_{col})	49%
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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 9806:2017.

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0.56	--
First-order coefficient (a_1)	1.37	W/(m ² K)
Second-order coefficient (a_2)	0.007	W/(m ² K ²)
Incidence angle modifier IAM (50°)	1.12	--

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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