

Annex to Solar Keymark Certificate					Licence Number		011-7S3106 R							
					Date issued		2025-09-11							
					Issued by		DIN CERTCO							
Licence holder		Beijing Sunda Solar Energy Technology Co., Ltd			Country		China							
Brand (optional)		Sunda			Web		www.sundasolar.com							
Street, Number		No.3 Hua Yuan Road, Haidian District			E-mail		zhaohua@sundasolar.com							
Postcode, City		100191, Beijing			Tel		+86 10 57930251							
Collector Type					Evacuated tubular collector									
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 = 1.3 m/s $\vartheta_m - \vartheta_a$					
									0 K	10 K	30 K	50 K	70 K	85 K
					W	W	W	W	W	W	W			
SEIDO2-6					1.54	2,160	713	151	888	875	832	768	683	605
SEIDO2-8					2.06	2,160	953	151	1,189	1,170	1,113	1,027	913	810
SEIDO2-12					3.10	2,160	1,433	151	1,789	1,761	1,674	1,545	1,374	1,219
SEIDO2-16					4.13	2,160	1,913	151	2,383	2,346	2,231	2,059	1,831	1,623
Power output per m² gross area					577	568	540	499	443	393				
Performance parameters test method		Steady state - outdoor												
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 ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0.586	0.72	0.017	0.000	0.00	8,690	0.000	0.00	0.00	0.90			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		$K_{\theta T, coll}$	1.03	1.05	1.08	1.10	1.12	0.84	0.56	0.28	0.00			
Longitudinal		$K_{\theta L, coll}$	0.99	0.97	0.96	0.94	0.92	0.70	0.47	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		$(\vartheta_m - \vartheta_a)_{max}$	55									K		
Standard stagnation temperature ($G = 1000 \text{ W/m}^2$; $\vartheta_a = 30 \text{ }^\circ\text{C}$)		ϑ_{stg}	270									°C		
Maximum operating temperature		$\vartheta_{max, op}$	120									°C		
Maximum operating pressure		$p_{max, op}$	600									kPa		
Testing laboratory		TÜV Rheinland (Guangdong) Ltd.					http://www.tuv.com							
Test report(s)		190909133GZU-001 (original report issued by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch) CN250VVQ 001_Test report(Document check)					Dated		2020-11-20					
									2025-09-11					
Comments of testing laboratory Ver. 6.2 (13.01.2022)														
Above efficiency parameters come from test type SEIDO2-6;										 TÜVRheinland® Precisely Right. <i>Constant Zhao</i>				
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S3106 R
	Issued	2025-09-11

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
SEIDO2-6		1,489	1,299	1,032	1,284	1,059	803	921	746	552	987	804	590
SEIDO2-8		1,991	1,737	1,381	1,718	1,417	1,074	1,232	998	739	1,321	1,075	789
SEIDO2-12		2,997	2,614	2,078	2,585	2,132	1,616	1,854	1,502	1,112	1,987	1,618	1,188
SEIDO2-16		3,993	3,482	2,768	3,444	2,841	2,153	2,469	2,001	1,482	2,648	2,155	1,582
Gross Thermal Yield per m ² gross area		967	843	670	834	688	521	598	485	359	641	522	383
Annual efficiency, η_a		55%	48%	38%	51%	42%	32%	51%	42%	31%	52%	42%	31%
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) >	540	
Maximum tested positive load					2400	Pa
Maximum tested negative load					2400	Pa
Hail resistance using steel ball (maximum drop height)					1.4	m

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

	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
SEIDO2-6	1.54	6-V-12S-A:9,3914-C:22,719	1.10
SEIDO2-8	2.06	8-V-12S-A:9,3914-C:22,959	1.45
SEIDO2-12	3.10	12-V-12S-A:9,3914-C:22,1439	2.18
SEIDO2-16	4.13	16-V-12S-A:9,3914-C:22,1919	2.93

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})	52%	Zero-loss efficiency (η_0)	0.58
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)	0.72
		Second-order coefficient (a_2)	0.017
		Incidence angle modifier IAM (50°)	1.01
		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.	