



CERTIFIKAT

Solar Keymark Certificate No. SP SC0022-16

Holder/Issued to

Company: Beijing Sunda Solar Energy Technology Co., Ltd.
Address: No.3 Huayuan Road, Haidian District, Beijing 100191, China

Product name and description

Vacuum tube thermal collectors. For technical information see Appendix (2 pages).

Models:	SEIDO8-8 SEIDO8-12 SEIDO8-16
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Certificate

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 Solar collectors Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN ISO 9806:2013 Solar thermal collectors – Test methods.

Marking

Products conforming to this certificate shall be marked in accordance with the requirements in the Specific CEN Keymark Scheme Rules for Solar Thermal Products. The marking shall, together with the Keymark logo, show the identification code of the empowered certification body (SP Technical Research Institute of Sweden, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

Validity

This certificate is valid until 2021-03-17 provided that the conditions in the Solar Keymark Rules are fulfilled and the standard or rules are not modified significantly. The validity of the certificate can be checked in the database, see Solar Keymark website <http://www.solarkeymark.org>

Miscellaneous

The manufacturer's factory production control procedures are under surveillance by the responsibility of SP. This is the first version of this certificate.

Borås, Sweden 2016-03-17

SP Technical Research Institute of Sweden Certification


Lennart Aronsson
Product Certification Manager


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Certification Officer



SP Technical Research Institute of Sweden

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Empowered Certification Body No. 012: SP Certification, Sweden
For more information of Solar Keymark visit: www.solarkeymar.org
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Annex to Solar Keymark Certificate



Summary of ISO 9806:2013 Test Results, annex to Solar KEYMARK Certificate						Licence Number		SP SC0022-16			
						Issued		2016-03-17			
Company holding the		Beijing Sunda Solar Energy Technology Co., Ltd.				Country		China			
Brand (optional)		SUNDA				Website		www.sundasolar.com			
Street, street number		No.3, Huayuan Road, Haidian District				E-mail		info@sundasolar.com			
Postal Code / City, province		100191 Beijing				Tel/Fax		+86 10-57930251/10-57930220			
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Evacuated tubular collector					
Thermal / photo voltaic hybrid collector? (PVT collector)						No					
Integration in the roof possible ? (manufacturers declaration)						No					
						Power output per collector module					
						G = 1000 W/m ²					
						T _m -T _a					
						0 K	10 K	30 K	50 K	70 K	
Collector name	Aperture area (A _a)	Gross length	Gross width	Gross height	Gross area (A _G)	W	W	W	W	W	
	m ²	mm	mm	mm	m ²						
SEIDO 8-8	1,45	2 162	962	132	2,08	1 014	985	913	822	711	
SEIDO 8-12	2,18	2 162	1 430	132	3,09	1 524	1 481	1 373	1 236	1 068	
SEIDO 8-16	2,90	2 162	1 920	132	4,15	2 027	1 970	1 827	1 644	1 421	
Performance test method						Glazed liquid heating collector - steady state - outdoor					
Performance parameters related to aperture						η ₀	a ₁	a ₂			
Units						-	W/(m ² K)	W/(m ² K ²)			
Test results - Flow rate and fluid see note 1						0,699	1,795	0,017			
Bi-directional incidence angle modifiers?						Yes <i>Kθ values are obligatory for 50°.</i>					
Incidence angle modifiers Kθ(θ _T) transversal direction		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
		Kθ(θ _T)		1,02		1,04		1,01			0,00
Incidence angle modifiers Kθ(θ _L) longitudinal direction		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
		Kθ(θ _L)		1,00		0,99		0,92			0,00
Stagnation temperature - Weather conditions see note 2						T _{stg}	260	°C			
Effective thermal capacity						ceff = C/Ag	4,19	kJ/(m ² K)			
Max. intended operation temperature - see note 3						T _{max,op}	150	°C			
Max. operation pressure - see note 3						p _{max,op}	600	kPa			
Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m ² aperture area											
Flow rate	kg/(s m ²)	0,000	0,006	0,009	0,014	0,019	0,023				
Pressure drop, ΔP	Pa	0	227	583	1264	2190	3280				
Optional weather data		Location				Link					
Testing Laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch									
Website		www.intertek.com									
Test report id. number		150831007-002				Date of test report		2016-02-24			
During the test GDIF/GTOT was always between		0,07	and	0,09							
Comments of testing laboratory:											
No comment											
Note 1	Flow rate	0,020	kg/(s m ²)	Fluid	Water						
Note 2	Irradiance, G = 1000 W/m ² ; Ambient temperature, T _a =30 °C										
Note 3	Given by manufacturer										
						Datasheet version: 4.06, 2014-01-15					
Certification Body: SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden www.sp.se info@sp.se tel +4610 516 5000											

Annex to Solar Keymark Certificate

Annual collector output based on ISO 9806:2013 Test Results, annex to Solar KEYMARK Certificate	Licence Number	SP SC0022-16
	Issued	2016-03-17

Annual collector output kWh/module												
Collector name	Location and collector temperature (T _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
SEIDO 8-8	1 699	1 381	1 031	1 397	1 086	777	1 009	759	527	1 090	822	564
SEIDO 8-12	2 554	2 076	1 550	2 100	1 633	1 169	1 517	1 141	792	1 639	1 236	848
SEIDO 8-16	3 398	2 761	2 062	2 794	2 172	1 555	2 018	1 517	1 053	2 181	1 644	1 128

Collector mounting: Fixed or tracking Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations				
Location	Latitude °	G _{tot} kWh/m ²	T _a °C	Collector orientation or tracking mode
Athens	38	1 765	18,5	South, 25°
Davos	47	1 714	3,2	South, 30°
Stockholm	59	1 166	7,5	South, 45°
Würzburg	50	1 244	9,0	South, 35°

G _{tot}	Annual total irradiation on collector plane	kWh/m ²
T _a	Mean annual ambient air temperature	°C
T _m	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (T_m). A detailed description of the calculations is available at <http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx>.

Certification Body: SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden www.sp.se info@sp.se tel +4610 516 5000	Datasheet version: 4.06, 2014-01-15 ScenoCalc version: Ver. 4.06 (Jan, 2014)
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