

Holder/Issued to/Manufacturer

Jiangsu Sunrain Solar Energy Co., Ltd.

Ninghai Industrial Zone, 222000, Lianyungang, Jiangsu, China

Product name and description

Flat plate solar thermal collector for water heating.
For technical information see Appendix (2 pages).

Model: FPC1200D

Performance specification

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 12975-2:2006 Solar collectors Part 2: 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 (RISE Research Institutes of Sweden AB, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

Validity

This certificate is valid until 2023-12-12 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 RISE. This certificate was first issued 2012-10-15. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Johan Åkesson

Magnus Sturesson

Certificate No. SC1710-12 | issue 3 | 2018-12-12


RISE Research Institutes of Sweden AB | Certification
Box 857, SE-501 15 Borås, Sweden
Phone: +46 10-516 50 00
certifiering@ri.se | www.ri.se

2017-08-08



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Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		SC1710-12								
					Date issued		2018-12-12								
					Issued by		RISE								
Licence holder		Jiangsu Sunrain Solar Energy Co.,Ltd			Country		China								
Brand (optional)		Sunrain			Web		http://en.sunrain.com								
Street, Number		Ninghai Industrial Zone			E-mail		certification@sunrain.com								
Postcode, City		222000		Lianyungang, Jiangsu			Tel		+86 518 85959993						
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 W/m ² ; G _d = 150 W/m ² ΔT _m - ΔT _a						
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	52 K	
FPC1200D					2,00	2000	1000	80	1 412	1 318	1 103	851	563	826	
Power output per m ² gross area					706	659	552	426	281	413					
Performance parameters test method					Steady state - outdoor										
Performance parameters (related to A _G)					η _{0,hem}	a ₁	a ₂								
Units					-	W/(m ² K)	W/(m ² K ²)								
Test results					0,706	4,456	0,023								
Incidence angle modifier test method					Steady state - outdoor										
Bi-directional incidence angle					No										
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal					K _{θT, coll}					0,88					
Longitudinal					K _{θL, coll}					0,88					
Heat transfer medium for testing					Water										
Flow rate for testing (per gross area, A _G)					dm/dt		0,019	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(ΔT _m -ΔT _a) _{max}		51,84	K							
Standard stagnation temperature (G = 1000 W/m ² ; ΔT _a = 30 °C)					ΔT _{stg}		170	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²		2,57	kJ/(Km ²)							
Maximum operating temperature					ΔT _{max op}		120	°C							
Maximum operating pressure					p _{max,op}		1200	kPa							
Testing					Intertek Testing Services Shenzhen Ltd. Guangzhou Branch					http://www.intertek.com					
Test report(s)					130617017GZU-002					Dated		25-11-2013			
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01										
Tests were performed based on EN 12975-2:2006.					 <i>William zheng</i>										
RISE Research Institutes of Sweden AB Certification Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifiering@ri.se www.ri.se															

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SC1710-12
	Issued	2018-12-12

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
FPC1200D		2 101	1 281	642	1 486	855	379	1 109	607	270	1 211	648	286
Annual output per m ² gross area		1 050	640	321	743	427	189	555	304	135	605	324	143
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	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	Yes	
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	5900	Pa
Maximum tested negative load	1000	Pa
Hail resistance using steel ball (maximum drop height)	2,0	m

Energy Labelling Information				
	Reference Area, A _{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A _{sol}		
FPC1200D	2,00	Collector efficiency (η_{col})	49	%
		<i>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 9806:2013.</i>		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0,706	--
		First-order coefficient (a ₁)	4,46	W/(m ² K)
		Second-order coefficient (a ₂)	0,023	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,88	--
		<i>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.</i>		