

Holder/Issued to/Manufacturer

Sunshore Solar Energy Co., Ltd.

Industrial Park, Xiting Town, Tongzhou City, Jiangsu Province, China

Product name and description

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

Model: P-G/0.6-L/HG-1.86-2

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 2024-01-03 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 2014-01-03. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Johan Åkesson

Magnus Sturesson

Certificate No. SC1448-13 | issue 2 | 2019-02-11


RISE Research Institutes of Sweden AB | Certification
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2017-08-08



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Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		SC1448-13																	
					Date issued		2019-02-11																	
					Issued by		RISE																	
Licence holder		SUNSHORE SOLAR ENERGY CO.,LTD.			Country		China																	
Brand (optional)		SUNSHORE			Web		www.sunshore.cn																	
Street, Number		Industrial Park, Xiting Town			E-mail		Global_market@sunshore.cn																	
Postcode, City		226301 Tongzhou City			Tel		+86 513-86247986																	
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 $\vartheta_m - \vartheta_a$											
					m ²		mm		mm		mm		0 K		10 K		30 K		50 K		70 K		51 K	
P-G/0.6-L/HG-1.86-2					2,00		2000		1000		85		1 372		1 282		1 082		855		601		839	
Power output per m ² gross area					686		641		541		428		301		420									
Performance parameters test method					Steady state - outdoor																			
Performance parameters (related to AG)					$\eta_{0,hem}$		a1		a2															
Units					-		W/(m ² K)		W/(m ² K ²)															
Test results					0,686		4,316		0,017															
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					$K_{\theta T, coll}$								0,85											
Longitudinal					$K_{\theta L, coll}$								0,85											
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					$(\vartheta_m - \vartheta_a)_{max}$		51,35																K	
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}		150																	
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²		2,54																kJ/(Km ²)	
Maximum operating temperature					$\vartheta_{max, op}$		80																°C	
Maximum operating pressure					$p_{max, op}$		600																kPa	
Testing		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch			http://www.intertek.com																			
Test report(s)		130628081GZU-001			Dated		2013.12.4																	
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																								
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SC1448-13
	Issued	2019-02-11

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
P-G/0.6-L/HG-1.86-2		1 994	1 227	647	1 419	841	406	1 054	591	283	1 148	630	298
Annual output per m ² gross area		997	613	324	709	420	203	527	296	142	574	315	149
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	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	B	--
Maximum tested positive load	6300	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}		
P-G/0.6-L/HG-1.86-2	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)	0,686	--
		First-order coefficient (a ₁)	4,32	W/(m ² K)
		Second-order coefficient (a ₂)	0,017	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,85	--
		<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>		