Solar Keymark Certificate

SC1413-13

Holder/Issued to/Manufacturer

Jiangsu Imposol New Energy Co., Ltd.

No. 5 Shengda Road, Konggang Industrial Park, 213136 Luoxi Town, Xinbei District, Changzhou City, Jiangsu Province, China

Product name and description

Vacuum tube solar thermal collectors for water heating.
For technical information see Appendix (2 pages).

Models:	IPRB 581810	IPRB 581812	IPRB 581815
	IPRB 581818	IPRB 581820	IPRB 581822
	IPRB 581824	IPRB 581825	IPRB 581830

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 2024-06-24 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 2014-06-24. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Johan Åkesson

Magnus Sturesson

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

012

Annex to Solar Keymark Certificate

Annex to Solar Keymark Certificate			
		Licence Number	**SC1413-13**
		Date issued	**2019-06-05**
		Issued by	**RISE**

Licence holder	Jiangsu Imposol New Energy Co., Ltd.	**Country**	China
Brand (optional)	IMPOSOL	**Web**	www.czimposol.cn
Street, Number	Shengda Road, Konggang Industrial Park	**E-mail**	Sales4@czimposol.cn
Postcode, City	213136, Changzhou, Jiangsu	**Tel**	+86 0519-83251620

Collector Type	Evacuated tubular collector

Collector name	**Gross height**	**Gross area (A_G)**	**Gross length**	**Gross width**	**Aperture area (A_a)**	**Power output per collector** Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
						0 K	10 K	30 K	50 K	70 K	101 K
	mm	m²	mm	mm	m²	W	W	W	W	W	W
IPRB 581810	137	1,68	1 990	845	0,94	744	730	687	621	532	351
IPRB 581812	137	2,17	1 990	1 090	1,13	960	943	887	802	687	454
IPRB 581815	137	2,65	1 990	1 330	1,41	1 173	1 152	1 084	979	839	554
IPRB 581818	137	3,12	1 990	1 570	1,70	1 381	1 356	1 276	1 153	987	653
IPRB 581820	137	3,44	1 990	1 730	1,89	1 522	1 496	1 407	1 271	1 089	720
IPRB 581822	137	3,76	1 990	1 890	2,07	1 664	1 635	1 538	1 389	1 190	787
IPRB 581824	137	4,08	1 990	2 050	2,26	1 806	1 774	1 668	1 508	1 291	853
IPRB 581825	137	4,24	1 990	2 130	2,36	1 877	1 843	1 734	1 567	1 342	887
IPRB 581830	137	4,89	1 990	2 455	2,83	2 164	2 126	2 000	1 807	1 548	1 023
Power output per m² gross area						443	435	409	370	317	209

Performance parameters test method	Steady state - outdoor									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0,440	0,611	0,017	0,000	0,000	0,000	0,000	0,000	0,000	1,04

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	*1,06*	1,12	*1,18*	1,33	*1,47*	0,98	0,49	0,00
Longitudinal	$K_{\theta L,coll}$	1,00	0,99	0,98	0,96	0,92	0,86	0,72	0,31	0,00

Heat transfer medium for testing	Water		
Flow rate for testing (per gross area, A_G)	dm/dt	0,011	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	71	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	250	°C
Maximum operating temperature	ϑ_{max_op}	226	°C
Maximum operating pressure	$p_{max,op}$	600	kPa

Testing laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch	http://www.intertek.com	
Test report(s)	130628151GZU-001	**Dated**	2014.3.27

Comments of testing laboratory

Datasheet version: 6.0, 2018-10-30

The "negative pressure test of the collector" according to EN 12975-2:2006,5.9.2 was not performed.

Tests were performed based on EN 12975-2:2006.

intertek

William zheng

Annex to Solar Keymark Certificate

Annex to Solar Keymark Certificate	Licence Number	SC1413-13
Supplementary Information	Issued	2019-06-05

Annual collector output in kWh/collector at mean fluid temperature ϑ_m

Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
IPRB 581810		1 384	1 194	919	1 172	943	679	854	678	479	920	735	515
IPRB 581812		1 788	1 542	1 187	1 514	1 218	877	1 103	876	618	1 188	949	665
IPRB 581815		2 183	1 883	1 450	1 848	1 487	1 071	1 347	1 070	755	1 450	1 159	813
IPRB 581818		2 570	2 218	1 707	2 176	1 751	1 260	1 586	1 260	889	1 708	1 364	957
IPRB 581820		2 834	2 445	1 882	2 399	1 930	1 390	1 749	1 389	980	1 883	1 504	1 055
IPRB 581822		3 097	2 672	2 057	2 623	2 110	1 519	1 911	1 518	1 071	2 058	1 644	1 153
IPRB 581824		3 361	2 900	2 232	2 846	2 289	1 648	2 074	1 647	1 162	2 233	1 784	1 251
IPRB 581825		3 493	3 014	2 320	2 957	2 379	1 713	2 155	1 712	1 208	2 321	1 854	1 300
IPRB 581830		4 028	3 476	2 676	3 411	2 744	1 975	2 486	1 974	1 393	2 676	2 138	1 500
Annual output per m² gross area		824	711	547	697	561	404	508	404	285	547	437	307
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1714 kWh/m²			1166 kWh/m²			1244 kWh/m²		
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 ϑm (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

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)					C	--
G (W/m²) >	800	ϑ_a (°C) >	10	H_x (MJ/m²) >		420
Maximum tested positive load					3100	Pa
Maximum tested negative load					--	Pa
Hail resistance using steel ball (maximum drop height)					1,0	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	☐ Wind and/or infrared sensitive collector(s) (WISC)
☐ Façade collector(s)	

Energy Labelling Information

	Reference Area, A_{sol} (m²)	Hydraulic Designation Code
IPRB 581810	1,68	1-H-12S-C:22,930-D
IPRB 581812	2,17	1-H-12S-C:22,1090-D
IPRB 581815	2,65	1-H-12S-C:22,1330-D
IPRB 581818	3,12	1-H-12S-C:22,1570-D
IPRB 581820	3,44	1-H-12S-C:22,1730-D
IPRB 581822	3,76	1-H-12S-C:22,1890-D
IPRB 581824	4,08	1-H-12S-C:22,2050-D
IPRB 581825	4,24	1-H-12S-C:22,2130-D
IPRB 581830	4,89	1-H-12S-C:22,2530-D

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	39%

Remark: Collector efficiency (ηcol) 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 ηcol is based on reference area (Asol) 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)	0,44	--
First-order coefficient (a_1)	0,61	W/(m²K)
Second-order coefficient (a_2)	0,017	W/(m²K²)
Incidence angle modifier IAM (50°)	1,11	--

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.

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