



CERTIFICATE

Solar Keymark Certificate No. SP SC0563-12

Holder/Issued to/Manufacturer

Company: Jiangsu Sunrain Solar Energy Co., Ltd.

Address: Ning Hai Industrial Zone, Lianyungang City, Jiangsu Province, China

Product name and description

Solar thermal systems for water heating

For technical information see Appendix (2 pages).

Models:	TZ58/1800-15E TZ58/1800-20E TZ58/1800-24E TZ58/1800-30E
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Certificate

The product is found to comply with the requirements in EN 12976-1:2006 Factory made systems, Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN 12976-2:2006 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 (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 2022-04-27 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 certificate was first issued 2012-03-03. This is issue number 2.

Borås, Sweden 2017-04-27

SP Technical Research Institute of Sweden Certification

Lennart Aronsson
Certification Manager

Magnus Sturesson
Certification Officer



SP Technical Research Institute of Sweden

Box 857, SE-501 15 Borås, Sweden

Phone: +46 10-516 50 00

E-mail/internet: info@sp.se/www.sp.se


Empowered Certification Body No. 012: SP Certification, Sweden

For more information of Solar Keymark visit: www.solarkeymar.org

This certificate may not be reproduced other than in full, except with the prior written approval by SP. SP Certification rules SPCR402 applies.



Annex to Solar Keymark Certificate

Summary of		EN12976-2	SOLAR SYSTEM test results		Licence Number		SP SC0563-12			
Annex to Solar KEYMARK Certificate					Issued		2017-04-27			
Company		JiangSu Sunrain Solar Energy Co.,Ltd.			Country		China			
Brand (optional)		Sunrain			Website		http://en.sunrain.com			
Street		NingHai Industrial Zone			E-mail		info@sunrain.com			
Postal Code		222000	Lianyungang city, Jianguo Province		Tel. / Fax		+86 518-8595-9889/9808			
System classification										
Application(s)				Hot water						
Solar loop, circulation principle				Thermosyphon						
Direct solar loop / heat exchanger				Heat exchanger						
Open, vented or closed solar loop				Vented						
Drain back/down				Always filled (no drain)						
Store location				Outdoor						
Store orientation (of main axis)				Horizontal						
Type of auxiliary heating (internal back-up heat)				Electric						
If other auxiliary/internal back-up heating, please specify:				None						
Solar+supplementary OR Solar-only / Solar pre-heat				Solar only / Solar preheat						
Collector(s)				Heat store(s)						
Company		JiangSu Sunrain Solar Energy			Company		JiangSu Sunrain Solar Energy			
<i>Keymark lic.no. if available</i>		None			<i>Keymark lic.no. if available</i>		None			
Collector name	Per module			Store name	Total nominal volume	Gross height	Gross width	Gross depth	Auxiliary heated volume	Electrical aux. heating power
	Gross Area (Ag)	Gross length	Gross width							
	m ²	mm	mm							
TZ58/1800-15E	1,53	1735	1305	150L	150	475	1435	475	optiona	1,5
TZ58/1800-20E	2,34	1735	1702	200L	200	475	1800	475	optiona	1,5
TZ58/1800-24E	2,74	1735	2006	240L	240	475	2180	475	optiona	1,5
TZ58/1800-30E	3,31	1735	2545	300L	300	475	2680	475	optiona	1,5
Solar loop controller				Solar loop fluid						
<i>Keymark lic.no. if available</i>		None			Recommended/required		No recommend./requirements			
Company Name		None			Company Name		NA			
Solar loop pump - power range		0 W to 0 W			Freezing point		-20 °C			
System family overview										
Collector name	Number of collectors in each configuration for each store									
	Store name									
	150L	200L	240L	300L						
TZ58/1800-15E	1									
TZ58/1800-20E		1								
TZ58/1800-24E			1							
TZ58/1800-30E				1						
Testing Laboratory				Intertek Testing Services Shenzhen Ltd. Guangzhou Branch						
Website				www.intertek.com.cn						
Test report id. number				GZ11071587-1/2/3/4/5,GZ11071587-5						
Date of test report				2017.4.13,2012.2.7						
Comments of test lab										
The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.										



Summary of	EN12976-2	test results	Certification No.	SP SC0563-12
Annex to Solar KEYMARK Certificate			Issued	2017-04-27
Company	JiangSu Sunrain Solar Energy Co.,Ltd.		Country	China
Brand (optional)	Sunrain		Website	http://en.sunrain.com
Street	NingHai Industrial Zone		E-mail	info@sunrain.com
Postal Code	222000	Lianyungang city, Jiangsu Province	Tel. / Fax	+86 518-8595-9889/9808

System family overview						
Collector name	For each storage and collector size, give number of collectors					
	150L	200L	240L	300L		
TZ58/1800-15E	1					
TZ58/1800-20E		1				
TZ58/1800-24E			1			
TZ58/1800-30E				1		

Name of system configuration	TZ58/1800-15E				
Collector name	TZ58/1800-15E	No. Collectors	1	Storage name	150L

Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh MJ/y	Daily drawoff 110 l				Daily drawoff 140 l				Daily drawoff 170 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE		6124	1912	0	31,2	7796	2355	0	30,2	9467	2668	0	28,2
WürzburgDE		5875	2022	0	34,4	7476	2467	0	33,0	9077	2819	0	31,1
Davos CH		6646	2808	0	42,3	8458	3368	0	39,8	10271	3864	0	37,6
Athens GR		4565	2793	0	61,2	5810	3488	0	60,0	7055	4101	0	58,1


Perf. indicators for the table above		
Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
$f_{sol} = Q_L / Q_d$	-	Solar fraction


Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	kWh/m ²	1 157	1 230	1 684
Ta,ave	°C	7,5	9,0	3,2	18,5
Tc,ave	°C	8,5	10,0	5,4	17,8
± ΔTc	K	6,4	3,0	0,8	7,4


G	kWh/m ²	Annual irradiation South, 45°
Ta,ave	°C	Annual average outdoor air temperature
Tc,ave	°C	Annual average mains cold water temp.
ΔTc	K	Seasonal variation of Tc
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	0	kPa	Max. operating press. - tank side	400	kPa
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Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com.cn
Test report id. number	GZ11071587-1/2/3/4/5,GZ11071587-5
Date of test report	2017.4.13,2012.2.7
Test method	ISO 9459-2 (CSTG)

Comments of test lab	
The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.	

Summary of	EN12976-2	test results	Certification No.	SP SC0563-12									
Annex to Solar KEYMARK Certificate			Issued	2017-04-27									
Company	JiangSu Sunrain Solar Energy Co.,Ltd.		Country	China									
Brand (optional)	Sunrain		Website	http://en.sunrain.com									
Street	NingHai Industrial Zone		E-mail	info@sunrain.com									
Postal Code	222000	Lianyungang city, Jiangu Province	Tel. / Fax	+86 518-8595-9889/9808									
System family overview													
For each storage and collector size, give number of collectors													
Collector name	150L	200L	240L	300L									
TZ58/1800-15E	1												
TZ58/1800-20E		1											
TZ58/1800-24E			1										
TZ58/1800-30E				1									
Name of system configuration			TZ58/1800-20E										
Collector name	TZ58/1800-20E	No. Collectors	1	Storage name	200L								
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	
Stockholm SE		9467	3515	0	37,1	11137	3971	0	35,7	13922	4344	0	31,2
WürzburgDE		9077	3649	0	40,2	10680	4179	0	39,1	13350	4595	0	34,4
Davos CH		10271	5157	0	50,2	12083	5804	0	48,0	15104	6327	0	41,9
Athens GR		7055	4685	0	66,4	8300	5426	0	65,4	10374	6363	0	61,3
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f _{sol} =Q _L /Q _d	-	Solar fraction											
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	T _{a,ave}	7,5	9,0	3,2	18,5								
	T _{c,ave}	8,5	10,0	5,4	17,8								
	± ΔT _c	6,4	3,0	0,8	7,4								
G	kWh/m ²	Annual irradiation South, 45°											
T _{a,ave}	°C	Annual average outdoor air temperature											
T _{c,ave}	°C	Annual average mains cold water temp.											
ΔT _c	K	Seasonal variation of T _c											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		0	kPa	Max. operating press. - tank side		400	kPa						
Testing Laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch											
Website		www.intertek.com.cn											
Test report id. number		GZ11071587-1/2/3/4/5,GZ11071587-5											
Date of test report		2017.4.13,2012.2.7											
Test method		ISO 9459-2 (CSTG)											
Comments of test lab													
The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.													
													

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Brand (optional)	Sunrain			Website	http://en.sunrain.com								
Street	NingHai Industrial Zone			E-mail	info@sunrain.com								
Postal Code	222000	Lianyungang city, Jiangsu Province		Tel. / Fax	+86	518-8595-9889/9808							
System family overview													
For each storage and collector size, give number of collectors													
Collector name	150L	200L	240L	300L									
TZ58/1800-15E	1												
TZ58/1800-20E		1											
TZ58/1800-24E			1										
TZ58/1800-30E				1									
Name of system configuration				TZ58/1800-24E									
Collector name	TZ58/1800-24E	No. Collectors	1		Storage name	240L							
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh MJ/y	Daily drawoff 200 l				Daily drawoff 250 l				Daily drawoff 300 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f _{sol} %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f _{sol} %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f _{sol} %
Stockholm SE		11137	3927	0	35,3	13922	4540	0	32,6	16706	5048	0	30,2
WürzburgDE		10680	4064	0	38,1	13350	4804	0	36,0	16020	5339	0	33,3
Davos CH		12083	5880	0	48,7	15104	6787	0	44,9	18125	7524	0	41,5
Athens GR		8300	5452	0	65,7	10374	6546	0	63,1	12449	7552	0	60,7
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f _{sol} =Q _l /Q _d	-	Solar fraction											
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	T _{a,ave}	7,5	9,0	3,2	18,5								
	T _{c,ave}	8,5	10,0	5,4	17,8								
	± ΔT _c	6,4	3,0	0,8	7,4								
G	kWh/m ²	Annual irradiation South, 45°											
T _{a,ave}	°C	Annual average outdoor air temperature											
T _{c,ave}	°C	Annual average mains cold water temp.											
ΔT _c	K	Seasonal variation of T_c											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		0	kPa	Max. operating press. - tank side		400	kPa						
Testing Laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch											
Website		www.intertek.com.cn											
Test report id. number		GZ11071587-1/2/3/4/5,GZ11071587-5											
Date of test report		2017.4.13,2012.2.7											
Test method		ISO 9459-2 (CSTG)											
Comments of test lab		The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.											

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Street	NingHai Industrial Zone				E-mail	info@sunrain.com							
Postal Code	222000	Lianyungang city, Jiangsu Province			Tel. / Fax	+86	518-8595-9889/9808						
System family overview													
For each storage and collector size, give number of collectors													
Collector name	150L	200L	240L	300L									
TZ58/1800-15E	1												
TZ58/1800-20E		1											
TZ58/1800-24E			1										
TZ58/1800-30E				1									
Name of system configuration					TZ58/1800-30E								
Collector name	TZ58/1800-30E		No. Collectors	1		Storage name	300L						
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 250				Daily drawoff 300				Daily drawoff 400			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE		13922	4897	0	35,2	16706	5753	0	34,4	22275	6731	0	30,2
WürzburgDE		13350	5105	0	38,2	16020	6027	0	37,6	21360	7146	0	33,5
Davos CH		15104	7480	0	49,5	18125	8688	0	47,9	24167	10020	0	41,5
Athens GR		10374	6813	0	65,7	12450	8102	0	65,1	16599	10044	0	60,5
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
$f_{sol} = Q_L / Q_d$	-	Solar fraction											
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	Ta,ave	7,5	9,0	3,2	18,5								
	Tc,ave	8,5	10,0	5,4	17,8								
	± ΔTc	6,4	3,0	0,8	7,4								
G	kWh/m ²	Annual irradiation South, 45°											
Ta,ave	°C	Annual average outdoor air temperature											
Tc,ave	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		0	kPa	Max. operating press. - tank side		400	kPa						
Testing Laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch											
Website		www.intertek.com.cn											
Test report id. number		GZ11071587-1/2/3/4/5,GZ11071587-5											
Date of test report		2017.4.13,2012.2.7											
Test method		ISO 9459-2 (CSTG)											
Comments of test lab													
The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.													
