

Holder/Issued to/Manufacturer

Jiangsu Micoe Solar Energy Co. Ltd.

NingHai Industrial Zone, 222243 Lianyungang City, Jiangsu Province, China

Product name and description

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

Models:	SZ58/1800-10H	SZ58/1800-12H	SZ58/1800-15H	SZ58/1800-18H
	SZ58/1800-20H	SZ58/1800-22H	SZ58/1800-24H	SZ58/1800-25H
	SZ58/1800-28H	SZ58/1800-30H		
	SZ58/1800-10H2	SZ58/1800-12H2	SZ58/1800-15H2	SZ58/1800-18H2
	SZ58/1800-20H2	SZ58/1800-22H2	SZ58/1800-24H2	SZ58/1800-25H2
	SZ58/1800-28H2	SZ58/1800-30H2		

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 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 (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 2023-01-09 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. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Lennart Aronsson

Magnus Sturesson

Certificate No. SC1190-17 | issue 1 | 2018-01-09


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		SC1190-17								
					Date issued		2018-01-09								
					Issued by		RISE								
Licence holder		Jiangsu Micoe Solar Energy Co., Ltd			Country		China								
Brand (optional)		Micoe			Web		en.micoe.com								
Street, Number		Ning Hai Industrial Zone,			E-mail		info@micoe.com								
Postcode, City		222243, Lianyungang City, Jiangsu Province			Tel		+86 518-85959563								
Collector Type					Evacuated tubular collector										
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 θ _m - θ _a						
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	47 K	
					W	W	W	W	W	W	W				
SZ58/1800-10H (H2)					1,71	1990	860	155	683	663	615	554	481	564	
SZ58/1800-12H (H2)					2,02	1990	1016	155	807	784	726	654	568	667	
SZ58/1800-15H (H2)					2,49	1990	1250	155	993	964	893	805	699	820	
SZ58/1800-18H (H2)					2,95	1990	1484	155	1178	1144	1061	956	830	974	
SZ58/1800-20H (H2)					3,26	1990	1640	155	1302	1265	1172	1056	917	1076	
SZ58/1800-22H (H2)					3,57	1990	1796	155	1426	1385	1284	1157	1004	1179	
SZ58/1800-24H (H2)					3,88	1990	1952	155	1550	1505	1395	1257	1091	1281	
SZ58/1800-25H (H2)					4,04	1990	2030	155	1612	1566	1451	1307	1135	1332	
SZ58/1800-28H (H2)					4,51	1990	2264	155	1798	1746	1618	1458	1266	1486	
SZ58/1800-30H (H2)					4,82	1990	2420	155	1922	1866	1730	1559	1353	1588	
Power output per m ² gross area					399	388	359	324	281	330					
Performance parameters test method					Steady state - outdoor										
Performance parameters (related to AG)					η _{0,hem}	a ₁	a ₂								
Units					-	W/(m ² K)	W/(m ² K ²)								
Test results					0,399	1,057	0,009								
Incidence angle modifier test method					Steady state - outdoor										
Bi-directional incidence angle modifiers					Yes										
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal					K _{θT, coll}	1,02	1,04	1,14	1,24	1,38	1,46	0,97	0,49	0,00	
Longitudinal					K _{θL, 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	0,020	kg/(sm ²)								
Maximum temperature difference for thermal performance calculations					(θ _m -θ _a) _{max}	46,8	K								
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	240	°C								
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	5,27	kJ/(Km ²)								
Maximum operating temperature					θ _{max, op}	120	°C								
Maximum operating pressure					p _{max, op}	600	kPa								
Testing laboratory					Intertek Testing Services Shenzhen Ltd. Guangzhou Branch			www.intertek.com							
Test report(s)					161227072GZU-003,161227072GZU-004			Dated		2017-11-09					
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01										
					 <i>William zheng</i>										
<p align="center">RISE Research Institutes of Sweden AB Certification</p> <p align="center">Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifiering@ri.se www.ri.se</p>															

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SC1190-17
	Issued	2018-01-09

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
SZ58/1800-10H (H2)		1274	1054	812	1045	829	613	764	590	425	826	639	456
SZ58/1800-12H (H2)		1505	1246	959	1235	979	724	903	697	502	976	755	539
SZ58/1800-15H (H2)		1851	1533	1180	1519	1205	890	1111	858	618	1200	929	663
SZ58/1800-18H (H2)		2198	1819	1401	1803	1430	1057	1319	1018	734	1425	1103	787
SZ58/1800-20H (H2)		2429	2011	1549	1993	1581	1168	1458	1125	811	1575	1219	870
SZ58/1800-22H (H2)		2660	2202	1696	2182	1731	1279	1596	1232	888	1725	1335	952
SZ58/1800-24H (H2)		2891	2393	1843	2372	1882	1390	1735	1339	965	1875	1451	1035
SZ58/1800-25H (H2)		3006	2489	1917	2467	1957	1446	1804	1393	1003	1950	1509	1076
SZ58/1800-28H (H2)		3353	2776	2138	2751	2182	1613	2012	1553	1119	2174	1683	1200
SZ58/1800-30H (H2)		3584	2967	2285	2941	2333	1724	2151	1660	1196	2324	1799	1283
Annual output per m ² gross area		744	616	475	611	484	358	447	345	248	483	374	266
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-Glycole	
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)	C	--
Maximum tested positive load	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using steel ball (maximum drop height)	1,2	m

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
SZ58/1800-10H (H2)	1,71	Collector efficiency (η_{col})	34	%
SZ58/1800-12H (H2)	2,02	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/m ² , 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.		
SZ58/1800-15H (H2)	2,49			
SZ58/1800-18H (H2)	2,95			
SZ58/1800-20H (H2)	3,26			
SZ58/1800-22H (H2)	3,57			
SZ58/1800-24H (H2)	3,88			
SZ58/1800-25H (H2)	4,04			
SZ58/1800-28H (H2)	4,51	Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
SZ58/1800-30H (H2)	4,82	Zero-loss efficiency (η_0)	0,399	--
		First-order coefficient (a_1)	1,06	W/(m ² K)
		Second-order coefficient (a_2)	0,009	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,19	--
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.				