

Holder/Issued to/Manufacturer

Jiangsu Micoe Solar Energy Co., Ltd.

Ninghai Industrial Zone, Lianyungang City, Jiangsu Province, China

Product name and description

Vacuum tube solar thermal collectors.

For technical information see Appendix (2 pages).

Models: SZ58/1800-10H5 SZ58/1800-15H5 SZ58/1800-20H5
SZ58/1800-25H5 SZ58/1800-30H5

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 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 2021-11-29 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 2015-06-24. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Lennart Aronsson

Magnus Sturesson

Certificate No. SC0417-15 | issue 2 | 2017-08-24


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 - Summary of EN ISO 9806:2013 Test Results						Licence Number		SP SC0417-15							
						Date issued		2017-08-24							
						Issued by		RISE							
Licence holder		Jiangsu Micoe Solar Energy Co.,Ltd				Country		China							
Brand (optional)		Micoe				Web		http://en.micoe.com							
Street, Number		Ning Hai Industrial Zone				E-mail		info@micoe.com							
Postcode, City		222000,Lianyungang				Tel		+86 51885810928							
Collector Type						Evacuated tubular collector									
						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² $\vartheta_m - \vartheta_a$									
												0 K	10 K	30 K	50 K
Collector name						m ²	mm	mm	mm	W	W	W	W	W	W
SZ58/1800-10H5						1,64	1978	828	110	629	606	545	465	365	469
SZ58/1800-15H5						2,41	1978	1218	110	925	891	802	684	537	690
SZ58/1800-20H5						3,18	1978	1608	110	1221	1177	1059	903	709	910
SZ58/1800-25H5						3,95	1978	1998	110	1518	1462	1316	1122	880	1131
SZ58/1800-30H5						4,72	1978	2388	110	1814	1748	1572	1341	1052	1352
Power output per m² gross area						384	370	333	284	223	286				
Performance parameters test method						Steady state - outdoor									
Performance parameters (related to AG)						η_0, hem	a1	a2							
Units						-	W/(m ² K)	W/(m ² K ²)							
Test results						0,384	1,253	0,015							
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						$K_{\theta T, \text{coll}}$	1,04	1,08	1,14	1,20	1,42	1,64	1,09	0,55	0,00
Longitudinal						$K_{\theta L, \text{coll}}$	0,99	0,98	0,96	0,95	0,94	0,71	0,47	0,24	0,00
Heat transfer medium for testing						Water									
Flow rate for testing (per gross area, A_G)						dm/dt	0,012							kg/(sm ²)	
Maximum temperature difference for thermal performance calculations						$(\vartheta_m - \vartheta_a)_{\text{max}}$	49,13							K	
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30^\circ\text{C}$)						ϑ_{stg}	230							°C	
Effective thermal capacity, incl. fluid (per gross area, A_G)						C/m ²	24,95							kJ/(Km ²)	
Maximum operating temperature						$\vartheta_{\text{max, op}}$	--							°C	
Maximum operating pressure						p _{max, op}	600							kPa	
Testing laboratory						Intertek Testing Services Shenzhen Ltd. Guangzhou				http://www.intertek.com					
Test report(s)						150513057GZU-001				Dated		2015-06-02			
Comments of testing laboratory						Datashet version: 5.01, 2016-03-01									
The negative test was not performed as it is an evacuated tube collector type not application for this item according to EN12975-2:2006.															
ITW Test reports No. 10COL919, 10COL920 and 10COL920Q dated 2011-05-10 are also used for evaluation of the certified product.															
RISE Research Institutes of Sweden AB Certification Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifierring@ri.se www.ri.se															

Annex to Solar Keymark Certificate	Licence Number	SP SC0417-15
Supplementary Information	Issued	2017-08-24

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	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
SZ58/1800-10H5		1172	911	622	929	676	423	688	487	302	745	528	322
SZ58/1800-15H5		1723	1340	914	1367	994	623	1012	716	444	1096	777	473
SZ58/1800-20H5		2275	1769	1207	1805	1312	822	1337	946	587	1447	1025	625
SZ58/1800-25H5		2827	2198	1500	2243	1630	1021	1661	1175	729	1797	1274	776
SZ58/1800-30H5		3379	2627	1792	2681	1949	1221	1985	1404	871	2148	1523	928
Annual output per m ² gross area		715	556	379	568	413	258	420	297	184	455	322	196
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	2600	Pa
Maximum tested negative load	--	Pa
Hail resistance using steel ball (maximum drop height)	--	m

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
SZ58/1800-10H5	1,64	Collector efficiency (η_{col})	31	%
SZ58/1800-15H5	2,41	<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>		
SZ58/1800-20H5	3,18			
SZ58/1800-25H5	3,95			
SZ58/1800-30H5	4,72			
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0,384	--
		First-order coefficient (a_1)	1,25	W/(m ² K)
		Second-order coefficient (a_2)	0,015	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,14	--
<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>				