

Holder/Issued to/Manufacturer

WUXI WANKANG ENERGY TECHNOLOGY CO., LTD.

No.6 Xiaohu Rd. Chengchang industrial park, Huangtu Town, Jiangyin City, 214400, WUXI, CHINA

Product name and description

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

Models:	WKPC-58/1800-A8	WKPC-58/1800-A9	WKPC-58/1800-A12
	WKPC-58/1800-A15	WKPC-58/1800-A16	WKPC-58/1800-A17
	WKPC-58/1800-A18	WKPC-58/1800-A20	WKPC-58/1800-A21
	WKPC-58/1800-A23	WKPC-58/1800-A25	WKPC-58/1800-A28
	WKPC-58/1800-A30		

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 2023-05-09 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.

Johan Åkesson

Magnus Sturesson

Certificate No. SC1475-17 | issue 1 | 2018-05-09


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		SC1475-17							
					Date issued		2018-05-09							
					Issued by		RISE							
Licence holder		WUXI WANKANG ENERGY TECHNOLOGY CO.,LTD			Country		China							
Brand (optional)		Adton			Web		www.wksolar.com							
Street, Number		No.6 Xiaohu Rd. Chengchang industrial park, Huangtu Town			E-mail		sales@wksolar.com							
Postcode, City		214400	Wuxi				Tel		+86 0510-86650098					
Collector Type					Evacuated tubular collector									
Collector name					Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector $G_b = 850 \text{ W/m}^2$; $G_d = 150 \text{ W/m}^2$ $\vartheta_m - \vartheta_a$					
					m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	48 K
WKPC-58/1800-A8					1,81	1940	931	134	865	844	787	709	611	718
WKPC-58/1800-A9					2,02	1940	1042	134	966	942	878	791	682	801
WKPC-58/1800-A12					2,67	1940	1375	134	1276	1245	1161	1046	902	1059
WKPC-58/1800-A15					3,31	1940	1708	134	1582	1544	1439	1297	1118	1312
WKPC-58/1800-A16					3,53	1940	1819	134	1687	1646	1534	1383	1192	1399
WKPC-58/1800-A17					3,74	1940	1930	134	1788	1744	1626	1465	1263	1483
WKPC-58/1800-A18					3,96	1940	2041	134	1893	1847	1721	1551	1337	1570
WKPC-58/1800-A20					4,39	1940	2263	134	2098	2047	1908	1720	1482	1740
WKPC-58/1800-A21					4,61	1940	2374	134	2204	2150	2004	1806	1557	1828
WKPC-58/1800-A23					5,04	1940	2596	134	2409	2350	2191	1974	1702	1998
WKPC-58/1800-A25					5,47	1940	2818	134	2615	2551	2378	2143	1847	2169
WKPC-58/1800-A28					6,11	1940	3151	134	2921	2849	2656	2394	2063	2422
WKPC-58/1800-A30					6,54	1940	3373	134	3126	3050	2843	2562	2208	2593
Power output per m ² gross area									478	466	435	392	338	396
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					0,478	1,025	0,014							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle					Yes									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					$K_{GT, coll}$	1,01	1,02	1,08	1,13	1,26	1,31	0,87	0,44	0,00
Longitudinal					$K_{GL, coll}$	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					$(\vartheta_m - \vartheta_a)_{max}$	48,04	K							
Standard stagnation temperature ($G = 1000 \text{ W/m}^2$; $\vartheta_a = 30 \text{ °C}$)					ϑ_{stg}	250	°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	4,32	kJ/(Km ²)							
Maximum operating temperature					$\vartheta_{max, op}$	99	°C							
Maximum operating pressure					$p_{max, op}$	800	kPa							
Testing		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch			http://www.intertek.com									
Test report(s)		170518064GZU-001			Dated		2018-04-24							
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01									
No Comments					 <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	SC1475-17
	Issued	2018-05-09

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
WKPC-58/1800-A8		1544	1289	980	1281	1012	729	933	720	507	1007	781	544
WKPC-58/1800-A9		1723	1439	1093	1429	1130	814	1041	804	566	1124	871	607
WKPC-58/1800-A12		2278	1902	1445	1889	1493	1076	1376	1063	748	1485	1151	802
WKPC-58/1800-A15		2824	2357	1792	2342	1851	1334	1706	1318	927	1841	1427	994
WKPC-58/1800-A16		3011	2514	1911	2498	1974	1422	1820	1405	989	1963	1522	1060
WKPC-58/1800-A17		3190	2664	2024	2646	2091	1507	1928	1489	1048	2080	1613	1123
WKPC-58/1800-A18		3378	2820	2143	2802	2214	1596	2041	1576	1109	2203	1708	1189
WKPC-58/1800-A20		3745	3127	2376	3106	2455	1769	2263	1747	1230	2442	1893	1318
WKPC-58/1800-A21		3933	3283	2495	3262	2578	1857	2376	1835	1291	2564	1988	1384
WKPC-58/1800-A23		4299	3590	2728	3566	2818	2031	2598	2006	1412	2803	2174	1514
WKPC-58/1800-A25		4666	3896	2961	3870	3059	2204	2820	2177	1532	3043	2359	1643
WKPC-58/1800-A28		5212	4352	3307	4323	3417	2462	3150	2432	1711	3398	2635	1835
WKPC-58/1800-A30		5579	4658	3540	4627	3657	2635	3371	2603	1832	3638	2820	1964
Annual output per m ² gross area		853	712	541	708	559	403	515	398	280	556	431	300
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)	B	--
Maximum tested positive load	2400	Pa
Maximum tested negative load	1100	Pa
Hail resistance using steel ball (maximum drop height)	0,8	m

Energy Labelling Information				
	Reference Area, A _{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A _{sol}		
WKPC-58/1800-A8	1,81	Collector efficiency (η_{col})	41	%
WKPC-58/1800-A9	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.		
WKPC-58/1800-A12	2,67			
WKPC-58/1800-A15	3,31			
WKPC-58/1800-A16	3,53			
WKPC-58/1800-A17	3,74			
WKPC-58/1800-A18	3,96			
WKPC-58/1800-A20	4,39			
WKPC-58/1800-A21	4,61	Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}		
WKPC-58/1800-A23	5,04	Zero-loss efficiency (η_0)	0,478	--
WKPC-58/1800-A25	5,47	First-order coefficient (a ₁)	1,03	W/(m ² K)
WKPC-58/1800-A28	6,11	Second-order coefficient (a ₂)	0,014	W/(m ² K ²)
WKPC-58/1800-A30	6,54	Incidence angle modifier IAM (50°)	1,08	--
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.				