

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:	WK24CPC-58/1800-A8	WK24CPC-58/1800-A10	WK24CPC-58/1800-A12
	WK24CPC-58/1800-A15	WK24CPC-58/1800-A16	WK24CPC-58/1800-A17
	WK24CPC-58/1800-A18	WK24CPC-58/1800-A20	WK24CPC-58/1800-A22
	WK24CPC-58/1800-A23	WK24CPC-58/1800-A25	WK24CPC-58/1800-A28
	WK24CPC-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 2023-05-16 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. SC1476-17 | issue 1 | 2018-05-16


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		SC1476-17							
					Date issued		2018-05-16							
					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 (0)510-86650098							
Collector Type					Evacuated tubular collector									
Collector name					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a									
					0 K	10 K	30 K	50 K	70 K	58 K				
					W	W	W	W	W	W				
					m ²	mm	mm	mm						
					Gross area (A _G)	Gross length	Gross width	Gross height						
WK24CPC-58/1800-A8					1,81	1940	931	134	874	861	825	776	714	753
WK24CPC-58/1800-A10					2,24	1940	1153	134	1082	1066	1021	961	884	932
WK24CPC-58/1800-A12					2,67	1940	1375	134	1290	1270	1217	1145	1054	1111
WK24CPC-58/1800-A15					3,31	1940	1708	134	1599	1575	1509	1420	1307	1377
WK24CPC-58/1800-A16					3,53	1940	1819	134	1705	1680	1610	1514	1393	1469
WK24CPC-58/1800-A17					3,74	1940	1930	134	1806	1779	1705	1604	1476	1556
WK24CPC-58/1800-A18					3,96	1940	2041	134	1913	1884	1806	1699	1563	1647
WK24CPC-58/1800-A20					4,39	1940	2263	134	2120	2089	2002	1883	1733	1826
WK24CPC-58/1800-A22					4,82	1940	2485	134	2328	2293	2198	2068	1903	2005
WK24CPC-58/1800-A23					5,04	1940	2596	134	2434	2398	2298	2162	1989	2097
WK24CPC-58/1800-A25					5,47	1940	2818	134	2642	2603	2494	2346	2159	2276
WK24CPC-58/1800-A28					6,11	1940	3151	134	2951	2907	2786	2621	2412	2542
WK24CPC-58/1800-A30					6,54	1940	3373	134	3159	3112	2982	2805	2582	2721
Power output per m ² gross area					483	476	456	429	395	416				
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					0,483	0,631	0,009							
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 _{θT,coil}	1,04	1,08	1,16	1,24	1,32	1,49	0,99	0,50	0,00
Longitudinal					K _{θL,coil}	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}	58								K
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	230								°C
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	4,50								kJ/(Km ²)
Maximum operating temperature					θ _{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)		170719041GZU-001			Dated		2018-04-27							
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01									
No Comments					 <i>William zheng</i>									
<p>RISE Research Institutes of Sweden AB Certification</p> <p>Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifierring@ri.se www.ri.se</p>														

Annex to Solar Keymark Certificate	Licence Number	SC1476-17
Supplementary Information	Issued	2018-05-16

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

Standard Locations Collector name	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
WK24CPC-58/1800-A8		1662	1495	1275	1435	1244	1026	1039	886	716	1116	956	773
WK24CPC-58/1800-A10		2057	1850	1577	1776	1539	1270	1285	1096	886	1382	1183	956
WK24CPC-58/1800-A12		2452	2205	1880	2117	1835	1513	1532	1307	1056	1647	1410	1140
WK24CPC-58/1800-A15		3040	2734	2331	2625	2275	1876	1900	1620	1309	2042	1747	1413
WK24CPC-58/1800-A16		3242	2915	2486	2799	2426	2001	2026	1728	1396	2177	1864	1507
WK24CPC-58/1800-A17		3434	3089	2634	2966	2570	2120	2146	1831	1479	2307	1974	1597
WK24CPC-58/1800-A18		3636	3271	2789	3140	2721	2245	2273	1938	1566	2443	2091	1690
WK24CPC-58/1800-A20		4031	3626	3091	3481	3017	2488	2519	2149	1736	2708	2318	1874
WK24CPC-58/1800-A22		4426	3981	3394	3822	3312	2732	2766	2359	1906	2973	2545	2058
WK24CPC-58/1800-A23		4628	4163	3549	3996	3463	2857	2892	2467	1993	3109	2661	2152
WK24CPC-58/1800-A25		5023	4518	3852	4337	3759	3100	3139	2677	2163	3374	2888	2335
WK24CPC-58/1800-A28		5611	5046	4303	4845	4199	3463	3506	2991	2416	3769	3226	2608
WK24CPC-58/1800-A30		6006	5401	4605	5186	4494	3707	3753	3201	2586	4034	3453	2792
Annual output per m ² gross area		918	826	704	793	687	567	574	489	395	617	528	427
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
Hybrid Thermal and Photo Voltaic collector	No
The collector is deemed to be suitable for roof integration	Yes
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}		
WK24CPC-58/1800-A8	1,81	Collector efficiency (η_{col})	44	%
WK24CPC-58/1800-A10	2,24	<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>		
WK24CPC-58/1800-A12	2,67			
WK24CPC-58/1800-A15	3,31			
WK24CPC-58/1800-A16	3,53			
WK24CPC-58/1800-A17	3,74			
WK24CPC-58/1800-A18	3,96			
WK24CPC-58/1800-A20	4,39			
WK24CPC-58/1800-A22	4,82	Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}		
WK24CPC-58/1800-A23	5,04	Zero-loss efficiency (η_0)	0,483	--
WK24CPC-58/1800-A25	5,47	First-order coefficient (a ₁)	0,63	W/(m ² K)
WK24CPC-58/1800-A28	6,11	Second-order coefficient (a ₂)	0,009	W/(m ² K ²)
WK24CPC-58/1800-A30	6,54	Incidence angle modifier IAM (50°)	1,19	--
<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>				