

Issued to

Zhejiang Jiadele Technology Co., Ltd.

No. 12 Fenghuang Road, Dingqiao Town, Haining City, Zhejiang, China

Product name and description

Vacuum tube solar thermal collectors for water heating.

For technical information see Appendix (2 pages).

Models:	JDL-HP100A	JDL-HP120A	JDL-HP150A	JDL-HP180A
	JDL-HP200A	JDL-HP240A	JDL-HP250A	JDL-HP300A

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 9806:2017 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 2025-12-21 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.

Martin Tillander

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RISE Research Institutes of Sweden AB | Certification

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Annex to Solar Keymark Certificate					Licence Number		C900097							
					Date issued		2020-12-21							
					Issued by		RISE							
Licence holder		Zhejiang Jiadele Technology Co., Ltd			Country		China							
Brand (optional)		Jiadele			Web		www.sh-jiadele.com							
Street, Number		No. 12 Fenghuang Road, Dingqiao Town			E-mail		webmaster@sh-jiadele.com							
Postcode, City		314413, Haining, Zhejiang Province			Tel		+86 573-87797662							
Collector Type					Evacuated tubular collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	92 K				
					m ²	mm	mm	mm	mm	mm				
					W	W	W	W	W	W				
JDL-HP100A					1,54	1 920	800	100	674	654	599	527	435	314
JDL-HP120A					1,83	1 920	950	100	801	777	712	626	517	373
JDL-HP150A					2,26	1 920	1 175	100	989	959	880	773	639	460
JDL-HP180A					2,69	1 920	1 400	100	1 177	1 142	1 047	920	760	548
JDL-HP200A					2,98	1 920	1 550	100	1 304	1 265	1 160	1 019	842	607
JDL-HP240A					3,55	1 920	1 850	100	1 554	1 507	1 382	1 214	1 003	723
JDL-HP250A					3,70	1 920	1 925	100	1 619	1 571	1 440	1 265	1 046	753
JDL-HP300A					4,42	1 920	2 300	100	1 934	1 876	1 720	1 511	1 249	900
Power output per m ² gross area					438	425	389	342	283	204				
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to A _G)					η_0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units					-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-
Test results					0,437	1,164	0,015	0,000	0,00	7 190	0,000	0,00	0,00	1,01
Incidence angle modifier test method					Steady state - outdoor									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{GT, coll}	1,08	1,16	1,24	1,33	1,42	1,06	0,71	0,35	0,00
Longitudinal					K _{GL, coll}	1,00	0,98	0,95	0,90	0,82	0,71	0,55	0,33	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 during thermal performance test					($\vartheta_m - \vartheta_a$) _{max}	62	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}	210	°C							
Maximum operating temperature					$\vartheta_{max, op}$	160	°C							
Maximum operating pressure					p _{max, op}	600	kPa							
Testing laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch			http://www.intertek.com									
Test report(s)		190823044GZU-001			Dated		2020-12-10							
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
Above efficiency parameters come from test type JDL-HP100A; The performance parameter based aperture area (0.93 m ²) are: $\eta_0, b' = 0.724$, $a1' = 1.928$, $a2' = 0.025$.														
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														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	C900097
	Issued	2020-12-21

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
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
JDL-HP100A		1 246	1 010	737	1 021	783	543	747	559	379	802	600	401
JDL-HP120A		1 481	1 200	876	1 213	931	645	888	664	451	953	713	477
JDL-HP150A		1 828	1 482	1 081	1 498	1 149	796	1 097	820	557	1 177	881	589
JDL-HP180A		2 176	1 764	1 287	1 783	1 368	948	1 306	976	663	1 401	1 048	701
JDL-HP200A		2 411	1 954	1 426	1 976	1 516	1 050	1 446	1 081	734	1 552	1 161	777
JDL-HP240A		2 872	2 328	1 699	2 353	1 805	1 251	1 723	1 288	875	1 849	1 383	925
JDL-HP250A		2 993	2 427	1 770	2 453	1 882	1 303	1 796	1 343	912	1 928	1 442	965
JDL-HP300A		3 576	2 899	2 115	2 930	2 248	1 557	2 145	1 604	1 089	2 303	1 722	1 152
Annual output per m ² gross area		809	656	478	663	509	352	485	363	246	521	390	261
Annual efficiency, η_a		46%	37%	27%	41%	31%	22%	42%	31%	21%	42%	31%	21%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1630 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. 6.1 (September 2019). A detailed description of the calculations is available at <http://www.estif.org/solarkeymarknew/>

Additional Information					
Collector heat transfer medium	Water-Glycole				
The collector is deemed to be suitable for roof integration	No				
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				B	--
G (W/m ²) >	900	ϑ_a (°C) >	15	H_x (MJ/m ²) >	540
Maximum tested positive load				1500	Pa
Maximum tested negative load				1500	Pa
Hail resistance using steel ball (maximum drop height)				0,4	m
Additional collector attribute(s)					
<input type="checkbox"/> Using external power source(s) for normal operation	<input type="checkbox"/> Active or passive measure(s) for self-protection				
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Façade collector(s)				

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
JDL-HP100A	1,54	1-H-12S-C:20,800-D	0,93
JDL-HP120A	1,83	1-H-12S-C:20,950-D	1,12
JDL-HP150A	2,26	1-H-12S-C:20,1175-D	1,40
JDL-HP180A	2,69	1-H-12S-C:20,1400-D	1,67
JDL-HP200A	2,98	1-H-12S-C:20,1550-D	1,86
JDL-HP240A	3,55	1-H-12S-C:20,1850-D	2,23
JDL-HP250A	3,70	1-H-12S-C:20,1925-D	2,33
JDL-HP300A	4,42	1-H-12S-C:20,2300-D	2,80

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	37%	Zero-loss efficiency (η_0)	0,44
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 9806:2017.		First-order coefficient (a_1)	1,16
		Second-order coefficient (a_2)	0,015
		Incidence angle modifier IAM (50°)	1,17
		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.	