


Annex to Solar Keymark Certificate					Licence Number		011-7S3034 R							
					Date issued		2022-05-26							
					Issued by		DIN CERTCO							
Licence holder		Jiangsu HETE Energy Conservation and Environmental Protection Co., Ltd.			Country	China								
Brand (optional)		HETE			Web	http://www.heatpipecollector.com								
Street, Number		No. 29 Ronghua Road, Chahe Town Laian county			E-mail	info@heatpipecollector.com								
Postcode, City		239236/Chuzhou city ANHUI			Tel	+86 25-58399023								
Collector Type					Evacuated tubular collector									
Collector name					Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector					
									G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s θ _m - θ _a					
									0 K	10 K	30 K	50 K	70 K	94 K
									W	W	W	W	W	W
HRZJ-58/1800-10					1.65	1,983	830	162	760	738	689	632	566	479
HRZJ-58/1800-15					2.36	1,983	1,190	162	1,090	1,058	988	906	812	687
HRZJ-58/1800-18					2.80	1,983	1,415	162	1,293	1,256	1,172	1,074	964	815
HRZJ-58/1800-20					3.10	1,983	1,565	162	1,431	1,390	1,297	1,190	1,067	902
HRZJ-58/1800-24					3.69	1,983	1,865	162	1,704	1,655	1,544	1,416	1,270	1,074
HRZJ-58/1800-30					4.57	1,983	2,303	162	2,109	2,048	1,911	1,753	1,572	1,330
Power output per m ² gross area									462	449	419	384	344	291
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to A _G)					η ₀ , b	a ₁	a ₂	a ₃	a ₄	a ₅	a ₆	a ₇	a ₈	K _d
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					0.461	1.259	0.006	0.000	0.000	3,470	0.000	0.000	0.000	1.01
Incidence angle modifier test method					Quasi dynamic - outdoor									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT, coll}	1.04	1.08	1.15	1.22	1.31	1.39	0.93	0.46	0.00
Longitudinal					K _{θL, coll}	1.00	0.99	0.97	0.93	0.88	0.78	0.58	0.29	0.00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0.013	kg/(sm ²)							
Maximum temperature difference during thermal performance test					(θ _m - θ _a) _{max}	64	K							
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	230	°C							
Maximum operating temperature					θ _{max, op}	95	°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)		131101048GZU-001 R1			Dated	2022/5/25								
Comments of testing laboratory					Draft Ver. 6.2 (22.09.2021)									
1. The "negative pressure test of the collector" according to EN 12975-2:2006.5.9.2 was not performed.					 Stamp & signature									
2. Tests were performed based on EN 12975-2:2006.3.														
3. Above efficiency parameters come from test type HRZJ-58/1800-10.														
4. This revision is for client address update only.														
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Supplementary Information		011-7S3034 R											
		Issued											
		2022-05-26											
Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m													
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
HRZJ-58/1800-10		1,396	1,167	936	1,151	937	734	840	664	506	904	716	541
HRZJ-58/1800-15		2,001	1,674	1,342	1,650	1,344	1,053	1,204	952	726	1,296	1,026	775
HRZJ-58/1800-18		2,374	1,986	1,592	1,958	1,595	1,249	1,429	1,130	862	1,538	1,217	919
HRZJ-58/1800-20		2,629	2,199	1,762	2,167	1,765	1,383	1,582	1,251	954	1,703	1,348	1,018
HRZJ-58/1800-24		3,129	2,617	2,098	2,580	2,102	1,646	1,883	1,489	1,135	2,027	1,604	1,212
HRZJ-58/1800-30		3,873	3,239	2,596	3,193	2,601	2,038	2,330	1,843	1,405	2,509	1,986	1,500
Gross Thermal Yield per m ² gross area		848	709	568	699	570	446	510	404	308	549	435	328
Annual efficiency, η_a		48%	40%	32%	43%	35%	27%	44%	35%	26%	44%	35%	26%
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 Draft Ver. 6.2 (22.09.2021). 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)											C	--	
G (W/m ²) >		800		ϑ_a (°C) >		10		H _x (MJ/m ²) >		420			
Maximum tested positive load											3400	Pa	
Maximum tested negative load											--	Pa	
Hail resistance using steel ball (maximum drop height)											1.0	m	
Additional collector attribute(s)													
Using external power source(s) for normal operation											No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power											No	Façade collector(s)	No
Energy Labelling Information						Additional Informative Technical Data							
		Reference Area, A _{sol} (m ²)		Hydraulic Designation Code		Aperture Area, A _a (m ²)							
HRZJ-58/1800-10		1.65		1-H-12S-C:24,865-D		0.94							
HRZJ-58/1800-15		2.36		1-H-12S-C:24,1240-D		1.40							
HRZJ-58/1800-18		2.80		1-H-12S-C:24,1465-D		1.68							
HRZJ-58/1800-20		3.10		1-H-12S-C:24,1615-D		1.87							
HRZJ-58/1800-24		3.69		1-H-12S-C:24,1915-D		2.25							
HRZJ-58/1800-30		4.57		1-H-12S-C:24,2365-D		2.81							
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})		40%				Zero-loss efficiency (η_0)		0.46		--			
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)		1.26		W/(m ² K)					
				Second-order coefficient (a ₂)		0.006		W/(m ² K ²)					
				Incidence angle modifier IAM (50°)		1.12		--					
						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.							
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