


Annex to Solar Keymark Certificate					Licence Number		011-7S3122 F							
					Date issued		2022-04-26							
					Issued by		DIN CERTCO							
Licence holder		Qingdao Economy and Technology Development Zone Haier Water Heater Co., Ltd.					Country		China					
Brand (optional)		Haier					Web		http://www.haier.com					
Street, Number		Haier Industrial Park, Huangdao District, Qingdao City, Shandong Province					E-mail		Jianglijun@haier.com					
Postcode, City		266400, Qingdao					Tel		+86 15905423303					
Collector Type						Flat plate 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	93 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
PGTL2.0-1					2.00	2,000	1,000	80	1,305	1,239	1,057	809	492	46
Power output per m² gross area					652	620	529	404	246	23				
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		0.668	2.864	0.042	0.000	0.000	4,018	0.000	0.000	0.000	0.845			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		$K_{\theta T, coll}$	1.00	0.99	0.97	0.94	0.88	0.78	0.62	0.38	0.00			
Longitudinal		$K_{\theta L, coll}$	1.00	0.99	0.97	0.94	0.88	0.78	0.62	0.38	0.00			
Heat transfer medium for testing						Water-Glycole								
Flow rate for testing (per gross area, A_G)						dm/dt	0.020	kg/(sm ²)						
Maximum temperature difference during thermal performance test						$(\vartheta_m - \vartheta_a)_{max}$	63.35	K						
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)						ϑ_{stg}	160	°C						
Maximum operating temperature						$\vartheta_{max, op}$	110	°C						
Maximum operating pressure						$p_{max, op}$	1100	kPa						
Testing laboratory		Intertek Testing Services Shenzhen Ltd. Guangzhou Branch					http://www.intertek.com							
Test report(s)		210831129GZU-001					Dated		2022/4/26					
Comments of testing laboratory						Draft Ver. 6.2 (22.09.2021)								
<i>No comments</i>						 Stamp & sig.								
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S3122 F
	Issued	2022-04-26

Gross Thermal Yield 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
PGTL2.0-1		1,986	1,300	636	1,470	856	345	1,095	620	257	1,190	665	275
Gross Thermal Yield per m ² gross area		993	650	318	735	428	173	547	310	129	595	333	137
Annual efficiency, η_a		56%	37%	18%	45%	26%	11%	47%	27%	11%	48%	27%	11%
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)	B		--		
G (W/m ²) >	900	ϑ_a (°C) >	15	H_x (MJ/m ²) >	540
Maximum tested positive load	2400		Pa		
Maximum tested negative load	1000		Pa		
Hail resistance using steel ball (maximum drop height)	1		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)
PGTL2.0-1	2.00	8-VH-1234S-A:7-1870-C:21,1060-D	1.86

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})	47%	Zero-loss efficiency (η_0)	0.65
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)	2.86
		Second-order coefficient (a_2)	0.042
		Incidence angle modifier IAM (50°)	0.87
		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.	