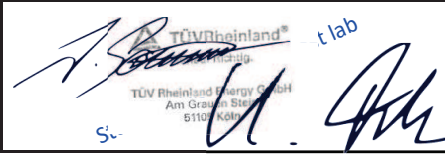


Annex to Solar Keymark Certificate					Licence Number		011-7S3071 F				
					Date issued		2021-10-06				
					Issued by		DIN CERTCO				
Licence holder		De Bruin Tankbouw b.v.			Country	Netherlands					
Brand (optional)		G2energy			Web	www.g2energy.nl					
Street, Number		Uddelerveen 79			E-mail	info@g2energy.nl					
Postcode, City		3888ML Uddel Town			Tel	+31 (0)577 72 3173					
Collector Type					Flat plate 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	115 K	
					W	W	W	W	W	W	
GC36	3.85	3 163	1 220	110	2 669	2 516	2 196	1 858	1 501	631	
GC54	5.74	4 710	1 220	110	3 976	3 748	3 272	2 768	2 236	939	
GC72	7.63	6 250	1 220	110	5 285	4 982	4 349	3 679	2 972	1 249	
Power output per m ² gross area					693	653	570	482	390	164	
Performance parameters test method		Quasi dynamic									
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		0.700	3.91	0.006	0.000	0.00	10 379	0.000	0.00	0.0E+00	0.93
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}	1.00	0.98	0.95	0.91	0.84	0.71	0.44	0.22	0.00
Longitudinal		K _{θL, coll}	1.00	0.98	0.95	0.91	0.84	0.71	0.44	0.22	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					(θ _m -θ _a) _{max}	85	K				
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	210	°C				
Maximum operating temperature					θ _{max, op}	99	°C				
Maximum operating pressure					p _{max, op}	800	kPa				
Testing laboratory		TÜV Rheinland Energy GmbH			www.tuv.com/solar						
Test report(s)		21252950.002			Dated		06.10.2021				
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26						
											
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de											

Annex to Solar Keymark Certificate		Licence Number		011-7S3071 F									
Supplementary Information		Issued		2021-10-06									
Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Standard Locations		Athens		Davos		Stockholm		Würzburg					
Collector name	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
GC36		4 072	2 737	1 708	2 986	1 971	1 195	2 209	1 370	807	2 419	1 482	849
GC54		6 066	4 077	2 545	4 448	2 936	1 780	3 290	2 041	1 203	3 603	2 208	1 266
GC72		8 063	5 419	3 383	5 913	3 903	2 367	4 374	2 712	1 599	4 790	2 936	1 682
Annual output per m ² gross area		1 057	710	443	775	512	310	573	355	210	628	385	220
Annual efficiency, η_a		60%	40%	25%	48%	31%	19%	49%	30%	18%	50%	31%	18%
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			
The collector is deemed to be suitable for roof integration										Yes			
The collector was tested successfully under the following conditions:													
Climate class (A+, A, B or C)										A		--	
G (W/m ²) >		1000		ϑ_a (°C) >		20		H _x (MJ/m ²) >		600			
Maximum tested positive load										2000		Pa	
Maximum tested negative load										1000		Pa	
Hail resistance using ice balls (diameter)										35		mm	
Additional collector attribute(s)													
Using external power source(s) for normal operation						Active or passive measure(s) for self-protection							
Co-generating thermal and electrical power						Façade collector(s)							
Energy Labelling Information						Additional Informative Technical Data							
<input type="checkbox"/>		Reference Area, A _{sol} (m ²)				<input type="checkbox"/> Hydraulic Designation Code				Aperture Area, A _a (m ²)			
GC36		3.85				8-V-1234S-A:6.5,2939-C:32,1212-D				3.48			
GC54		5.74				8-V-1234S-A:6.5,4456-C:32,1212-D				5.74			
GC72		7.63				8-V-1234S-A:6.5,6027-C:32,1212-D				7.63			
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})		53%				Zero-loss efficiency (η_0)				0.69		--	
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)				3.91		W/(m ² K)	
						Second-order coefficient (a ₂)				0.006		W/(m ² K ²)	
						Incidence angle modifier IAM (50°)				0.84		--	
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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