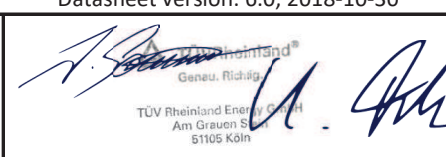


Annex to Solar Keymark Certificate						Licence Number		011-7S2500 F					
						Date issued		2020-09-25					
						Issued by		TÜV Rheinland Energy GmbH					
Licence holder			Gasokol GmbH			Country		Austria					
Brand (optional)			-			Web		www.gasokol.at					
Street, Number			Solarpark 1			E-mail		office@gasokol.at					
Postcode, City			A-4351 Saxen			Tel		+43 726 976 600					
Collector Type						Flat plate collector							
Collector name		Gross height	Gross area (A _G)	Gross length	Gross width	Aperture area (A _a)	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						
		mm	m ²	mm	mm	m ²	0 K	10 K	30 K	50 K	70 K	120 K	
							W	W	W	W	W	W	
sunWin 27V		98	2.70	2 150	1 255	2.52	1 951	1 858	1 651	1 415	1 151	369	
sunWin 27H		98	2.70	1 255	2 150	2.52	1 951	1 858	1 651	1 415	1 151	369	
Power output per m ² gross area							723	688	611	524	426	137	
Performance parameters test method		Quasi dynamic											
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		0.728	3.32	0.013	0.000	0.00	5 765	0.000	0.00	0.0E+00	0.95		
Incidence angle modifier test method		Quasi dynamic - outdoor											
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°		
Transversal		K _{GT, coll}	1.00	0.99	0.98	0.96	0.93	0.88	0.76	0.41	0.00		
Longitudinal		K _{GL, coll}	1.00	0.99	0.98	0.96	0.93	0.88	0.76	0.41	0.00		
Heat transfer medium for testing						Water							
Flow rate for testing (per gross area, A _G)						dm/dt	0.022	kg/(sm ²)					
Maximum temperature difference during thermal performance test						(θ _m -θ _a) _{max}	90	K					
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)						θ _{stg}	210	°C					
Maximum operating temperature						θ _{max, op}	100	°C					
Maximum operating pressure						p _{max, op}	1000	kPa					
Testing laboratory		TÜV Rheinland Energy GmbH				www.tuv.com\solarenergy							
Test report(s)		21246747.002 21246747.003 21250086.002				Dated		12.09.2019 12.09.2019 22.09.2020					
Comments of testing laboratory						Datasheet version: 6.0, 2018-10-30							
The collector performance parameter related to the aperture area of 2.52 m ² are h ₀ , h _{em} , a = 0.771, a _{1a} = 3.561 and a _{2a} = 0.014.													
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Annex to Solar Keymark Certificate						Licence Number		011-7S2500 F						
Supplementary Information						Issued		2020-09-25						
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	
sunWin 27V		3 144	2 257	1 477	2 392	1 655	1 034	1 763	1 157	697	1 922	1 255	744	
sunWin 27H		3 144	2 257	1 477	2 392	1 655	1 034	1 763	1 157	697	1 922	1 255	744	
Annual output per m ² gross area		1 165	836	547	886	613	383	653	428	258	712	465	276	
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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc														
Additional Information														
Collector heat transfer medium										Water-Glycole				
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										3500		Pa		
Maximum tested negative load										2750		Pa		
Hail resistance using ice balls (diameter)										35		mm		
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"/> Wind and/or infrared sensitive collector(s) (WISC)									
<input type="checkbox"/> Façade collector(s)														
Energy Labelling Information														
	Reference Area, A _{sol} (m ²)				Hydraulic Designation Code									
sunWin 27V	2.70				1-V-1234S-A:7.2,21840-C:20.8,1295									
sunWin 27H	2.70				1-V-1234S-A:7.2,20680-C:20.8,2190									
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})						57%		Zero-loss efficiency (η_0)		0.72		--		
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)		3.32		W/(m ² K)				
						Second-order coefficient (a ₂)		0.013		W/(m ² K ²)				
						Incidence angle modifier IAM (50°)		0.93		--				
						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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