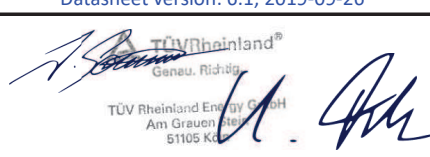


Annex to Solar Keymark Certificate					Licence Number		011-7S2214 F							
					Date issued		2020-01-28							
					Issued by		TÜV Rheinland Energy GmbH							
Licence holder		GASOKOL GmbH			Country		Austria							
Brand (optional)					Web		http://www.gasokol.at							
Street, Number		Solarpark 1			E-mail		office@gasokol.at							
Postcode, City		A-4351 Saxen			Tel		+43 7269 76600-0							
Collector Type					Flat plate collector									
Collector name					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	90 K				
					m ²	mm	mm	mm	mm	mm	mm			
					W	W	W	W	W	W				
gigaSol 24H					2.44	1 050	2 320	105	1 573	1 492	1 319	1 127	919	692
gigaSol 60H					6.06	1 050	5 770	105	3 906	3 706	3 275	2 800	2 281	1 719
gigaSol 35M					3.48	1 500	2 320	105	2 243	2 128	1 881	1 608	1 310	987
gigaSol 86M					8.66	1 500	5 770	105	5 581	5 296	4 680	4 001	3 260	2 457
gigaSol 48D					4.82	4 122	1 170	105	3 106	2 948	2 605	2 227	1 815	1 367
gigaSol 49					4.83	2 080	2 320	105	3 113	2 954	2 610	2 232	1 818	1 370
gigaSol 120					12.00	2 080	5 770	105	7 734	7 339	6 485	5 544	4 517	3 404
Power output per m ² gross area					644	612	540	462	376	284				
Performance parameters test method		Steady state - indoor												
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		0.656	3.20	0.009	0.000	0.00	5 344	0.000	0.00	0.0E+00	0.88			
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	1.00	0.99	0.97	0.93	0.85	0.71	0.36	0.00			
Longitudinal		K _{GL, coll}	1.00	1.00	0.99	0.97	0.93	0.85	0.71	0.36	0.00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0.026	kg/(sm ²)							
Maximum temperature difference during thermal performance test					(θ _m -θ _a) _{max}	60	K							
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	200	°C							
Maximum operating temperature					θ _{max, op}	n.n.	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory		ASiC Austria Solar Innovation Center					www.asic.at							
Test report(s)		P-201306001_1_PC (by ASiC) P-201306001_2 (by ASiC)					Dated		14.10.2013 14.10.2013					
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
Die kundenspezifisch gefertigte Kollektorserie gigaSol beinhaltet die Standardmodule mit einer Bruttofläche von 2.4 bis 12 m ² auch Sonderbauformen, sämtliche Zwischengrößen und Sonderabmessungen. The customer specific collector series gigaSol comprises the standard modules with a gross area between 2.4 and 12 m ² as well as special construction forms and all intermediate sizes. All tests were performed according to EN12975-2:2006.					 TÜVRheinland® Genuß. Richtig. TÜV Rheinland Energy GmbH Am Grauen Stein 51105 Köln									
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		011-7S2214 F						
Supplementary Information						Issued		2020-01-28						
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	
gigaSol 24H		2 482	1 747	1 135	1 875	1 289	812	1 378	894	541	1 498	962	573	
gigaSol 60H		6 164	4 340	2 819	4 658	3 200	2 017	3 422	2 220	1 343	3 720	2 390	1 424	
gigaSol 35M		3 540	2 492	1 619	2 675	1 838	1 158	1 965	1 275	771	2 136	1 373	818	
gigaSol 86M		8 809	6 202	4 029	6 656	4 573	2 883	4 890	3 172	1 920	5 317	3 416	2 035	
gigaSol 48D		4 903	3 452	2 242	3 705	2 545	1 604	2 722	1 765	1 068	2 959	1 901	1 133	
gigaSol 49		4 913	3 459	2 247	3 712	2 551	1 608	2 727	1 769	1 071	2 965	1 905	1 135	
gigaSol 120		12 206	8 593	5 583	9 224	6 337	3 994	6 776	4 395	2 660	7 367	4 733	2 820	
Annual output per m ² gross area		1 017	716	465	769	528	333	565	366	222	614	394	235	
Annual efficiency, η_a		58%	41%	26%	47%	32%	20%	48%	31%	19%	49%	32%	19%	
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										Yes				
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										2000		Pa		
Maximum tested negative load										1000		Pa		
Hail resistance using steel ball (maximum drop height)										-		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 checked="" 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)			
gigaSol 24H						2.44		8-VH-24S-A:9,2203-C:20.1000			2.13			
gigaSol 60H						6.06		8-VH-24S-A:9,5653-C:20.1000			5.35			
gigaSol 35M						3.48		12-VH-12T-A:9,2203-C:20.1500			3.12			
gigaSol 86M						8.66		12-VH-12T-A:9,5653-C:20.1500			7.84			
gigaSol 48D						4.82		9-V-12T-A:9,4005-C:20,3000			4.39			
gigaSol 49						4.83		6,6,6-VH-24S-A:9,2203-C:20.2000			4.40			
gigaSol 120						12.00		6,6,6-VH-24S-A:9,5653-C:20.2000			11.05			
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})						50%		Zero-loss efficiency (η_0)			0.64		--	
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)			3.20			W/(m ² K)		
						Second-order coefficient (a_2)			0.009			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.								
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														