


Annex to Solar Keymark Certificate					Licence Number		011-7S2966 F							
					Date issued		2023-12-04							
					Issued by		DIN CERTCO							
Licence holder		SST GmbH			Country		Austria							
Brand (optional)					Web		https://www.sst-energy.com							
Street, Number		Barnabas-Fink-Straße 2			E-mail		david.moeslinger@sst-energy.com							
Postcode, City		A-6845 Hohenems			Tel		+43 5525 20 580-11							
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 $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	111 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
SST ECO SA					4.56	2'004	2'274	99	3'158	2'979	2'583	2'136	1'638	457
SST ECO SA					1.00	1'000	1'000	99	693	653	567	469	359	100
Power output per m² gross area					693	653	567	469	359	100				
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		0.699	3.78	0.014	0.000	0.00	10'540	0.000	0.00	0.0	0.94			
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	1.00	0.99	0.98	0.91	0.78	0.54	0.27	0.00			
Longitudinal		K _{θL, coll}	1.00	1.00	0.99	0.98	0.91	0.78	0.54	0.27	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					($\vartheta_m - \vartheta_a$) _{max}	81	K							
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ_{stg}	170	°C							
Maximum operating temperature					$\vartheta_{max, op}$	k.A.	°C							
Maximum operating pressure					p _{max, op}	800	kPa							
Testing laboratory		Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)					http://www.igte.uni-stuttgart.de							
Test report(s)		19COL1506/1 19COL1506Q/1					Dated		09.11.2023 09.11.2023					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Collectors can be manufactured in customer-specific sizes. Kollektoren können in unterschiedlichen Größen nach Kundenwunsch gefertigt werden. This data sheet replaces the SK data sheet issued 28th January 2020. Reason for the replacement: change of company name and contact person.					 TzS Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70569 Stuttgart (Vaihingen)									
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														

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Supplementary Information													Issued			2023-12-04			
Gross Thermal Yield 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						
SST ECO SA		5'004	3'374	2'025	3'703	2'405	1'364	2'728	1'673	924	2'986	1'812	980						
SST ECO SA		1'097	740	444	812	527	299	598	367	203	655	397	215						
Gross Thermal Yield per m ² gross area		1'097	740	444	812	527	299	598	367	203	655	397	215						
Annual efficiency, η_a		62%	42%	25%	50%	32%	18%	51%	31%	17%	53%	32%	17%						
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. 6.2 (13.01.2022). 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												3000		Pa					
Maximum tested negative load												2750		Pa					
Hail resistance using steel ball (maximum drop height)												2		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)		Yes			
Energy Labelling Information								Additional Informative Technical Data											
Reference Area, A _{sol} (m ²)								Hydraulic Designation Code				Aperture Area, A _a (m ²)							
SST ECO SA								4.56				19-V-24R -7.2,2144-20.6,1917-D				4.18			
SST ECO SA								1.00				not specified							
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}																			
Collector efficiency (η_{col})								52%				Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}							
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.								Zero-loss efficiency (η_0)				0.69				--			
								First-order coefficient (a ₁)				3.78				W/(m ² K)			
								Second-order coefficient (a ₂)				0.014				W/(m ² K ²)			
								Incidence angle modifier IAM (50°)				0.96				--			
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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