


Annex to Solar Keymark Certificate					Licence Number		011-7S2965 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	100 K				
					m ²	mm	mm	mm	mm	mm				
SST ECO SE					4.55	2'002	2'274	127	3'143	2'980	2'619	2'211	1'755	983
SST ECO SE					1.00	1'000	1'000	127	691	655	576	486	386	216
Power output per m ² gross area					691	655	576	486	386	216				
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			0.697	3.45	0.013	0.000	0.00	11'800	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	0.92	0.77	0.57	0.29	0.00		
Longitudinal			K _{θL, coll}	1.00	1.00	0.99	0.98	0.92	0.77	0.57	0.29	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}		70		K							
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)			ϑ _{stg}		176		°C							
Maximum operating temperature			ϑ _{max, op}		100		°C							
Maximum operating pressure			p _{max, op}		100		kPa							
Testing laboratory			Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)					http://www.igte.uni-stuttgart.de						
Test report(s)			19COL1507/1 19COL1507Q/1					Dated		30.10.2023 30.10.2023				
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 peson.			 <p>Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)</p>											
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Supplementary Information		Issued											
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		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 SE		5'007	3'494	2'205	3'772	2'542	1'533	2'768	1'765	1'030	3'025	1'912	1'095
SST ECO SE		1'101	768	485	829	559	337	608	388	226	665	420	241
Gross Thermal Yield per m ² gross area		1'101	768	485	829	559	337	608	388	226	665	420	241
Annual efficiency, η_a		62%	44%	27%	51%	34%	21%	52%	33%	19%	53%	34%	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. 6.2 (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 SE		4.55					19-V-24R -7.2,2144-20.6,1917-D				4.18		
SST ECO SE		1.00					not specified						
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)				3.45		W/(m ² K)
							Second-order coefficient (a ₂)				0.013		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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