


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S1272 F								
						Date issued		2017-03-22								
						Issued by		DIN CERTCO								
Licence holder		GREENoneTEC Solarindustrie GmbH				Country		ÖSTERREICH								
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Collector Type						Flat plate collector, glazed										
Collector name						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² $\vartheta_m - \vartheta_a$										
						Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	100 K	
						m ²	mm	mm	mm	W	W	W	W	W	W	
FK 9251 N						2.58	2 079	1 240	95	1 852	1 764	1 572	1 363	1 134	757	
Power output per m² gross area						718	684	609	528	440	293					
Performance parameters test method						Steady state - indoor										
Performance parameters (related to A_G)						$\eta_{0,hem}$	a1	a2								
Units						-	W/(m ² K)	W/(m ² K ²)								
Test results						0.718	3.347	0.009								
Incidence angle modifier test method						Quasi dynamic - outdoor										
Bi-directional incidence angle modifiers						No										
Incidence angle modifier						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal						K _{θT, coll}	1.00	1.00	1.00	0.98	0.96	0.89	0.77	0.51	0.00	
Longitudinal						K _{θL, coll}	1.00	1.00	1.00	0.98	0.96	0.89	0.77	0.51	0.00	
Heat transfer medium for testing						Water										
Flow rate for testing (per gross area, A_G)						dm/dt		0.018		kg/(sm ²)						
Maximum temperature difference for thermal performance calculations						$(\vartheta_m - \vartheta_a)_{max}$		100		K						
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)						ϑ_{stg}		174		°C						
Effective thermal capacity, incl. fluid (per gross area, A_G)						C/m ²		3.968		kJ/(Km ²)						
Maximum operating pressure						$\vartheta_{max, op}$		n.a.		°C						
Maximum operating pressure						p _{max, op}		1000		kPa						
Testing laboratory						TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de						
Test report(s)						KTB Nr. 2010-08-k issued by Fraunhofer ISE				Dated		28.06.2010				
Comments of testing laboratory						This data sheet replaces the data sheet issued from Fraunhofer ISE on 28.06.2010						Datashet version: 5.01, 2016-03-01				
						 <p>Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Plattenwaldring 8, 70560 Stuttgart (Vaihingen)</p>										
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S1272 F
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
FK 9251 N		2 991	2 165	1 463	2 288	1 618	1 063	1 679	1 121	706	1 825	1 212	751
Annual output per m ² gross area		1 159	839	567	887	627	412	651	434	274	707	470	291
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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	1000	Pa
Maximum tested negative load	1000	Pa
Hail resistance using steel ball (maximum drop height)	n.a.	m

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
FK 9251 N	2.58	Collector efficiency (η_{col})	57	%
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 9806:2013.				
Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}				
		Zero-loss efficiency (η_0)	0.718	--
		First-order coefficient (a_1)	3.35	W/(m ² K)
		Second-order coefficient (a_2)	0.009	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.				