


Annex to Solar Keymark Certificate						Licence Number		011-7S1917 F					
						Date issued		2019-07-29					
						Issued by		DIN CERTCO					
Licence holder		KWB- Kraft und Wärme aus Biomasse GmbH				Country		Österreich					
Brand (optional)						Web		www.kwb.at					
Street, Number		Industriestraße 235				E-mail		office@kwb.at					
Postcode, City		8321 St.Margarethen/Raab				Tel		+43 69 918 008 400					
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 $\vartheta_m - \vartheta_a$							
						0 K	10 K	30 K	50 K	70 K	100 K		
	mm	m ²	mm	mm	m ²	W	W	W	W	W	W		
KWB FlexiSun FK8250L	83	2.52	2 150	1 170	2.39	1 819	1 732	1 535	1 308	1 050	608		
Power output per m ² gross area						722	687	609	519	417	241		
Performance parameters test method		Steady state - indoor											
Performance parameters (related to A _G)		$\eta_{0,b}$	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		0.732	3.31	0.015	0.000	0.00	5 438	0.000	0.00	0.0E+00	0.91		
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	0.95	0.89	0.76	0.50	0.00		
Longitudinal		K _{θL, coll}	1.00	1.00	0.99	0.98	0.95	0.89	0.76	0.50	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}	70	K					
Standard stagnation temperature (G = 1000 W/m ² ; ϑ_a = 30 °C)						ϑ_{stg}	234	°C					
Maximum operating temperature						$\vartheta_{max, op}$	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.2006-35-k-f issued by Fraunhofer ISE				Dated		21.05.2012					
Comments of testing laboratory						Datasheet version: 6.0, 2018-10-30							
This data sheet replaces the data sheet issued on 12.04.2017 The collector name, the WEB-address and the E-mail address were corrected.						 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmelehre Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)							
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Supplementary Information						Issued		2019-07-29					
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
KWB FlexiSun FK8250L		2 920	2 087	1 347	2 226	1 531	942	1 637	1 067	633	1 780	1 154	674
Annual output per m ² gross area		1 159	828	535	883	607	374	650	424	251	706	458	268
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										No			
The collector was tested successfully under the following conditions:													
Climate class (A+, A, B or C)										C		--	
G (W/m ²) >		ϑ_a (°C) >			H _x (MJ/m ²) >								
Maximum tested positive load										1000		Pa	
Maximum tested negative load										1000		Pa	
Hail resistance using steel ball (maximum drop height)										n.a.		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 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							
KWB FlexiSun FK8250L				2.52		12-V-12S-A:7.2,2030-C21.4,1090							
Data required for CDR (EU) No 811/2013 - Reference Area						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)			3.31		W/(m ² K)		
						Second-order coefficient (a ₂)			0.015		W/(m ² K ²)		
						Incidence angle modifier IAM (50°)			0.95		--		
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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