


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S085 F							
						Date issued		2017-03-01							
						Issued by		DIN CERTCO							
Licence holder			Ernst Schweizer AG			Country		Schweiz							
Brand (optional)						Web		www.schweizer-metallbau.ch							
Street, Number			Bahnhofplatz 11			E-mail		info@schweizer-metallbau.ch							
Postcode, City		8909	Hedingen			Tel		+41 (0) 44 763 61 11							
Collector Type						Flat plate collector, glazed									
Collector name						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² ; u = 3 m/s ̑m - ̑a									
						Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	105 K
						m ²	mm	mm	mm	W	W	W	W	W	W
FK1-H2						2.58	2 090	1 234	108	1 874	1 788	1 594	1 373	1 125	627
FK1-V2						2.58	2 090	1 234	108	1 874	1 788	1 594	1 373	1 125	627
FK1-V2V						2.58	2 090	1 234	108	1 874	1 788	1 594	1 373	1 125	627
Power output per m ² gross area						727	693	618	532	436	243				
Performance parameters test method			Quasi dynamic												
Performance parameters (related to AG)			̑ _{0,b}	c1	c2	c3	c4	c6	Kd						
Units			-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-						
Test results			0.735	3.238	0.013	0.000	0.000	0.000	0.923						
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 _{̑T, coll}	1.00	0.99	0.97	0.94	0.89	0.80	0.61	0.03	0.00			
Longitudinal			K _{̑L, coll}	1.00	0.99	0.97	0.94	0.89	0.80	0.61	0.03	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			(̑ _m -̑ _a) _{max}	105	K										
Standard stagnation temperature (G = 1000 W/m ² ; ̑ _a = 30 °C)			̑ _{stg}	201	°C										
Effective thermal capacity, incl. fluid (per gross area, A _G)			C/m ²	8.700	kJ/(Km ²)										
Maximum operating temperature			̑ _{max, op}	n.a.	°C										
Maximum operating pressure			p _{max, op}	600	kPa										
Testing laboratory			TZS, ITW University Stuttgart			www.itw.uni-stuttgart.de									
Test report(s)			06COL476/4			Dated		18.02.2010							
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01									
This data sheet replaces the data sheet issued on 18.02.2010 Documented performance parameters are taken from FK1-H2.						 <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	011-7S085 F
	Issued	2017-03-01

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

Standard Locations Collector name	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
FK1-H2		2 942	2 118	1 393	2 251	1 566	990	1 649	1 093	667	1 798	1 181	709
FK1-V2		2 942	2 118	1 393	2 251	1 566	990	1 649	1 093	667	1 798	1 181	709
FK1-V2V		2 942	2 118	1 393	2 251	1 566	990	1 649	1 093	667	1 798	1 181	709
Annual output per m ² gross area		1 141	821	540	872	607	384	639	424	258	697	458	275
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	3000	Pa
Maximum tested negative load	3000	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}	
FK1-H2	2.58	Collector efficiency (η_{col})	58 %
FK1-V2	2.58	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.	
FK1-V2V	2.58		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.727 --
		First-order coefficient (a_1)	3.24 W/(m ² K)
		Second-order coefficient (a_2)	0.013 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.89 --
		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.	