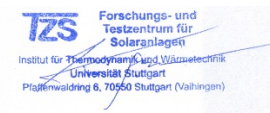


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2686 F							
					Date issued		2018-09-26							
					Issued by		DIN CERTCO							
Licence holder	GrennOneTEC Solarindustrie GmbH				Country	Austria								
Brand (optional)					Web	www.greenonetec.com								
Street, Number	Industriepark St. Veit, Energieplatz 1				E-mail	info@greenonetec.com								
Postcode, City	9300-St Veit / Glan				Tel	+43	4212 28136-0							
Collector Type					Flat plate collector, glazed									
Collector name	Gross area (A_G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ; u = 3 m/s ̑ _m - ̑ _a									
					0 K W	10 K W	30 K W	50 K W	70 K W	84 K W				
FK8259N 2H ID M/P	2.530	2 153	1 173	83	1 877	1 778	1 550	1 282	973	733				
Power output per m² gross area					742	703	613	507	385	290				
Performance parameters test method					Quasi dynamic									
Performance parameters (related to AG)					̑ _{0,b}	c1	c2	c3	c4	c6	K _d			
Units					-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results					0.752	3.702	0.020	0.000	0.000	0.000	0.910			
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	1.00	0.99	0.98	0.94	0.83	0.62	0.31	0.00
Longitudinal					K _{̑L, coll}	1.00	1.00	0.99	0.98	0.94	0.83	0.62	0.31	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 for thermal performance calculations					(̑ _m -̑ _a) _{max}	84	K							
Standard stagnation temperature (G = 1000 W/m²; ̑_a = 30 °C)					̑ _{stg}	180	°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	8.77	kJ/(Km ²)							
Maximum operating temperature					̑ _{max, op}	200	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory	TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de									
Test report(s)	18COL1455 17COLP2040136010Q/2				Dated	26.09.2018 26.09.2018								
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01									
This data sheet replaces the data sheet issued 04.12.2017 Documented performance parameters are taken from test report 18COL1455														
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2686 F
	Issued	2018-09-26

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
FK8259N 2H ID M/P		2 976	2 042	1 223	2 228	1 456	814	1 641	1 019	556	1 790	1 101	590
Annual output per m ² gross area		1 176	807	483	881	576	322	649	403	220	708	435	233
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	Yes	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	A	--
Maximum tested positive load	5110	Pa
Maximum tested negative load	3076	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
FK8259N 2H ID M/P	2.53	Collector efficiency (η_{col})	56 %
		<i>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/m², 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.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.742 --
		First-order coefficient (a_1)	3.70 W/(m ² K)
		Second-order coefficient (a_2)	0.020 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.94 --
		<i>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.</i>	