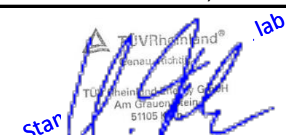


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2807 F				
					Date issued		2017-11-10				
					Issued by		TÜV Rheinland Energy GmbH				
Licence holder		Rossato Group SRL			Country		Italy				
Brand (optional)					Web		www.rossatogroup.com				
Street, Number		Strada Migliara 49 nr. 9			E-mail		info@rossatogroup.com				
Postcode, City		04016 Sabaudia (LT)			Tel		+39 (0)773 844051				
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 ϑ _m - ϑ _a						
					0 K	10 K	30 K	50 K	70 K	90 K	
					W	W	W	W	W	W	
FKA 200 V Al/Cu	2.13	1 777	1 200	115	1 459	1 391	1 242	1 075	891	689	
FKA 240 V Al/Cu	2.52	2 100	1 200	115	1 726	1 646	1 469	1 272	1 054	815	
FKA 270 V Al/Cu	2.88	2 400	1 200	115	1 973	1 881	1 679	1 453	1 204	931	
FKA 200 H Al/Cu	2.13	1 200	1 777	115	1 459	1 391	1 242	1 075	891	689	
FKA 240 H Al/Cu	2.52	1 200	2 100	115	1 726	1 646	1 469	1 272	1 054	815	
FKA 270 H Al/Cu	2.88	1 200	2 400	115	1 973	1 881	1 679	1 453	1 204	931	
Power output per m ² gross area					685	653	583	505	418	323	
Performance parameters test method		Steady state - indoor									
Performance parameters (related to AG)		η _{0,hem}	a ₁	a ₂							
Units		-	W/(m ² K)	W/(m ² K ²)							
Test results		0.685	3.092	0.010							
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	0.99	0.97	0.95	0.90	0.82	0.64		0.00
Longitudinal		K _{θL, coll}	1.00	0.99	0.97	0.95	0.90	0.82	0.64		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		(ϑ _m -ϑ _a) _{max}	90	K							
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)		ϑ _{stg}	204	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)		C/m ²	6.33	kJ/(Km ²)							
Maximum operating temperature		ϑ _{max, op}	*	°C							
Maximum operating pressure		p _{max, op}	600	kPa							
Testing laboratory		TÜV Rheinland Energy GmbH				www.tuv.com/solarpower					
Test report(s)		21241502.001_Rossato_P1 21241502.002_Rossato_R 21241502.003_Rossato_R1				Dated		10.11.2017 10.11.2017 10.11.2017			
Comments of testing laboratory		Datashet version: 5.01, 2016-03-01									
<p><i>*This data sheet is not complete as the testing of the collector was not performed according to ISO 9806:2013. The steady state test evaluation was recalculated with gross area. The former values related to 1.838 m² aperture area had been: eta0a=0.794; a1a=3.586; a2a=0.012.</i></p>											
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de											

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2807 F
	Issued	2017-11-10

Annual collector output in kWh/collector at mean fluid temperature ϑ_m, based on EN ISO 9806:2013 test results													
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
FKA 200 V Al/Cu		2 251	1 617	1 074	1 723	1 207	780	1 263	839	521	1 369	901	551
FKA 240 V Al/Cu		2 663	1 914	1 271	2 039	1 429	923	1 494	992	617	1 619	1 065	652
FKA 270 V Al/Cu		3 044	2 187	1 453	2 330	1 633	1 055	1 707	1 134	705	1 851	1 218	745
FKA 200 H Al/Cu		2 251	1 617	1 074	1 723	1 207	780	1 263	839	521	1 369	901	551
FKA 240 H Al/Cu		2 663	1 914	1 271	2 039	1 429	923	1 494	992	617	1 619	1 065	652
FKA 270 H Al/Cu		3 044	2 187	1 453	2 330	1 633	1 055	1 707	1 134	705	1 851	1 218	745
Annual output per m ² gross area		1 057	759	504	809	567	366	593	394	245	643	423	259
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)	*	--
Maximum tested positive load	5400	Pa
Maximum tested negative load	2400	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}		
FKA 200 V Al/Cu	2.13	Collector efficiency (η_{col})	54	%
FKA 240 V Al/Cu	2.52	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.		
FKA 270 V Al/Cu	2.88			
FKA 200 H Al/Cu	2.13			
FKA 240 H Al/Cu	2.52	Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
FKA 270 H Al/Cu	2.88			
		Zero-loss efficiency (η_0)	0.685	--
		First-order coefficient (a_1)	3.09	W/(m ² K)
		Second-order coefficient (a_2)	0.010	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.90	--
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.				