
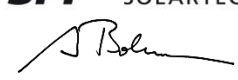


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2786 F								
					Date issued		2017-08-30								
					Issued by										
Licence holder		Riello S.p.A.			Country		Italy								
Brand (optional)					Web		www.riello.com								
Street, Number		Via Risorgimento 23/A			E-mail		info@riello.com								
Postcode, City		IT-23900, Lecco			Tel		+39 0341 277424								
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 $\vartheta_m - \vartheta_a$						
									0 K W	10 K W	30 K W	50 K W	70 K W	130 K W	
RPS 25/4					2.30	2'004	1'148	85	1'726	1'632	1'437	1'231	1'014	296	
Power output per m ² gross area					750	709	625	535	441	129					
Performance parameters test method					Steady state - outdoor										
Performance parameters (related to A _G)					η ₀ ,hem	a ₁	a ₂								
Units					-	W/(m ² K)	W/(m ² K ²)								
Test results					0.750	4.000	0.006								
Incidence angle modifier test method					Steady state - outdoor										
Bi-directional incidence angle modifiers					Yes										
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal					K _{GT, coll}	1.00	1.00	0.99	0.98	0.94	0.87	0.74	0.48	0.00	
Longitudinal					K _{GL, coll}	1.00	1.00	0.99	0.98	0.95	0.88	0.75	0.49	0.00	
Heat transfer medium for testing					Water-Glycole										
Flow rate for testing (per gross area, A _G)					dm/dt	0.020	kg/(sm ²)								
Maximum temperature difference for thermal performance calculations					($\vartheta_m - \vartheta_a$) _{max}	130	K								
Standard stagnation temperature (G = 1000 W/m ² ; ϑ_a = 30 °C)					ϑ_{stg}	197	°C								
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	5.48	kJ/(Km ²)								
Maximum operating temperature					$\vartheta_{max, op}$	--	°C								
Maximum operating pressure					p _{max, op}	1000	kPa								
Testing laboratory					SPF, CH-8640 Rapperswil				www.spf.ch						
Test report(s)					C1723LPEN C1723QPEN				Dated		26.07.2017 26.07.2017				
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01										
--					 INSTITUT FÜR SOLARTECHNIK 										
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2786 F
	Issued	2017-08-30

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on EN 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
RPS 25/4		2'751	1'919	1'257	2'060	1'415	909	1'517	978	600	1'652	1'055	638
Annual output per m ² gross area		1'195	834	546	895	615	395	659	425	261	718	458	277
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	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using ice balls (diameter)	45	mm

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
RPS 25/4	2.30	Collector efficiency (η_{col})	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.		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0.750	--
		First-order coefficient (a_1)	4.00	W/(m ² K)
		Second-order coefficient (a_2)	0.006	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.		