

Annex to Solar Keymark Certificate						Licence Number		011-7S3152 F						
Supplementary Information						Issued		2022-11-30						
Gross Thermal Yield 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	
C.SOL 8.23 FK		3 070	2 197	1 349	2 351	1 576	886	1 726	1 108	609	1 886	1 207	655	
C.SOL 9.23 FK		3 070	2 197	1 349	2 351	1 576	886	1 726	1 108	609	1 886	1 207	655	
Gross Thermal Yield per m ² gross area		1 218	872	535	933	626	352	685	440	242	748	479	260	
Annual efficiency, η_a		69%	49%	30%	57%	38%	22%	59%	38%	21%	60%	38%	21%	
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m ²			1630 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. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/														
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)											A		--	
G (W/m ²) >		1000		ϑ_a (°C) >		20		H_x (MJ/m ²) >			600			
Maximum tested positive load											3000		Pa	
Maximum tested negative load											2500		Pa	
Hail resistance using steel ball (maximum drop height)											2		m	
Additional collector attribute(s)														
Using external power source(s) for normal operation						No		Active or passive measure(s) for self-protection				No		
Co-generating thermal and electrical power						No		Façade collector(s)				No		
Energy Labelling Information						Additional Informative Technical Data								
						Reference Area, A_{sol} (m ²)		Hydraulic Designation Code			Aperture Area, A_a (m ²)			
C.SOL 8.23 FK						2.52		1-H-1234S-7.2,22498-20.4,1215-D			2.39			
C.SOL 9.23 FK						2.52		1-H-1234S-7.2,21156-20.4,2196-D			2.39			
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}						Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}								
Collector efficiency (η_{col})						57%		Zero-loss efficiency (η_0)			0.74		--	
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)			3.13		W/(m ² K)			
						Second-order coefficient (a_2)			0.026		W/(m ² K ²)			
						Incidence angle modifier IAM (50°)			1.00		--			
						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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