

Annex to Solar Keymark Certificate							Licence Number		011-7S2929 F						
Supplementary Information							Issued		2019-07-22						
Annual collector output 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		
C2000 D12		1975	1347	843	1463	972	589	1082	678	398	1180	730	418		
C2500 D12		2398	1635	1024	1777	1181	715	1314	824	483	1433	887	508		
Annual output per m² gross area		941	641	402	697	463	280	515	323	190	562	348	199		
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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc															
Additional Information															
Collector heat transfer medium										Water					
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)										B		--			
G (W/m²) >		900		ϑ_a (°C) >		15		H_x (MJ/m²) >		540					
Maximum tested positive load										2250		Pa			
Maximum tested negative load										2250		Pa			
Hail resistance using steel ball (maximum drop height)										2.0		m			
Additional collector attribute(s)															
<input type="checkbox"/> Using external power source(s) for normal operation				<input type="checkbox"/> Active or passive measure(s) for self-protection											
<input type="checkbox"/> Co-generating thermal and electrical power				<input type="checkbox"/> Wind and/or infrared sensitive collector(s) (WISC)											
<input type="checkbox"/> Façade collector(s)															
Energy Labelling Information															
	Reference Area, A_{sol} (m²)			Hydraulic Designation Code											
C2000 D12	2.10			8-V-1234S-A:11.3,1858-C:20.6,1060-D											
C2500 D12	2.55			8-V-1234S-A:11.3,1840-C:20.6,1310-D											
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})							47%		Zero-loss efficiency (η_0)		0.61		--		
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 (a₁)		3.27		W/(m ² K)				
							Second-order coefficient (a₂)		0.008		W/(m ² K ²)				
							Incidence angle modifier IAM (50°)		0.85		--				
							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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