

Annex to Solar Keymark Certificate		Licence Number											
Supplementary Information		011-7S2501 F											
		Issued											
		2020-06-22											
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
sunWin 24M		2 784	1 981	1 256	2 111	1 431	852	1 558	1 004	579	1 701	1 092	619
Annual output per m ² gross area		1 170	832	528	887	601	358	654	422	243	715	459	260
Annual efficiency, η_a		66%	47%	30%	54%	37%	22%	56%	36%	21%	57%	37%	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. 6.1 (July 2019). 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											Yes		
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											2750		Pa
Maximum tested negative load											2250		Pa
Hail resistance using ice balls (diameter)											35		mm
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"/> Façade collector(s)													
Energy Labelling Information							Additional Informative Technical Data						
						Reference Area, A _{sol} (m ²)		Hydraulic Designation Code			Aperture Area, A _a (m ²)		
sunWin 24M						2.38		10-VH-1234S-A:7.3,1920-C:20.8,1200			2.22		
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})						56%		Zero-loss efficiency (η_0)			0.72		--
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)		3.31			W/(m ² K)		
						Second-order coefficient (a ₂)		0.017			W/(m ² K ²)		
						Incidence angle modifier IAM (50°)		0.95			--		
						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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