

Annex to Solar Keymark Certificate		Licence Number		011-7S2828 F													
Supplementary Information		Issued		2023-03-23													
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				
SLIM+		2.404	1.779	1.229	1.866	1.345	907	1.359	931	602	1.483	1.010	646				
SLIML+		2.666	1.973	1.362	2.069	1.492	1.006	1.507	1.032	668	1.644	1.121	716				
SLIMX+		2.999	2.220	1.533	2.327	1.679	1.131	1.695	1.161	751	1.850	1.261	806				
SLIMXL+		3.475	2.572	1.776	2.697	1.945	1.311	1.964	1.345	871	2.144	1.461	933				
Gross Thermal Yield per m ² gross area		1.190	881	608	924	666	449	673	461	298	734	500	320				
Annual efficiency, η_a		67%	50%	34%	57%	41%	28%	58%	40%	26%	59%	40%	26%				
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)																	
G (W/m ²) >		1000		ϑ_a (°C) >		20		H _x (MJ/m ²) >		A		--					
Maximum tested positive load											2600		Pa				
Maximum tested negative load											1500		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)											
SLIM+	2,02	9-V-1234S-7.2,1897-20.6,1060-D				1,83											
SLIML+	2,24	10-V-1234S-7.2,1782-20.6,1240-D				2,05											
SLIMX+	2,52	11-V-1234S-7.2,1897-20.6,1310-D				2,32											
SLIMXL+	2,92	12-V-1234S-7.2,1897-20.6,1510-D				2,71											
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})						60%											
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.						Zero-loss efficiency (η_0)						0,74		--			
						First-order coefficient (a_1)						3,16		W/(m ² K)			
						Second-order coefficient (a_2)						0,010		W/(m ² K ²)			
						Incidence angle modifier IAM (50°)						0,94		--			
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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