

Annex to Solar Keymark Certificate										Licence Number			011-7S2393 F		
Supplementary Information										Issued			2019-06-12		
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		
PFMS2000		2 329	1 599	993	1 733	1 148	677	1 278	804	462	1 401	871	489		
PFMS2500		2 954	2 028	1 259	2 199	1 457	859	1 622	1 020	586	1 777	1 105	621		
PFMS3300		3 846	2 641	1 640	2 863	1 896	1 118	2 112	1 327	763	2 314	1 439	808		
Annual output per m ² gross area		1 159	795	494	862	571	337	636	400	230	697	433	243		
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-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)										B		--			
G (W/m ²) >		900		ϑ_a (°C) >		15		H _x (MJ/m ²) >		540					
Maximum tested positive load										3000		Pa			
Maximum tested negative load										3000		Pa			
Hail resistance using steel ball (maximum drop height)										2		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} (m ²)			Hydraulic Designation Code											
PFMS2000	2.01			1-V-1,2,3,4S-A:7.2,15,700-C:20.4,1165-D											
PFMS2500	2.55			1-V-1,2,3,4S-A:7.2,22.090-C:20.4,1165-D											
PFMS3300	3.32			1-V-1,2,3,4S-A:7.2,28.920-C:20.4,1165-D											
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}															
Collector efficiency (η_{col})		57%													
Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}															
Zero-loss efficiency (η_0)		0.74													
First-order coefficient (a_1)		3.83													
Second-order coefficient (a_2)		0.013													
Incidence angle modifier IAM (50°)		0.88													
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.															
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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