

[illegible]

Annex to Solar Keymark Certificate						Licence Number		011-7S894 F			
Supplementary Information						Issued		2017-06-29			

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on EN ISO 9806:2013 test results														
Collector name	Standard Locations	ϑ_m	Athens			Davos			Stockholm			Würzburg		
			25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SOLARPLUS V			2 448	1 804	1 245	1 893	1 362	914	1 387	946	610	1 503	1 021	647
SOLARPLUS O			2 448	1 804	1 245	1 893	1 362	914	1 387	946	610	1 503	1 021	647
Annual output per m ² gross area			1 088	802	553	841	605	406	616	420	271	668	454	288
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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	2000	Pa
Maximum tested negative load	1500	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SOLARPLUS V	2.25	Collector efficiency (η_{col})	55 %
SOLARPLUS H	2.25	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 9806:2013.	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.685 --
		First-order coefficient (a_1)	2.93 W/(m ² K)
		Second-order coefficient (a_2)	0.009 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.93 --
		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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