

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2770 F
	Issued	2017-06-26

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on 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
Plus 15		1 588	951	459	1 102	614	256	832	440	184	914	474	198
Plus 17		1 767	1 058	510	1 226	683	285	925	489	205	1 017	528	220
Plus 19		2 062	1 235	595	1 431	796	332	1 080	571	239	1 186	616	257
Plus 20		2 125	1 273	614	1 474	821	342	1 113	588	246	1 223	634	265
Plus 23		2 356	1 411	680	1 635	910	379	1 234	652	273	1 356	704	293
Plus 25		2 651	1 588	766	1 839	1 024	427	1 388	734	307	1 525	792	330
Annual output per m ² gross area		1 052	630	304	730	406	169	551	291	122	605	314	131
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)	B	--
Maximum tested positive load	2500	Pa
Maximum tested negative load	2250	Pa
Hail resistance using steel ball (maximum drop height)	n.a.	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
Plus 15	1.51	Collector efficiency (η_{col})	45 %
Plus 17	1.68	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.	
Plus 19	1.96		
Plus 20	2.02		
Plus 23	2.24		
Plus 25	2.52		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.670 --
		First-order coefficient (a_1)	4.61 W/(m ² K)
		Second-order coefficient (a_2)	0.021 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.			