



<b>Annex to Solar Keymark Certificate Supplementary Information</b>	<b>Licence Number</b>	<b>011-7S404 F</b>
	<b>Issued</b>	<b>2018-07-31</b>

<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math>, based on EN ISO 9806:2013 test results</b>													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SRD 2.3		2 857	2 001	1 299	2 151	1 474	932	1 583	1 024	622	1 719	1 100	658
SRDV 2.3		2 857	2 001	1 299	2 151	1 474	932	1 583	1 024	622	1 719	1 100	658
SRD 2.3 H		2 857	2 001	1 299	2 151	1 474	932	1 583	1 024	622	1 719	1 100	658
SRD 2.3 V		2 857	2 001	1 299	2 151	1 474	932	1 583	1 024	622	1 719	1 100	658
Annual output per m <sup>2</sup> gross area		1 140	798	518	858	588	372	631	408	248	686	439	262
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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 $\vartheta_m$ (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 <a href="http://www.solarkeymark.org/scenocalc">www.solarkeymark.org/scenocalc</a>													

<b>Additional Information</b>		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	Yes	
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	5400	Pa
Maximum tested negative load	3500	Pa
Hail resistance using steel ball (maximum drop height)	-	m

<b>Energy Labelling Information</b>				
	Reference Area, A <sub>sol</sub> (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>		
SRD 2.3	2.51	Collector efficiency ( $\eta_{col}$ )	57	%
SRDV 2.3	2.51	Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.		
SRD 2.3 H	2.51			
SRD 2.3 V	2.51			
		Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>		
		Zero-loss efficiency ( $\eta_0$ )	0.734	--
		First-order coefficient (a <sub>1</sub> )	3.69	W/(m <sup>2</sup> K)
		Second-order coefficient (a <sub>2</sub> )	0.009	W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0.91	--
		Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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.		