



<b>Annex to Solar Keymark Certificate</b>						<b>Licence Number</b>		<b>011-7S2944 F</b>					
<b>Supplementary Information</b>						<b>Issued</b>		<b>2019-08-12</b>					
<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>													
	<b>Standard Locations</b>	<b>Athens</b>			<b>Davos</b>			<b>Stockholm</b>			<b>Würzburg</b>		
<b>Collector name</b>	$\vartheta_m$	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>
KT-2108		2 409	1 724	1 136	1 829	1 269	804	1 348	884	539	1 469	959	574
Annual output per m <sup>2</sup> gross area		1 164	833	549	884	613	388	651	427	260	709	463	277
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. 6.0 (October 2018). 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			
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)										C		--	
G (W/m <sup>2</sup> ) >		$\vartheta_a$ (°C) >			H <sub>x</sub> (MJ/m <sup>2</sup> ) >								
Maximum tested positive load										3000		Pa	
Maximum tested negative load										2250		Pa	
Hail resistance using steel ball (maximum drop height)										n.a.		m	
<b>Additional collector attribute(s)</b>													
<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)													
<b>Energy Labelling Information</b>													
Reference Area, A <sub>sol</sub> (m <sup>2</sup> )		Hydraulic Designation Code											
KT-2108		2.07			10-V-1234S-A:7.0,1900-C:16.6,1095-D								
<b>Data required for CDR (EU) No 811/2013 - Reference Area A<sub>sol</sub></b>						<b>Data required for CDR (EU) No 812/2013 - Reference Area A<sub>sol</sub></b>							
Collector efficiency ( $\eta_{col}$ )		57%				Zero-loss efficiency ( $\eta_0$ )		0.72		--			
						First-order coefficient ( $a_1$ )		3.42		W/(m <sup>2</sup> K)			
						Second-order coefficient ( $a_2$ )		0.011		W/(m <sup>2</sup> K <sup>2</sup> )			
						Incidence angle modifier IAM (50°)		0.94		--			
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 9806:2017.						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.							
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