



Annex to Solar Keymark Certificate							Licence Number		011-7S2234 F				
Supplementary Information							Issued		2019-06-19				
<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math></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
BLUh		2 409	1 724	1 136	1 829	1 269	804	1 348	884	539	1 469	959	574
BLUhx		2 828	2 024	1 333	2 147	1 489	943	1 583	1 038	632	1 724	1 125	674
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								
BLUh		2.07			10-V-1234S-A:7.0,1900-C:16.6,1095-D								
BLUhx		2.43			12-V-1234S-A:7.0,1900-C:16.6,1272-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		--				
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.		First-order coefficient (a <sub>1</sub> )		3.42		W/(m <sup>2</sup> K)							
		Second-order coefficient (a <sub>2</sub> )		0.011		W/(m <sup>2</sup> K <sup>2</sup> )							
		Incidence angle modifier IAM (50°)		0.94		--							
							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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