



Annex to Solar Keymark Certificate		Licence Number		011-7S3078 F									
Supplementary Information		Issued		2021-11-15									
<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			
SHT 2000A		2,311	1,546	852	1,711	1,063	522	1,270	754	368	1,383	813	392
Annual output per m <sup>2</sup> gross area		1,156	773	426	856	532	261	635	377	184	692	406	196
Annual efficiency, $\eta_a$		65%	44%	24%	52%	33%	16%	54%	32%	16%	56%	33%	16%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 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. 6.1 (September 2019). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</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)										B		--	
G (W/m <sup>2</sup> ) >		900		$\vartheta_a$ (°C) >		15		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		540			
Maximum tested positive load										2400		Pa	
Maximum tested negative load										2400		Pa	
Hail resistance using steel ball (maximum drop height)										2		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"/> Façade collector(s)									
<b>Energy Labelling Information</b>						<b>Additional Informative Technical Data</b>							
		Reference Area, A <sub>sol</sub> (m <sup>2</sup> )		Hydraulic Designation Code		Aperture Area, A <sub>a</sub> (m <sup>2</sup> )							
SHT 2000A		2.00		9-VH-1234S-A:8,1950-C:22,1000-D		1.85							
Data required for CDR (EU) No 811/2013 - Reference Area						Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>							
Collector efficiency ( $\eta_{col}$ )		54%				Zero-loss efficiency ( $\eta_0$ )		0.73		--			
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> )		3.65		Second-order coefficient (a <sub>2</sub> )		0.029		W/(m <sup>2</sup> K)			
		Incidence angle modifier IAM (50°)		0.93						W/(m <sup>2</sup> K <sup>2</sup> )			
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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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