

Annex to Solar Keymark Certificate							Licence Number		011-7S2908 F						
Supplementary Information							Issued		2019-01-25						
Annual collector output in kWh/collector at mean fluid temperature ϑ_m															
	Standard Locations	Athens			Davos			Stockholm			Würzburg				
Collector name	ϑ_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		
ZELIOS DR 2.0-2 B		1 989	1 320	774	1 452	923	507	1 079	649	349	1 182	702	369		
Annual output per m ² gross area		1 036	688	403	756	481	264	562	338	182	616	366	192		
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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc															
Additional Information															
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)										A+		--			
G (W/m ²) >		1100		ϑ_a (°C) >		40		H_x (MJ/m ²) >		700					
Maximum tested positive load										2400		Pa			
Maximum tested negative load										2250		Pa			
Hail resistance using steel ball (maximum drop height)										35		m			
Additional collector attribute(s)															
<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)															
Energy Labelling Information															
	Reference Area, A_{sol} (m ²)				Hydraulic Designation Code										
ZELIOS DR 2.0-2 B	1.92				6-VH-1234S-A:11.2,1863-C:20.6,996										
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}							Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}								
Collector efficiency (η_{col})							49%		Zero-loss efficiency (η_0)		0.66		--		
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 9806:2017.							First-order coefficient (a_1)		3.73		W/(m ² K)				
							Second-order coefficient (a_2)		0.013		W/(m ² K ²)				
							Incidence angle modifier IAM (50°)		0.89		--				
							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.								
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