

Annex to Solar Keymark Certificate							Licence Number		011-7S2949 F						
Supplementary Information							Issued		2019-09-25						
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		
THK M20 V		2 192	1 500	956	1 626	1 092	678	1 196	755	453	1 312	819	480		
THK M25 V		2 731	1 869	1 191	2 027	1 361	846	1 490	941	564	1 635	1 021	599		
THK M25 H		2 731	1 869	1 191	2 027	1 361	846	1 490	941	564	1 635	1 021	599		
Annual output per m ² gross area		1 080	739	471	801	538	334	589	372	223	646	404	237		
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) >		1000		ϑ_a (°C) >		20		H_x (MJ/m ²) >		600					
Maximum tested positive load										3072		Pa			
Maximum tested negative load										2810		Pa			
Hail resistance using steel ball (maximum drop height)										n.a.		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											
THK M20 V	2.03			8-V-1234S-A:8,1590-C:18,1230-D											
THK M25 V	2.53			8-V-1234S-A:8,2100-C:18,1230-D											
THK M25 H	2.53			10-H-12S-A:8,2380-C:18,1105											
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})							53%		Zero-loss efficiency (η_0)		0.69		--		
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)		3.79		W/(m ² K)				
							Second-order coefficient (a_2)		0.006		W/(m ² K ²)				
							Incidence angle modifier IAM (50°)		0.93		--				
							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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