



Annex to Solar Keymark Certificate		Licence Number		OEM 9999.1.18											
Supplementary Information		Issued		2023-11-30											
Gross Thermal Yield 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		
ATON 415-KC1500		1.848	1.320	859	1.405	970	605	1.034	675	405	1.125	731	431		
ATON 415-KC1500H		1.848	1.320	859	1.405	970	605	1.034	675	405	1.125	731	431		
ATON 415-KC1800		2.243	1.601	1.042	1.705	1.177	734	1.254	819	491	1.365	886	523		
ATON 415-KC1800H		2.243	1.601	1.042	1.705	1.177	734	1.254	819	491	1.365	886	523		
ATON 415-KC2000		2.464	1.759	1.145	1.874	1.293	806	1.379	900	540	1.500	974	575		
ATON 415-KC2000H		2.464	1.759	1.145	1.874	1.293	806	1.379	900	540	1.500	974	575		
ATON 415-KC2500		2.920	2.085	1.357	2.221	1.532	955	1.634	1.066	639	1.778	1.154	682		
ATON 415-KC2500H		2.920	2.085	1.357	2.221	1.532	955	1.634	1.066	639	1.778	1.154	682		
ATON 415-KC2700		3.352	2.393	1.558	2.549	1.759	1.097	1.875	1.223	734	2.040	1.325	782		
ATON 415-KC2700H		3.352	2.393	1.558	2.549	1.759	1.097	1.875	1.223	734	2.040	1.325	782		
Gross Thermal Yield per m ² gross area		1.232	880	573	937	647	403	689	450	270	750	487	288		
Annual efficiency, η_a		70%	50%	32%	57%	40%	25%	59%	39%	23%	60%	39%	23%		
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)													
Annual irradiation on collector plane		1765 kWh/m ²			1630 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. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/															
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										3000		Pa			
Maximum tested negative load										3000		Pa			
Hail resistance using steel ball (maximum drop height)										2		m			
Additional collector attribute(s)															
Using external power source(s) for normal operation										No		Active or passive measure(s) for self-protection		No	
Co-generating thermal and electrical power										No		Façade collector(s)		No	
Energy Labelling Information						Additional Informative Technical Data									
		Reference Area, A _{sol} (m ²)		Hydraulic Designation Code				Aperture Area, A _a (m ²)							
ATON 415-KC1500		1,50		9-V-1234S-A:7.2,1380-C:20.6,1080-D				1,38							
ATON 415-KC1500H		1,50		14-V-1234S-A:7.2,908-C:20.6,1560-D				1,38							
ATON 415-KC1800		1,82		11-V-1234S-A:7.2,1378-C:20.6,1300-D				1,72							
ATON 415-KC1800H		1,82		14-V-1234S-A:7.2,1128-C:20.6,1560-D				1,72							
ATON 415-KC2000		2,00		9-V-1234S-A:7.2,1878-C:20.6,1080-D				1,86							
ATON 415-KC2000H		2,00		18-V-1234S-A:7.2,908-C:20.6,2060-D				1,86							
ATON 415-KC2500		2,37		11-V-1234S-A:7.2,1828-C:20.6,1300-D				2,23							
ATON 415-KC2500H		2,37		18-V-1234S-A:7.2,1128-C:20.6,2010-D				2,23							
ATON 415-KC2700		2,72		11-V-1234S-A:7.2,2060-C:20.6,1320-D				2,57							
ATON 415-KC2700H		2,72		18-V-1234S-A:7.2,1158-C:20.6,2240-D				2,57							
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})		60%		Zero-loss efficiency (η_0)				0,76		--					
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)				3,59		W/(m ² K)							
		Second-order coefficient (a_2)				0,014		W/(m ² K ²)							
		Incidence angle modifier IAM (50°)				0,96		--							
		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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