

[illegible]

Annex to Solar Keymark Certificate										Licence Number		011-7S3171 R	
Supplementary Information										Issued		2023-04-14	

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
EnergieWerk CPC Classic M		2 288	2 128	1 906	2 011	1 817	1 581	1 456	1 298	1 114	1 567	1 403	1 206
EnergieWerk CPC Classic L		2 860	2 660	2 382	2 513	2 271	1 976	1 820	1 623	1 392	1 958	1 754	1 507
EnergieWerk CPC Classic XL		3 422	3 183	2 850	3 007	2 717	2 364	2 178	1 942	1 666	2 343	2 099	1 803
Gross Thermal Yield per m ² gross area		1 003	933	836	882	797	693	639	569	489	687	615	529
Annual efficiency, η_a		57%	53%	47%	54%	49%	43%	55%	49%	42%	55%	49%	43%
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	
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				2400	Pa
Maximum tested negative load				1000	Pa
Hail resistance using steel ball (maximum drop height)				0.4	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)
EnergieWerk CPC Classic M	2.28	6-VH-12S-A:6.6,6015-C:13,1396-No D	2.00
EnergieWerk CPC Classic L	2.85	5-VH-12S-A:6.6,9080-C:13,1741-No D	2.50
EnergieWerk CPC Classic XL	3.41	6-VH-12S-A:6.6,9080-C:13,2086-No D	3.00

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)	0.56
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)	0.45
		Second-order coefficient (a_2)	0.007
		Incidence angle modifier IAM (50°)	1.01
		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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