

Annex to Solar Keymark Certificate					Licence Number		011-7S2793 F				
					Date issued		2022-03-02				
					Issued by		DIN CERTCO				
Licence holder		KOLLECTOR BIOME BEJA - K.B.B. SA			Country		Tunisia				
Brand (optional)					Web		www.biome-solar.com				
Street, Number		Zone Industrielle - Beja Nord			E-mail		mohamed.zarrouk@solar-kbb.com				
Postcode, City		9000 Béja			Tel		+216 78 440 440				
Collector Type					Flat plate collector						
Collector name		Gross area (A _G)	Gross length	Gross width	Gross height	Power output per collector G _b = 850 W/m2, G _d = 150 W/m2 & u = 1.3 m/s θ _m - θ _a					
		m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	106 K
		W	W	W	W	W	W	W	W	W	W
K720-TS		1.95	1 884	1 035	77	1 384	1 314	1 160	987	796	404

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Supplementary Information										Issued		2022-03-02	

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
K720-TS		2 260	1 603	1 035	1 708	1 168	722	1 257	814	484	1 375	886	519
Gross Thermal Yield per m ² gross area		1 159	822	531	876	599	370	644	417	248	705	454	266
Annual efficiency, η_a		66%	47%	30%	54%	37%	23%	55%	36%	21%	57%	37%	21%
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
Maximum tested positive load		3000 Pa	
Maximum tested negative load		3000 Pa	
Hail resistance using steel ball (maximum drop height)		1.2 m	
Additional collector attribute(s)			
Using external power source(s) for normal operation		No	
Co-generating thermal and electrical power		No	
Active or passive measure(s) for self-protection		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)
K720-TS	1.95	8-V-1234S-A:17.3,174S-C:16.6,1072- D	1.84

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})	55%	Zero-loss efficiency (η_0)	0.71
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)	3.47 W/(m ² K)
		Second-order coefficient (a_2)	0.012 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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