

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2969 F
	Issued	2020-03-02

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	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
PBS180		2 021	1 456	976	1 544	1 084	708	1 128	749	469	1 234	814	502
PBS200		2 297	1 654	1 109	1 755	1 232	804	1 281	851	533	1 403	926	571
PBS210		2 377	1 712	1 147	1 816	1 275	833	1 326	881	552	1 452	958	591
PBS250		2 653	1 911	1 280	2 027	1 423	929	1 480	983	616	1 620	1 069	659
PBS260		2 744	1 977	1 325	2 097	1 472	961	1 531	1 017	637	1 676	1 106	682
PBS270		3 055	2 200	1 474	2 334	1 639	1 070	1 704	1 132	709	1 866	1 231	759
Annual output per m ² gross area		1 148	827	554	877	616	402	641	425	266	701	463	285
Annual efficiency, η_a		65%	47%	31%	54%	38%	25%	55%	36%	23%	56%	37%	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. 6.1 (September 2019). 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	Yes		
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	2750		Pa
Maximum tested negative load	2500		Pa
Hail resistance using steel ball (maximum drop height)	2		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"/>	Façade collector(s)

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
PBS180	1.76	8-VH-1234S-A:8,1780-C:22,921-NoD	
PBS200	2.00	8-VH-1234S-A:8,1828-C:22,1026-NoD	
PBS210	2.07	10-VH-1234S-A:8,1628-C:22,1181-NoD	
PBS250	2.31	10-VH-1234S-A:8,1828-C:22,1181-NoD	
PBS260	2.39	10-VH-1234S-A:8,1828-C:22,1226-NoD	
PBS270	2.66	10-VH-1234S-A:8,2128-C:22,1181-NoD	

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})	56%	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)	3.37
		Second-order coefficient (a_2)	0.009
		Incidence angle modifier IAM (50°)	0.96
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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.			