



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SKM 10013/1
	Issued	2021-12-09

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
H81-15		1,582	1,056	611	1,163	739	397	863	519	272	942	560	289
H81-17		1,763	1,177	681	1,296	823	442	962	578	303	1,049	624	322
H81-19		2,068	1,380	799	1,520	966	518	1,128	678	355	1,231	732	378
H81-20		2,124	1,418	821	1,562	992	533	1,159	697	365	1,264	752	388
H81-21		2,260	1,509	873	1,661	1,055	567	1,233	741	388	1,345	800	413
H81-22		2,305	1,539	891	1,695	1,077	578	1,258	756	396	1,372	816	421
H81-23		2,361	1,577	913	1,736	1,103	592	1,288	775	405	1,406	836	431
H81-25		2,678	1,788	1,035	1,969	1,251	671	1,461	878	460	1,594	948	489
H81-26		2,734	1,826	1,057	2,010	1,277	685	1,492	897	470	1,628	968	499
Annual output per m² gross area		1,130	754	437	831	528	283	616	371	194	673	400	206
Annual efficiency, η_a		64%	43%	25%	51%	32%	17%	53%	32%	17%	54%	32%	17%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 kWh/m²		
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					No		
The collector was tested successfully under the following conditions:							
Climate class (A+, A, B or C)				A		--	
G (W/m²) >		1000	θ _a (°C) >		20	H _x (MJ/m²) >	600
Maximum tested positive load					2400	Pa	
Maximum tested negative load					2500	Pa	
Hail resistance using steel ball (maximum drop height)					1.2	m	

Additional collector attribute(s)

☐ Using external power source(s) for normal operation	☐ Active or passive measure(s) for self-protection
☐ Co-generating thermal and electrical power	☐ Façade collector(s)

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
H81-15	1.40	10-VH-1234S-A:7.2,1392-C:20.6,1030-	1.35
H81-17	1.56	10-VH-1234S-A:7.2,1310-C:20.6,1205-	1.54
H81-19	1.83	10-VH-1234S-A:7.2,1390-C:20.6,1325-	1.80
H81-20	1.88	10-VH-1234S-A:7.2,1895-C:20.6,1030-	1.83
H81-21	2.00	10-VH-1234S-A:7.2,1935-C:20.6,1070-	1.97
H81-22	2.04	10-VH-1234S-A:7.2,1895-C:20.6,1110-	2.01
H81-23	2.09	10-VH-1234S-A:7.2,1780-C:20.6,1205-	2.06
H81-25	2.37	10-VH-1234S-A:7.2,1895-C:20.6,1280-	2.33
H81-26	2.42	10-VH-1234S-A:7.2,1937-C:20.6,1280-	2.39

Data required for CDR (EU) No 811/2013 - Reference Area		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	52%	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)	3.89
		Second-order coefficient (a_2)	0.018
		Incidence angle modifier IAM (50°)	0.95
		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.	