

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S3018 R
	Issued	2021-05-26

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
CVT10		2,035	1,752	1,470	1,713	1,447	1,197	1,235	1,013	814	1,332	1,095	877
CVT15		3,020	2,600	2,181	2,541	2,147	1,776	1,832	1,504	1,208	1,977	1,624	1,301
Annual output per m ² gross area		938	807	677	789	667	552	569	467	375	614	504	404
Annual efficiency, η_a		53%	46%	38%	48%	41%	34%	49%	40%	32%	49%	41%	32%
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	No				
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				C	--
G (W/m ²) >	800	ϑ_a (°C) >	10	H_x (MJ/m ²) >	420
Maximum tested positive load				2860	Pa
Maximum tested negative load				-	Pa
Hail resistance using steel ball (maximum drop height)				0.8	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)
CVT10	2.17	1-H-12S-C:22,1205-D	1.78
CVT15	3.22	1-H-12S-C:22,1755-D	2.72

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})	48%	Zero-loss efficiency (η_0)	0.54	
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)	1.21	
		Second-order coefficient (a_2)	0.004	
		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.		