


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		SK0011							
						Date issued		2018-10-16							
						Issued by		ECC							
Licence holder		Heliofrance SARL				Country		France							
Brand (optional)						Web		www.heliofrance.fr							
Street, Number		2862, route de Toulouse				E-mail		j.simonin@heliofrance.fr							
Postcode, City		31370 BERAT				Tel		+33 561 444 689							
Collector Type						Flat plate collector, glazed									
Collector name						Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ∅ _m - ∅ _a									
						Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	80 K
						m ²	mm	mm	mm	W	W	W	W	W	W
H272.12MK1						2,72	2 192	1 241	90	2 067	1 951	1 707	1 444	1 165	1 018
H232.12MK1						2,32	1 870	1 241	90	1 763	1 664	1 456	1 232	993	869
V272.12MK1						2,72	1 241	2 192	90	2 067	1 951	1 707	1 444	1 165	1 018
V232.12MK1						2,32	1 241	1 870	90	1 763	1 664	1 456	1 232	993	869
Power output per m ² gross area						760	717	627	531	428	374				
Performance parameters test method		Steady state - outdoor													
Performance parameters (related to AG)		η ₀ ,hem	a ₁	a ₂											
Units		-	W/(m ² K)	W/(m ² K ²)											
Test results		0,760	4,180	0,008											
Incidence angle modifier test method		Steady state - outdoor													
Bi-directional incidence angle modifiers		No													
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°				
Transversal		K _{GT, coll}	0,99	0,99	0,99	0,99	0,99	0,99	0,98	0,96	0,00				
Longitudinal		K _{GL, coll}	0,99	0,99	0,99	0,99	0,99	0,99	0,98	0,96	0,00				
Heat transfer medium for testing		Water-Glycole													
Flow rate for testing (per gross area, A _G)		dm/dt	0,020	kg/(Sm ²)											
Maximum temperature difference for thermal performance calculations		(∅ _m -∅ _a) _{max}	80	K											
Standard stagnation temperature (G = 1000 W/m ² ; ∅ _a = 30 °C)		∅ _{stg}	212	°C											
Effective thermal capacity, incl. fluid (per gross area, A _G)		C/m ²	8,5	kJ/(Km ²)											
Maximum operating temperature		∅ _{max, op}	212	°C											
Maximum operating pressure		p _{max, op}	800	kPa											
Testing laboratory		CESP - University of Perpignan					http://www.cesplab.univ-perp.fr								
Test report(s)		PV-FRL201807276-1 PV-FRL201807276-2					Dated		15/10/2018 15/10/2018						
Comments of testing laboratory		Datashet version: 5.01, 2016-03-01													
Hydraulic designation code of the sample tested : 1-H-23S-A:11.5,21581															
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SK0011
	Issued	2018-10-16

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
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
H272.12MK1		3 415	2 364	1 512	2 527	1 698	1 041	1 884	1 186	696	2 057	1 292	745
H232.12MK1		2 912	2 017	1 290	2 155	1 449	888	1 607	1 012	593	1 754	1 102	635
V272.12MK1		3 415	2 364	1 512	2 527	1 698	1 041	1 884	1 186	696	2 057	1 292	745
V232.12MK1		2 912	2 017	1 290	2 155	1 449	888	1 607	1 012	593	1 754	1 102	635
Annual output per m ² gross area		1 255	869	556	929	624	383	693	436	256	756	475	274
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	B	--
Maximum tested positive load	3000	Pa
Maximum tested negative load	3000	Pa
Hail resistance using steel ball (maximum drop height)	0,2	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
H272.12MK1	2,72	Collector efficiency (η_{col})	58 %
H232.12MK1	2,32	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 9806:2013.	
V272.12MK1	2,72		
V232.12MK1	2,32		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,760 --
		First-order coefficient (a_1)	4,18 W/(m ² K)
		Second-order coefficient (a_2)	0,008 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,99 --
		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.	