



Annex to Solar Keymark Certificate					Licence Number		011-7S2166 F							
					Date issued		2023-06-27							
					Issued by		DIN CERTCO							
Licence holder		Gaïa Energies Nouvelles			Country		La Réunion							
Brand (optional)					Web		www.gaia.re							
Street, Number		25 rue Canne Bambou, ZAC Portail			E-mail		contact@gaia.re							
Postcode, City		97424 Le Piton Saint Leu			Tel		+262 700 900							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m <sup>2</sup> , Gd = 150 W/m <sup>2</sup> & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	119 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm	mm			
Gaia Run 2.15 BLUE					2.12	2'040	1'040	90	1'515	1'446	1'295	1'126	941	415
Gaia Run 2.55 BLUE					2.53	2'040	1'240	90	1'808	1'726	1'545	1'344	1'123	496
Power output per m <sup>2</sup> gross area					715	682	611	531	444	196				
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A <sub>G</sub> )		$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0.729	3.17	0.010	0.000	0.00	5'082	0.000	0.00	0.0E+00	0.87			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>θT, coll</sub>	1.00	1.00	0.99	0.98	0.95	0.86	0.65	0.35	0.00			
Longitudinal		K <sub>θL, coll</sub>	1.00	1.00	0.99	0.98	0.95	0.86	0.65	0.35	0.00			
Heat transfer medium for testing		Water-Glycole												
Flow rate for testing (per gross area, A <sub>G</sub> )		dm/dt	0.018	kg/(sm <sup>2</sup> )										
Maximum temperature difference during thermal performance test		( $\vartheta_m - \vartheta_a$ ) <sub>max</sub>	89	K										
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a = 30$ °C)		$\vartheta_{stg}$	180	°C										
Maximum operating temperature		$\vartheta_{max, op}$	150	°C										
Maximum operating pressure		p <sub>max, op</sub>	1000	kPa										
Testing laboratory		SPF Testing, CH-8640 Rapperswil, Switzerland					www.spf.ch							
Test report(s)		C1891 C1892 C1922EN					Dated		25.01.2023 25.01.2023 27.06.2023					
Comments of testing laboratory		Draft Ver. 6.2 (22.09.2021)												
		 INSTITUT FÜR SOLARTECHNIK 												
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<b>Annex to Solar Keymark Certificate</b> <b>Supplementary Information</b>	<b>Licence Number</b>	<b>011-7S2166 F</b>
	<b>Issued</b>	<b>2023-06-27</b>

<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>													
Collector name	$\vartheta_m$	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
Gaia Run 2.15 BLUE		2'395	1'746	1'185	1'848	1'317	873	1'349	910	578	1'464	980	614
Gaia Run 2.55 BLUE		2'859	2'083	1'414	2'206	1'572	1'041	1'610	1'086	690	1'747	1'170	732
Gross Thermal Yield per m <sup>2</sup> gross area		1'130	823	559	872	621	412	636	429	273	690	462	290
Annual efficiency, $\eta_a$		64%	47%	32%	53%	38%	25%	55%	37%	23%	55%	37%	23%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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  $\vartheta_m$  (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Draft Ver. 6.2 (22.09.2021). A detailed description of the calculations is available at <http://www.estif.org/solarkeymarknew/>

<b>Additional Information</b>			
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 <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
		$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load			2400 Pa
Maximum tested negative load			2400 Pa
Hail resistance using ice balls (diameter)			35 mm
<b>Additional collector attribute(s)</b>			
Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	No

<b>Energy Labelling Information</b>		<b>Additional Informative Technical Data</b>	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
Gaia Run 2.15 BLUE	2.12	1-H-1234S-7.2,19630-20.4,1080	1.91
Gaia Run 2.55 BLUE	2.53	1-H-1234S-7.2,23750-20.4,1280	2.30

<b>Data required for CDR (EU) No 811/2013 - Reference Area <math>A_{sol}</math></b>		<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>	
Collector efficiency ( $\eta_{col}$ )	57%	Zero-loss efficiency ( $\eta_0$ )	0.71
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ 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 ( $a_1$ )	3.17 W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )	0.010 W/(m <sup>2</sup> K <sup>2</sup> )
		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.	