


Annex to Solar Keymark Certificate					Licence Number		011-7S1945 F							
					Date issued		2023-06-06							
					Issued by		DINCERTCO							
Licence holder		Ariston S.p.A.			Country		Italy							
Brand (optional)		ARISTON			Web		www.ariston.com							
Street, Number		Via A. Merloni 45			E-mail		marketing@ariston.com							
Postcode, City		60044 Fabriano (AN)			Tel		+39 02763209-1							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	120 K				
					W	W	W	W	W	W				
KAIROS XP 2.5-1 V					2.53	2 240	1 125	99	1 749	1 674	1 505	1 314	1 101	471
KAIROS XP 2.5-1 H					2.53	1 125	2 240	99	1 749	1 674	1 505	1 314	1 101	471
Power output per m ² gross area					691	661	595	519	435	186				
Performance parameters test method		Steady state - indoor												
Performance parameters (related to A _G)		$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0.702	2.89	0.011	0.000	0.00	5 281	0.000	0.00	0.0E+00	0.90			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{GT, coll}	1.00	1.00	0.99	0.97	0.94	0.88	0.74	0.43	0.00			
Longitudinal		K _{GL, coll}	1.00	1.00	0.99	0.97	0.94	0.88	0.74	0.43	0.00			
Heat transfer medium for testing					Water-Glycol									
Flow rate for testing (per gross area, A _G)					dm/dt	0.020	kg/(sm ²)							
Maximum temperature difference during thermal performance test					($\vartheta_m - \vartheta_a$) _{max}	90	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}	210	°C							
Maximum operating temperature					$\vartheta_{max, op}$	210	°C							
Maximum operating pressure					p _{max, op}	600	kPa							
Testing laboratory		TÜV Rheinland Energy GmbH					http://www.tuv.com/solar							
Test report(s)		300100419.001 (XP 2.5-1 V) 300100419.002 (XP 2.5-1 H) C1894 (SPF; Thermal Performance XP 2.5-1 V)					Dated		30.03.2023 30.03.2023 08.03.2023					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
					 TÜVRheinland® lab TÜV Rheinland Solar GmbH Am Grauen Stein 51105 Köln									
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de														

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Supplementary Information							Issued		2023-06-06						
Gross Thermal Yield 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		
KAIROS XP 2.5-1 V		2 802	2 073	1 422	2 174	1 563	1 038	1 591	1 085	693	1 726	1 173	737		
KAIROS XP 2.5-1 H		2 802	2 073	1 422	2 174	1 563	1 038	1 591	1 085	693	1 726	1 173	737		
Gross Thermal Yield per m ² gross area		1 108	819	562	859	618	410	629	429	274	682	464	291		
Annual efficiency, η_a		63%	46%	32%	53%	38%	25%	54%	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 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. 6.2 (13.01.2022). 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) >		1100		ϑ_a (°C) >		40		H_x (MJ/m ²) >		700					
Maximum tested positive load										2400		Pa			
Maximum tested negative load										2400		Pa			
Hail resistance using ice balls (diameter)										35		mm			
Additional collector attribute(s)															
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			
Energy Labelling Information						Additional Informative Technical Data									
						Reference Area, A_{sol} (m ²)		Hydraulic Designation Code				Aperture Area, A_a (m ²)			
KAIROS XP 2.5-1 V						2.53		1-H-1234S-A:9.2,22608-C:16.4,1127-D				2.24			
KAIROS XP 2.5-1 H						2.53		1-H-1234S-A:9.2,21760-C:16.4,2232-D				2.24			
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)				0.69		--	
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)				2.89		W/(m ² K)	
								Second-order coefficient (a_2)				0.011		W/(m ² K ²)	
								Incidence angle modifier IAM (50°)				0.93		--	
								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.							
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