


Annex to Solar Keymark Certificate					Licence Number		011-7S1981 F																	
					Date issued		2023-06-06																	
					Issued by		DINCERTCO																	
Licence holder		ELCO Shared Services GmbH			Country		Germany																	
Brand (optional)		ELCO			Web		www.elco.net																	
Street, Number		Hohenzollernstraße			E-mail		thomas.klink@de.elco.net																	
Postcode, City		72379 Hechingen			Tel		+49 7471187142																	
Collector Type					Flat plate collector																			
Collector name					Gross area (A_G)		Gross length		Gross width		Gross height		Power output per collector											
					m ²		mm		mm		mm		Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s ϑ _m - ϑ _a											
					0 K		10 K		30 K		50 K		70 K		120 K									
					W		W		W		W		W		W									
SOLATRON S 2.5-1 V					2.53		2 240		1 125		99		1 749		1 674		1 505		1 314		1 101		471	
SOLATRON S 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 m² gross area					691		661		595		519		435		186									
Performance parameters test method					Steady state - indoor																			
Performance parameters (related to A_G)					η _{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					(ϑ _m -ϑ _a) _{max}		90		K															
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ _{stg}		210		°C															
Maximum operating temperature					ϑ _{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)																			
																								
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		
SOLATRON S 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		
SOLATRON S 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)							
SOLATRON S 2.5-1 V		2.53			1-H-1234S-A:9.2,22608-C:16.4,1127-D			2.24							
SOLATRON S 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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