


Annex to Solar Keymark Certificate					Licence Number		011-7S1764 F							
					Date issued		2022-02-21							
					Issued by		DIN CERTCO							
Licence holder			ELDOMINVEST LTD		Country		Bulgaria							
Brand (optional)					Web		www.eldominvest.com							
Street, Number			275-A Vladislav Varnenchik Blvd.		E-mail		info@eldominvest.com							
Postcode, City			9009 Varna		Tel		+359 52-502 116							
Collector Type					Flat plate collector									
Collector name					Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector					
									$G_b = 850 \text{ W/m}^2, G_d = 150 \text{ W/m}^2 \text{ \& } u = 1.3 \text{ m/s}$ $\vartheta_m - \vartheta_a$					
					m²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	112 K
					W	W	W	W	W	W	W	W	W	W
CLASSIC R 1.5					1.51	1 503	1 007	85	1 093	1 038	921	797	666	367
CLASSIC R 2.0					2.02	2 006	1 007	85	1 462	1 388	1 232	1 066	891	491
CLASSIC R 2.5					2.52	2 006	1 257	85	1 824	1 732	1 537	1 330	1 112	613
Power output per m² gross area					724	687	610	528	441	243				
Performance parameters test method					Quasi dynamic									
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					0.725	3.62	0.006	0.000	0.00	13 660	0.000	0.00	0.0E+00	0.99
Incidence angle modifier test method					Quasi dynamic - outdoor									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					$K_{\theta T, coll}$	1.00	1.00	1.00	0.99	0.96	0.87	0.63	0.32	0.00
Longitudinal					$K_{\theta L, coll}$	1.00	1.00	1.00	0.99	0.96	0.87	0.63	0.32	0.00
Heat transfer medium for testing					Water-Glycole									
Flow rate for testing (per gross area, A_G)					dm/dt		0.020		kg/(sm²)					
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$		82		K					
Standard stagnation temperature ($G = 1000 \text{ W/m}^2; \vartheta_a = 30 \text{ °C}$)					ϑ_{stg}		230		°C					
Maximum operating temperature					$\vartheta_{max, op}$		-		°C					
Maximum operating pressure					$p_{max, op}$		1000		kPa					
Testing laboratory			Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)				http://www.igte.uni-stuttgart.de							
Test report(s)			21COL1632OEM02 21COL1631QOEM02				Dated		21.02.2022 21.02.2022					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Documented performance parameters are taken from 21COL1632OEM02 (CLASSIC R 1.5) This data sheet replaces the data sheet issued on 01.03.2017 Following data have been changed: - The data sheet was created based on new test reports - The email address and the telephone number were updated					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70560 Stuttgart (Vaihingen)									
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Supplementary Information								Issued			2022-02-21				
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		
CLASSIC R 1.5		1 793	1 287	870	1 362	959	636	998	662	419	1 092	720	450		
CLASSIC R 2.0		2 399	1 722	1 164	1 822	1 283	851	1 335	886	561	1 460	963	602		
CLASSIC R 2.5		2 993	2 148	1 452	2 273	1 601	1 062	1 665	1 105	700	1 822	1 202	751		
Gross Thermal Yield per m ² gross area		1 188	852	576	902	635	421	661	439	278	723	477	298		
Annual efficiency, η_a		67%	48%	33%	55%	39%	26%	57%	38%	24%	58%	38%	24%		
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 Senocalc 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											No				
The collector was tested successfully under the following conditions:															
Climate class (A+, A, B or C)											A		--		
G (W/m ²) >		1000		ϑ_a (°C) >		20		H _x (MJ/m ²) >		600					
Maximum tested positive load											2750		Pa		
Maximum tested negative load											2400		Pa		
Hail resistance using steel ball (maximum drop height)											2		m		
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)					
CLASSIC R 1.5		1.51					8-V-1234S-7.2,1383-20.6,1060-D			1.36					
CLASSIC R 2.0		2.02					8-V-1234S-7.2,1888-20.6,1060-D			1.83					
CLASSIC R 2.5		2.52					11-V-1234S-7.2,1888-20.6,1310-D			2.32					
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})							57%		Zero-loss efficiency (η_0)			0.72		--	
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)			3.62		W/(m ² K)			
							Second-order coefficient (a ₂)			0.006		W/(m ² K ²)			
							Incidence angle modifier IAM (50°)			0.98		--			
							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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