


Annex to Solar Keymark Certificate					Licence Number		011-7S2023 F							
					Date issued		2023-02-01							
					Issued by		DIN CERTCO							
Licence holder		DOMUSA CALEFACCIÓN S.COOP.			Country		Spanien							
Brand (optional)					Web		http://www.domusatechnik.com							
Street, Number		San Esteban auzoa z/g			E-mail		info@domusatechnik.com							
Postcode, City		20737 Errezil			Tel		+34 943 813 899							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					$G_b = 850 \text{ W/m}^2$, $G_d = 150 \text{ W/m}^2$ & $u = 1.3 \text{ m/s}$ $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	109 K				
					m ²	mm	mm	mm	mm	mm	mm			
DS CLASS V3					2,07	1.988	1.041	90	1.501	1.422	1.258	1.083	899	510
Power output per m ² gross area					725	687	608	523	434	247				
Performance parameters test method		Quasi dynamic												
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		0,726	3,74	0,006	0,000	0,00	9.746	0,000	0,00	0,00	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	0,99	0,98	0,95	0,81	0,58	0,29	0,00			
Longitudinal		$K_{\theta L, coll}$	1,00	1,00	0,99	0,98	0,95	0,81	0,58	0,29	0,00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0,020	kg/(sm ²)							
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$	79	K							
Standard stagnation temperature ($G = 1000 \text{ W/m}^2$; $\vartheta_a = 30 \text{ °C}$)					ϑ_{stg}	210	°C							
Maximum operating temperature					$\vartheta_{max, op}$	135	°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)		22COL1657OEM04 22COL1658QOEM04					Dated		31.01.2023 31.01.2023					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Documented performance parameters are taken from 22COL1657OEM04 (DS CLASS V3) This data sheet replaces the data sheet issued on 08.10.2012					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70560 Stuttgart (Vaihingen)									
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Supplementary Information						Issued		2023-02-01					
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
DS CLASS V3		2.440	1.729	1.152	1.841	1.280	836	1.350	885	552	1.479	961	591
Gross Thermal Yield per m ² gross area		1.179	835	556	889	618	404	652	427	267	714	464	286
Annual efficiency, η_a		67%	47%	32%	55%	38%	25%	56%	37%	23%	57%	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		No											
The collector was tested successfully under the following conditions:													
Climate class (A+, A, B or C)		B										--	
G (W/m ²) >		900	ϑ_a (°C) >		15	H_x (MJ/m ²) >			540				
Maximum tested positive load		2500										Pa	
Maximum tested negative load		1600										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)				
DS CLASS V3		2,07		10-V-1234S-7.1,1894-16.6,1087-D					1,89				
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)					0,73	--			
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)					3,74	W/(m ² K)			
				Second-order coefficient (a_2)					0,006	W/(m ² K ²)			
				Incidence angle modifier IAM (50°)					0,97	--			
	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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