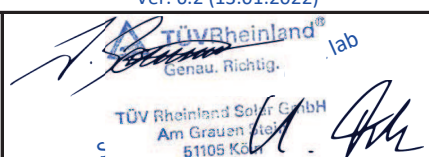


Annex to Solar Keymark Certificate						Licence Number	011-7S2072 F				
						Date issued	2023-08-08				
						Issued by	DINCERTCO				
Licence holder	Bosch Thermotechnik GmbH					Country	Germany				
Brand (optional)	Bosch					Web	www.bosch-thermotechnik.de				
Street, Number	Junkersstrasse 20-24					E-mail	solarthermie@de.bosch.com				
Postcode, City	73249 Wernau					Tel	49 (0)2557 9399-0 / -				
Collector Type						Flat plate collector					
Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector						
					G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$						
					0 K	10 K	30 K	50 K	70 K	115 K	
	m ²	mm	mm	mm	W	W	W	W	W	W	
FT 226-2H	2.55	1 175	2 170	87	1 934	1 830	1 600	1 342	1 056	310	
					0	0	0	0	0	0	
Power output per m² gross area					759	718	627	526	414	122	
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		0.762	3.96	0.014	0.000	0.00	4 613	0.000	0.00	0.0E+00	0.97
Incidence angle modifier test method		Quasi dynamic - outdoor									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K _{GT, coll}	1.00	0.99	0.99	0.97	0.95	0.91	0.82	0.41	0.00
Longitudinal		K _{GL, coll}	1.00	0.99	0.99	0.97	0.95	0.91	0.82	0.41	0.00
Heat transfer medium for testing						Water-Glycole					
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}	85	K			
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30^\circ\text{C}$)						ϑ_{stg}	200	°C			
Maximum operating temperature						$\vartheta_{max, op}$	n.n.	°C			
Maximum operating pressure						p _{max, op}	1000	kPa			
Testing laboratory		TÜV Rheinland Energy GmbH				www.tuv.com/solarthermal					
Test report(s)		21249763.001				Dated		11.09.2020			
Comments of testing laboratory						Ver. 6.2 (13.01.2022)					
						 TÜVRheinland [®] Genau. Richtig. lab TÜV Rheinland Solar GmbH Am Grauen Aick 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											

Annex to Solar Keymark Certificate		Licence Number		011-7S2072 F										
Supplementary Information		Issued		2023-08-08										
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	
FT 226-2H		3 140	2 174	1 354	2 340	1 555	916	1 733	1 089	620	1 896	1 183	663	
Gross Thermal Yield per m² gross area		1 231	853	531	918	610	359	680	427	243	743	464	260	
Annual efficiency, η_a		70%	48%	30%	56%	37%	22%	58%	37%	21%	60%	37%	21%	
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 kWh/m²			
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/m²) >		1000		ϑ_a (°C) >		20		H_x (MJ/m²) >		600				
Maximum tested positive load											4000		Pa	
Maximum tested negative load											3000		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} (m²)		Hydraulic Designation Code			Aperture Area, A_a (m²)			
FT 226-2H						2.55		2-V-1234S-A:7.1.13219-C:16.8.2125			2.43			
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})						58%		Zero-loss efficiency (η_0)			0.76		--	
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)			3.96		W/(m²K)			
						Second-order coefficient (a_2)			0.014		W/(m²K²)			
						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.								
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