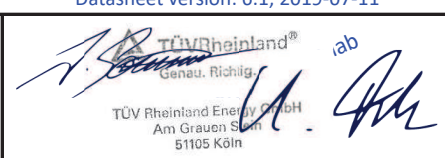


Annex to Solar Keymark Certificate					Licence Number		011-7S2984 R							
					Date issued		2020-09-29							
					Issued by		TÜV Rheinland DINCERTCO							
Licence holder		Viessmann Werke GmbH & Co. KG			Country		Germany							
Brand (optional)		Viessmann			Web		http://www.viessmann.com							
Street, Number		Viessmannstrasse 1			E-mail		---							
Postcode, City		35107 Allendorf (Eder)			Tel		+49 (0)6452-70-0							
Collector Type					Evacuated tubular 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				
					m ²	mm	mm	mm	mm	mm	mm			
Vitosol 200-T SPX-F					5.05	2 197	2 294	149	3 100	3 050	2 931	2 790	2 626	2 117
					0	0	--	--	--	0				
Power output per m ² gross area					614	604	580	552	520	419				
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		0.617	0.95	0.006	0.000	0.00	16 756	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}	0.99	1.01	1.02	1.01	0.96	0.85	0.64	0.29	0.00			
Longitudinal		K _{GL, coll}	1.00	1.00	1.00	0.99	0.98	0.97	0.94	0.47	0.00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0.026	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}	350	°C							
Maximum operating temperature					$\vartheta_{max, op}$	---	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory		TÜV Rheinland Energy GmbH			http://www.tuv.com/solarthermie									
Test report(s)		21250636.002			Dated		29.09.2020							
Comments of testing laboratory					Datasheet version: 6.1, 2019-07-11									
The given values are also valid for tilt angle/inclination <20° (down to 3°)														
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Annex to Solar Keymark Certificate							Licence Number			011-7S2984 R			
Supplementary Information							Issued			2020-09-29			
Annual collector output 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
Vitosol 200-T SPX-F		5 215	4 646	4 017	4 514	3 933	3 339	3 215	2 735	2 263	3 471	2 960	2 450
Annual output per m ² gross area		1 033	920	795	894	779	661	637	541	448	687	586	485
Annual efficiency, η_a		59%	52%	45%	55%	48%	41%	55%	46%	38%	55%	47%	39%
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		
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										5400		Pa	
Maximum tested negative load										3200		Pa	
Hail resistance using ice balls (diameter)										25		mm	
Additional collector attribute(s)													
<input type="checkbox"/> Using external power source(s) for normal operation					<input type="checkbox"/> Active or passive measure(s) for self-protection								
<input type="checkbox"/> Co-generating thermal and electrical power					<input type="checkbox"/> Façade collector(s)								
Energy Labelling Information						Additional Informative Technical Data							
		Reference Area, A_{sol} (m ²)				Hydraulic Designation Code			Aperture Area, A_a (m ²)				
Vitosol 200-T SPX-F		5.05				1-HV-12S-C:40,2290			4.06				
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)			0.61		--		
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)			0.95		W/(m ² K)		
						Second-order coefficient (a_2)			0.006		W/(m ² K ²)		
						Incidence angle modifier IAM (50°)			0.99		--		
						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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