



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S2870 R							
						Date issued		2018-07-11							
						Issued by		DIN CERTCO							
Licence holder	Viessmann Werke GmbH & Co.KG					Country		Germany							
Brand (optional)	Viessmann					Web		www.viessmann.com							
Street, Number	Viessmannstraße 1					E-mail		Lect@viessmann.com							
Postcode, City	35107, Allendorf					Tel		+33 387906402							
Collector Type						Evacuated tubular collector									
Collector name						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² ; u = 3 m/s ∅ _m - ∅ _a									
						Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	100 K
						m ²	mm	mm	mm	W	W	W	W	W	W
Vitosol 200-TM CP1A 9 tubes						2.60	2 230	1 164	167	1 260	1 238	1 181	1 104	1 009	831
Vitosol 200-TM CP1A 16 tubes						4.47	2 230	2 004	167	2 166	2 129	2 030	1 898	1 735	1 429
Vitosol 200-TM CP1A 18 tubes						5.00	2 230	2 244	167	2 423	2 381	2 270	2 124	1 941	1 599
Power output per m ² gross area						485	476	454	425	388	320				
Performance parameters test method						Quasi dynamic									
Performance parameters (related to AG)						η _{0,b}	c1	c2	c3	c4	c6	Kd			
Units						-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results						0.484	0.749	0.009	0.000	0.000	0.000	1.009			
Incidence angle modifier test method						Quasi dynamic - outdoor									
Bi-directional incidence angle modifiers						Yes									
Incidence angle modifier						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal						K _{θT, coll}	1.00	1.02	1.06	1.10	1.03	0.99	0.91	-	0.00
Longitudinal						K _{θL, coll}	1.00	0.99	0.98	0.97	0.94	0.89	0.80	-	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 for thermal performance calculations						(∅ _m -∅ _a) _{max}	100		K						
Standard stagnation temperature (G = 1000 W/m ² ; ∅ _a = 30 °C)						∅ _{stg}	174.5		°C						
Effective thermal capacity, incl. fluid (per gross area, A _G)						C/m ²	24.8		kJ/(Km ²)						
Maximum operating temperature						∅ _{max, op}	99		°C						
Maximum operating pressure						p _{max, op}	600		kPa						
Testing laboratory						TÜV Rheinland (Shanghai) Co., Ltd.			www.tuv.com						
Test report(s)						50153850-001 50159680-001			Dated		7/10/2018 7/10/2018				
Comments of testing laboratory						Datashet version: 5.01, 2016-03-01									
Given collector parameters are determined on Vitosol 200-TM CP1A 9 tubes															
DIN CERTCO • Alboinstraße 56 • 12103 Berlin															
Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de															



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2870 R
	Issued	2018-07-11

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		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-TM CP1A 9 tubes		2 202	1 934	1 602	1 884	1 592	1 273	1 358	1 123	875	1 465	1 217	948
Vitosol 200-TM CP1A 16 tubes		3 786	3 326	2 754	3 240	2 736	2 189	2 334	1 932	1 504	2 519	2 092	1 629
Vitosol 200-TM CP1A 18 tubes		4 235	3 720	3 080	3 624	3 061	2 448	2 611	2 161	1 682	2 818	2 340	1 822
Annual output per m ² gross area		847	744	616	725	612	490	522	432	336	564	468	364
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information

Collector heat transfer medium	Water-Glycole
Hybrid Thermal and Photo Voltaic collector	No
The collector is deemed to be suitable for roof integration	No
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:	
Climate class (A, B or C)	B --
Maximum tested positive load	2400 Pa
Maximum tested negative load	1000 Pa
Hail resistance using steel ball (maximum drop height)	0.6 m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
Vitosol 200-TM CP1A 9 tubes	2.60	Collector efficiency (η_{col})	44	%
Vitosol 200-TM CP1A 16 tubes	4.47	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 9806:2013.		
Vitosol 200-TM CP1A 18 tubes	5.00			
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0.485	--
		First-order coefficient (a_1)	0.75	W/(m ² K)
		Second-order coefficient (a_2)	0.009	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1.07	--
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.				