TÜVRheinland®
DIN CERTCO
Genau. Richtig.

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2122 R
	Issued	2014-12-18

Company holding the	Viessmann Werke GmbH & Co. KG	Country	Germany
Brand (optional)	Viessmann	Website	www.viessmann.com
Street, street number	Viessmannstrasse 1	E-mail	
Postal Code / City, province	35107 Allendorf/Eder	Tel/Fax	49 (0)6452 70-0

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Evacuated tubular collector
Thermal / photo voltaic hybrid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module G = 1000 W/m², Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	m²	W	W	W	W	W
Vitosol 200-T SPE 1.63 m²	1.73	2 260	1 220	198	**2.76**	1 202	1 173	1 104	1 022	925
Vitosol 200-T SPE 3.26 m²	3.46	2 260	2 390	198	**5.40**	2 405	2 346	2 209	2 043	1 850

Performance test method	Glazed liquid heating collector - steady state - indoor		
Performance parameters related to aperture	η0	a1	a2
Units	-	W/(m²K)	W/(m²K²)
Test results - Flow rate and fluid see note 1	0.695	1.589	0.010

Bi-directional incidence angle	Yes	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT) transversal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θT)	1.01	1.02	1.03	1.03	0.98	0.86	0.70	0.35	0.00
Incidence angle modifiers Kθ(θL) longitudinal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θL)	1.00	0.99	0.97	0.95	0.91	0.83	0.65	0.33	0.00

Stagnation temperature - Weather conditions see note 2	Tstg	260	°C
Effective thermal capacity	ceff = C/Ag	3.23	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	273	°C
Max. operation pressure - see note 3	pmax,op	600	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area

Flow rate	kg/(s m²)									
Pressure drop, ΔP	Pa									

Optional weather data	Location		Link

Testing Laboratory	TÜV Rheinland Energie und Umwelt GmbH		
Website	www.tuv.com/solarthermal		
Test report id. number	21223642.001_SPE; 21223642.002_SPE; 117-12/KQ	Date of test report	18-12-2014; 18-12-2014; 17-12-2013

During the test GDIF/GTOT was always between	0.1	and	0.3

Comments of testing laboratory:

Note 1	Flow rate	0.091	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

TÜV Rheinland Energie und Umwelt GmbH
Am Grauen Stein
D - 51105 Köln

Datasheet version: 4.05, 2013-11-07

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2122 R
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Annual collector output kWh/module

Collector name	Location and collector temperature (Tm)											
	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-T SPE 1.63 m²	1 968	1 652	1 319	1 646	1 342	1 047	1 185	937	708	1 275	1 009	756
Vitosol 200-T SPE 3.26 m²	3 936	3 304	2 639	3 291	2 684	2 093	2 369	1 873	1 417	2 550	2 018	1 512

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m²	Ta °C	Collector orientation or tracking mode
Athens	38	1 765	18.5	South, 25°
Davos	47	1 714	3.2	South, 30°
Stockholm	59	1 166	7.5	South, 45°
Würzburg	50	1 244	9.0	South, 35°

Gtot	Annual total irradiation on collector plane	kWh/m²
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). A detailed description of the calculations is available at http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx.

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Datasheet version: 4.05, 2013-11-07
ScenoCalc version: Ver. 4.05 (Nov, 2013)