



<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>			<b>Licence number</b>		<b>011-7S2069 R</b>
			<b>Date of issue</b>		<b>2012-Jan-08</b>
<b>Company holding the licence</b>		Viessmann Werke GmbH&Co. KG	<b>Country</b>		Germany
<b>Brand (optional)</b>			<b>Website</b>		<a href="http://www.viessmann.com">www.viessmann.com</a>
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<b>City</b>		Allendorf	<b>Fax</b>		+49 64524269
<b>Collector Type (flat plate / evacuate tubular / un-glazed)</b>			Evacuated tubular collector		

**Integration in the roof possible ?** No

Collector name	Aperture area (A <sub>a</sub> ) [m <sup>2</sup> ]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (A <sub>g</sub> ) [m <sup>2</sup> ]	Power output per collector unit G = 1000 W/m <sup>2</sup> T <sub>m</sub> -T <sub>a</sub> :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
Vitosol 100-T CD1V-16	2.98	2 178	1 962	169	4.27	2 090	2 054	1 968	1 864	1 736
Vitosol 100-T CD1V-8	1.49	2 178	1 010	168	2.20	1 050	1 025	971	910	868

Collector efficiency parameters related to aperture area (A <sub>a</sub> ) Type of fluid and flow rate see note 1	η <sub>0a</sub>	0.70	-
	a <sub>1a</sub>	1.13	W/(m <sup>2</sup> K)
	a <sub>2a</sub>	0.008	W/(m <sup>2</sup> K <sup>2</sup> )

Stagnation temperature - Weather conditions see note 2	t <sub>stg</sub>	196	°C
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Effective thermal capacity	c	23.773	kJ/(m <sup>2</sup> K)
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Max. operation pressure - see note 3	p <sub>max</sub>	600	kPa
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Incidence angle modifiers K <sub>θ</sub> (θ)	G <sub>DIF</sub> /G <sub>TOT</sub>		θ <sub>T</sub> / θ <sub>L</sub>	50°	10°	20°	30°	40°	60°	70°
	min	max	K <sub>θ</sub> (θ <sub>T</sub> )	1.07	1.00	1.02	1.04	1.07	0.97	0.84
	G <sub>DIF</sub> /G <sub>TOT</sub> : min&max - while measuring		K <sub>θ</sub> (θ <sub>L</sub> )	0.95	1.00	0.99	0.99	0.97	0.97	0.91
					<i>Optional values</i>					

Testing Laboratory	TUV Rheinland (Shanghai) Co., Ltd.
Website	<a href="http://www.tuv.com">www.tuv.com</a>
Test report id. number	153186893_EN_Vitosol 100-T CD1V-
Date of test report	07-Jan-2013
Perf. test method	EN 12975-2 6.3 (outdoor)

**Comments of testing laboratory :**  
Keine  
none  
aucune

Note 1	Fluid	Water	Flow rate	0.021 kg/s per m <sup>2</sup>		
Note 2	Irradiance, G <sub>s</sub> =1000 W/m <sup>2</sup> ; Ambient temperature , T <sub>a</sub> =30 °C					
Note 3	Given by manufacturer					



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	011-7S2069 R
	Issued	2012-Jan-08

Annual collector output kWh															
Collector name	Location and collector temperature (T <sub>m</sub> )														
	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 100-T CD1V-16	3 576	3 165	2 700	3 262	2 843	2 382	2 201	1 858	1 518	2 372	2 007	1 635			
Vitosol 100-T CD1V-8	1 866	1 603	1 342	1 663	1 415	1 168	1 127	923	741	1 224	1 004	803			

Collector mounting: Fixed or tracking	No tracking; Slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	G <sub>tot</sub> kWh/m <sup>2</sup>	T <sub>a</sub> °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°

G <sub>tot</sub>	Annual total irradiation on collector plane	kWh/m <sup>2</sup>
T <sub>a</sub>	Mean annual ambient air temperature	°C
T <sub>m</sub>	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (T<sub>m</sub>). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

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Datasheet version:  
 VERSION 3.7, 2012.03.22  
 Calculation program version:  
 3.07, October 2011 (SP)