



Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7 S516 F
	Date of issue	31-05-2013

Company	Glow-worm	Country	Great Britain
Brand (optional)	Flurosorb	Website	www.vaillant-group.com
Street, number	Nottingham Road, Belper	E-mail	marc.imann@vaillant.de
Postal Code	DE56 1JQ	Tel.	+49 (0) 2191 18 2043
City	Derbyshire	Fax	+49 (0) 2191 18 72043

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
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Integration in the roof possible ?	Yes
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Collector name	Aperture area (A _a) [m ²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (A _G) [m ²]	Power output per collector unit G = 1000 W/m ² T _m -T _a :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
SRV 2.3	2.352	2 033	1 233	80	2.507	1 858	1 767	1 562	1 326	1 061
SRH 2.3	2.352	1 233	2 033	80	2.507	1 858	1 767	1 562	1 326	1 061

Collector efficiency parameters related to aperture area (A_a) Type of fluid and flow rate see note 1	η _{0a}	0.790	-
	a _{1a}	3.721	W/(m ² K)
	a _{2a}	0.016	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t _{stg}	199	°C
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Effective thermal capacity	C _{eff} = C/A _a	6.03	kJ/(m ² K)
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Max. operation pressure - see note 3	p _{max}	1000	kPa
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Incidence angle modifiers K _θ (θ)	G _{DIF} /G _{TOT}		θ _T / θ _L	50°	10°	20°	30°	40°	60°	70°
	min	max	K _θ (θ _T)	0.90	1.00	0.99	0.97	0.95	0.82	0.66
	0	0	K _θ (θ _L)	0.90	1.00	0.99	0.97	0.95	0.82	0.66
G _{DIF} /G _{TOT} : min&max - while measuring					Optional values					

Testing Laboratory	TÜV Energie und Umwelt GmbH
Website	www.eco-tuv.de
Test report id. number	21221150_EN_P_GW_SRV2.3 ; 21221150_EN_R_GW_SRV2.3 ; 21221150_EN_P_GW_SRH2.3 ; 21221150_EN_R_GW_SRH2.3
Date of test report	all 29-05-2013
Perf. test method	EN 12975-2 6.1.5 (indoor)

Comments of testing laboratory :

Note 1	Fluid	Water	Flow rate	0.021 kg/s per m ²	<p>TÜV Rheinland Energie und Umwelt GmbH Am Graven Stein D - 51105 Köln</p>
Note 2	Irradiance, G_s=1000 W/m² Ambient temperature, T_a=30 °C				
Note 3	Given by manufacturer				



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7 S516 F
	Issued	31-05-2013

Annual collector output kWh													
Collector name	Location and collector temperature (T _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	
SRV 2.3	2 860	2 007	1 270	2 316	1 557	932	1 590	1 024	599	1 727	1 099	633	
SRH 2.3	2 860	2 007	1 270	2 316	1 557	932	1 590	1 024	599	1 727	1 099	633	

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	G _{tot} kWh/m ²	T _a °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 _{tot}	Annual total irradiation on collector plane	kWh/m ²
T _a	Mean annual ambient air temperature	°C
T _m	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_m). 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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