TÜVRheinland®
DIN CERTCO

SPF Solartechnik Prüfung Forschung

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	**Certificate No.**	**011-7S1983 F**
	Date of issue	07.08.2012

Company	Riello S.p.A.	**Country**		Italy
Brand (optional)	--	**Website**		www.riellogroup.com
Street, number	Via Mussa 20	**E-mail**		info@riello.it
Postal Code	35017	**Tel.**	+39	049 932 39 11
City	Piombino Dese	**Fax**	+39	049 932 39 46

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
Integration in the roof possible ?	Yes

Collector name	**Aperture area (Aa)** [m²]	**Gross length** [mm]	**Gross width** [mm]	**Gross height** [mm]	**Gross area (AG)** [m²]	**Power output per collector unit** G = 1000 W/m² Tm-Ta : 0 K [W]	10 K [W]	30 K [W]	50 K [W]	70 K [W]
CP25VVA	2.289	2'077	1'239	101	2.573	1'719	1'634	1'453	1'257	1'046

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.751	-
	a_{1a}	3.62	W/(m²K)
	a_{2a}	0.0083	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	tstg	202	°C
Effective thermal capacity	ceff = C/Aa	5.6	kJ/(m²K)
Max. operation pressure - see note 3	pmax	1000	kPa

Incidence angle modifiers $K_\theta(\theta)$	G_{DIF}/G_{TOT} min	G_{DIF}/G_{TOT} max	θ_T / θ_L	50°	*10°*	*20°*	*30°*	*40°*	*60°*	*70°*
			$K_\theta(\theta_T)$	0.85	*1.00*	*0.99*	*0.96*	*0.92*	*0.75*	*0.59*
	0.20	0.27	$K_\theta(\theta_L)$	0.85	*1.00*	*0.99*	*0.96*	*0.92*	*0.75*	*0.59*
G_{DIF}/G_{TOT}: min&max - while measuring					***Optional values***					

Testing Laboratory	SPF, CH-8640 Rapperswil
Website	www.solarenergy.ch
Test report id. number	C1456LPEN, C1456QPEN
Date of test report	27.07.2012 /27.07.2012
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :

Note 1	**Fluid**	Water-Glycole	**Flow rate**	0.023	kg/s per m²	Dr. Andreas Bohren
Note 2	**Irradiance, Gs=1000 W/m²** **Ambient temperature , Ta=30 °C**					
Note 3	**Given by manufacturer**					

VERSION 3.5, 2012.01.13

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S1983 F
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Annual collector output kWh

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
CP25VVA	2'574	1'813	1'193	2'072	1'422	911	1'431	935	582	1'549	1'000	611

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	0.751	1'244	9.0	South, -15°

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

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 (Tm). 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:
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Calculation program version:
3.07, October 2011 (SP)