TÜVRheinland®
DIN CERTCO

SPF Solartechnik Prüfung Forschung

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S411 R
	Date of issue	16.01.2013

Company	AMK Collectra AG	**Country**		Switzerland
Brand (optional)	--	**Website**		www.amk-collectra.ch
Street, number	Lagerstrasse 30	**E-mail**		info@amk-collectra.ch
Postal Code	CH-9470	**Tel.**	+41	(0)81 750 16 90
City	Buchs SG	**Fax**	+41	(0)81 750 16 91

Collector Type (flat plate / evacuate tubular / un-glazed)	Evacuated tubular collector
Integration in the roof possible ?	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector unit 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]
OPC 10	1.143	1'700	850	99	1.445	864	848	813	775	735
OPC 15	1.716	1'700	1'250	98	2.125	1'297	1'273	1'220	1'164	1'104

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.756	-
	a_{1a}	1.41	W/(m²K)
	a_{2a}	0.0029	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	t_{stg}	323	°C
Effective thermal capacity	$c_{eff} = C/A_a$	12.6	kJ/(m²K)
Max. operation pressure - see note 3	p_{max}	1000	kPa

Incidence angle modifiers $K_\theta(\theta)$	G_{DIF}/G_{TOT} min	max	θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
			$K_\theta(\theta_T)$	0.96	0.99	0.95	0.89	0.86	1.12	1.09
	0.16	0.18	$K_\theta(\theta_L)$	0.97	1.00	1.00	1.00	0.99	0.91	0.79
G_{DIF}/G_{TOT}: min&max - while measuring					***Optional values***					

Testing Laboratory	SPF, CH-8640 Rapperswil
Website	www.solarenergy.ch
Test report id. number	C926LPEN, C927LPEN, C927QPEN
Date of test report	16.01.2013 / 16.01.2013 / 16.01.2013
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :

Note 1	**Fluid**	Water-Glycole	**Flow rate**	0.026	kg/s per m²	Dr. Andreas Bohren
Note 2	**Irradiance, Gs=1000 W/m²** **Ambient temperature , Ta=30 °C**					
Note 3	**Given by manufacturer**					

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S411 R
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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
OPC 10	1'419	1'249	1'082	1'289	1'127	970	871	736	615	937	793	663
OPC 15	2'130	1'875	1'624	1'935	1'692	1'456	1'308	1'105	923	1'407	1'191	995

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

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)