

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S1889 R
	Date of issue	05.06.2014

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

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]
AQUA PLASMA 19/17 *	1.49	2058	823	110	1.69	1024	1014	992	967	938
AQUA PLASMA 19/34 *	3.00	2058	1628	110	3.35	2061	2042	1998	1947	1888
AQUA PLASMA 19/50 *	4.50	2058	2433	110	5.01	3092	3063	2997	2920	2832
AQUA PLASMA 15/27*	2.33	1 642	1 627	111	2.67	1601	1586	1552	1512	1466
AQUA PLASMA 15/40*	3.49	1 642	2 432	111	3.99	2398	2375	2324	2264	2197

Collector efficiency parameters related to aperture area (A _a) Type of fluid and flow rate see note 1	η _{0a}	0.687	-
	a _{1a}	0.613	W/(m ² K)
	a _{2a}	0.003	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t _{stg}	338	°C
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Effective thermal capacity	C _{eff} = C/A _a	8.78	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)	0.96	1.01	1.02	1.02	1.02	1.06	1.20
	-	-	K _θ (θ _L)	0.90	1.00	0.99	0.97	0.94	0.86	0.85

G_{DIF}/G_{TOT}: min&max - while measuring

Testing Laboratory	TZS, ITW University of Stuttgart
Website	www.tzs.uni-stuttgart.de
Test report id. number	11COL1008/2, 11COL1007/1, 11COL1007Q/3
Date of test report	05.06.2014 und 29.05.2012
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :
 * dimensions according to manufacturer

Note 1	Fluid	Water	Flow rate	0.020 kg/s per m ²
Note 2	Irradiance, G _s =1000 W/m ² 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

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Annual collector output kWh

Location and collector temperature (T_m)

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
AQUA PLASMA 19/17 *	1768	1664	1544	1659	1551	1430	1128	1032	934	1207	1106	1001
AQUA PLASMA 19/34 *	3560	3350	3109	3340	3123	2879	2271	2078	1881	2430	2227	2015
AQUA PLASMA 19/50 *	5340	5026	4663	5010	4684	4319	3407	3117	2821	3645	3340	3023
AQUA PLASMA 15/27*	2765	2602	2414	2594	2425	2236	1764	1614	1461	1887	1730	1565
AQUA PLASMA 15/40*	4141	3898	3616	3886	3633	3349	2642	2417	2188	2827	2591	2345

Collector mounting: Fixed or tracking

Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m ²	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/m ²
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 (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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Datasheet version:

VERSION 3.6, 2012.01.13

Calculation program version:

3.07, October 2011 (SP)