Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	011-7S1889 R
		Issued	2015-06-01

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Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Evacuated tubular collector
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module 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
AQUA PLASMA 19/17*	1.49	2 058	822	111	**1.69**	1 024	1 014	992	967	938
AQUA PLASMA 19/34*	3.00	2 058	1 627	111	**3.35**	2 061	2 042	1 998	1 947	1 888
AQUA PLASMA 19/50*	4.50	2 058	2 432	111	**5.01**	3 092	3 063	2 997	2 920	2 832
AQUA PLASMA 15/27*	2.33	1 642	1 627	111	**2.67**	1 601	1 586	1 552	1 512	1 466
AQUA PLASMA 15/40*	3.49	1 642	2 432	111	**3.99**	2 398	2 375	2 324	2 264	2 197

Performance test method		Glazed liquid heating collector - steady state - outdoor								
Performance parameters related to aperture		η0	a1	a2						
Units		-	W/(m²K)	W/(m²K²)						
Test results - Flow rate and fluid see note 1		0.687	0.613	0.003						
Bi-directional incidence angle modifiers?	Yes	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT) transversal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θT)	1.01	1.02	1.02	1.02	0.96	1.06	1.20	0.60	0.00
Incidence angle modifiers Kθ(θL) longitudinal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θL)	1.00	0.99	0.97	0.94	0.90	0.86	0.85	0.43	0.00

Stagnation temperature - Weather conditions see note 2	Tstg	338	°C
Effective thermal capacity	ceff = C/Ag	8.78	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	-	°C
Max. operation pressure - see note 3	pmax,op	1000	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area											
Flow rate	kg/(s m²)	-	-	-	-	-	-	-	-	-	-
Pressure drop, ΔP	Pa	-	-	-	-	-	-	-	-	-	-

Optional weather data	Location	-	Link	-
Testing Laboratory	TZS, ITW University Stuttgart			
Website	http://www.itw.uni-stuttgart.de			
Test report id. number	11COL1008/3, 11COL1007Q/4, 11COL1007/2	Date of test report	2015.01.26	

During the test GDIF/GTOT was always between	0	and	1

Comments of testing laboratory:

* dimensions according to manufacturer

Note 1	Flow rate	0.020	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

Datasheet version: 4.06, 2014-01-15

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S1889 R
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Annual collector output kWh/module

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
AQUA PLASMA 19/17	1 762	1 653	1 529	1 560	1 444	1 320	1 122	1 022	922	1 200	1 097	989
AQUA PLASMA 19/34	3 547	3 328	3 079	3 141	2 908	2 658	2 259	2 058	1 857	2 417	2 208	1 991
AQUA PLASMA 19/50	5 321	4 991	4 619	4 712	4 362	3 988	3 388	3 088	2 786	3 625	3 312	2 986
AQUA PLASMA 15/27	2 755	2 584	2 391	2 440	2 258	2 065	1 754	1 599	1 442	1 877	1 715	1 546
AQUA PLASMA 15/40	4 127	3 871	3 582	3 654	3 383	3 093	2 628	2 395	2 160	2 811	2 568	2 316

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

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). A detailed description of the calculations is available at http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx.

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Datasheet version: 4.06, 2014-01-15

ScenoCalc version: Ver. 4.06 (Jan, 2014)