

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S612 F			
						Issued		2015-03-17			
Company holding the		Aquasol Solartechnik GmbH				Country		Germany			
Brand (optional)						Website		http://www.aquasol-solartechnik.de			
Street, street number		Dr.-Carl-Schwenk-Str. 20				E-mail		info@aquasol.de			
Postal Code / City, province		89233 Neu-Ulm				Tel/Fax		+49 (0) 731-880070-0 / 880070-48			
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Flat plate collector - glazed					
Thermal / photo voltaic hybrid collector? (PVT collector)						No					
Integration in the roof possible ? (manufacturers declaration)						Yes					
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	
AS7.2	6,60	2.380	3.000	120	7,14	5.071	4.835	4.341	3.816	3.262	
AS9.6	8,60	2.380	3.992	120	9,50	6.605	6.297	5.651	4.964	4.235	
AS12g	11,20	2.380	4.982	120	11,86	8.602	8.201	7.360	6.465	5.516	
AS14g	13,00	2.380	5.972	120	14,21	9.984	9.519	8.543	7.504	6.402	
AS17	15,40	2.380	6.962	120	16,57	11.827	11.276	10.120	8.889	7.584	
AS19	17,50	2.380	7.954	120	18,93	13.440	12.814	11.500	10.101	8.618	
AS8	7,50	1.980	3.992	120	7,90	5.760	5.492	4.928	4.329	3.694	
AS10	9,30	1.980	4.982	120	9,86	7.142	6.810	6.111	5.368	4.580	
AS12	11,20	1.980	5.972	120	11,82	8.602	8.201	7.360	6.465	5.516	
AS14	12,90	1.980	6.962	120	13,78	9.907	9.446	8.477	7.446	6.353	
AS16	14,50	1.980	7.954	120	15,75	11.136	10.617	9.528	8.369	7.141	
AS7.5	6,80	1.510	4.982	120	7,52	5.222	4.979	4.468	3.925	3.349	
AS9	8,20	1.510	5.972	120	9,02	6.298	6.004	5.388	4.733	4.038	
AS10.5	9,60	1.510	6.962	120	10,51	7.373	7.030	6.308	5.541	4.728	
AS12m	10,90	1.510	7.954	120	12,01	8.371	7.981	7.163	6.291	5.368	
Performance test method						Glazed liquid heating collector - steady state - outdoor					
Performance parameters related to aperture area		η_0	a1	a2							
Units		-	W/(m ² K)	W/(m ² K ²)							
Test results - Flow rate and fluid see note 1		0,768	3,516	0,006							
Bi-directional incidence angle modifiers?		No									
		<i>Kθ values are obligatory for 50°.</i>									
Incidence angle modifiers Kθ(θ)		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
		K θ (θ)	1,00	1,00	1,00	0,99	0,97	0,92	0,81	0,56	0,00
Incidence angle modifier not bi-directional - leave fields blank											
Stagnation temperature - Weather conditions see note 2						Tstg	212	°C			
Effective thermal capacity						ceff = C/Ag	5,64	kJ/(m ² K)			
Max. intended operation temperature - see note 3						Tmax,op	130	°C			
Max. operation pressure - see note 3						pmax,op	600	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 m ²)										
Pressure drop, ΔP	Pa										
Testing Laboratory		Fraunhofer TestLab Solar Thermal Systems									
Website		www.collectortest.com									
Test report id. number		ktb-2014-20-k				Date of test report		2014.11.11			
During the test GDIF/GTOT was always between		0,1	and	0,2							
Comments of testing laboratory:											
The aperture area of the tested collector AS7.2 was determined by the testing laboratory. All other size and area specifications are given by the manufacturer.											
Note 1	Flow rate	0,020	kg/(s m ²)	Fluid	Water						
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature, Ta=30 °C										
Note 3	Given by manufacturer										
						TestLab Solar Thermal Systems Heidenhofstraße D-79110 Badenweiler Version: 4.06, 2014-01-15 Tel: +49 (0)761 4588 5354					
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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S612 F
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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			
AS7.2	8.275	6.091	4.270	6.374	4.618	3.179	4.670	3.191	2.101	5.077	3.458	2.239			
AS9.6	10.777	7.934	5.561	8.302	6.015	4.141	6.082	4.155	2.736	6.612	4.503	2.916			
AS12g	14.036	10.332	7.242	10.811	7.833	5.392	7.920	5.412	3.563	8.611	5.865	3.798			
AS14g	16.291	11.993	8.406	12.549	9.092	6.259	9.193	6.282	4.136	9.995	6.807	4.409			
AS17	19.299	14.207	9.958	14.866	10.771	7.414	10.891	7.441	4.899	11.840	8.064	5.222			
AS19	21.931	16.144	11.316	16.893	12.240	8.426	12.376	8.456	5.567	13.454	9.164	5.935			
AS8	9.399	6.919	4.850	7.240	5.246	3.611	5.304	3.624	2.386	5.766	3.927	2.543			
AS10	11.655	8.580	6.014	8.977	6.505	4.478	6.577	4.494	2.959	7.150	4.870	3.154			
AS12	14.036	10.332	7.242	10.811	7.833	5.392	7.920	5.412	3.563	8.611	5.865	3.798			
AS14	16.166	11.901	8.341	12.452	9.022	6.211	9.123	6.233	4.104	9.918	6.755	4.375			
AS16	18.171	13.377	9.376	13.997	10.141	6.981	10.254	7.006	4.613	11.148	7.593	4.917			
AS7.5	8.522	6.273	4.397	6.564	4.756	3.274	4.809	3.286	2.163	5.228	3.561	2.306			
AS9	10.276	7.565	5.302	7.915	5.735	3.948	5.799	3.962	2.609	6.304	4.294	2.781			
AS10.5	12.030	8.856	6.207	9.267	6.714	4.622	6.789	4.639	3.054	7.381	5.027	3.256			
AS12m	13.660	10.056	7.048	10.522	7.624	5.248	7.708	5.267	3.468	8.380	5.708	3.696			

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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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

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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	ScenoCalc version: Ver. 4.06 (Jan, 2014)