



Summary of		EN12976-2	SOLAR SYSTEM test results		Licence Number		011-752700 A											
Annex to Solar KEYMARK Certificate					Issued		2016-09-20											
Company		SUNERG SOLAR S.R.L.			Country		Italy											
Brand (optional)		SUNERG			Website		www.sunergsolar.com											
Street		Via Donini, 51			E-mail		info@sunergsolar.com											
Postal Code		06012	Città di Castello (PG)		Tel. / Fax		+39 (0)75-8540018 / 8648105											
System classification																		
Application(s)					Hot water													
Solar loop, circulation principle					Thermosyphon													
Direct solar loop / heat exchanger					Direct													
Open, vented or closed solar loop					Closed													
Drain back/down					Always filled (no drain)													
Store location					Outdoor													
Store orientation (of main axis)					Horizontal													
Type of auxiliary heating (internal back-up heat)					None													
If other auxiliary/internal back-up heating, please specify:																		
Solar+supplementary OR Solar-only / Solar pre-heat					Solar only / Solar preheat													
Collector(s)					Heat store(s)													
Company		SUNERG SOLAR S.R.L.			Company		SUNERG SOLAR S.R.L.											
Keymark lic.no. if available		NA			Keymark lic.no. if available		NA											
Collector name		Per module			Store name		Total nominal volume		Gross height		Gross width		Gross depth		Auxiliary heated volume		Electrical aux. heating power	
		Gross Area (Ag)	Gross length	Gross width														
A9H8		1.74	1.80	0.83	HV100	97	1080	460	460	-	-	-	-	-	-	-	-	
A9H12		2.59	1.80	1.27	HV150	144	1520	460	460	-	-	-	-	-	-	-	-	
A9H15		3.22	1.80	1.60	HV200	180	1850	460	460	-	-	-	-	-	-	-	-	
A9H20		4.28	1.80	2.15	HV300	239	2400	460	460	-	-	-	-	-	-	-	-	
Solar loop controller					Solar loop fluid													
Keymark lic.no. if available		NA			Recommended/required		Recommended											
Company		NA			Company		NA											
Name		NA			Name		NA											
Solar loop pump - power range		- W to - W			Freezing point		-40 °C											
System family overview																		
Number of collectors in each configuration for each store																		
Collector name		Store name																
		HV100				HV150				HV200				HV300				
A9H8		1																
A9H12						1												
A9H15										1								
A9H20														1				
Testing Laboratory					TUV Rheinland (Shanghai) Co., Ltd													
Website					www.tuv.com													
Test report id. number					154196258_EN_SUNERG_System_Report_HV150_zhao; 154196258_EN_SUNERG_System_Report_HV300_zhao													
Date of test report					2016-09-18													
Comments of test lab																		
Performance results are based on HV150 system.																		



Summary of		EN12976-2	test results		Certification No.		011-7S2700 A						
Annex to Solar KEYMARK Certificate					Issued		2016-09-20						
Company	SUNERG SOLAR S.R.L.				Country	Italy							
Brand (optional)	SUNERG				Website	www.sunergsolar.com							
Street	Via Donini, 51				E-mail	info@sunergsolar.com							
Postal Code	6012	Città di Castello (PG)		Tel. / Fax	+39	(0)75-8540018 / 8648105							
System family overview													
For each storage and collector size, give number of collectors													
Collector name	HV100		HV150		HV200		HV300						
A9H8	1												
A9H12			1										
A9H15					1								
A9H20							1						
Name of system configuration					HV100								
Collector name	A9H8		No. Collectors		1		Storage name		HV100				
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 80 l				Daily drawoff 110 l				Daily drawoff 140 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	4478	2100	-	47.1	6150	2378	-	38.7	7821	2469	-	31.6
Würzburg DE	-	4289	2163	-	50.5	5897	2501	-	42.5	7506	2602	-	34.7
Davos CH	-	4857	3065	-	63.3	6654	3406	-	50.9	8483	3500	-	41.2
Athens GR	-	3343	2649	-	79.6	4573	3217	-	70.2	5834	3564	-	61.2
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f_{sol}=QL/Qd	-	Solar fraction											
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	Ta,ave	7.5	9.0	3.2	18.5								
	Tc,ave	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m²	Annual irradiation South, 45°											
Ta,ave	°C	Annual average outdoor air temperature											
Tc,ave	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		600 kPa		Max. operating press. - tank side		600 kPa							
Testing Laboratory		TUV Rheinland (Shanghai) Co., Ltd											
Website		www.tuv.com											
Test report id. number		154196258_EN_SUNERG_System_Report_HV150_zhao; 154196258_EN_SUNERG_System_Report_HV300_zhao											
Date of test report		2016-09-18											
Test method		ISO 9459-5 (DST)											
Comments of test lab													
No comments													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 3.6, 2014-06-18



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Street	Via Donini, 51				E-mail	info@sunergsolar.com							
Postal Code	6012	Città di Castello (PG)		Tel. / Fax	+39 (0)75-8540018 / 8648105								
System family overview													
For each storage and collector size, give number of collectors													
Collector name	HV100		HV150		HV200		HV300						
A9H8	1												
A9H12			1										
A9H15					1								
A9H20							1						
Name of system configuration					HV150								
Collector name	A9H12		No. Collectors		1		Storage name		HV150				
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 80 l				Daily drawoff 110 l				Daily drawoff 140 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	4478	2769	-	62.0	6150	-	-	7821	4068	-	52.1	
Würzburg DE	-	4289	2794	-	65.3	5897	3564	-	60.7	7506	-	-	
Davos CH	-	4857	4163	-	86.2	6654	5298	-	79.6	8483	-	-	
Athens GR	-	3343	3132	-	94.2	4573	-	-	5834	4951	-	85.1	
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f _{sol} =Q _L /Q _d	-	Solar fraction											
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	T _{a,ave}	7.5	9.0	3.2	18.5								
	T _{c,ave}	8.5	10.0	5.4	17.8								
	± ΔT _c	6.4	3.0	0.8	7.4								
G	kWh/m ²	Annual irradiation South, 45°											
T _{a,ave}	°C	Annual average outdoor air temperature											
T _{c,ave}	°C	Annual average mains cold water temp.											
ΔT _c	K	Seasonal variation of T _c											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		600 kPa		Max. operating press. - tank side		600 kPa							
Testing Laboratory		TUV Rheinland (Shanghai) Co., Ltd											
Website		www.tuv.com											
Test report id. number		154196258_EN_SUNERG_System_Report_HV150_zhao; 154196258_EN_SUNERG_System_Report_HV300_zhao											
Date of test report		2016-09-18											
Test method		ISO 9459-5 (DST)											
Comments of test lab		No comments											



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Brand (optional)		SUNERG				Website		www.sunergsolar.com					
Street		Via Donini, 51				E-mail		info@sunergsolar.com					
Postal Code		6012		Città di Castello (PG)		Tel. / Fax		+39 (0)75-8540018 / 8648105					
System family overview													
For each storage and collector size, give number of collectors													
Collector name	HV100		HV150		HV200		HV300						
A9H8	1												
A9H12			1										
A9H15					1								
A9H20							1						
Name of system configuration						HV200							
Collector name		A9H15		No. Collectors		1		Storage name		HV200			
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 110 				Daily drawoff 140 				Daily drawoff 170 			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	6150	3343	-	54.4	7821	3879	-	49.6	9492	4257	-	44.8
Würzburg DE	-	5897	3374	-	57.5	7506	4005	-	53.4	9114	4447	-	49.0
Davos CH	-	6654	4983	-	74.7	8483	5771	-	67.9	10281	6244	-	60.8
Athens GR	-	4573	4005	-	87.7	5834	4825	-	82.8	7064	5487	-	77.6
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f_{sol}=QL/Qd	-	Solar fraction											
Ref. conditions													
		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1 157	1 230	1 684	1 736								
	T _{a,ave}	7.5	9.0	3.2	18.5								
	T _{c,ave}	8.5	10.0	5.4	17.8								
	± ΔT _c	6.4	3.0	0.8	7.4								
G	kWh/m²	Annual irradiation South, 45°											
T_{a,ave}	°C	Annual average outdoor air temperature											
T_{c,ave}	°C	Annual average mains cold water temp.											
ΔT_c	K	Seasonal variation of T_c											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		600		kPa		Max. operating press. - tank side		600		kPa			
Testing Laboratory						TUV Rheinland (Shanghai) Co., Ltd							
Website						www.tuv.com							
Test report id. number						154196258_EN_SUNERG_System_Report_HV150_zhao; 154196258_EN_SUNERG_System_Report_HV300_zhao							
Date of test report						2016-09-18							
Test method						ISO 9459-5 (DST)							
Comments of test lab													
No comments													



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Brand (optional)	SUNERG				Website	www.sunergsolar.com							
Street	Via Donini, 51				E-mail	info@sunergsolar.com							
Postal Code	6012	Città di Castello (PG)		Tel. / Fax	+39 (0)75-8540018 / 8648105								
System family overview													
For each storage and collector size, give number of collectors													
Collector name	HV100		HV150		HV200		HV300						
A9H8	1												
A9H12			1										
A9H15					1								
A9H20							1						
Name of system configuration						HV300							
Collector name	A9H20		No. Collectors		1		Storage name		HV300				
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh	Daily drawoff 140 l				Daily drawoff 170 l				Daily drawoff 200 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	7821	4257	-	54.6	9492	4857	-	51.1	11164	5330	-	47.7
Würzburg DE	-	7506	4320	-	57.8	9114	4983	-	54.9	10691	5550	-	51.7
Davos CH	-	8483	6402	-	75.3	10281	7253	-	70.3	12110	7884	-	65.2
Athens GR	-	5834	5140	-	88.2	7064	5992	-	84.6	8326	6717	-	80.9
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f _{sol} =Q _L /Q _d	-	Solar fraction											
Ref. conditions			Stockholm SE	Würzburg DE	Davos CH	Athens GR							
		G	1 157	1 230	1 684	1 736							
		T _{a,ave}	7.5	9.0	3.2	18.5							
		T _{c,ave}	8.5	10.0	5.4	17.8							
		± ΔT _c	6.4	3.0	0.8	7.4							
G	kWh/m ²	Annual irradiation South, 45°											
T _{a,ave}	°C	Annual average outdoor air temperature											
T _{c,ave}	°C	Annual average mains cold water temp.											
ΔT _c	K	Seasonal variation of T_c											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side			600	kPa	Max. operating press. - tank side			600	kPa				
Testing Laboratory					TUV Rheinland (Shanghai) Co., Ltd								
Website					www.tuv.com								
Test report id. number					154196258_EN_SUNERG_System_Report_HV150_zhao; 154196258_EN_SUNERG_System_Report_HV300_zhao								
Date of test report					2016-09-18								
Test method					ISO 9459-5 (DST)								
Comments of test lab													
No comments													

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