



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration No.	SKM 9916/1
	Registernummer	
	Num. d'enregistrement	
	Date / Datum / Date	10/2/2012

Company / Firma / Société	HELIOAKMI S.A.	Country/Land/Pays	Greece
Street / Straße / Rue	Thesi Nea Zoi - Aspropyrgos, Attiki	Website	www.helioakmi.com
Postal Code, Place / PLZ, Ort / Code postal, Place	19300 Aspropyrgos, Attiki	E-mail	megasun@helioakmi.com
		Tel. / Fax	+030 210 5595625 / 210 55957

System classification / G / F	
Flow principle / G / F	Forced / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Closed / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Indoor / G / F
Storage position / G / F	Vertical / G / F
Int. back-up / G / F	None / G / F
If other: / G / F	English / Deutsch / Francais
EN12976 type / G / F	Solar only / G / F

Collector(s) / Kollektor(en) / Capteur(s)					Storage(s) / Akkumulator(en) / F					
Company / Hersteller / Manufactuer HELIOAKMI S.A.					Company / Hersteller / Manufactuer HELIOAKMI S.A.					
Keymark reg. no. (optional) PSK - 073/2009										
Model Bezeichnung Modèle	Per module / G / F				No. modules G F	Model Bezeichnung Modèle	Total volume G F litres	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout Höhe (Außenmaß) Höhe (Außenmaß) epaisseur hors tout	Back-up heated volume G F litres	El. back-up power G F kW
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout	min - max						
ST 2000	1.8	2.049	1.01	1 - 1		200 BL2	195	603	1400	~
ST 2500	2.35	2.049	1.273	1 - 1		300 BL2	275	603	1930	~
						500 BL2	495	730	1970	~

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur	xxxxxxxxxxxxxxxx	Company/Hersteller/Manufacteur	
Model / Bezeichnung / Modèle	xxxxxxxxxxxxxxxx	Model / Bezeichnung / Modèle	Propylene glycol solution
Functions	English Deutsch Francais	Freezing point	-7 to -34 °C

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	200 BL2	300 BL2	500 BL2	0	0	
ST 2000 Selective	2		3			
ST 2500 Selective		2				
0						
0						
0						

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	6002DE2, 6003DE2, 6004DE2, 6044DE1, 6045DE1
Date of test report / Datum G / date F	16/06/2008, 3/11/2011

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English	
Deutsch Francais	

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Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	HELIOAKMI S.A. Thesi Nea Zoi - Aspropyrgos, Attiki 19300 Aspropyrgos, Attiki	Country/Land/Pays Website E-mail Tel. / Fax	Greece www.helioakmi.com megasun@helioakmi.com +99 210 5595625 / 210 55957
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System family overview / G / F	
Collector type	Number of collectors / G / F
	Storage type / G / F
G	
F	
	200 BL2 300 BL2 500 BL2
ST 2000 Selective	2 3
ST 2500 Selective	2

Name of system konfiguration / G / F Collector type: ST 2000 Selective No. collectors: 2 Storage type: 200 BL2		200 BL2 X 4.20 m ²
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Calculated annual results / G / F	
Location	Daily draw-off litres/day / G / F /
	170 200 250 170 200 250 170 200 250 170 200 250
G	l/d l/d l/d l/d l/d l/d l/d l/d l/d l/d l/d l/d
F	
	Q _d kWh/y Q _L kWh/y f _{sol} % Q _{par} kWh/y
Stockholm, SE	2,630 3,094 3,867 1,426 1,593 1,817 54.2 51.5 47.0
Würzburg, DE	2,521 2,966 3,708 1,523 1,696 1,908 60.4 57.2 51.4
Davos, CH	2,853 3,357 4,196 2,142 2,380 2,673 75.1 70.9 63.7
Athens, GR	1,960 2,306 2,882 1,574 1,797 2,133 80.3 77.9 74.0


Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	Q _L /Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions G G F		Stockholm	Würzburg DE	Davos CH	Athens GR
	G	1,156	1,226	1,682	1,717
	T _a	7.5	9.0	3.2	18.5
	T _c	8.5	10.0	5.4	17.8
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2

G	kWh/m ²	Annual irradiation South, 45° / G / F
T _a	°C	Annual mean air temp. / G / F
T _c	°C	Annual mean cold water temp. / G / F
ΔT _c	°C	Seasonal variation of T _c / G / F
T _h	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F	700 kPa	Max. operating press. - tank side G F	600 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	Demokritos www.solar.demokritos.gr 6002DE2, 6003DE2, 6004DE2, 6044DE1, 6045DE1 16/06/2008, 3/11/2011 ISO 9459-2 (CSTG)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece 
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System family overview / G / F									
Collector type	Number of collectors / G / F								
	200 BL2			300 BL2			500 BL2		
G									
F									
ST 2000 Selective	2						3		
ST 2500 Selective			2						

Name of system configuration / G / F				300 BL2 X 5.20 m ²			
Collector type G F	ST 2500 Selective	No. collectors G F	2	Storage type G F	300 BL2		

Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F /											
	250	300	400	250	300	400	250	300	400	250	300	400
G	l/d											
F	l/d											
	Qd kWh/y			QL kWh/y			fsol %			Qpar kWh/y		
Stockholm, SE	3,867	4,641	6,188	1,928	2,273	2,585	49.8	49.0	41.8			
Würzburg, DE	3,708	4,450	5,933	2,036	2,399	2,697	54.9	53.9	45.5			
Davos, CH	4,196	5,035	6,713	2,842	3,333	3,680	67.7	66.2	54.8			
Athens, GR	2,882	3,458	4,611	2,200	2,629	3,170	76.3	76.0	68.7			

Perf. indicators G F	Q _d	Heat demand / G / F										
	Q _L	System output / G / F										
	f _{sol}	QL/Q_d; solar fraction / G / F										
	Q _{par}	Elec. for pumps/controllers / G / F										

Ref. conditions G F		Stockholm	Würzburg DE	Davos CH	Athens GR			
	G	1,156	1,226	1,682	1,717			
	Ta	7.5	9.0	3.2	18.5			
	Tc	8.5	10.0	5.4	17.8			
	ΔTc	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2			

G	kWh/m ²	Annual irradiation South, 45° / G / F										
Ta	°C	Annual mean air temp. / G / F										
Tc	°C	Annual mean cold water temp. / G / F										
ΔTc	°C	Seasonal variation of Tc / G / F										
Th	45°C	Desired (mix. valve) temp. / G / F										

Max. operating press. - collector side G F	700 kPa	Max. operating press. - tank side G F	600 kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	Demokritos
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	6002DE2, 6003DE2, 6004DE2, 6044DE1, 6045DE1
Date of test report / G / F	16/06/2008, 3/11/2011
Test method / G / F	ISO 9459-2 (CSTG)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544509 153 10 Ag. Paraskevi - Attiki - Greece Stamp
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System family overview / G / F												
Collector type	Number of collectors / G / F											
	Storage type / G / F											
G												
F	200 BL2			300 BL2			500 BL2					
ST 2000 Selective	2						3					
ST 2500 Selective			2									

Name of system configuration / G / F											500 BL2 X 6.30 m ²
Collector type	ST 2000 Selective			No. collectors	3			Storage type	500 BL2		
G				G				G			
F				F				F			

Calculated annual results / G / F																		
Location	Daily draw-off litres/day / G / F /																	
	300			400			600			300			400			600		
G	l/d			l/d			l/d			l/d			l/d			l/d		
F	Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y								
Stockholm, SE	4,641	6,188	9,281	2,212	2,746	3,313	47.7	44.4	35.7									
Würzburg, DE	4,450	5,933	8,899	2,334	2,878	3,460	52.5	48.5	38.9									
Davos, CH	5,035	6,713	10,070	3,299	4,013	4,695	65.5	59.8	46.6									
Athens, GR	3,458	4,611	6,916	2,518	3,240	4,317	72.8	70.3	62.4									

Perf. indicators	Q _d	Heat demand / G / F										
	Q _L	System output / G / F										
	f _{sol}	QL/Q _d ; solar fraction / G / F										
	Q _{par}	Elec. for pumps/controllers / G / F										

Ref. conditions	Stockholm SE					Würzburg DE					Davos CH					Athens GR					
	G	1,156					1,226					1,682					1,717				
G	T _a	7.5					9.0					3.2					18.5				
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G	kWh/m ²	Annual irradiation South, 45° / G / F																			
T _a	°C	Annual mean air temp. / G / F																			
T _c	°C	Annual mean cold water temp. / G / F																			
ΔT _c	°C	Seasonal variation of T _c / G / F																			
Th	45°C	Desired (mix. valve) temp. / G / F																			

Max. operating press. - collector side				Max. operating press. - tank side			
G	700 kPa			G	600 kPa		
F				F			

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