



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. Registernummer Num. d'enregistrement SKM 9944
	Date / Datum / Date 12/4/2013

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	193 00 Aspropyrgos, Attiki	E-mail	megasun@helioakmi.com
		Tel. / Fax	+030 210 5595625 / 210 55957

System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Open / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Int. collector-storage / G / F
Storage position / G / F	Vertical / G / F
Int. back-up / G / F	Electric / 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) SKM 9944										
Model Bezeichnung Modèle	Per module / G / F				Model Bezeichnung Modèle	Total volume G F	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout	Höhe (Außenmaß) Höhe (Außenmaß) epaisseur hors tout	Back-up heated volume G F	El. back-up power G F
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout	No. modules G F						
COMPACT	0.95	1.21	0.89	1 - 1	COMPACT 125	96	350	970	~	4
COMPACT	1.64	2.03	0.89	1 - 1	COMPACT 160	148	325	1890	~	4
COMPACT	1.63	2.03	0.89	1 - 1	COMPACT 200	174	350	1890	~	4

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur	none	Company/Hersteller/Manufacteur	none
Model / Bezeichnung / Modèle	none	Model / Bezeichnung / Modèle	none
Functions G F	English Deutsch Francais	Freezing point G F	0 °C

System family overview / G / F					
Collector G F	No. collectors / G / F				
	Storage / G / F				
	COMPACT 125AK	COMPACT 160AK	COMPACT 200AK	0	0
COMPACT	1				
COMPACT		1			
COMPACT			1		
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	6056DE1, 6057DE1, 6058DE1
Date of test report / Datum G / date F	5/4/2013

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	<p>English</p> <p>Deutsch</p> <p>Francais</p>
<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544597 153 10 Ag. Paraskevi - Attiki - Greece</p> <p>Stamp & Signature</p>	

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Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK					Num. d'enregistrement						
					Date / Datum / Date		12/4/2013				
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			193 00	Aspropyrgos, Attiki		E-mail			megasun@helioakmi		
						Tel. / Fax		+99 210 5595625 / 210 55957			
System family overview / G / F											
Collector type		Number of collectors / G / F									
G		Storage type / G / F									
F		COMPACT 125AK		COMPACT 160AK		COMPACT 200AK					
COMPACT		1									
COMPACT			1								
COMPACT					1						
Name of system konfiguration / G / F								COMPACT 125 AK			
Collector type		COMPACT		No. collectors		1		Storage type			
G				G				COMPACT 125AK			
F				F				F			
Calculated annual results / G / F											
Location		Daily draw-off litres/day / G / F /									
G		80	110	140	80	110	140	80	110	140	
F		l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	
		Qd kWh/y			QL kWh/y			fsol %		Qpar kWh/y	
Stockholm, SE		1238	1702	2166	381	398	408	31	23	19	
Würzburg, DE		1187	1632	2077	407	424	435	34	26	21	
Davos, CH		1343	1846	2349	534	556	570	40	30	24	
Athens, GR		922	1268	1614	554	624	640	60	49	40	
Perf. indicators		Heat demand / G / F									
G		Qd									
F		QL	System output / G / F								
		fsol	QL/Qd; solar fraction / G / F								
		Qpar	Elec. for pumps/controllers / G / F								
Ref. conditions		Stockholm SE		Würzburg DE		Davos CH		Athens GR			
G		1,157		1,230		1,684		1,718			
F		Ta		7.5		9.0		3.2		18.5	
		Tc		8.5		10.0		5.4		17.8	
		ΔTc		6.4		3.0		0.8		7.4	
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				kPa		Max. operating press. - tank side				700 kPa	
G						G					
F						F					
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS I					
Website						www.solar.demokritos.gr					
Test report id. number / Prüberichtsnummer / F						6056DE1, 6057DE1, 6058DE1					
Date of test report / G / F						5/4/2013					
Test method / G / F						ISO 9459-2 (CSTG)					
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire											
English Deutsch Francais						<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544597 153 10 Ag. Paraskevi - Attiki - Greece</p>					



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Postal Code, Place / PLZ, Ort / Code postal, Place			193 00 Aspropyrgos, Attiki		E-mail		megasun@helioakmi.com						
					Tel. / Fax		+99 210 5595625 / 210 55957						
System family overview / G / F													
Collector type		Number of collectors / G / F											
G		Storage type / G / F											
F													
		COMPACT 125AK	COMPACT 160AK	COMPACT 200AK									
COMPACT		1											
COMPACT			1										
COMPACT				1									
Name of system konfiguration / G / F							COMPACT 160AK						
Collector type		COMPACT		No. collectors		1		Storage type					
G				G				COMPACT 160AK					
F				F				F					
Calculated annual results / G / F													
Location		Daily draw-off litres/day / G / F /											
G		140	170	200	140	170	200	140	170	200	140	170	200
F		l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
		Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE		2166	2630	3094	704	718	727	33	27	24			
Würzburg, DE		2077	2522	2967	744	758	768	36	30	26			
Davos, CH		2349	2853	3357	959	976	988	41	34	29			
Athens, GR		1614	1960	2306	987	1066	1094	61	54	47			
Perf. indicators													
G		Q _d	Heat demand / G / F										
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		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
F		G	1,157	1,230	1,684	1,718							
		T _a	7.5	9.0	3.2	18.5							
		T _c	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° / 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					kPa		Max. operating press. - tank side			700		kPa	
G							G						
F							F						
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais					NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS								
Website					www.solar.demokritos.gr								
Test report id. number / Prüberichtsnummer / F					6056DE1, 6057DE1, 6058DE1								
Date of test report / G / F					5/4/2013								
Test method / G / F					ISO 9459-2 (CSTG)								
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire													
English Deutsch Francais					 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503915 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece								



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System family overview / G / F						
Collector type G F	Number of collectors / G / F					
	Storage type / G / F					
	COMPACT 125AK	COMPACT 160AK	COMPACT 200AK			
COMPACT	1					
COMPACT		1				
COMPACT			1			

Name of system configuration / G / F COMPACT 200AK			
Collector type G F	COMPACT	No. collectors G F	1
Storage type G F		COMPACT 200AK	

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	170 l/d	200 l/d	250 l/d	170 l/d	200 l/d	250 l/d	170 l/d	200 l/d	250 l/d	170 l/d	200 l/d	250 l/d
	Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	2630	3094	3867	735	741	753	28	24	19			
Würzburg, DE	2522	2967	3708	783	790	802	31	27	22			
Davos, CH	2853	3357	4196	1028	1038	1054	36	31	25			
Athens, GR	1960	2306	2882	1113	1161	1184	57	50	41			

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

Ref. conditions G F	Stockholm SE Würzburg DE Davos CH Athens GR				
	G	1,157	1,230	1,684	1,718
T _a	7.5	9.0	3.2	18.5	
T _c	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° / 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 G F		kPa	Max. operating press. - tank side G F	700	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	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS www.solar.demokritos.gr 6056DE1, 6057DE1, 6058DE1 5/4/2013 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 Belessiotis Tel: +210 6503819 - Fax: +210 6544529 153 10 Ag. Paraskevi - Attiki - Greece Stamp
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