



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	Registration No. Registernummer Num. d'enregistrement SKM 9921/3
	Date / Datum / Date 28/1/2013

Company / Firma / Société COSMOSOLAR LTD	Country/Land/Pays Greece
Street / Straße / Rue Ntrei Road, Dervenochorion Gate	Website http://www.cosmosol
Postal Code, Place / PLZ, Ort / Code postal, Place 322 00 Viotia	E-mail info@cosmosolar.co
Tel. / Fax +030 210 3478897 / 210 34794	

System classification / G / F	
Flow principle / G / F	Thermosyphon / 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	Outdoor / G / F
Storage position / G / F	Horizontal / 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 COSMOSOLAR LTD Keymark reg. no. (optional) SKM 9921/1					Company / Hersteller / Manufactuer COSMOSOLAR LTD								
Model Bezeichnung Modèle	Per module / G / F			No. modules G F		Model Bezeichnung Modèle	Total volume		Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout	Gross length Länge (Außenmaß) longueur hors tout	Back-up heated volume		El. back-up power G F
	Aperture area (A _a) Aperturfäche (A _a) Superficie d'entrée (A _a)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout				G	F			litres	mm	
MNE 16	1,302	1519	1019	1	-	1	120L	107	530	1120	~	~	~
MNE 04	1,613	1517	1247	1	-	1	160L	149	530	1320	~	~	~
MNE 20	1,768	2017	1017	1	-	1	200L	186	580	1320	~	~	~
MNE 01	1,995	1917	1197	1	-	1	250L	245	580	2120	~	~	~
MNE 03	2,266	2022	1278	1	-	1	300L	290	580	2120	~	~	~

Controller / G / F			Fluid / G / F		
Company/Hersteller/Manufacteur COSMOSOLAR LTD Model / Bezeichnung / Modèle MNE			Company/Hersteller/Manufacteur Model / Bezeichnung / Modèle Propylene glycol solution		
Functions G English F Deutsch F Francais			Freezing point G -4 to - F 36 °C		

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	120L	160L	200L	250L	300L	
MNE 16		2	2			
MNE 04	1					
MNE 20	1		2	2	2	
MNE 01		1	1	2	2	
MNE 03		1	1			

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / Datum G / date F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6040 DE2, 6042 DE2 6/9/2011
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Francais	Stamp & signature of test lab
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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120L			160L			200L			250L			300L					
MNE 16				2			2											
MNE 04	1																	
MNE 20		1						2		2						2		
MNE 01					1				1		2						2	
MNE 03						1			1									

Name of system konfiguration / G / F												GLK 120/1.89			
Collector type G F	MNE 04			No. collectors G F			1			Storage type G F			120L		

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	80	110	140	80	110	140	80	110	140	80	110	140
	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	1.244	1.708	2.172	552	646	683	44,4	37,8	31,5			
Würzburg, DE	1.191	1.638	2.085	555	654	694	46,5	39,9	33,3			
Davos, CH	1.349	1.848	2.356	749	865	911	55,5	46,8	38,7			
Athens, GR	929	1.270	1.621	724	894	972	77,9	70,3	60,0			

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 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	200	kPa	Max. operating press. - tank side G F	1.000	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	Demokritos
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	6040 DE2, 6042 DE2
Date of test report / G / F	6/9/2011
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	Stamp & signature of test lab
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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	Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	SKM 9921/3 28/1/2013
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System family overview / G / F																		
Collector type G F	Number of collectors / G / F																	
	Storage type / G / F																	
	120L			160L			200L			250L			300L					
MNE 16				2			2											
MNE 04	1																	
MNE 20		1					2			2			2					
MNE 01				1				1			2					2		
MNE 03					1				1									

Name of system konfiguration / G / F												GLK 120/2.05
Collector type G F	MNE 20	No. collectors G F	1	Storage type G F	120L							

Calculated annual results / G / F													
Location G F	Daily draw-off litres/day / G / F /												
	80	110	140	80	110	140	80	110	140	80	110	140	
	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	1.244	1.708	2.172	576	678	717	46,3	39,7	33,0				
Würzburg, DE	1.191	1.638	2.085	576	686	730	48,3	41,9	35,0				
Davos, CH	1.349	1.848	2.356	788	911	964	58,4	49,3	40,9				
Athens, GR	929	1.270	1.621	743	929	1.016	80,0	73,1	62,7				
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 F	Stockholm					Würzburg DE					Davos CH					Athens GR				
	G	Ta	Tc	ΔTc	Th	G	Ta	Tc	ΔTc	Th	G	Ta	Tc	ΔTc	Th	G	Ta	Tc	ΔTc	Th
	1.156	7,5	8,5	2.1 - 14.9	45°C	1.226	9,0	10,0	7.0 - 13.0	45°C	1.682	3,2	5,4	4.6 - 6.2	45°C	1.717	18,5	17,8	10.4 - 25.2	45°C
G	Annual irradiation South, 45° / G / F																			
Ta	Annual mean air temp. / G / F																			
Tc	Annual mean cold water temp. / G / F																			
ΔTc	Seasonal variation of Tc / G / F																			
Th	Desired (mix. valve) temp. / G / F																			

Max. operating press. - collector side G F	200	kPa	Max. operating press. - tank side G F	1.000	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	Demokritos
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	6040 DE2, 6042 DE2
Date of test report / G / F	6/9/2011
Test method / G / F	ISO 9459-5 (DST)

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



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Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat		Registernummer	SKM 9921/3															
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar		Num. d'enregistrement																
		Date / Datum / Date	28/1/2013															
Company / Firma / Société		Country/Land/Pays	Greece															
COSMOSOLAR LTD		Website	http://www.cosmosol															
Street / Straße / Rue		E-mail																
Ntrei Road, Dervenochorion Gate		info@cosmosolar.co																
Postal Code, Place / PLZ, Ort / Code postal, Place		Tel. / Fax	+99 210 3478897 / 210 34794															
322 00 Viotia																		
System family overview / G / F																		
Collector type	Number of collectors / G / F																	
	Storage type / G / F																	
G																		
F																		
	120L			160L			200L			250L			300L					
MNE 16				2			2											
MNE 04	1																	
MNE 20		1					2			2			2					
MNE 01			1			1			2			2		2				
MNE 03					1			1										
Name of system konfiguration / G / F				GLK 160/2.30														
Collector type		No. collectors		Storage type														
G	MNE 01	G	1	160L														
F		F																
Calculated annual results / G / F																		
Daily draw-off litres/day / G / F /																		
Location	110			140			170			110			140			170		
	G	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	1.708	2.172	2.637	731	823	894	42,8	37,9	33,9									
Würzburg, DE	1.638	2.085	2.532	735	831	902	44,9	39,9	35,6									
Davos, CH	1.848	2.356	2.856	981	1.095	1.183	53,1	46,5	41,4									
Athens, GR	1.270	1.621	1.962	972	1.139	1.261	76,6	70,3	64,3									
Perf. indicators		Heat demand / G / F																
G	Q _d																	
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	G	1.156	1.226	1.682	1.717													
F	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		200 kPa				Max. operating press. - tank side												
G						1.000 kPa												
F																		
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais		Demokritos																
Website		www.solar.demokritos.gr																
Test report id. number / Prüberichtnummer / F		6040 DE2, 6042 DE2																
Date of test report / G / F		6/9/2011																
Test method / G / F		ISO 9459-5 (DST)																
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire																		
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3																						
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer																								
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen																								
				Date / Datum / Date		28/1/2013																						
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece																						
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosol																						
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.co																						
				Tel. / Fax		+99 210 3478897 / 210 34794																						
System family overview / G / F																												
Collector type		Number of collectors / G / F																										
G		Storage type / G / F																										
F		120L		160L		200L																						
		250L		300L																								
MNE 16				2																								
MNE 04		1																										
MNE 20				2		2																						
MNE 01		1		1		2																						
MNE 03		1		1																								
Name of system konfiguration / G / F						GLK 160/2.58																						
Collector type		No. collectors		Storage type																								
G		MNE 03		G		1																						
F				F		160L																						
Calculated annual results / G / F																												
Location		Daily draw-off litres/day / G / F /																										
G		110			140			170			110			140			170											
F		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		1.708			2.172			2.637			774			876			955			45,3			40,3			36,2		
Würzburg, DE		1.638			2.085			2.532			775			885			964			47,3			42,4			38,1		
Davos, CH		1.848			2.356			2.856			1.051			1.183			1.270			56,9			50,2			44,5		
Athens, GR		1.270			1.621			1.962			1.007			1.191			1.332			79,3			73,5			67,9		
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		Stockholm		Würzburg DE		Davos CH		Athens GR																				
G		1.156		1.226		1.682		1.717																				
G		Ta		7,5		9,0		3,2		18,5																		
F		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				200 kPa		Max. operating press. - tank side				1.000 kPa																		
G						G																						
F						F																						
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos																						
Website						www.solar.demokritos.gr																						
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2																						
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G		Storage type / G / F																										
F		120L		160L		200L																						
		250L		300L																								
MNE 16				2																								
MNE 04		1																										
MNE 20		1		2		2																						
MNE 01		1		1		2																						
MNE 03		1		1																								
Name of system konfiguration / G / F						GLK 160/3.10																						
Collector type		No. collectors		Storage type																								
G		MNE 16		G		2																						
F				F		160L																						
Calculated annual results / G / F																												
Location		Daily draw-off litres/day / G / F /																										
G		110			140			170			110			140			170											
F		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		1.708			2.172			2.637			820			937			1.025			48,0			43,1			38,9		
Würzburg, DE		1.638			2.085			2.532			817			946			1.034			49,9			45,4			40,8		
Davos, CH		1.848			2.356			2.856			1.130			1.279			1.384			61,1			54,3			48,5		
Athens, GR		1.270			1.621			1.962			1.042			1.253			1.410			82,1			77,3			71,9		
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																								
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Ref. conditions		Stockholm		Würzburg DE		Davos CH		Athens GR																				
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G		Ta		7,5		9,0		3,2		18,5																		
F		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																								
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Max. operating press. - collector side				200		kPa		Max. operating press. - tank side				1.000		kPa														
G								G																				
F								F																				
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System family overview / G / F																												
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F		120L		160L		200L																						
		250L		300L																								
MNE 16				2																								
MNE 04		1																										
MNE 20				2		2																						
MNE 01		1		1		2																						
MNE 03		1		1																								
Name of system konfiguration / G / F						GLK 200/2.30																						
Collector type		No. collectors		Storage type																								
G		MNE 01		G		1																						
F				F		200L																						
Calculated annual results / G / F																												
Location		Daily draw-off litres/day / G / F /																										
G		170			200			250			170			200			250											
F		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		2.637			3.101			3.881			911			972			1.007			34,6			31,4			26,0		
Würzburg, DE		2.532			2.970			3.714			920			981			1.016			36,3			33,0			27,4		
Davos, CH		2.856			3.364			4.205			1.191			1.261			1.296			41,7			37,5			30,8		
Athens, GR		1.962			2.313			2.891			1.279			1.375			1.437			65,2			59,5			49,7		
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				Stockholm		Würzburg DE		Davos CH		Athens GR																		
G				1.156		1.226		1.682		1.717																		
G		Ta		7,5		9,0		3,2		18,5																		
F		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				200		kPa		Max. operating press. - tank side				1.000		kPa														
G								G																				
F								F																				
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos																						
Website						www.solar.demokritos.gr																						
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2																						
Date of test report / G / F						6/9/2011																						
Test method / G / F						ISO 9459-5 (DST)																						
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire																												
English																												
Deutsch																												
Français																												



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	Registration No. Registernummer Num. d'enregistremen Date / Datum / Date	SKM 9921/3 28/1/2013
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Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	COSMOSOLAR LTD Ntrei Road, Dervenochorion Gate 322 00 Viotia	Country/Land/Pays Website E-mail Tel. / Fax	Greece http://www.cosmosol info@cosmosolar.co +99 210 3478897 / 210 34794
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System family overview / G / F

Collector type G F	Number of collectors / G / F														
	Storage type / G / F														
	120L			160L			200L			250L			300L		
MNE 16				2			2								
MNE 04	1														
MNE 20		1					2			2			2		
MNE 01				1			1			2			2		
MNE 03					1			1							

Name of system konfiguration / G / F GLK 200/2.58

Collector type G F	MNE 03	No. collectors G F	1	Storage type G F	200L
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Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	170			200			250			170			200			250		
	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	2.637	3.101	3.881	972	1.042	1.086	36,9	33,6	28,0									
Würzburg, DE	2.532	2.970	3.714	981	1.051	1.095	38,8	35,4	29,5									
Davos, CH	2.856	3.364	4.205	1.288	1.367	1.419	45,1	40,6	33,8									
Athens, GR	1.962	2.313	2.891	1.349	1.472	1.542	68,8	63,6	53,3									

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 F		Stockholm	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
	F	T _c	8,5	10,0	5,4	17,8
	F	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
Th	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F	200	kPa	Max. operating press. - tank side G F	1.000	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 6040 DE2, 6042 DE2 6/9/2011 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Francais	amp & signature of test lab
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3							
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer									
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen									
				Date / Datum / Date		28/1/2013							
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece							
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosolar.com							
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.com							
				Tel. / Fax		+99 210 3478897 / 210 34794							
System family overview / G / F													
Collector type		Number of collectors / G / F											
		Storage type / G / F											
		120L		160L		200L		250L		300L			
G													
F													
MNE 16				2		2							
MNE 04		1											
MNE 20		1				2		2		2			
MNE 01				1		1		2		2			
MNE 03				1		1							
Name of system konfiguration / G / F								GLK 200/3.10					
Collector type		MNE 16		No. collectors		2		Storage type		200L			
G				G				G					
F				F				F					
Calculated annual results / G / F													
Location		Daily draw-off litres/day / G / F /											
G		170	200	250	170	200	250	170	200	250	170	200	250
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		2.637	3.101	3.881	1.051	1.121	1.174	39,9	36,2	30,2			
Würzburg, DE		2.532	2.970	3.714	1.060	1.139	1.191	41,9	38,3	32,1			
Davos, CH		2.856	3.364	4.205	1.410	1.498	1.551	49,4	44,5	36,9			
Athens, GR		1.962	2.313	2.891	1.437	1.568	1.664	73,2	67,8	57,6			
Perf. indicators		Q_d Heat demand / G / F											
G		Q_L System output / G / F											
F		f_{sol} QL/Q_d; solar fraction / G / F											
		Q_{par} Elec. for pumps/controllers / G / F											
Ref. conditions		Stockholm		Würzburg DE		Davos CH		Athens GR					
G		1.156		1.226		1.682		1.717					
G		Ta		7,5		9,0		3,2		18,5			
F		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/m² 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				200 kPa		Max. operating press. - tank side				1.000 kPa			
G						G							
F						F							
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos							
Website						www.solar.demokritos.gr							
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2							
Date of test report / G / F						6/9/2011							
Test method / G / F						ISO 9459-5 (DST)							
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire													
English Deutsch Français													



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3																						
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer																								
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen																								
				Date / Datum / Date		28/1/2013																						
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece																						
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosolar.com																						
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.com																						
				Tel. / Fax		+99 210 3478897 / 210 34794																						
System family overview / G / F																												
Collector type		Number of collectors / G / F																										
G		Storage type / G / F																										
F		120L		160L		200L																						
MNE 16				2																								
MNE 04		1																										
MNE 20		1				2																						
MNE 01				1		2																						
MNE 03				1																								
Name of system konfiguration / G / F						GLK 200/4.10																						
Collector type		No. collectors		Storage type																								
G		MNE 20		G		2																						
F				F		200L																						
Calculated annual results / G / F																												
Location		Daily draw-off litres/day / G / F /																										
G		170			200			250			170			200			250											
F		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		2.637			3.101			3.881			1.200			1.296			1.367			45,5			41,8			35,2		
Würzburg, DE		2.532			2.970			3.714			1.209			1.314			1.384			47,8			44,2			37,3		
Davos, CH		2.856			3.364			4.205			1.656			1.778			1.857			58,0			52,9			44,2		
Athens, GR		1.962			2.313			2.891			1.568			1.752			1.927			79,9			75,8			66,7		
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		Stockholm		Würzburg DE		Davos CH		Athens GR																				
G		1.156		1.226		1.682		1.717																				
G		Ta		7,5		9,0		3,2		18,5																		
F		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				200 kPa		Max. operating press. - tank side				1.000 kPa																		
G						G																						
F						F																						
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos																						
Website						www.solar.demokritos.gr																						
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2																						
Date of test report / G / F						6/9/2011																						
Test method / G / F						ISO 9459-5 (DST)																						
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire																												
English																												
Deutsch																												
Français																												



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3													
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer															
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen															
				Date / Datum / Date		28/1/2013													
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece													
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosolar.com													
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.com													
				Tel. / Fax		+99 210 3478897 / 210 34794													
System family overview / G / F																			
Collector type		Number of collectors / G / F																	
G		Storage type / G / F																	
F		120L		160L		200L		250L		300L									
MNE 16				2		2													
MNE 04		1																	
MNE 20		1				2		2		2									
MNE 01				1		1		2		2									
MNE 03				1		1													
Name of system konfiguration / G / F								GLK 250/4.10											
Collector type		MNE 20		No. collectors		2		Storage type		250L									
G				G				G											
F				F				F											
Calculated annual results / G / F																			
Location		Daily draw-off litres/day / G / F /																	
G		200		250		300		200		250		300							
F		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		3.101		3.881		4.652		1.358		1.472		1.551		43,7		38,0		33,3	
Würzburg, DE		2.970		3.714		4.459		1.367		1.498		1.577		46,1		40,2		35,3	
Davos, CH		3.364		4.205		5.046		1.831		1.962		2.050		54,4		46,7		40,6	
Athens, GR		2.313		2.891		3.469		1.805		2.050		2.208		78,1		71,0		63,6	
Perf. indicators		Q _d		Heat demand / G / F															
G		Q _L		System output / G / F															
F		f _{sol}		Q _L /Q _d ; solar fraction / G / F															
		Q _{par}		Elec. for pumps/controllers / G / F															
Ref. conditions		Stockholm		Würzburg DE		Davos CH		Athens GR											
G		1.156		1.226		1.682		1.717											
G		Ta		7,5		9,0		3,2		18,5									
F		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				200		kPa		Max. operating press. - tank side				1.000		kPa					
G								G											
F								F											
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos													
Website						www.solar.demokritos.gr													
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2													
Date of test report / G / F						6/9/2011													
Test method / G / F						ISO 9459-5 (DST)													
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire																			
English Deutsch Français																			



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3							
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer									
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen									
				Date / Datum / Date		28/1/2013							
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece							
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosol							
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.co							
				Tel. / Fax		+99 210 3478897 / 210 34794							
System family overview / G / F													
Collector type		Number of collectors / G / F											
G		Storage type / G / F											
F		120L		160L		200L		250L		300L			
MNE 16				2		2							
MNE 04		1											
MNE 20			1			2		2		2			
MNE 01				1		1		2		2			
MNE 03					1								
Name of system konfiguration / G / F								GLK 250/4.60					
Collector type		MNE 01		No. collectors		2		Storage type		250L			
G				G				G					
F				F				F					
Calculated annual results / G / F													
Location		Daily draw-off litres/day / G / F /											
G		200	250	300	200	250	300	200	250	300	200	250	300
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		3.101	3.881	4.652	1.410	1.568	1.664	45,5	40,4	35,8			
Würzburg, DE		2.970	3.714	4.459	1.419	1.594	1.691	47,8	42,9	37,9			
Davos, CH		3.364	4.205	5.046	1.927	2.129	2.260	57,3	50,6	44,8			
Athens, GR		2.313	2.891	3.469	1.840	2.146	2.339	79,5	74,2	67,4			
Perf. indicators		Q_d Heat demand / G / F											
G		Q_L System output / G / F											
F		f_{sol} QL/Q_d; solar fraction / G / F											
		Q_{par} Elec. for pumps/controllers / G / F											
Ref. conditions		Stockholm	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								
F		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											
Th	45°C	Desired (mix. valve) temp. / G / F											
Max. operating press. - collector side				200	kPa	Max. operating press. - tank side				1.000	kPa		
G						G							
F						F							
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos							
Website						www.solar.demokritos.gr							
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2							
Date of test report / G / F						6/9/2011							
Test method / G / F						ISO 9459-5 (DST)							
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire													
English Deutsch Français													



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3							
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer									
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen									
				Date / Datum / Date		28/1/2013							
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece							
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosol							
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.co							
				Tel. / Fax		+99 210 3478897 / 210 34794							
System family overview / G / F													
Collector type		Number of collectors / G / F											
G		Storage type / G / F											
F		120L		160L		200L		250L		300L			
MNE 16				2		2							
MNE 04		1											
MNE 20			1			2		2		2			
MNE 01				1		1		2			2		
MNE 03					1								
Name of system konfiguration / G / F								GLK 300/4.10					
Collector type		MNE 20		No. collectors		2		Storage type		300L			
G				G				G					
F				F				F					
Calculated annual results / G / F													
Location		Daily draw-off litres/day / G / F /											
G		250	300	400	250	300	400	250	300	400	250	300	400
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		3.881	4.652	6.202	1.498	1.621	1.726	38,6	34,8	27,8			
Würzburg, DE		3.714	4.459	5.948	1.515	1.638	1.743	40,8	36,7	29,3			
Davos, CH		4.205	5.046	6.728	1.997	2.137	2.251	47,5	42,4	33,5			
Athens, GR		2.891	3.469	4.625	2.059	2.278	2.453	71,2	65,7	53,0			
Perf. indicators		Q_d Heat demand / G / F											
G		Q_L System output / G / F											
F		f_{sol} QL/Q_d; solar fraction / G / F											
		Q_{par} Elec. for pumps/controllers / G / F											
Ref. conditions		Stockholm	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								
F		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											
Th	45°C	Desired (mix. valve) temp. / G / F											
Max. operating press. - collector side				200 kPa		Max. operating press. - tank side				1.000 kPa			
G						G							
F						F							
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais						Demokritos							
Website						www.solar.demokritos.gr							
Test report id. number / Prüberichtsnummer / F						6040 DE2, 6042 DE2							
Date of test report / G / F						6/9/2011							
Test method / G / F						ISO 9459-5 (DST)							
Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire													
English Deutsch Français													



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate				Registration No.		SKM 9921/3																						
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat				Registernummer																								
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar				Num. d'enregistremen																								
				Date / Datum / Date		28/1/2013																						
Company / Firma / Société		COSMOSOLAR LTD		Country/Land/Pays		Greece																						
Street / Straße / Rue		Ntrei Road, Dervenochorion Gate		Website		http://www.cosmosolar.com																						
Postal Code, Place / PLZ, Ort / Code postal, Place		322 00 Viotia		E-mail		info@cosmosolar.com																						
				Tel. / Fax		+99 210 3478897 / 210 34794																						
System family overview / G / F																												
Collector type		Number of collectors / G / F																										
G		Storage type / G / F																										
F		120L		160L		200L																						
		250L		300L																								
MNE 16				2																								
MNE 04		1																										
MNE 20				2		2																						
MNE 01		1		1		2																						
MNE 03		1		1		2																						
Name of system konfiguration / G / F						GLK 300/4.60																						
Collector type		No. collectors		Storage type																								
G		MNE 01		G		2																						
F				F		300L																						
Calculated annual results / G / F																												
Location		Daily draw-off litres/day / G / F /																										
G		250			300			400			250			300			400											
F		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		3.881			4.652			6.202			1.594			1.726			1.840			41,1			37,1			29,7		
Würzburg, DE		3.714			4.459			5.948			1.603			1.743			1.866			43,2			39,1			31,4		
Davos, CH		4.205			5.046			6.728			2.146			2.304			2.435			51,0			45,7			36,2		
Athens, GR		2.891			3.469			4.625			2.155			2.400			2.628			74,5			69,2			56,8		
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				Stockholm		Würzburg DE		Davos CH		Athens GR																		
G				1.156		1.226		1.682		1.717																		
G		Ta		7,5		9,0		3,2		18,5																		
F		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				200		kPa		Max. operating press. - tank side				1.000		kPa														
G								G																				
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire																												
English												Stamp & signature of test lab																
Deutsch																												
Français																												