

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 9943
	Registernummer	
	Num. d'enregistrement	
	Date / Datum / Date	30/01/13

Company / Firma / Société	PAPAEMMANOUEL S.A.	Country/Land/Pays	Greece
Street / Straße / Rue	1o Km Inofyta – St. Thomas, Inofyta Viotia	Website	www.papaemmanouel.gr
Postal Code, Place / PLZ, Ort / Code postal, Place	32011 Viotia	E-mail	papaemmanouel-sa@li
		Tel. / Fax	+030 2262031931 / 2262032166

System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Indirect / G / F
Press. principle / G / F	Closed / 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	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 PAPAEMMANOUEL S.A.					Company / Hersteller / Manufactuer PAPAEMMANOUEL S.A.									
Keymark reg. no. (optional)														
Model Bezeichnung Modèle	Per module / G / F				No. modules G F	Model Bezeichnung Modèle	Total volume		Gross diameter/width		Back-up heated volume		El. back-up power	
	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	min - max			G F	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout	Höhe (Außenmaß) Höhe (Außenmaß) épaisseur hors tout	G F	G F			
	m ²	m	m				litres	mm	mm	litres		kW		
COMPACT	1,77	0,98	1,979	1	-	1	COMPACT	98	400	910	-	-	-	-
COMPACT	2,15	1,179	1,979	1	-	1	COMPACT	134	480	910	-	-	-	-

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufacteur	none	Company/Hersteller/Manufacteur	
Model / Bezeichnung / Modèle	none	Model / Bezeichnung / Modèle	Ethylic Alcohol
Functions	English Deutsch Francais	Freezing point	-60 °C
G		G	
F		F	

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	COMPACT T110AL	COMPACT T150AL	0	0	0	
COMPACT T110AL	1					
COMPACT T150AL		1				
0						
0						
0						

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS L
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	4107 DQ2, 6046 DE2
Date of test report / Datum G / date F	22/01/2013, 24/01/2013

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

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	Date / Datum / Date	30/01/13

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	PAPAEMMANOUEL S.A. 1o Km Inofyta – St. Thomas, Inofyta Viotia 32011 Viotia	Country/Land/Pays Website E-mail Tel. / Fax	Greece www.papaemmanouel. papaemmanouel-sa@i +99 2262031931 / 2262032166
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System family overview / G / F				
Collector type	Number of collectors / G / F			
	Storage type / G / F			
G				
F				
COMPACT T110AL	1			
COMPACT T150AL		1		

Name of system konfiguration / G / F				COMPACT T110AL			
Collector type	COMPACT T110AL	No. collectors	1	Storage type	COMPACT T110AL		
G		G		G			
F		F		F			

Calculated annual results / G / F												
Location	Daily draw-off litres/day / G / F /											
	80	110	140	80	110	140	80	110	140	80	110	140
G	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	885	972	1.007	51,8	44,8	38,2			
Würzburg, DE	1.638	2.085	2.532	902	1.016	1.069	55,1	48,7	51,4			
Davos, CH	1.848	2.356	2.856	1.323	1.428	1.463	71,6	60,6	63,7			
Athens, GR	1.270	1.621	1.962	1.086	1.253	1.375	85,5	77,3	74,0			

Perf. indicators	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
G		
F		

Ref. conditions	Stockholm					Würzburg DE					Davos CH					Athens GR					
	G	1.156					1.226					1.682					1.717				
	G	7,5					9,0					3,2					18,5				
	F	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				

	Unit	Annual irradiation South, 45° / G / F
G	kWh/m ²	
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	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	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS L www.solar.demokritos.gr 4107 DQ2, 6046 DE2 22/01/2013, 24/01/2013 ISO 9459-5 (DST)
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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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	Date / Datum / Date	02/07/12

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	PAPAEMMANOUEL S.A. 1o Km Inofyta – St. Thomas, Inofyta Viotia 32011 Viotia	Country/Land/Pays Website E-mail Tel. / Fax	Greece www.papaemmanouel. papaemmanouel-sa@i +99 2262031931 / 2262032166
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System family overview / G / F												
Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	COMPACT T110AL	COMPACT T150AL										
COMPACT T110AL	1											
COMPACT T150AL		1										

Name of system konfiguration / G / F										COMPACT T150AL		
Collector type G F	COMPACT T150AL	No. collectors G F	1	Storage type G F	COMPACT T150AL							

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	110 l/d	140 l/d	170 l/d	110 l/d	140 l/d	170 l/d	110 l/d	140 l/d	170 l/d	110 l/d	140 l/d	170 l/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	1.708	2.172	2.637	885	972	1.007	51,8	44,8	38,2			
Würzburg, DE	1.638	2.085	2.532	902	1.016	1.069	55,1	48,7	42,2			
Davos, CH	1.848	2.356	2.856	1.323	1.428	1.463	71,6	60,6	51,2			
Athens, GR	1.270	1.621	1.962	1.086	1.253	1.375	85,5	77,3	70,1			

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	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		kPa	Max. operating press. - tank side G F	1.000	kPa
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Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS L
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	4107 DQ2, 6046 DE2
Date of test report / G / F	22/01/2013, 24/01/2013
Test method / G / F	ISO 9459-5 (DST)

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