

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 9965/14
	Registernummer	
	Num. d'enregistrement	
	Date / Datum / Date	30/10/2017

Company / Firma / Société	NOBEL INTERNATIONAL EAD	Country/Land/Pays	BULGARIA
Street / Straße / Rue	48, VITOSHA BLV	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

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	NOBEL INTERNATIONAL EAD	Company / Hersteller / Manufactuer	NOBEL INTERNATIONAL EAD
<i>Keymark reg. no. (optional)</i>	<i>SKM 9965/6</i>		

Model Bezeichnung Modèle	Per module / G / F				No. modules G F min - max	Model Bezeichnung Modèle	Total volume G F litres	Gross diameter/width Diam. / Breite (Außenmaß) Diam. / Largeur hors tout mm	Gross length Länge (Außenmaß) longueur hors tout mm	Back-up heated volume G F litres	El. back-up power G F kW
	Aperture area (A _a) Aperturfäche (A _a) Superficie d'entree (A _a) m ²	Gross length Länge (Außenmaß) Longueur hors tout m	Gross width Breite (Außenmaß) Largeur hors tout m								
	AEIOS CuS 1500	1.4	1.53	1.03							
AEIOS CuS 2000	1.88	2.03	1.03	1 - 1	150L	141	530	1280	~	0 ~ 4	
AEIOS CuS 2600	2.37	2.03	1.28	1 - 1	160L	151	580	1053	~	0 ~ 4	
					200L	191	580	1312	~	0 ~ 4	
					250L	241	580	1706	~	0 ~ 4	
					300L	293	580	1970	~	0 ~ 4	
					320L	309	580	2072	~	0 ~ 4	

Controller / G / F		Fluid / G / F	
Company/Hersteller/Manufactuer		Company/Hersteller/Manufactuer	
Model / Bezeichnung / Modèle		Model / Bezeichnung / Modèle	Propylene glycol solution
Functions	English Deutsch Francais	Freezing point	-6 to 10 °C

System family overview / G / F									
Collector G F	No. collectors / G / F								
	Storage / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	3	
AEIOS CuS 2600		1	1	1	2	2	2		
0									
0									

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / Datum G / date F	4/9/2013, 24/10/2017

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
English	
Deutsch	
Francais	
	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilios Belesiotis Tel: +210 6503815 Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece

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Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	NOBEL INTERNATIONAL EAD 48, VITOSHA BLV 2100 SOFIA BULGARIA	Country/Land/Pays Website E-mail Tel. / Fax	BULGARIA www.nobel.gr info1@nobel.gr +0359 2 4210232
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System family overview / G / F							
Collector type G F	Number of collectors / G / F						
	Storage type / G / F						
	120L	150L	160L	200L	250L	300L	320L
AEIOS CuS 1500			2	2			
AEIOS CuS 2000	1	1	1	2	2	2	2 3
AEIOS CuS 2600		1	1	1	2	2	2

Name of system configuration / G / F Collector type G F				No. collectors G F	1 1	Storage type G F	AELIOS 120/2 CuS 120L
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Location G F	Daily draw-off litres/day / G / F /																	
	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	l/d	l/d	l/d	l/d	l/d	
	Qd kWh/y			QL kWh/y			fsol %						Qpar kWh/y					
Stockholm, SE	1,244	1,708	2,172	729	885	972	58.7	51.8	44.9									
Würzburg, DE	1,191	1,638	2,085	709	875	990	59.6	53.5	47.4									
Davos, CH	1,349	1,848	2,356	1,016	1,226	1,340	75.7	66.1	56.8									
Athens, GR	929	1,270	1,621	846	1,095	1,296	91.6	86.1	80.0									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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	1,156	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	300 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 / Prüfberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6031 DE3, 6033 DE8, 6033 F7 4/9/2013, 24/10/2017 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 8503815 - Fax: +210 8541602 153 10 Ag. Paraskevi - Attiki - Greece
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Street / Straße / Rue		48, VITOSHA BLV		Website															
Postal Code, Place / PLZ, Ort / Code postal, Place		2100 SOFIA BULGARIA		E-mail		info1@nobel.gr													
				Tel. / Fax		+0359 2 4210232													
System family overview / G / F																			
Collector type		Number of collectors / G / F																	
G		Storage type / G / F																	
F		120L		150L		160L		200L		250L		300L		320L					
AEIOS CuS 1500					2			2											
AEIOS CuS 2000		1		1		1		2		2		2		2	3				
AEIOS CuS 2600			1		1		1		2		2		2		2				
Name of system configuration / G / F								AEIOS 150/2.6 CuS											
Collector type		AEIOS CuS 2600		No. collectors		1		Storage type		150L									
G				G				G											
F				F				F											
Calculated annual results / G / F								Daily draw-off litres/day / G / F /											
Location		110		140		170		110		140		170		110		140		170	
G		l/d		l/d		l/d		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		1708		2172		2637		911		1034		1121		53.3		47.6		42.5	
Würzburg, DE		1638		2085		2532		920		1069		1183		56.1		51.3		46.7	
Davos, CH		1848		2356		2856		1349		1542		1664		73.0		65.4		58.3	
Athens, GR		1270		1621		1962		1095		1314		1489		86.2		81.1		75.9	
Perf. indicators		Q _d		Heat demand / G / F						Q _L		System output / G / F							
G										f _{sol}		Q _L /Q _d ; solar fraction / G / F							
F										Q _{par}		Elec. for pumps/controllers / G / F							
Ref. conditions		Stockholm SE		Würzburg DE		Davos CH		Athens GR											
G		G		G		G		G											
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				300		kPa		Max. operating press. - tank side				1,000		kPa					
G								G											
F								F											
Testing Laboratory / Prüflaboratorium / Laboratoire d'essais				NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB				Website				www.solar.demokritos.gr							
Test report id. number / Prüberichtnummer / F				6031 DE3, 6033 DE8, 6033 F7				Date of test report / G / F				4/9/2013, 24/10/2017							
Test method / G / F				ISO 9459-5 (DST)				Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire											
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".												<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 9503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>							

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Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2		2	

Name of system configuration / G / F				AEIOS 160/2 CuS
Collector type G F	AEIOS CuS 2000	No. collectors G F	1	Storage type G F
				160L

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	1,708	2,172	2,637	894	1,007	1,077	52.3	46.3	40.8									
Würzburg, DE	1,638	2,085	2,532	885	1,007	1,095	54.0	48.6	43.3									
Davos, CH	1,848	2,356	2,856	1,235	1,367	1,454	66.5	58.1	50.8									
Athens, GR	1,270	1,621	1,962	1,095	1,314	1,472	86.5	81.1	75.1									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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
T _a	°C	7.5	9.0	3.2	18.5
T _c	°C	8.5	10.0	5.4	17.8
ΔT _c	°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	300 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 LAB
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Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".
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		Tel. / Fax	+0359 2 4210232

System family overview / G / F							
Collector type G F	Number of collectors / G / F						
	Storage type / G / F						
	120L	150L	160L	200L	250L	300L	320L
AElios CuS 1500			2	2			
AElios CuS 2000	1	1	1	2		2	2 3
AElios CuS 2600		1	1	1	2	2	2

Name of system konfiguration / G / F			AElios 160/2.6 CuS
Collector type G F	AElios CuS 2600	No. collectors G F	Storage type G F
		1	160L

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F /																	
	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170
	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d
	Qd kWh/y			QL kWh/y			fsol %						Qpar kWh/y					
Stockholm, SE	1,708	2,172	2,637	981	1,130	1,235	57.6	52.2	46.9									
Würzburg, DE	1,638	2,085	2,532	955	1,121	1,244	58.6	53.9	49.3									
Davos, CH	1,848	2,356	2,856	1,367	1,568	1,699	74.0	66.7	59.5									
Athens, GR	1,270	1,621	1,962	1,156	1,402	1,612	90.7	86.5	82.0									

Perf. Indicators G F	Qd	Heat demand / G / F
	QL	System output / G / F
	fsol	QL/Qd; solar fraction / G / F
	Qpar	Elec. for pumps/controllers / G / F

Ref. conditions G F		Stockholm SE	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/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 G F	300	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 LAB
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Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Heag: Dr Vassilios Belesiotis Tel: +210 6503815 - Fax: +210 6544524 153 10 Ag. Paraskevi - Attiki - Greece</p> 
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System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F					AELIOS 160/3 CuS
Collector type	AELIOS CuS 1500	No. collectors	2	Storage type	160L
G		G		G	
F		F		F	

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170	110	140	170
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	1,708	2,172	2,637	1,034	1,218	1,340	60.8	55.9	50.9									
W�rzburg, DE	1,638	2,085	2,532	1,007	1,191	1,332	61.4	57.1	52.8									
Davos, CH	1,848	2,356	2,856	1,454	1,691	1,857	78.6	71.8	65.0									
Athens, GR	1,270	1,621	1,962	1,183	1,445	1,682	92.9	89.5	85.5									

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

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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			
T _h	45�C	Desired (mix. valve) temp. / G / F			

Max. operating press. - collector side		300	kPa	Max. operating press. - tank side		1,000	kPa
G				G			
F				F			

Testing Laboratory / Pr�flaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB
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Comments of test lab / Commentaires des laboratoires / Commentaires du laboratoire	N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY
The long term prediction was extrapolated according to the Annex D of "Solar Keymark - Specific Scheme Rules".	Head: Dr Vassilis Belasiotis
	Tel: +210 6503815 - Fax: +210 6544500
	153 10 Ag. Faraskevi - Attiki - Greece

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 Date / Datum / Date	SKM 9965/14 30/10/2017
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Company / Firma / Soci�t� Street / Stra�e / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	NOBEL INTERNATIONAL EAD 48, VITOSHA BLV 2100 SOFIA BULGARIA	Country/Land/Pays Website E-mail Tel. / Fax	BULGARIA info1@nobel.gr +0359 2 4210232
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System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F				AEIOS 200/2.6 CuS	
Collector type G F	AEIOS CuS 2600	No. collectors G F	1	Storage type G F	200L

Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	170	200	250	170	200	250	170	200	250	170	200	250	170	200	250	170	200	250
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	2,637	3,101	3,881	1,261	1,340	1,428	47.7	43.2	36.9									
W�rzburg, DE	2,532	2,970	3,714	1,261	1,358	1,454	50.0	45.7	39.1									
Davos, CH	2,856	3,364	4,205	1,726	1,822	1,918	60.2	54.1	45.7									
Athens, GR	1,962	2,313	2,891	1,621	1,805	2,015	82.6	78.0	69.7									

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

Ref. conditions G F		Stockholm SE	W�rzburg 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	300 kPa	Max. operating press. - tank side G F	1,000 kPa
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Testing Laboratory / Pr�flaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Pr�berichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Commentaires des laboratoires / Commentaires du laboratoire	N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6514592 153 10 Ag. Paraskevi - Attiki - Greece
The long term prediction was extrapolated according to the Annex D of "Solar Keymark - Specific Scheme Rules".	

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 Date / Datum / Date		SKM 9965/14 30/10/2017																						
Company / Firma / Soci�t� Street / Stra�e / Rue		NOBEL INTERNATIONAL EAD 48, VITOSHA BLV		Country/Land/Pays Website		BULGARIA																						
Postal Code, Place / PLZ, Ort / Code postal, Place		2100 SOFIA BULGARIA		E-mail Tel. / Fax		info1@nobel.gr +0359 2 4210232																						
System family overview / G / F																												
Collector type G F		Number of collectors / G / F																										
		Storage type / G / F																										
		120L		150L		160L		200L		250L		300L		320L														
AEIOS CuS 1500						2		2																				
AEIOS CuS 2000		1		1		1		2		2		2		2	3													
AEIOS CuS 2600				1		1		1		2		2		2														
Name of system configuration / G / F												AEIOS 200/3 CuS																
Collector type G F		AEIOS CuS 1500		No. collectors G F		2		Storage type G F						200L														
Calculated annual results / G / F																												
Daily draw-off litres/day / G / F /																												
Location G F		170			200			250			170			200			250											
		l/d			l/d			l/d			l/d			l/d			l/d											
		Qd kWh/y			QL kWh/y			f _{sol} %									Q _{par} kWh/y											
Stockholm, SE		2,637			3,101			3,881			1,367			1,472			1,586			51.9			47.5			40.8		
W�rzburg, DE		2,532			2,970			3,714			1,358			1,480			1,612			53.6			49.7			43.3		
Davos, CH		2,856			3,364			4,205			1,892			2,024			2,155			66.1			60.0			51.2		
Athens, GR		1,962			2,313			2,891			1,691			1,910			2,172			86.2			82.4			75.3		
Perf. indicators G F		Q _d		Heat demand / G / F																								
		Q _L		System output / G / F																								
		f _{sol}		QL/Q _a ; solar fraction / G / F																								
		Q _{par}		Elec. for pumps/controllers / G / F																								
Ref. conditions G F				Stockholm SE		W�rzburg 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		300		kPa		Max. operating press. - tank side G F		1,000		kPa																		
Testing Laboratory / Pr�flaboratorium / Laboratoire d'essais				NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB																								
Website				www.solar.demokritos.gr																								
Test report id. number / Pr�berichtsnummer / F				6031 DE3, 6033 DE8, 6033 F7																								
Date of test report / G / F				4/9/2013, 24/10/2017																								
Test method / G / F				ISO 9459-5 (DST)																								
Comments of test lab / Commentaires des laboratoires / Commentaires du laboratoire				N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503915 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece																								
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".																												

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 Date / Datum / Date	SKM 9965/14 30/10/2017
	Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	
	NOBEL INTERNATIONAL EAD 48, VITOSHA BLV 2100 SOFIA BULGARIA	Country/Land/Pays Website E-mail Tel. / Fax

System family overview / G / F Collector type G F		Number of collectors / G / F Storage type / G / F					
	120L	150L	160L	200L	250L	300L	320L
AEIOS CuS 1500			2	2			
AEIOS CuS 2000	1	1	1	2	2	2	2 3
AEIOS CuS 2600		1	1	1	2	2	2

Name of system configuration / G / F Collector type G F		No. collectors G F	Storage type G F	AELIOS 200/4 CuS 200L
AELIOS CuS 2000		2		

Calculated annual results / G / F Location G F		Daily draw-off litres/day / G / F													
	170	200	250	170	200	250	170	200	250	170	200	250	170	200	250
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y		
Stockholm, SE	2,637	3,101	3,881	1,542	1,699	1,875	58.6	54.7	48.3						
Würzburg, DE	2,532	2,970	3,714	1,498	1,664	1,883	59.4	56.1	50.6						
Davos, CH	2,856	3,364	4,205	2,155	2,365	2,602	75.4	70.3	61.8						
Athens, GR	1,962	2,313	2,891	1,796	2,050	2,409	91.5	88.7	83.5						

Perf. indicators G F		Q _d Q _L f _{sol} Q _{par}	Heat demand / G / F System output / G / F QL/Qa; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F		Stockholm SE Würzburg DE Davos CH Athens GR	G T _a T _c ΔT _c	1,156 7.5 8.5 2.1 - 14.9	1,226 9.0 10.0 7.0 - 13.0	1,682 3.2 5.4 4.6 - 6.2	1,717 18.5 17.8 10.4 - 25.2
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G T _a T _c ΔT _c Th	kWh/m ² °C °C °C 45°C	Annual irradiation South, 45° / G / F Annual mean air temp. / G / F Annual mean cold water temp. / G / F Seasonal variation of Tc / G / F Desired (mix. valve) temp. / G / F
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Max. operating press. - collector side G F	300 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 / Prüfberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6031 DE3, 6033 DE8, 6033 F7 4/9/2013, 24/10/2017 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503915 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece
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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate		Registration No.	SKM 9965/14
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat		Registernummer	
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK		Num. d'enregistrement	
		Date / Datum / Date	30/10/2017

Company / Firma / Société	NOBEL INTERNATIONAL EAD	Country/Land/Pays	BULGARIA
Street / Straße / Rue	48, VITOSHA BLV	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	3	
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F				AELIOS 250/4 CuS
Collector type	AEIOS CuS 2000	No. collectors	2	Storage type
G		G		G
F		F		F
				250L

Calculated annual results / G / F															
Location G F	Daily draw-off litres/day / G / F														
	200	250	300	200	250	300	200	250	300	200	250	300	200	250	300
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y		
Stockholm, SE	3,101	3,881	4,652	1,717	1,927	2,050	55.4	49.6	44.1						
Würzburg, DE	2,970	3,714	4,459	1,682	1,918	2,085	56.7	51.7	46.7						
Davos, CH	3,364	4,205	5,046	2,391	2,654	2,812	71.0	63.2	55.8						
Athens, GR	2,313	2,891	3,469	2,059	2,444	2,751	89.1	84.5	79.3						

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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
Ta	°C	7.5	9.0	3.2	18.5
Tc	°C	8.5	10.0	5.4	17.8
ΔTc	°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			
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	300	kPa	Max. operating press. - tank side	1,000	kPa
G			G		
F			F		

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüfberichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	

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 Date / Datum / Date	SKM 9965/14 30/10/2017
	Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	
	NOBEL INTERNATIONAL EAD 48, VITOSHA BLV 2100 SOFIA BULGARIA	
	Country/Land/Pays Website E-mail Tel. / Fax	

System family overview / G / F Collector type G F		Number of collectors / G / F Storage type / G / F						
		120L	150L	160L	200L	250L	300L	320L
AEIOS CuS 1500				2	2			
AEIOS CuS 2000		1	1	1	2	2	2	2 3
AEIOS CuS 2600			1	1	1	2	2	2

Name of system configuration / G / F Collector type G F				No. collectors G F	Storage type G F	AELIOS 250/5.2 CuS 250L												
Calculated annual results / G / F Location G F				Daily draw-off litres/day / G / F /														
				200	250	300	200	250	300	200	250	300	200	250	300	200	250	300
				l/d	l/d	l/d	l/d	l/d	l/d	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				3,101	3,881	4,652	1,734	1,962	2,137	55.9	50.6	45.9						
Würzburg, DE				2,970	3,714	4,459	1,752	2,032	2,243	59.0	54.7	50.3						
Davos, CH				3,364	4,205	5,046	2,610	2,970	3,224	77.6	70.6	63.9						
Athens, GR				2,313	2,891	3,469	2,050	2,435	2,768	88.6	84.2	79.8						

Perf. indicators G F		Qd QL fsol Qpar	Heat demand / G / F System output / G / F QL/Qa; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F		Stockholm SE Würzburg DE Davos CH Athens GR	G Ta Tc ΔTc	1,156 7.5 8.5 2.1 - 14.9	1,226 9.0 10.0 7.0 - 13.0	1,682 3.2 5.4 4.6 - 6.2	1,717 18.5 17.8 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		300 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 / Prüfberichtsnummer / F Date of test report / G / F Test method / G / F		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6031 DE3, 6033 DE8, 6033 F7 4/9/2013, 24/10/2017 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".		N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503015 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece
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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 KEYMARK		Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	SKM 9965/14 30/10/2017
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Company / Firma / Société	NOBEL INTERNATIONAL EAD	Country/Land/Pays	BULGARIA
Street / Straße / Rue	48, VITOSHA BLV	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	3	
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F				AELIOS 300/4 CuS
Collector type	AEIOS CuS 2000	No. collectors	2	Storage type
G		G		G
F		F		F
				300L


Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	3,881	4,652	6,202	1,813	1,936	2,102	46.7	41.6	33.9									
Würzburg, DE	3,714	4,459	5,948	1,875	2,050	2,234	50.5	46.0	37.6									
Davos, CH	4,205	5,046	6,728	2,672	2,856	3,048	63.5	56.6	45.3									
Athens, GR	2,891	3,469	4,625	2,313	2,602	2,996	80.0	75.0	64.8									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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	1,156	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 Tc / G / F					
Th	45°C	Desired (mix. valve) temp. / G / F					

Max. operating press. - collector side	300	kPa	Max. operating press. - tank side	1,000	kPa
G			G		
F			F		

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüfberichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".
	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilios Belesiotis Tel: +210 6503815 - Fax: +210 6544332 153 10 Ag. Paraskevi - Attiki - Greece

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 Date / Datum / Date	SKM 9965/14 30/10/2017
	Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	
	NOBEL INTERNATIONAL EAD 48, VITOSHA BLV 2100 SOFIA BULGARIA	
	Country/Land/Pays Website E-mail Tel. / Fax	

System family overview / G / F Collector type G F		Number of collectors / G / F Storage type / G / F						
		120L	150L	160L	200L	250L	300L	320L
AEIOS CuS 1500				2	2			
AEIOS CuS 2000		1	1	1	2	2	2	2 3
AEIOS CuS 2600			1	1	1	2	2	2

Name of system configuration / G / F Collector type G F				No. collectors G F	Storage type G F	AELIOS 300/5.2 CuS 300L												
Calculated annual results / G / F Location G F				Daily draw-off litres/day / G / F /														
				250	300	400	250	300	400	250	300	400	250	300	400	250	300	400
				l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
				Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y					
Stockholm, SE				3,881	4,652	6,202	2,015	2,190	2,435	51.9	47.1	39.3						
Würzburg, DE				3,714	4,459	5,948	2,050	2,286	2,575	55.2	51.3	43.3						
Davos, CH				4,205	5,046	6,728	3,005	3,285	3,574	71.5	65.1	53.1						
Athens, GR				2,891	3,469	4,625	2,462	2,803	3,311	85.1	80.8	71.6						

Perf. indicators G F		Q _d Q _L f _{sol} Q _{par}	Heat demand / G / F System output / G / F QL/Qa; solar fraction / G / F Elec. for pumps/controllers / G / F
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Ref. conditions G F		Stockholm SE	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		300	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 / Prüfberichtsnummer / F Date of test report / G / F Test method / G / F		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6031 DE3, 6033 DE8, 6033 F7 4/9/2013, 24/10/2017 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".		N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece
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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 KEYMARK		Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	SKM 9965/14 30/10/2017
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Company / Firma / Société	NOBEL INTERNATIONAL EAD	Country/Land/Pays	BULGARIA
Street / Straße / Rue	48, VITOSHA BLV	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F				AEIOS 320/4 CuS
Collector type G F	AEIOS CuS 2000	No. collectors G F	2	Storage type G F
				320L


Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	3,881	4,652	6,202	1,953	2,111	2,304	50.4	45.4	37.1									
Würzburg, DE	3,714	4,459	5,948	1,945	2,137	2,339	52.4	47.8	39.4									
Davos, CH	4,205	5,046	6,728	2,689	2,882	3,101	64.0	57.1	46.0									
Athens, GR	2,891	3,469	4,625	2,462	2,794	3,241	85.1	80.5	70.1									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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	1,156	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	300	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 LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüfberichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	

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Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate		Registration No.	SKM 9965/14
Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat		Registernummer	
Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK		Num. d'enregistrement	
		Date / Datum / Date	30/10/2017

Company / Firma / Société	NOBEL INTERNATIONAL EAD	Country/Land/Pays	BULGARIA
Street / Straße / Rue	48, VITOSHA BLV	Website	
Postal Code, Place / PLZ, Ort / Code postal, Place	2100 SOFIA BULGARIA	E-mail	info1@nobel.gr
		Tel. / Fax	+0359 2 4210232

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2	2	2	2

Name of system configuration / G / F				AEIOS 320/5.2 CuS
Collector type	AEIOS CuS 2600	No. collectors	2	Storage type
G		G		G
F		F		F
				320L


Calculated annual results / G / F																		
Location G F	Daily draw-off litres/day / G / F																	
	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %						Q _{par} kWh/y					
Stockholm, SE	3,881	4,652	6,202	2,015	2,199	2,453	51.9	47.3	39.5									
Würzburg, DE	3,714	4,459	5,948	2,050	2,286	2,602	55.2	51.3	43.7									
Davos, CH	4,205	5,046	6,728	3,005	3,294	3,600	71.5	65.3	53.5									
Athens, GR	2,891	3,469	4,625	2,462	2,812	3,329	85.1	81.1	72.0									

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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
G	T _a	7.5	9.0	3.2	18.5
G	T _c	8.5	10.0	5.4	17.8
G	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	300	kPa	Max. operating press. - tank side	1,000	kPa
G			G		
F			F		

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüfberichtsnummer / F	6031 DE3, 6033 DE8, 6033 F7
Date of test report / G / F	4/9/2013, 24/10/2017
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".
	 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544566 153 10 Ag. Paraskevi - Attiki - Greece</p>

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 Date / Datum / Date	SKM 9965/14 30/10/2017
	Company / Firma / Société Street / Straße / Rue	
	Postal Code, Place / PLZ, Ort / Code postal, Place	
	Country/Land/Pays Website E-mail Tel. / Fax	

NOBEL INTERNATIONAL EAD 48, VITOSHA BLV		BULGARIA info1@nobel.gr +0359 2 4210232	
2100 SOFIA BULGARIA			

System family overview / G / F									
Collector type G F	Number of collectors / G / F								
	Storage type / G / F								
	120L	150L	160L	200L	250L	300L	320L		
AEIOS CuS 1500			2	2					
AEIOS CuS 2000	1	1	1	2	2	2	2	2	3
AEIOS CuS 2600		1	1	1	2	2	2	2	

Name of system configuration / G / F Collector type: G, F No. collectors: 3 Storage type: G, F AELIOS 320/6 CuS 320L									
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Location G F	Daily draw-off litres/day / G / F											
	250	300	400	250	300	400	250	300	400	250	300	400
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	3,881	4,652	6,202	2,313	2,584	2,935	59.7	55.6	47.3			
Würzburg, DE	3,714	4,459	5,948	2,251	2,540	2,961	60.5	56.9	49.7			
Davos, CH	4,205	5,046	6,728	3,241	3,600	4,056	77.0	71.3	60.3			
Athens, GR	2,891	3,469	4,625	2,672	3,101	3,819	92.4	89.4	82.6			

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/Qa; 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	Ta	Tc	ΔTc	G	Ta	Tc	ΔTc	G	Ta	Tc	ΔTc	G	Ta	Tc	ΔTc
	1,156	7.5	8.5	2.1 - 14.9	1,226	9.0	10.0	7.0 - 13.0	1,682	3.2	5.4	4.6 - 6.2	1,717	18.5	17.8	10.4 - 25.2
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	300 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 / Prüfberichtsnummer / F Date of test report / G / F Test method / G / F	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB www.solar.demokritos.gr 6031 DE3, 6033 DE8, 6033 F7 4/9/2013, 24/10/2017 ISO 9459-5 (DST)
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Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	 N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 8503815 - Fax: +210 8544632 153 10 Ag. Paraskevi - Attiki - Greece
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