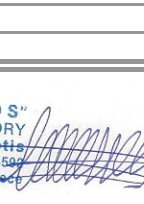
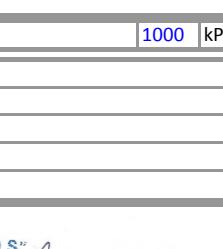






Summary of	EN12976-2	test results	Certification No.	SKM 9999/3									
Annex to Solar KEYMARK Certificate			Issued	2017-01-20									
Company	PAPAEMMANOUEL S.A.		Country	Greece									
Brand (optional)	0		Website	http://www.papaemmanouel.gr									
Street	1o Km Inofyta – St. Thomas, Inofyta Viotia		E-mail	exports@papaemmanouel.gr									
Postal Code	32011	Viotia	Tel. / Fax	+30 22620 31931									
<b>System family overview</b>													
For each storage and collector size, give number of collectors													
Collector name	SOLAR FLAME 120	SOLAR FLAME 160	SOLAR FLAME 200	SOLAR FLAME 300									
FMAX_1.50	1 2	1 2	1 2	2 3									
FMAX_1.50H	1 2	1 2	1										
FMAX_1.82	1	1	1 2	2									
FMAX_1.82H	1	1	1										
FMAX_2.00	1	1 2	1 2	2 3									
FMAX_2.00H	1	1 2	1 2										
FMAX_2.37	1	1	1 2	2									
FMAX_2.37H	1	1	1 2										
FMAX_2.72		1	1	1 2									
FMAX_2.72H		1	1	1									
Name of system configuration													
			SOLAR FLAME 120 MAX 150										
Collector name	FMAX_1.50	No. Collectors	1	Storage name	SOLAR FLAME 120								
Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh MJ/y	Daily drawoff 80				Daily drawoff 110				Daily drawoff 140			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	4478	2107	-	47	6150	2545	-	41	7821	2781	-	36
Würzburg DE	-	4289	2160	-	50	5897	2649	-	45	7506	2990	-	40
Davos CH	-	4857	3106	-	64	6654	3690	-	55	8483	4100	-	48
Athens GR	-	3343	2684	-	80	4573	3406	-	74	5834	3974	-	68
Perf. indicators for the table above													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>L</sub> /Q <sub>d</sub>	-	Solar fraction											
Ref. conditions	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	T <sub>a,ave</sub>	1,157	1,230	1,684	1,736								
	T <sub>c,ave</sub>	7.5	9.0	3.2	18.5								
	± ΔT <sub>c</sub>	8.5	10.0	5.4	17.8								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side		250	kPa	Max. operating press. - tank side		1000	kPa						
Testing Laboratory	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB												
Website	www.solar.demokritos.gr												
Test report id. number	6081 DE1, 6082 DE1, 6082 F2												
Date of test report	6/12/2016, 6/12/2016, 8/2/2017												
Test method	ISO 9459-5 (DST)												
Comments of test lab													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>										
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	<b>2017-01-20</b>										
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece										
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr										
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr										
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30 22620 31931										
<b>System family overview</b>														
<b>Collector name</b>	<b>For each storage and collector size, give number of collectors</b>													
	SOLAR FLAME 120			SOLAR FLAME 160			SOLAR FLAME 200			SOLAR FLAME 300				
FMAX_1.50	1	2		1	2		1	2		2	3			
FMAX_1.50H	1	2		1	2		1							
FMAX_1.82	1			1			1	2		2				
FMAX_1.82H	1			1			1							
FMAX_2.00	1			1	2		1	2		2	3			
FMAX_2.00H	1			1	2		1	2						
FMAX_2.37	1			1			1	2		2				
FMAX_2.37H	1			1			1	2						
FMAX_2.72				1			1			1	2			
FMAX_2.72H				1			1			1				
<b>Name of system configuration</b>					SOLAR FLAME 120 MAX 150H									
<b>Collector name</b>	FMAX_1.50H	<b>No. Collectors</b>	1		<b>Storage name</b>	SOLAR FLAME 120								
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 80				Daily drawoff 110				Daily drawoff 140				
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	
Stockholm SE	-	4478	2107	-	47	6150	2545	-	41	7821	2781	-	36	
Würzburg DE	-	4289	2160	-	50	5897	2649	-	45	7506	2990	-	40	
Davos CH	-	4857	3106	-	64	6654	3690	-	55	8483	4100	-	48	
Athens GR	-	3343	2684	-	80	4573	3406	-	74	5834	3974	-	68	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction												
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR									
	G	1,157	1,230	1,684	1,736									
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5									
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8									
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature												
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.												
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>												
T <sub>h</sub>	45 °C	Desired hot water temperature (mixing valve temperature).												
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000 kPa								
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB													
<b>Website</b>	www.solar.demokritos.gr													
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2													
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017													
<b>Test method</b>	ISO 9459-5 (DST)													
<b>Comments of test lab</b>														
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														
 <b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece														

<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2017-01-20</b>						
<b>Company</b>			PAPAEMMANOUEL S.A.		<b>Country</b>		Greece						
<b>Brand (optional)</b>			0		<b>Website</b>		http://www.papaemmanouel.gr						
<b>Street</b>			1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr						
<b>Postal Code</b>			32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931						
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					<b>SOLAR FLAME 120 MAX 182</b>								
<b>Collector name</b>		<b>FMAX_1.82</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>					
								<b>SOLAR FLAME 120</b>					
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80 l</b>				<b>Daily drawoff 110 l</b>				<b>Daily drawoff 140 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	4478	2337	- 52	6150	2873	- 47	7821	3185	- 41			
Würzburg DE	-	4289	2372	- 55	5897	2961	- 50	7506	3406	- 45			
Davos CH	-	4857	3500	- 72	6654	4257	- 64	8483	4793	- 57			
Athens GR	-	3343	2851	- 85	4573	3658	- 80	5834	4352	- 75			
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
<b>± ΔTc</b>	6.4	3.0	0.8	7.4									
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔTc</b>	<b>K</b>	<b>Seasonal variation of Tc</b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>			<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>			<b>1000</b>		<b>kPa</b>	
<b>Testing Laboratory</b>			NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB										
<b>Website</b>			www.solar.demokritos.gr										
<b>Test report id. number</b>			6081 DE1, 6082 DE1, 6082 F2										
<b>Date of test report</b>			6/12/2016, 6/12/2016, 8/2/2017										
<b>Test method</b>			ISO 9459-5 (DST)										
<b>Comments of test lab</b>													
													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

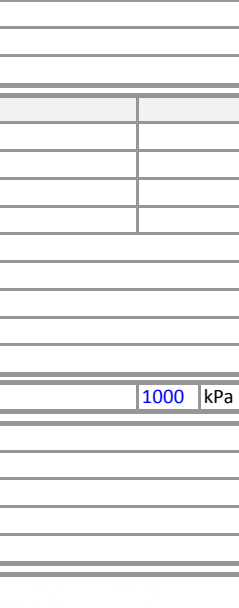
<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>									
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	<b>2017-01-20</b>									
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece									
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30 22620 31931									
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>										
FMAX_1.50	1 2	1 2	1 2	2 3									
FMAX_1.50H	1 2	1 2	1										
FMAX_1.82	1	1	1 2	2									
FMAX_1.82H	1	1	1										
FMAX_2.00	1	1 2	1 2	2 3									
FMAX_2.00H	1	1 2	1 2										
FMAX_2.37	1	1	1 2	2									
FMAX_2.37H	1	1	1 2										
FMAX_2.72		1	1	1 2									
FMAX_2.72H		1	1	1									
<b>Name of system configuration</b>													
			<b>SOLAR FLAME 120 MAX 182H</b>										
<b>Collector name</b>	<b>FMAX_1.82H</b>	<b>No. Collectors</b>	<b>1</b>	<b>Storage name</b>									
<b>SOLAR FLAME 120</b>													
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80 l</b>				<b>Daily drawoff 110 l</b>				<b>Daily drawoff 140 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	4478	2324	-	52	6150	2870	-	47	7821	3185	-	41
Würzburg DE	-	4289	2356	-	55	5897	2952	-	50	7506	3406	-	45
Davos CH	-	4857	3469	-	71	6654	4226	-	64	8483	4762	-	56
Athens GR	-	3343	2841	-	85	4573	3658	-	80	5834	4352	-	75
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>sol</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>	<b>kPa</b>	<b>Max. operating press. - tank side</b>		<b>1000</b>	<b>kPa</b>						
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													
<b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544507 153 10 Ag. Paraskevi - Attiki - Greece													

<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>									
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	2017-01-20									
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece									
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30	22620 31931								
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>								
FMAX_1.50	1	2	1	2	1								
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1								
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1								
FMAX_2.00H	1		1	2	1								
FMAX_2.37	1		1		1								
FMAX_2.37H	1		1		1								
FMAX_2.72			1		1								
FMAX_2.72H			1		1								
<b>Name of system configuration</b>													
			SOLAR FLAME 120 MAX 200										
<b>Collector name</b>	FMAX_2.00	<b>No. Collectors</b>	1		<b>Storage name</b>								
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80  </b>				<b>Daily drawoff 110  </b>				<b>Daily drawoff 140  </b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	4478	2387	-	53	6150	2968	-	48	7821	3311	-	42
Würzburg DE	-	4289	2409	-	56	5897	3037	-	52	7506	3532	-	47
Davos CH	-	4857	3564	-	73	6654	4384	-	66	8483	4983	-	59
Athens GR	-	3343	2879	-	86	4573	3721	-	81	5834	4447	-	76
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	Not relevant for solar domestic hot water system											
<b>Qd</b>	<b>MJ/y</b>	Annual heat demand for domestic hot water											
<b>QL</b>	<b>MJ/y</b>	Annual heat energy delivered by the solar system											
<b>Qpar</b>	<b>MJ/y</b>	Annual parasitic energy: (electricity for pumps/controllers)											
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	-	Solar fraction											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>±ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	Annual irradiation South, 45°											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	Annual average outdoor air temperature											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	Annual average mains cold water temp.											
<b>ΔT<sub>c</sub></b>	<b>K</b>	Seasonal variation of T <sub>c</sub>											
<b>Th</b>	<b>45 °C</b>	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 120 MAX 200H</b>							
<b>Collector name</b>		<b>FMAX_2.00H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 120</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80 l</b>				<b>Daily drawoff 110 l</b>				<b>Daily drawoff 140 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	4478	2394	-	53	6150	2974	-	48	7821	3311	-	42
Würzburg DE	-	4289	2416	-	56	5897	3043	-	52	7506	3532	-	47
Davos CH	-	4857	3564	-	73	6654	4415	-	66	8483	5014	-	59
Athens GR	-	3343	2882	-	86	4573	3721	-	81	5834	4447	-	76
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>T<sub>a,ave</sub></b>	1,157	1,230	1,684	1,736								
	<b>T<sub>c,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>ΔT<sub>c</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										 <p><b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544534 153 10 Ag. Paraskevi - Attiki - Greece</p>			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %




<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 120 MAX 237</b>							
<b>Collector name</b>		<b>FMAX_2.37</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 120</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80  </b>				<b>Daily drawoff 110  </b>				<b>Daily drawoff 140  </b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	4478	2539	-	57	6150	3217	-	52	7821	3627	-	46
Würzburg DE	-	4289	2545	-	59	5897	3248	-	55	7506	3816	-	51
Davos CH	-	4857	3816	-	79	6654	4793	-	72	8483	5519	-	65
Athens GR	-	3343	2974	-	89	4573	3879	-	85	5834	4699	-	81
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4									
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".										 <p><b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544597 153 10 Ag. Paraskevi - Attiki - Greece</p>			




<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 120 MAX 237H</b>							
<b>Collector name</b>		<b>FMAX_2.37H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 120</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80 l</b>				<b>Daily drawoff 110 l</b>				<b>Daily drawoff 140 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	4478	2542	-	57	6150	3217	-	52	7821	3627	-	46
Würzburg DE	-	4289	2548	-	59	5897	3248	-	55	7506	3816	-	51
Davos CH	-	4857	3816	-	79	6654	4793	-	72	8483	5550	-	65
Athens GR	-	3343	2977	-	89	4573	3879	-	85	5834	4699	-	81
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>				1000		kPa	
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										 <p><b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		<b>2017-01-20</b>							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				<b>SOLAR FLAME 120 MAX 300</b>									
<b>Collector name</b>		<b>FMAX_1.50</b>		<b>No. Collectors</b>		<b>2</b>		<b>Storage name</b>		<b>SOLAR FLAME 120</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 80 l</b>				<b>Daily drawoff 110 l</b>				<b>Daily drawoff 140 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	4478	2693	-	60	6150	3437	-	56	7821	3974	-	51
Würzburg DE	-	4289	2677	-	62	5897	3437	-	58	7506	4131	-	55
Davos CH	-	4857	4037	-	83	6654	5140	-	77	8483	6055	-	71
Athens GR	-	3343	3056	-	91	4573	4037	-	88	5834	4920	-	84
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													
 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> <b>Head: Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece													


All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

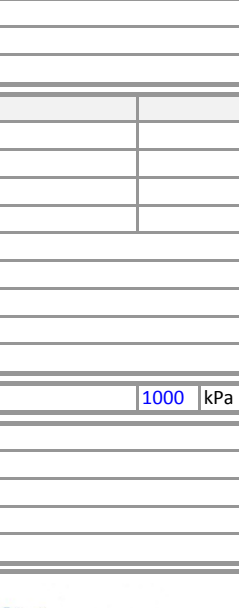
<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>											
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	<b>2017-01-20</b>											
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece											
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr											
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr											
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30 22620 31931											
<b>System family overview</b>															
<b>Collector name</b>	<b>For each storage and collector size, give number of collectors</b>														
	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300								
FMAX_1.50	1	2	1	2	1	2	2	3							
FMAX_1.50H	1	2	1	2	1										
FMAX_1.82	1		1		1	2	2								
FMAX_1.82H	1		1		1										
FMAX_2.00	1		1	2	1	2	2	3							
FMAX_2.00H	1		1	2	1	2									
FMAX_2.37	1		1		1	2	2								
FMAX_2.37H	1		1		1	2									
FMAX_2.72			1		1		1	2							
FMAX_2.72H			1		1		1								
<b>Name of system configuration</b>					SOLAR FLAME 120 MAX 300H										
<b>Collector name</b>	FMAX_1.50H	<b>No. Collectors</b>	2		<b>Storage name</b>	SOLAR FLAME 120									
<b>Calculated annual results for "solar-only / preheat system"</b>															
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 80 l				Daily drawoff 110 l				Daily drawoff 140 l					
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %		
Stockholm SE	-	4478	2687	-	60	6150	3437	-	56	7821	3942	-	50		
Würzburg DE	-	4289	2671	-	62	5897	3437	-	58	7506	4100	-	55		
Davos CH	-	4857	4005	-	82	6654	5140	-	77	8483	6023	-	71		
Athens GR	-	3343	3053	-	91	4573	4037	-	88	5834	4920	-	84		
<b>Perf. indicators for the table above</b>															
Qd,sh	MJ/y	Not relevant for solar domestic hot water system													
Qd	MJ/y	Annual heat demand for domestic hot water													
QL	MJ/y	Annual heat energy delivered by the solar system													
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)													
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction													
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR										
	G	1,157	1,230	1,684	1,736										
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5										
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8										
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4										
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°													
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature													
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.													
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>													
Th	45 °C	Desired hot water temperature (mixing valve temperature).													
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa								
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB														
<b>Website</b>	www.solar.demokritos.gr														
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2														
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017														
<b>Test method</b>	ISO 9459-5 (DST)														
<b>Comments of test lab</b>															
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".															
 <b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece															

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 160 MAX 150</b>							
<b>Collector name</b>		<b>FMAX_1.50</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 160</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	7821	2740	-	35	9492	2933	-	31	11164	3053	-	27
Würzburg DE	-	7506	2933	-	39	9114	3185	-	35	10691	3406	-	32
Davos CH	-	8483	4005	-	47	10281	4320	-	42	12110	4573	-	38
Athens GR	-	5834	3942	-	68	7064	4415	-	63	8326	4793	-	58
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										<b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544540 153 10 Ag. Paraskevi - Attiki - Greece			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 160 MAX 150H</b>							
<b>Collector name</b>		<b>FMAX_1.50H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 160</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	7821	2740	-	35	9492	2933	-	31	11164	3053	-	27
Würzburg DE	-	7506	2933	-	39	9114	3185	-	35	10691	3406	-	32
Davos CH	-	8483	4005	-	47	10281	4320	-	42	12110	4573	-	38
Athens GR	-	5834	3942	-	68	7064	4415	-	63	8326	4793	-	58
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>±ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece</p>			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %


<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>									
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	2017-01-20									
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece									
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30	22620 31931								
<b>System family overview</b>													
<b>Collector name</b>	<b>For each storage and collector size, give number of collectors</b>												
	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>			SOLAR FLAME 160 MAX 182										
<b>Collector name</b>	FMAX_1.82	<b>No. Collectors</b>	1		<b>Storage name</b>	SOLAR FLAME 160							
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 140 l				Daily drawoff 170 l				Daily drawoff 200 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	7821	3154	-	40	9492	3406	-	36	11164	3564	-	32
Würzburg DE	-	7506	3374	-	45	9114	3721	-	41	10691	3974	-	37
Davos CH	-	8483	4699	-	55	10281	5109	-	50	12110	5424	-	45
Athens GR	-	5834	4320	-	74	7064	4920	-	70	8326	5393	-	65
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	T <sub>a,ave</sub>	1,157	1,230	1,684	1,736								
	T <sub>c,ave</sub>	7.5	9.0	3.2	18.5								
	ΔT <sub>c</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													
 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> <b>Head: Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544534 153 10 Ag. Paraskevi - Attiki - Greece													

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 160 MAX 182H</b>							
<b>Collector name</b>		<b>FMAX_1.82H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 160</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	7821	3154	-	40	9492	3437	-	36	11164	3595	-	32
Würzburg DE	-	7506	3374	-	45	9114	3721	-	41	10691	3974	-	37
Davos CH	-	8483	4699	-	55	10281	5109	-	50	12110	5424	-	45
Athens GR	-	5834	4320	-	74	7064	4920	-	70	8326	5393	-	65
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544509 153 10 Ag. Paraskevi - Attiki - Greece</p>			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													





<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 160 MAX 200</b>							
<b>Collector name</b>		<b>FMAX_2.00</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 160</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	7821	3311	-	42	9492	3595	-	38	11164	3753	-	34
Würzburg DE	-	7506	3500	-	47	9114	3879	-	43	10691	4194	-	39
Davos CH	-	8483	4920	-	58	10281	5393	-	52	12110	5740	-	47
Athens GR	-	5834	4447	-	76	7064	5077	-	72	8326	5582	-	67
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>±ΔTc</b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔTc</b>	<b>K</b>	<b>Seasonal variation of Tc</b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".										 <p><b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503915 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece</p>			

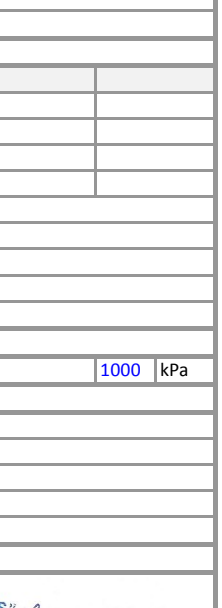
All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2017-01-20</b>						
<b>Company</b>		PAPAEMMANOUEL S.A.			<b>Country</b>		Greece						
<b>Brand (optional)</b>		0			<b>Website</b>		http://www.papaemmanouel.gr						
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>		exports@papaemmanouel.gr						
<b>Postal Code</b>		32011	Viotia		<b>Tel. / Fax</b>		+30 22620 31931						
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					<b>SOLAR FLAME 160 MAX 200H</b>								
<b>Collector name</b>		<b>FMAX_2.00H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>					
								<b>SOLAR FLAME 160</b>					
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	7821	3311	- 42	9492	3595	- 38	11164	3784	- 34			
Würzburg DE	-	7506	3500	- 47	9114	3910	- 43	10691	4194	- 39			
Davos CH	-	8483	4951	- 58	10281	5393	- 52	12110	5740	- 47			
Athens GR	-	5834	4447	- 76	7064	5077	- 72	8326	5582	- 67			
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>			250	kPa	<b>Max. operating press. - tank side</b>			1000	kPa				
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2017-01-20</b>						
<b>Company</b>		PAPAEMMANOUEL S.A.			<b>Country</b>		Greece						
<b>Brand (optional)</b>		0			<b>Website</b>		http://www.papaemmanouel.gr						
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>		exports@papaemmanouel.gr						
<b>Postal Code</b>		32011	Viotia		<b>Tel. / Fax</b>		+30 22620 31931						
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					<b>SOLAR FLAME 160 MAX 237</b>								
<b>Collector name</b>		FMAX_2.37		<b>No. Collectors</b>		1		<b>Storage name</b>					
								SOLAR FLAME 160					
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>
Stockholm SE	-	7821	3658	-	47	9492	4005	-	42	11164	4226	-	38
Würzburg DE	-	7506	3816	-	51	9114	4320	-	47	10691	4699	-	44
Davos CH	-	8483	5519	-	65	10281	6086	-	59	12110	6528	-	54
Athens GR	-	5834	4699	-	81	7064	5424	-	77	8326	6055	-	73
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=QL/Qd</b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	<b>G</b>	1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔTc</b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔTc</b>	<b>K</b>	<b>Seasonal variation of Tc</b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		250	kPa		<b>Max. operating press. - tank side</b>				1000	kPa			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".											
		 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> <b>Head: Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece											

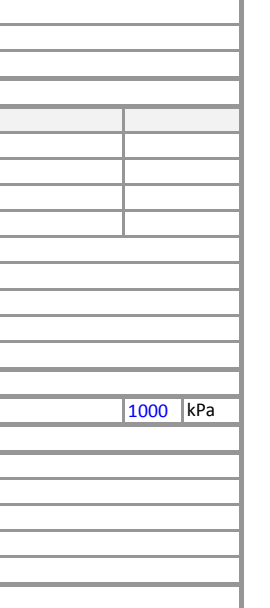
<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2017-01-20</b>							
<b>Company</b>		PAPAEMMANOUEL S.A.			<b>Country</b>		Greece							
<b>Brand (optional)</b>		0			<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011	Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>					<b>SOLAR FLAME 160 MAX 237H</b>									
<b>Collector name</b>		<b>FMAX_2.37H</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>						
								<b>SOLAR FLAME 160</b>						
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	7821	3658	-	47	9492	4005	-	42	11164	4226	-	38	
Würzburg DE	-	7506	3816	-	51	9114	4320	-	47	10691	4699	-	44	
Davos CH	-	8483	5519	-	65	10281	6086	-	59	12110	6528	-	54	
Athens GR	-	5834	4699	-	81	7064	5424	-	77	8326	6055	-	73	
<b>Perf. indicators for the table above</b>														
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>												
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>												
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>												
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>												
<b>f<sub>sol</sub>=Q<sub>L</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>												
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR									
		1,157	1,230	1,684	1,736									
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5									
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8									
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4									
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>												
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>												
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>												
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>												
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>												
<b>Max. operating press. - collector side</b>		<b>250</b>		<b>kPa</b>		<b>Max. operating press. - tank side</b>		<b>1000</b>		<b>kPa</b>				
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>		www.solar.demokritos.gr												
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>		ISO 9459-5 (DST)												
<b>Comments of test lab</b>														
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														
 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece														

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 160 MAX 272									
<b>Collector name</b>		FMAX_2.72		<b>No. Collectors</b>		1							
<b>Storage name</b>				SOLAR FLAME 160									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140 l</b>				<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>			
	MJ/y	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>
Stockholm SE	-	7821	3879	-	50	9492	4320	-	46	11164	4573	-	41
WürzburgDE	-	7506	4037	-	54	9114	4573	-	50	10691	5046	-	47
Davos CH	-	8483	5897	-	70	10281	6591	-	64	12110	7127	-	59
Athens GR	-	5834	4888	-	84	7064	5645	-	80	8326	6339	-	76
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		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 Belessiotis Tel: +210 6503815 - Fax: +210 6544507 153 10 Ag. Paraskevi - Attiki - Greece</p>											

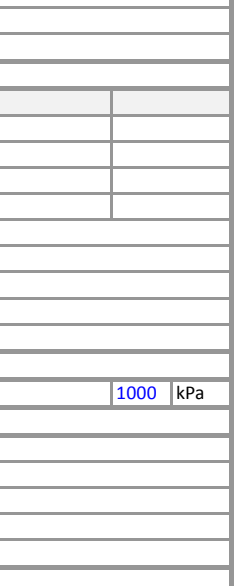


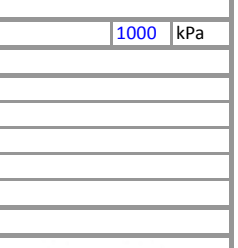
<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>				PAPAEMMANOUEL S.A.		<b>Country</b>		Greece					
<b>Brand (optional)</b>				0		<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>				1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>													
						SOLAR FLAME 160 MAX 272H							
<b>Collector name</b>		FMAX_2.72H		<b>No. Collectors</b>		1		<b>Storage name</b>		SOLAR FLAME 160			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 140 l				Daily drawoff 170 l				Daily drawoff 200 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %
Stockholm SE	-	7821	3879	-	50	9492	4320	-	46	11164	4604	-	41
WürzburgDE	-	7506	4037	-	54	9114	4604	-	51	10691	5046	-	47
Davos CH	-	8483	5929	-	70	10281	6623	-	64	12110	7127	-	59
Athens GR	-	5834	4888	-	84	7064	5676	-	80	8326	6370	-	77
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

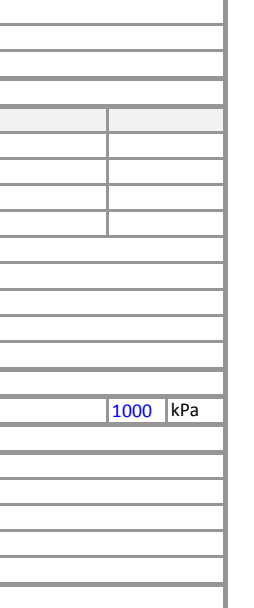
All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

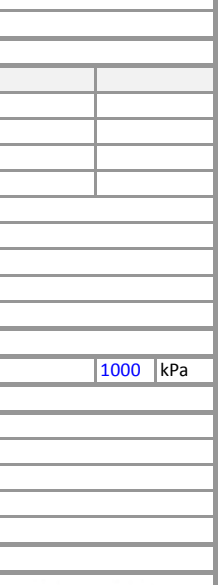
<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>								SOLAR FLAME 160 MAX 300					
<b>Collector name</b>		FMAX_1.50		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 160			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 140				Daily drawoff 170				Daily drawoff 200			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	7821	4005	-	51	9492	4478	-	47	11164	4762	-	43
WürzburgDE	-	7506	4131	-	55	9114	4730	-	52	10691	5235	-	49
Davos CH	-	8483	6086	-	72	10281	6875	-	67	12110	7442	-	61
Athens GR	-	5834	4951	-	85	7064	5771	-	82	8326	6496	-	78
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	Ta,ave	7.5	9.0	3.2	18.5								
	Tc,ave	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
Ta,ave	°C	Annual average outdoor air temperature											
Tc,ave	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		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 6544502 153 10 Ag. Paraskevi - Attiki - Greece</p>											



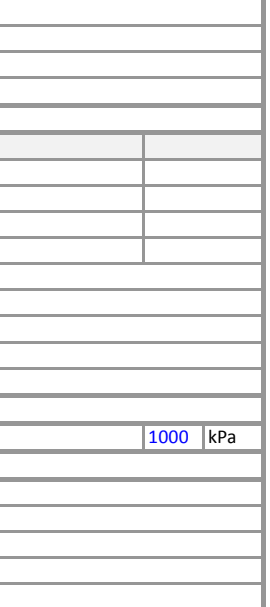
<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>						
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece						
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr						
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr						
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931						
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>						<b>SOLAR FLAME 160 MAX 300H</b>								
<b>Collector name</b>		<b>FMAX_1.50H</b>		<b>No. Collectors</b>		<b>2</b>		<b>Storage name</b>		<b>SOLAR FLAME 160</b>				
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff</b>				<b>Daily drawoff</b>				<b>Daily drawoff</b>				
		<b>140</b>		<b>170</b>		<b>200</b>								
	<b>Qd,hw</b>	<b>Ql</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>Ql</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>Ql</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>		
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>		
Stockholm SE	-	7821	4005	-	51	9492	4447	-	47	11164	4762	-	43	
WürzburgDE	-	7506	4131	-	55	9114	4730	-	52	10691	5203	-	49	
Davos CH	-	8483	6086	-	72	10281	6843	-	67	12110	7442	-	61	
Athens GR	-	5834	4951	-	85	7064	5771	-	82	8326	6496	-	78	
<b>Perf. indicators for the table above</b>														
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>												
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>												
<b>Ql</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>												
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>												
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>												
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR									
		1,157	1,230	1,684	1,736									
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5									
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8									
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4									
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>												
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>												
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>												
<b>ΔT<sub>c</sub></b>	<b>K</b>	<b>Seasonal variation of T<sub>c</sub></b>												
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>												
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa				
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>		www.solar.demokritos.gr												
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>		ISO 9459-5 (DST)												
<b>Comments of test lab</b>										 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece</p>				
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		2017-01-20						
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece						
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr						
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr						
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931						
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>						SOLAR FLAME 160 MAX 400								
<b>Collector name</b>		FMAX_2.00		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 160				
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff</b>				<b>Daily drawoff</b>				<b>Daily drawoff</b>				
		140		170		200								
	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>		
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%		
Stockholm SE	-	7821	4447	-	57	9492	5014	-	53	11164	5456	-	49	
WürzburgDE	-	7506	4510	-	60	9114	5203	-	57	10691	5834	-	55	
Davos CH	-	8483	6749	-	80	10281	7726	-	75	12110	8578	-	71	
Athens GR	-	5834	5235	-	90	7064	6150	-	87	8326	7001	-	84	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction												
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR									
	G	1,157	1,230	1,684	1,736									
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5									
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8									
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature												
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.												
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>												
Th	45 °C	Desired hot water temperature (mixing valve temperature).												
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa				
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>		www.solar.demokritos.gr												
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>		ISO 9459-5 (DST)												
<b>Comments of test lab</b>						 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>								
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>	PAPAEMMANOUEL S.A.			<b>Country</b>	Greece								
<b>Brand (optional)</b>	0			<b>Website</b>	http://www.papaemmanouel.gr								
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>	exports@papaemmanouel.gr								
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>													
				SOLAR FLAME 160 MAX 400H									
<b>Collector name</b>	FMAX_2.00H		<b>No. Collectors</b>	2		<b>Storage name</b>	SOLAR FLAME 160						
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 140  </b>				<b>Daily drawoff 170  </b>				<b>Daily drawoff 200  </b>			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	7821	4415	-	56	9492	5014	-	53	11164	5456	-	49
Würzburg DE	-	7506	4510	-	60	9114	5203	-	57	10691	5834	-	55
Davos CH	-	8483	6717	-	79	10281	7695	-	75	12110	8546	-	71
Athens GR	-	5834	5203	-	89	7064	6150	-	87	8326	7001	-	84
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>													
		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
G		1,157	1,230	1,684	1,736								
T <sub>a,ave</sub>	°C	7.5	9.0	3.2	18.5								
T <sub>c,ave</sub>	°C	8.5	10.0	5.4	17.8								
± ΔTc		6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						<b>SOLAR FLAME 200 MAX 150</b>							
<b>Collector name</b>		<b>FMAX_1.50</b>		<b>No. Collectors</b>		<b>1</b>		<b>Storage name</b>		<b>SOLAR FLAME 200</b>			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 250 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>fsol</b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	9492	2860	-	30	11164	3056	-	27	13939	3217	-	23
WürzburgDE	-	9114	3106	-	34	10691	3311	-	31	13371	3595	-	27
Davos CH	-	10281	4163	-	40	12110	4447	-	37	15137	4762	-	31
Athens GR	-	7064	4320	-	61	8326	4730	-	57	10407	5140	-	49
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	<b>Not relevant for solar domestic hot water system</b>											
<b>Qd</b>	<b>MJ/y</b>	<b>Annual heat demand for domestic hot water</b>											
<b>QL</b>	<b>MJ/y</b>	<b>Annual heat energy delivered by the solar system</b>											
<b>Qpar</b>	<b>MJ/y</b>	<b>Annual parasitic energy: (electricity for pumps/controllers)</b>											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	<b>-</b>	<b>Solar fraction</b>											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔTc</b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	<b>Annual irradiation South, 45°</b>											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	<b>Annual average outdoor air temperature</b>											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	<b>Annual average mains cold water temp.</b>											
<b>ΔTc</b>	<b>K</b>	<b>Seasonal variation of Tc</b>											
<b>Th</b>	<b>45 °C</b>	<b>Desired hot water temperature (mixing valve temperature).</b>											
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

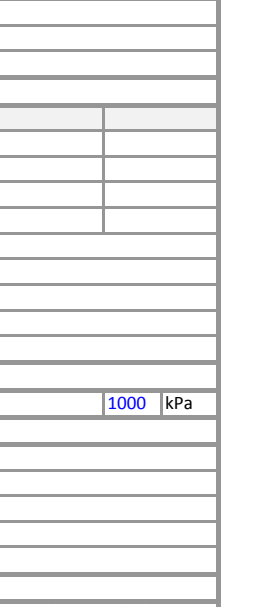
Summary of	EN12976-2	test results	Certification No.	SKM 9999/3									
Annex to Solar KEYMARK Certificate			Issued	2017-01-20									
Company	PAPAEMMANOUEL S.A.		Country	Greece									
Brand (optional)	0		Website	http://www.papaemmanouel.gr									
Street	1o Km Inofyta – St. Thomas, Inofyta Viotia		E-mail	exports@papaemmanouel.gr									
Postal Code	32011	Viotia	Tel. / Fax	+30 22620 31931									
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
Collector name	SOLAR FLAME 120	SOLAR FLAME 160	SOLAR FLAME 200	SOLAR FLAME 300									
FMAX_1.50	1 2	1 2	1 2	2 3									
FMAX_1.50H	1 2	1 2	1										
FMAX_1.82	1	1	1 2	2									
FMAX_1.82H	1	1	1										
FMAX_2.00	1	1 2	1 2	2 3									
FMAX_2.00H	1	1 2	1 2										
FMAX_2.37	1	1	1 2	2									
FMAX_2.37H	1	1	1 2										
FMAX_2.72		1	1	1 2									
FMAX_2.72H		1	1	1									
Name of system configuration: SOLAR FLAME 200 MAX 150H													
Collector name	FMAX_1.50H	No. Collectors	1	Storage name: SOLAR FLAME 200									
<b>Calculated annual results for "solar-only / preheat system"</b>													
Location	Qd,sh	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
	MJ/y	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>
Stockholm SE	-	9492	2863	-	30	11164	3056	-	27	13939	3217	-	23
WürzburgDE	-	9114	3109	-	34	10691	3343	-	31	13371	3595	-	27
Davos CH	-	10281	4163	-	40	12110	4447	-	37	15137	4762	-	31
Athens GR	-	7064	4352	-	62	8326	4730	-	57	10407	5140	-	49
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
Ref. conditions	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
± ΔTc	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1000	kPa								
Testing Laboratory	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB												
Website	www.solar.demokritos.gr												
Test report id. number	6081 DE1, 6082 DE1, 6082 F2												
Date of test report	6/12/2016, 6/12/2016, 8/2/2017												
Test method	ISO 9459-5 (DST)												
Comments of test lab	The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules". <div style="float: right; text-align: right;">                     N.C.S.R "DEMOKRITOS"                      SOLAR ENERGY LABORATORY                      Head: Dr Vassilis Belessiotis                      Tel: +210 6503815 - Fax: +210 6544502                      153 10 Ag. Paraskevi - Attiki - Greece                 </div>												

Summary of	EN12976-2	test results	Certification No.	SKM 9999/3										
Annex to Solar KEYMARK Certificate			Issued	2017-01-20										
Company	PAPAEMMANOUEL S.A.		Country	Greece										
Brand (optional)	0		Website	http://www.papaemmanouel.gr										
Street	1o Km Inofyta – St. Thomas, Inofyta Viotia		E-mail	exports@papaemmanouel.gr										
Postal Code	32011	Viotia	Tel. / Fax	+30 22620 31931										
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
Collector name	SOLAR FLAME 120	SOLAR FLAME 160	SOLAR FLAME 200	SOLAR FLAME 300										
FMAX_1.50	1 2	1 2	1 2	2 3										
FMAX_1.50H	1 2	1 2	1											
FMAX_1.82	1	1	1 2	2										
FMAX_1.82H	1	1	1											
FMAX_2.00	1	1 2	1 2	2 3										
FMAX_2.00H	1	1 2	1 2											
FMAX_2.37	1	1	1 2	2										
FMAX_2.37H	1	1	1 2											
FMAX_2.72		1	1	1 2										
FMAX_2.72H		1	1	1										
Name of system configuration: SOLAR FLAME 200 MAX 182														
Collector name	FMAX_1.82	No. Collectors	1	Storage name: SOLAR FLAME 200										
<b>Calculated annual results for "solar-only / preheat system"</b>														
Location	Qd,sh	Daily drawoff				Daily drawoff				Daily drawoff				
	MJ/y	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	
Stockholm SE	-	9492	3374	-	36	11164	3595	-	32	13939	3816	-	27	
WürzburgDE	-	9114	3627	-	40	10691	3910	-	37	13371	4257	-	32	
Davos CH	-	10281	4983	-	48	12110	5330	-	44	15137	5740	-	38	
Athens GR	-	7064	4857	-	69	8326	5361	-	64	10407	5992	-	58	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction												
Ref. conditions	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR									
		1,157	1,230	1,684	1,736									
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5									
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8									
	± ΔTc	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature												
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.												
ΔTc	K	Seasonal variation of Tc												
Th	45 °C	Desired hot water temperature (mixing valve temperature).												
Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1000	kPa									
Testing Laboratory	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB													
Website	www.solar.demokritos.gr													
Test report id. number	6081 DE1, 6082 DE1, 6082 F2													
Date of test report	6/12/2016, 6/12/2016, 8/2/2017													
Test method	ISO 9459-5 (DST)													
Comments of test lab	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 Belessiotis Tel: +210 6503815 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece</p>														

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>	PAPAEMMANOUEL S.A.			<b>Country</b>	Greece								
<b>Brand (optional)</b>	0			<b>Website</b>	http://www.papaemmanouel.gr								
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>	exports@papaemmanouel.gr								
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>													
				SOLAR FLAME 200 MAX 182H									
<b>Collector name</b>	FMAX_1.82H		<b>No. Collectors</b>	1		<b>Storage name</b>	SOLAR FLAME 200						
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 170				Daily drawoff 200				Daily drawoff 250			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	3374	-	36	11164	3627	-	32	13939	3816	-	27
Würzburg DE	-	9114	3627	-	40	10691	3910	-	37	13371	4257	-	32
Davos CH	-	10281	4983	-	48	12110	5330	-	44	15137	5740	-	38
Athens GR	-	7064	4857	-	69	8326	5361	-	64	10407	5992	-	58
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>				<b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece									
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5% to ± 15%



<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		2017-01-20						
<b>Company</b>	PAPAEMMANOUEL S.A.				<b>Country</b>	Greece							
<b>Brand (optional)</b>	0				<b>Website</b>	http://www.papaemmanouel.gr							
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>	exports@papaemmanouel.gr							
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931							
<b>System family overview</b>													
For each storage and collector size, give number of collectors													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					SOLAR FLAME 200 MAX 200								
<b>Collector name</b>	FMAX_2.00		<b>No. Collectors</b>	2		<b>Storage name</b>	SOLAR FLAME 200						
Calculated annual results for "solar-only / preheat system"													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	3532	-	37	11164	3816	-	34	13939	4068	-	29
Würzburg DE	-	9114	3816	-	42	10691	4131	-	39	13371	4510	-	34
Davos CH	-	10281	5267	-	51	12110	5645	-	47	15137	6118	-	40
Athens GR	-	7064	5014	-	71	8326	5550	-	67	10407	6276	-	60
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	T <sub>a,ave</sub>	1,157	1,230	1,684	1,736								
	T <sub>c,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

Version 3.6, 2014-06-18



Summary of	EN12976-2	test results	Certification No.	SKM 9999/3
Annex to Solar KEYMARK Certificate			Issued	2017-01-20
Company	PAPAEMMANOUEL S.A.		Country	Greece
Brand (optional)	0		Website	http://www.papaemmanouel.gr
Street	1o Km Inofyta – St. Thomas, Inofyta Viotia		E-mail	exports@papaemmanouel.gr
Postal Code	32011	Viotia	Tel. / Fax	+30 22620 31931

System family overview					
Collector name	For each storage and collector size, give number of collectors				
	SOLAR FLAME 120	SOLAR FLAME 160	SOLAR FLAME 200	SOLAR FLAME 300	
FMAX_1.50	1 2	1 2	1 2	2 3	
FMAX_1.50H	1 2	1 2	1		
FMAX_1.82	1	1	1 2	2	
FMAX_1.82H	1	1	1		
FMAX_2.00	1	1 2	1 2	2 3	
FMAX_2.00H	1	1 2	1 2		
FMAX_2.37	1	1	1 2	2	
FMAX_2.37H	1	1	1 2		
FMAX_2.72		1	1	1 2	
FMAX_2.72H		1	1	1	

Name of system configuration	SOLAR FLAME 200 MAX 200H		
Collector name	FMAX_2.00H	No. Collectors	1
Storage name	SOLAR FLAME 200		

Calculated annual results for "solar-only / preheat system"													
Location	Qd,sh MJ/y	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	3532	-	37	11164	3816	-	34	13939	4068	-	29
WürzburgDE	-	9114	3816	-	42	10691	4131	-	39	13371	4510	-	34
Davos CH	-	10281	5267	-	51	12110	5645	-	47	15137	6118	-	40
Athens GR	-	7064	5014	-	71	8326	5550	-	67	10407	6276	-	60

Perf. indicators for the table above	
Qd,sh	MJ/y
Qd	MJ/y
QL	MJ/y
Qpar	MJ/y
fsol=Q <sub>sol</sub> /Q <sub>d</sub>	-

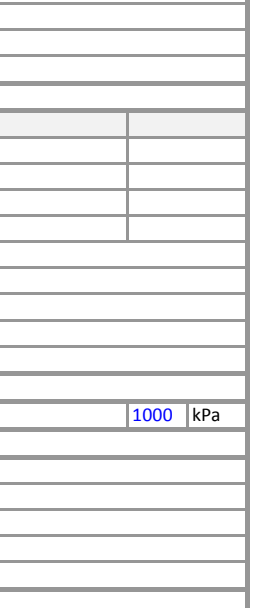
Ref. conditions	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°			
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature			
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.			
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>			
Th	45 °C	Desired hot water temperature (mixing valve temperature).			

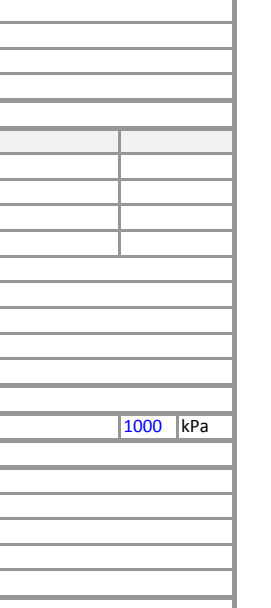
Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1000	kPa
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Testing Laboratory	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number	6081 DE1, 6082 DE1, 6082 F2
Date of test report	6/12/2016, 6/12/2016, 8/2/2017
Test method	ISO 9459-5 (DST)


Comments of test lab	<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544509 153 10 Ag. Paraskevi - Attiki - Greece</p>
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".	

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						SOLAR FLAME 200 MAX 237							
<b>Collector name</b>		FMAX_2.37		<b>No. Collectors</b>		1		<b>Storage name</b>		SOLAR FLAME 200			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 300 l</b>			
	MJ/y	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>
Stockholm SE	-	9492	3974	-	42	11164	4320	-	39	13939	4636	-	33
WürzburgDE	-	9114	4257	-	47	10691	4636	-	43	13371	5140	-	38
Davos CH	-	10281	5992	-	58	12110	6433	-	53	15137	7033	-	46
Athens GR	-	7064	5393	-	76	8326	6023	-	72	10407	6906	-	66
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
ΔT <sub>c</sub>		6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa			
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		<b>2017-01-20</b>						
<b>Company</b>	PAPAEMMANOUEL S.A.				<b>Country</b>	Greece							
<b>Brand (optional)</b>	0				<b>Website</b>	http://www.papaemmanouel.gr							
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>	exports@papaemmanouel.gr							
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931							
<b>System family overview</b>													
For each storage and collector size, give number of collectors													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					SOLAR FLAME 200 MAX 237H								
<b>Collector name</b>	FMAX_2.37H		<b>No. Collectors</b>	1		<b>Storage name</b>	SOLAR FLAME 200						
Calculated annual results for "solar-only / preheat system"													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	3974	-	42	11164	4320	-	39	13939	4636	-	33
WürzburgDE	-	9114	4257	-	47	10691	4636	-	43	13371	5140	-	38
Davos CH	-	10281	5992	-	58	12110	6433	-	53	15137	7033	-	46
Athens GR	-	7064	5393	-	76	8326	6023	-	72	10407	6906	-	66
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>L</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	T <sub>a,ave</sub>	1,157	1,230	1,684	1,736								
	T <sub>c,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

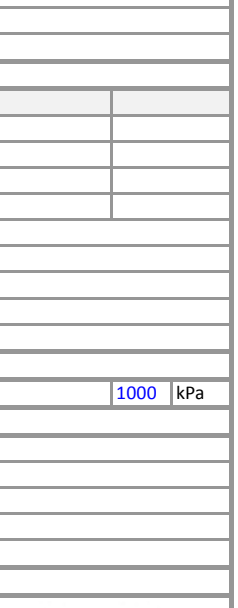
All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>								
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20								
<b>Company</b>	PAPAEMMANOUEL S.A.			<b>Country</b>	Greece									
<b>Brand (optional)</b>	0			<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931								
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>				SOLAR FLAME 200 MAX 272										
<b>Collector name</b>	FMAX_2.72		<b>No. Collectors</b>	1		<b>Storage name</b>	SOLAR FLAME 200							
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170</b>				<b>Daily drawoff 200</b>				<b>Daily drawoff 250</b>				
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%		
Stockholm SE	-	9492	4289	-	45	11164	4699	-	42	13939	5077	-	36	
WürzburgDE	-	9114	4541	-	50	10691	5014	-	47	13371	5613	-	42	
Davos CH	-	10281	6528	-	63	12110	7064	-	58	15137	7758	-	51	
Athens GR	-	7064	5645	-	80	8326	6339	-	76	10407	7348	-	71	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
$f_{sol} = Q_{sol} / Q_d$	-	Solar fraction												
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR									
	G	1,157	1,230	1,684	1,736									
	Ta,ave	7.5	9.0	3.2	18.5									
	Tc,ave	8.5	10.0	5.4	17.8									
	± ΔTc	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
Ta,ave	°C	Annual average outdoor air temperature												
Tc,ave	°C	Annual average mains cold water temp.												
ΔTc	K	Seasonal variation of Tc												
Th	45 °C	Desired hot water temperature (mixing valve temperature).												
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>				1000	kPa					
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB													
<b>Website</b>	www.solar.demokritos.gr													
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2													
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017													
<b>Test method</b>	ISO 9459-5 (DST)													
<b>Comments of test lab</b>														
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														
 <b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544509 153 10 Ag. Paraskevi - Attiki - Greece														





<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		2017-01-20					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						SOLAR FLAME 200 MAX 272H							
<b>Collector name</b>		FMAX_2.72H		<b>No. Collectors</b>		1		<b>Storage name</b>		SOLAR FLAME 200			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 170				Daily drawoff 200				Daily drawoff 250			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	4289	-	45	11164	4699	-	42	13939	5077	-	36
WürzburgDE	-	9114	4541	-	50	10691	5014	-	47	13371	5613	-	42
Davos CH	-	10281	6528	-	63	12110	7096	-	59	15137	7758	-	51
Athens GR	-	7064	5645	-	80	8326	6339	-	76	10407	7348	-	71
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
± ΔTc	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>										<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>			
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %


<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>								
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20								
<b>Company</b>	PAPAEMMANOUEL S.A.			<b>Country</b>	Greece									
<b>Brand (optional)</b>	0			<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931								
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>				SOLAR FLAME 200 MAX 300										
<b>Collector name</b>	FMAX_1.50		<b>No. Collectors</b>	2		<b>Storage name</b>	SOLAR FLAME 200							
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 250 l</b>				
	MJ/y	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	
Stockholm SE	-	9492	4447	-	47	11164	4920	-	44	13939	5330	-	38	
WürzburgDE	-	9114	4699	-	52	10691	5203	-	49	13371	5866	-	44	
Davos CH	-	10281	6812	-	66	12110	7411	-	61	15137	8168	-	54	
Athens GR	-	7064	5771	-	82	8326	6528	-	78	10407	7569	-	73	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction												
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR									
		1,157	1,230	1,684	1,736									
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5									
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8									
± ΔTc	6.4	3.0	0.8	7.4										
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature												
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.												
ΔTc	K	Seasonal variation of Tc												
Th	45 °C	Desired hot water temperature (mixing valve temperature).												
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>				1000	kPa					
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB													
<b>Website</b>	www.solar.demokritos.gr													
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2													
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017													
<b>Test method</b>	ISO 9459-5 (DST)													
<b>Comments of test lab</b>														
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".														
 <p><b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544502 153 10 Ag. Paraskevi - Attiki - Greece</p>														

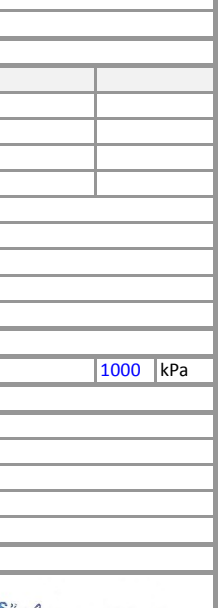


<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>							
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece							
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>															
<b>For each storage and collector size, give number of collectors</b>															
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>								
FMAX_1.50	1	2	1	2	1	2	2	3							
FMAX_1.50H	1	2	1	2	1	2									
FMAX_1.82	1		1		1	2	2								
FMAX_1.82H	1		1		1										
FMAX_2.00	1		1	2	1	2	2	3							
FMAX_2.00H	1		1	2	1	2									
FMAX_2.37	1		1		1	2	2								
FMAX_2.37H	1		1		1	2									
FMAX_2.72			1		1		1	2							
FMAX_2.72H			1		1		1								
<b>Name of system configuration</b>						SOLAR FLAME 200 MAX 364									
<b>Collector name</b>		FMAX_1.82		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 200					
<b>Calculated annual results for "solar-only / preheat system"</b>															
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff</b>				<b>Daily drawoff</b>				<b>Daily drawoff</b>					
		170		200		250									
	Qd,hw	Ql	Qpar	fsol	Qd,hw	Ql	Qpar	fsol	Qd,hw	Ql	Qpar	fsol			
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%			
Stockholm SE	-	9492	4920	-	52	11164	5456	-	49	13939	6023	-	43		
WürzburgDE	-	9114	5109	-	56	10691	5708	-	53	13371	6559	-	49		
Davos CH	-	10281	7506	-	73	12110	8326	-	69	15137	9366	-	62		
Athens GR	-	7064	6086	-	86	8326	6906	-	83	10407	8168	-	78		
<b>Perf. indicators for the table above</b>															
Qd,sh	MJ/y	Not relevant for solar domestic hot water system													
Qd	MJ/y	Annual heat demand for domestic hot water													
Ql	MJ/y	Annual heat energy delivered by the solar system													
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)													
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction													
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR										
	G	1,157	1,230	1,684	1,736										
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5										
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8										
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4										
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°													
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature													
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.													
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>													
Th	45 °C	Desired hot water temperature (mixing valve temperature).													
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa					
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB													
<b>Website</b>		www.solar.demokritos.gr													
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2													
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017													
<b>Test method</b>		ISO 9459-5 (DST)													
<b>Comments of test lab</b>															
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".															
 <b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece															


<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 200 MAX 400									
<b>Collector name</b>		FMAX_2.00		<b>No. Collectors</b>		2							
<b>Storage name</b>				SOLAR FLAME 200									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 250 l</b>			
	MJ/y	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
Stockholm SE	-	9492	5046	-	53	11164	5645	-	51	13939	6276	-	45
WürzburgDE	-	9114	5235	-	57	10691	5866	-	55	13371	6780	-	51
Davos CH	-	10281	7758	-	75	12110	8641	-	71	15137	9808	-	65
Athens GR	-	7064	6181	-	88	8326	7033	-	84	10407	8357	-	80
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		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 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece											

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		<b>2017-01-20</b>							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>													
				SOLAR FLAME 200 MAX 400H									
<b>Collector name</b>		FMAX_2.00H		<b>No. Collectors</b>		2							
				<b>Storage name</b>		SOLAR FLAME 200							
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 170				Daily drawoff 200				Daily drawoff 250			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	9492	5046	-	53	11164	5645	-	51	13939	6244	-	45
Würzburg DE	-	9114	5203	-	57	10691	5866	-	55	13371	6780	-	51
Davos CH	-	10281	7726	-	75	12110	8609	-	71	15137	9776	-	65
Athens GR	-	7064	6150	-	87	8326	7033	-	84	10407	8326	-	80
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>L</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>													
		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
G	kWh/m <sup>2</sup>	1,157	1,230	1,684	1,736								
T <sub>a,ave</sub>	°C	7.5	9.0	3.2	18.5								
T <sub>c,ave</sub>	°C	8.5	10.0	5.4	17.8								
± ΔT <sub>c</sub>	K	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".											
		 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece											

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>		PAPAEMMANOUEL S.A.				<b>Country</b>		Greece					
<b>Brand (optional)</b>		0				<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						SOLAR FLAME 200 MAX 474							
<b>Collector name</b>		FMAX_2.37		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 200			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 250 l</b>			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	
Stockholm SE	-	9492	5361	-	56	11164	6023	-	54	13939	6812	-	49
WürzburgDE	-	9114	5487	-	60	10691	6213	-	58	13371	7253	-	54
Davos CH	-	10281	8199	-	80	12110	9209	-	76	15137	10628	-	70
Athens GR	-	7064	6339	-	90	8326	7285	-	87	10407	8704	-	84
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>						 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>							
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 200 MAX 474H									
<b>Collector name</b>		FMAX_2.37H		<b>No. Collectors</b>		2							
<b>Storage name</b>				SOLAR FLAME 200									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 170 l</b>				<b>Daily drawoff 200 l</b>				<b>Daily drawoff 250 l</b>			
	MJ/y	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
Stockholm SE	-	9492	5361	-	56	11164	6023	-	54	13939	6780	-	49
WürzburgDE	-	9114	5487	-	60	10691	6181	-	58	13371	7222	-	54
Davos CH	-	10281	8199	-	80	12110	9209	-	76	15137	10628	-	70
Athens GR	-	7064	6339	-	90	8326	7285	-	87	10407	8704	-	84
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													



<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 300 MAX 272									
<b>Collector name</b>		FMAX_2.72		<b>No. Collectors</b>		1							
<b>Storage name</b>				SOLAR FLAME 300									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250</b>				<b>Daily drawoff 300</b>				<b>Daily drawoff 400</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	13939	5203	-	37	16746	5424	-	32	22327	5992	-	27
WürzburgDE	-	13371	5456	-	41	16052	5929	-	37	21413	6528	-	30
Davos CH	-	15137	7506	-	50	18165	8073	-	44	24220	8799	-	36
Athens GR	-	10407	7222	-	69	12488	8073	-	65	16651	9051	-	54
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	Not relevant for solar domestic hot water system											
<b>Qd</b>	<b>MJ/y</b>	Annual heat demand for domestic hot water											
<b>QL</b>	<b>MJ/y</b>	Annual heat energy delivered by the solar system											
<b>Qpar</b>	<b>MJ/y</b>	Annual parasitic energy: (electricity for pumps/controllers)											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	-	Solar fraction											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔTc</b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	Annual irradiation South, 45°											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	Annual average outdoor air temperature											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	Annual average mains cold water temp.											
<b>ΔTc</b>	<b>K</b>	Seasonal variation of Tc											
<b>Th</b>	<b>45 °C</b>	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>				1000 kPa					
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".											
		 <b>N.C.S.R "DEMOKRITOS"</b> <b>SOLAR ENERGY LABORATORY</b> Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece											

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %



<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 300 MAX 272H									
<b>Collector name</b>		FMAX_2.72H		<b>No. Collectors</b>		1							
<b>Storage name</b>				SOLAR FLAME 300									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250</b>				<b>Daily drawoff 300</b>				<b>Daily drawoff 400</b>			
	MJ/y	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>
Stockholm SE	-	13939	5235	-	38	16746	5456	-	33	22327	6023	-	27
WürzburgDE	-	13371	5487	-	41	16052	5960	-	37	21413	6559	-	31
Davos CH	-	15137	7537	-	50	18165	8105	-	45	24220	8830	-	36
Athens GR	-	10407	7253	-	70	12488	8105	-	65	16651	9082	-	55
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔT <sub>c</sub>	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													
<b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belesiotis</b> Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece 													

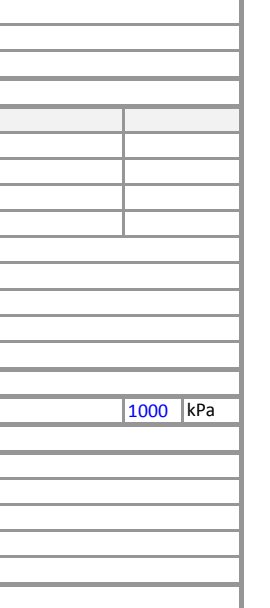
All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

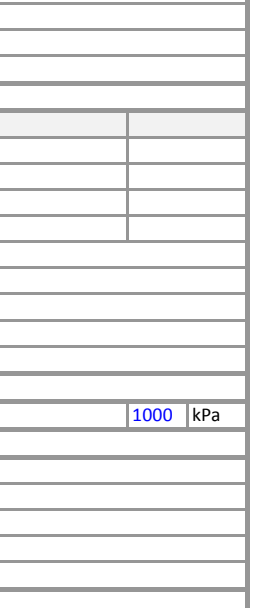


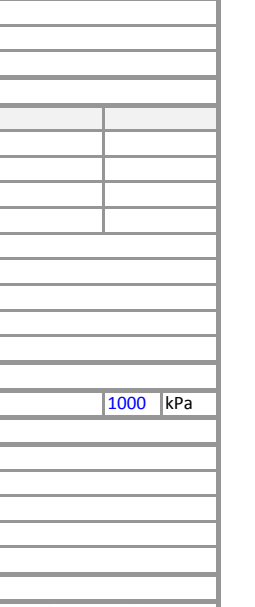


<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>									
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	<b>2017-01-20</b>									
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece									
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30 22620 31931									
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>	<b>SOLAR FLAME 160</b>	<b>SOLAR FLAME 200</b>	<b>SOLAR FLAME 300</b>									
FMAX_1.50	1 2	1 2	1 2	2 3									
FMAX_1.50H	1 2	1 2	1										
FMAX_1.82	1	1	1 2	2									
FMAX_1.82H	1	1	1										
FMAX_2.00	1	1 2	1 2	2 3									
FMAX_2.00H	1	1 2	1 2										
FMAX_2.37	1	1	1 2	2									
FMAX_2.37H	1	1	1 2										
FMAX_2.72		1	1	1 2									
FMAX_2.72H		1	1	1									
<b>Name of system configuration</b>													
			SOLAR FLAME 300 MAX 300										
<b>Collector name</b>	FMAX_1.50	<b>No. Collectors</b>	2	<b>Storage name</b>									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250 l</b>				<b>Daily drawoff 300 l</b>				<b>Daily drawoff 400 l</b>			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	13939	5487	-	39	16746	5740	-	34	22327	6339	-	28
WürzburgDE	-	13371	5740	-	43	16052	6244	-	39	21413	6906	-	32
Davos CH	-	15137	7916	-	52	18165	8546	-	47	24220	9335	-	39
Athens GR	-	10407	7474	-	72	12488	8357	-	67	16651	9492	-	57
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>													
		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
G	kWh/m <sup>2</sup>	1,157	1,230	1,684	1,736								
T <sub>a,ave</sub>	°C	7.5	9.0	3.2	18.5								
T <sub>c,ave</sub>	°C	8.5	10.0	5.4	17.8								
± ΔTc	K	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".											
		<b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece											

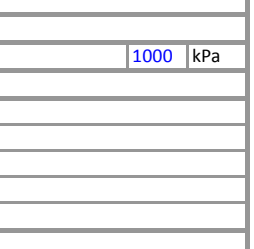
All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5% to ± 15%

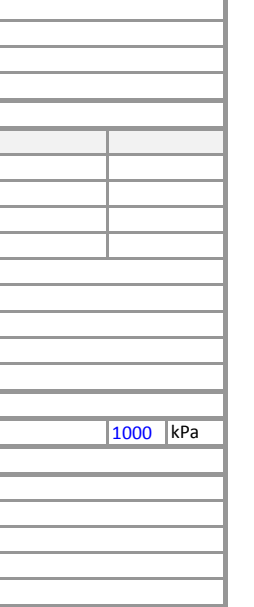
<b>Summary of</b>	<b>EN12976-2</b>	<b>test results</b>	<b>Certification No.</b>	<b>SKM 9999/3</b>									
<b>Annex to Solar KEYMARK Certificate</b>			<b>Issued</b>	<b>2017-01-20</b>									
<b>Company</b>	PAPAEMMANOUEL S.A.		<b>Country</b>	Greece									
<b>Brand (optional)</b>	0		<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia	<b>Tel. / Fax</b>	+30 22620 31931									
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>	<b>SOLAR FLAME 160</b>	<b>SOLAR FLAME 200</b>	<b>SOLAR FLAME 300</b>									
FMAX_1.50	1 2	1 2	1 2	2 3									
FMAX_1.50H	1 2	1 2	1										
FMAX_1.82	1	1	1 2	2									
FMAX_1.82H	1	1	1										
FMAX_2.00	1	1 2	1 2	2 3									
FMAX_2.00H	1	1 2	1 2										
FMAX_2.37	1	1	1 2	2									
FMAX_2.37H	1	1	1 2										
FMAX_2.72		1	1	1 2									
FMAX_2.72H		1	1	1									
<b>Name of system configuration</b>													
			SOLAR FLAME 300 MAX 364										
<b>Collector name</b>	FMAX_1.82	<b>No. Collectors</b>	2	<b>Storage name</b>									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250</b>				<b>Daily drawoff 300</b>				<b>Daily drawoff 400</b>			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	-	13939	6244	-	45	16746	6623	-	40	22327	7442	-	33
Würzburg DE	-	13371	6496	-	49	16052	7190	-	45	21413	8010	-	37
Davos CH	-	15137	9209	-	61	18165	9997	-	55	24220	11006	-	45
Athens GR	-	10407	8136	-	78	12488	9209	-	74	16651	10691	-	64
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =QL/Qd	-	Solar fraction											
<b>Ref. conditions</b>													
		Stockholm SE	Würzburg DE	Davos CH	Athens GR								
G	kWh/m <sup>2</sup>	1,157	1,230	1,684	1,736								
T <sub>a,ave</sub>	°C	7.5	9.0	3.2	18.5								
T <sub>c,ave</sub>	°C	8.5	10.0	5.4	17.8								
± ΔTc	K	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		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 Belessiotis Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece</p>											

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		<b>2017-01-20</b>					
<b>Company</b>				PAPAEMMANOUEL S.A.		<b>Country</b>		Greece					
<b>Brand (optional)</b>				0		<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>				1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						SOLAR FLAME 300 MAX 400							
<b>Collector name</b>		FMAX_2.00		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 300			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 250				Daily drawoff 300				Daily drawoff 400			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	f <sub>sol</sub> %
Stockholm SE	-	13939	6496	-	47	16746	6938	-	41	22327	7821	-	35
WürzburgDE	-	13371	6717	-	50	16052	7474	-	47	21413	8452	-	39
Davos CH	-	15137	9650	-	64	18165	10533	-	58	24220	11605	-	48
Athens GR	-	10407	8326	-	80	12488	9492	-	76	16651	11101	-	67
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	G	1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>						 <p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece</p>							
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													

<b>Summary of</b>		<b>EN12976-2</b>	<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>						
<b>Annex to Solar KEYMARK Certificate</b>					<b>Issued</b>		2017-01-20						
<b>Company</b>	PAPAEMMANOUEL S.A.				<b>Country</b>	Greece							
<b>Brand (optional)</b>	0				<b>Website</b>	http://www.papaemmanouel.gr							
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia				<b>E-mail</b>	exports@papaemmanouel.gr							
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931							
<b>System family overview</b>													
For each storage and collector size, give number of collectors													
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>					SOLAR FLAME 300 MAX 450								
<b>Collector name</b>	FMAX_1.50		<b>No. Collectors</b>	3		<b>Storage name</b>	SOLAR FLAME 300						
Calculated annual results for "solar-only / preheat system"													
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 250				Daily drawoff 300				Daily drawoff 400			
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %
Stockholm SE	-	13939	6496	-	47	16746	6938	-	41	22327	7821	-	35
Würzburg DE	-	13371	6717	-	50	16052	7474	-	47	21413	8452	-	39
Davos CH	-	15137	9650	-	64	18165	10533	-	58	24220	11605	-	48
Athens GR	-	10407	8326	-	80	12488	9492	-	76	16651	11101	-	67
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>L</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
	T <sub>a,ave</sub>	1,157	1,230	1,684	1,736								
	T <sub>c,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
	± ΔTc	6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔTc	K	Seasonal variation of Tc											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>		1000	kPa						
<b>Testing Laboratory</b>	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>	www.solar.demokritos.gr												
<b>Test report id. number</b>	6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>	6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>	ISO 9459-5 (DST)												
<b>Comments of test lab</b>													
The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".													


All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %

<b>Summary of</b>		<b>EN12976-2</b>		<b>test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>					
<b>Annex to Solar KEYMARK Certificate</b>						<b>Issued</b>		2017-01-20					
<b>Company</b>				PAPAEMMANOUEL S.A.		<b>Country</b>		Greece					
<b>Brand (optional)</b>				0		<b>Website</b>		http://www.papaemmanouel.gr					
<b>Street</b>				1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr					
<b>Postal Code</b>		32011		Viotia		<b>Tel. / Fax</b>		+30 22620 31931					
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>						SOLAR FLAME 300 MAX 474							
<b>Collector name</b>		FMAX_2.37		<b>No. Collectors</b>		2		<b>Storage name</b>		SOLAR FLAME 300			
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250</b>				<b>Daily drawoff 300</b>				<b>Daily drawoff 400</b>			
		Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>	Qd,hw	QL	Qpar	f <sub>sol</sub>
	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	
Stockholm SE	-	13939	7033	-	50	16746	7663	-	46	22327	8767	-	39
WürzburgDE	-	13371	7222	-	54	16052	8136	-	51	21413	9398	-	44
Davos CH	-	15137	10596	-	70	18165	11731	-	65	24220	13119	-	54
Athens GR	-	10407	8735	-	84	12488	10028	-	80	16651	11952	-	72
<b>Perf. indicators for the table above</b>													
Qd,sh	MJ/y	Not relevant for solar domestic hot water system											
Qd	MJ/y	Annual heat demand for domestic hot water											
QL	MJ/y	Annual heat energy delivered by the solar system											
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)											
f <sub>sol</sub> =Q <sub>l</sub> /Q <sub>d</sub>	-	Solar fraction											
<b>Ref. conditions</b>	G	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	T <sub>a,ave</sub>	7.5	9.0	3.2	18.5								
	T <sub>c,ave</sub>	8.5	10.0	5.4	17.8								
ΔT <sub>c</sub>		6.4	3.0	0.8	7.4								
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°											
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature											
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.											
ΔT <sub>c</sub>	K	Seasonal variation of T <sub>c</sub>											
Th	45 °C	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250		kPa		<b>Max. operating press. - tank side</b>		1000		kPa			
<b>Testing Laboratory</b>				NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB									
<b>Website</b>				www.solar.demokritos.gr									
<b>Test report id. number</b>				6081 DE1, 6082 DE1, 6082 F2									
<b>Date of test report</b>				6/12/2016, 6/12/2016, 8/2/2017									
<b>Test method</b>				ISO 9459-5 (DST)									
<b>Comments of test lab</b>				The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".									
													

<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>								
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20								
<b>Company</b>	PAPAEMMANOUEL S.A.			<b>Country</b>	Greece									
<b>Brand (optional)</b>	0			<b>Website</b>	http://www.papaemmanouel.gr									
<b>Street</b>	1o Km Inofyta – St. Thomas, Inofyta Viotia			<b>E-mail</b>	exports@papaemmanouel.gr									
<b>Postal Code</b>	32011	Viotia		<b>Tel. / Fax</b>	+30	22620 31931								
<b>System family overview</b>														
<b>For each storage and collector size, give number of collectors</b>														
<b>Collector name</b>	SOLAR FLAME 120		SOLAR FLAME 160		SOLAR FLAME 200		SOLAR FLAME 300							
FMAX_1.50	1	2	1	2	1	2	2	3						
FMAX_1.50H	1	2	1	2	1									
FMAX_1.82	1		1		1	2	2							
FMAX_1.82H	1		1		1									
FMAX_2.00	1		1	2	1	2	2	3						
FMAX_2.00H	1		1	2	1	2								
FMAX_2.37	1		1		1	2	2							
FMAX_2.37H	1		1		1	2								
FMAX_2.72			1		1		1	2						
FMAX_2.72H			1		1		1							
<b>Name of system configuration</b>														
				SOLAR FLAME 300 MAX 544										
<b>Collector name</b>	FMAX_2.72		<b>No. Collectors</b>	2		<b>Storage name</b>	SOLAR FLAME 300							
<b>Calculated annual results for "solar-only / preheat system"</b>														
<b>Location</b>	Qd,sh MJ/y	Daily drawoff 250				Daily drawoff 300				Daily drawoff 400				
		Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	Qd,hw MJ/y	QL MJ/y	Qpar MJ/y	fsol %	
Stockholm SE	-	13939	7442	-	53	16746	8168	-	49	22327	9492	-	43	
Würzburg DE	-	13371	7569	-	57	16052	8609	-	54	21413	10092	-	47	
Davos CH	-	15137	11227	-	74	18165	12583	-	69	24220	14317	-	59	
Athens GR	-	10407	8988	-	86	12488	10407	-	83	16651	12583	-	76	
<b>Perf. indicators for the table above</b>														
Qd,sh	MJ/y	Not relevant for solar domestic hot water system												
Qd	MJ/y	Annual heat demand for domestic hot water												
QL	MJ/y	Annual heat energy delivered by the solar system												
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)												
f <sub>sol</sub> =QL/Qd	-	Solar fraction												
<b>Ref. conditions</b>														
		Stockholm SE	Würzburg DE	Davos CH	Athens GR									
G	kWh/m <sup>2</sup>	1,157	1,230	1,684	1,736									
T <sub>a,ave</sub>	°C	7.5	9.0	3.2	18.5									
T <sub>c,ave</sub>	°C	8.5	10.0	5.4	17.8									
± ΔTc	K	6.4	3.0	0.8	7.4									
G	kWh/m <sup>2</sup>	Annual irradiation South, 45°												
T <sub>a,ave</sub>	°C	Annual average outdoor air temperature												
T <sub>c,ave</sub>	°C	Annual average mains cold water temp.												
ΔTc	K	Seasonal variation of Tc												
Th	45 °C	Desired hot water temperature (mixing valve temperature).												
<b>Max. operating press. - collector side</b>		250	kPa	<b>Max. operating press. - tank side</b>				1000	kPa					
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB												
<b>Website</b>		www.solar.demokritos.gr												
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2												
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017												
<b>Test method</b>		ISO 9459-5 (DST)												
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".												

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5% to ± 15%



<b>Summary of</b>		<b>EN12976-2 test results</b>		<b>Certification No.</b>		<b>SKM 9999/3</b>							
<b>Annex to Solar KEYMARK Certificate</b>				<b>Issued</b>		2017-01-20							
<b>Company</b>		PAPAEMMANOUEL S.A.		<b>Country</b>		Greece							
<b>Brand (optional)</b>		0		<b>Website</b>		http://www.papaemmanouel.gr							
<b>Street</b>		1o Km Inofyta – St. Thomas, Inofyta Viotia		<b>E-mail</b>		exports@papaemmanouel.gr							
<b>Postal Code</b>		32011 Viotia		<b>Tel. / Fax</b>		+30 22620 31931							
<b>System family overview</b>													
<b>For each storage and collector size, give number of collectors</b>													
<b>Collector name</b>	<b>SOLAR FLAME 120</b>		<b>SOLAR FLAME 160</b>		<b>SOLAR FLAME 200</b>		<b>SOLAR FLAME 300</b>						
FMAX_1.50	1	2	1	2	1	2	2	3					
FMAX_1.50H	1	2	1	2	1								
FMAX_1.82	1		1		1	2	2						
FMAX_1.82H	1		1		1								
FMAX_2.00	1		1	2	1	2	2	3					
FMAX_2.00H	1		1	2	1	2							
FMAX_2.37	1		1		1	2	2						
FMAX_2.37H	1		1		1	2							
FMAX_2.72			1		1		1	2					
FMAX_2.72H			1		1		1						
<b>Name of system configuration</b>				SOLAR FLAME 300 MAX 600									
<b>Collector name</b>		FMAX_2.00		<b>No. Collectors</b>		3							
<b>Storage name</b>				SOLAR FLAME 300									
<b>Calculated annual results for "solar-only / preheat system"</b>													
<b>Location</b>	<b>Qd,sh</b>	<b>Daily drawoff 250 l</b>				<b>Daily drawoff 300 l</b>				<b>Daily drawoff 400 l</b>			
		<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>	<b>Qd,hw</b>	<b>QL</b>	<b>Qpar</b>	<b>f<sub>sol</sub></b>
	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>MJ/y</b>	<b>%</b>	
Stockholm SE	-	13939	7632	-	55	16746	8452	-	50	22327	9871	-	44
WürzburgDE	-	13371	7758	-	58	16052	8830	-	55	21413	10438	-	49
Davos CH	-	15137	11511	-	76	18165	12993	-	72	24220	14948	-	62
Athens GR	-	10407	9114	-	88	12488	10596	-	85	16651	12867	-	77
<b>Perf. indicators for the table above</b>													
<b>Qd,sh</b>	<b>MJ/y</b>	Not relevant for solar domestic hot water system											
<b>Qd</b>	<b>MJ/y</b>	Annual heat demand for domestic hot water											
<b>QL</b>	<b>MJ/y</b>	Annual heat energy delivered by the solar system											
<b>Qpar</b>	<b>MJ/y</b>	Annual parasitic energy: (electricity for pumps/controllers)											
<b>f<sub>sol</sub>=Q<sub>l</sub>/Q<sub>d</sub></b>	-	Solar fraction											
<b>Ref. conditions</b>	<b>G</b>	Stockholm SE	Würzburg DE	Davos CH	Athens GR								
		1,157	1,230	1,684	1,736								
	<b>T<sub>a,ave</sub></b>	7.5	9.0	3.2	18.5								
	<b>T<sub>c,ave</sub></b>	8.5	10.0	5.4	17.8								
	<b>± ΔT<sub>c</sub></b>	6.4	3.0	0.8	7.4								
<b>G</b>	<b>kWh/m<sup>2</sup></b>	Annual irradiation South, 45°											
<b>T<sub>a,ave</sub></b>	<b>°C</b>	Annual average outdoor air temperature											
<b>T<sub>c,ave</sub></b>	<b>°C</b>	Annual average mains cold water temp.											
<b>ΔT<sub>c</sub></b>	<b>K</b>	Seasonal variation of T <sub>c</sub>											
<b>Th</b>	<b>45 °C</b>	Desired hot water temperature (mixing valve temperature).											
<b>Max. operating press. - collector side</b>		250 kPa		<b>Max. operating press. - tank side</b>		1000 kPa							
<b>Testing Laboratory</b>		NCSR "DEMOKRITOS" - SOLAR & ENERGY SYSTEMS LAB											
<b>Website</b>		www.solar.demokritos.gr											
<b>Test report id. number</b>		6081 DE1, 6082 DE1, 6082 F2											
<b>Date of test report</b>		6/12/2016, 6/12/2016, 8/2/2017											
<b>Test method</b>		ISO 9459-5 (DST)											
<b>Comments of test lab</b>		The long term prediction was extrapolated according to the Annex D of "Solar Keymark – Specific Scheme Rules".											
		 <b>N.C.S.R "DEMOKRITOS"</b> SOLAR ENERGY LABORATORY Head: <b>Dr Vassilis Belessiotis</b> Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece											

All values are subject to some uncertainty; e.g. the uncertainty on system output is typically in the range of ± 5 % to ± 15 %