



<b>Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate</b> Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	<b>Registration No.</b>	<b>011-7S1707 A</b>
	Registernummer Num. d'enregistrement	
	<b>Date / Datum / Date</b>	<b>05.09.2011</b>

<b>Company / Firma / Société</b>	<b>HUCU Solar España SL</b>	<b>Country/Land/Pays</b>	<b>Spain</b>
<b>Street / Straße / Rue</b>	<b>Centro Logístico de Antequera</b>	<b>Website</b>	<b>www.hucusolar.com</b>
<b>Postal Code, Place / PLZ, Ort / Code postal, Place</b>	<b>ES-29200 Antequera, Málaga</b>	<b>E-mail</b>	<b>info@hucusolar.com</b>
		<b>Tel. / Fax</b>	<b>+34 902 111 -501/-502</b>



<b>System classification / G / F</b>	
<b>Flow principle / G / F</b>	Thermosyphon / G / F
<b>Direct / indirect / G / F</b>	Indirect / G / F
<b>Press. principle / G / F</b>	Closed / G / F
<b>Drain back/down / G / F</b>	No drain (always filled) / G / F
<b>Storage location / G / F</b>	Outdoor / G / F
<b>Storage position / G / F</b>	Horizontal / G / F
<b>Int. back-up / G / F</b>	None / G / F
<b>If other: / G / F</b>	
<b>EN12976 type / G / F</b>	Solar only / G / F

<b>Collector(s) / Kollektor(en) / Capteur(s)</b>						<b>Storage(s) / Akkumulator(en) / F</b>					
<b>Company / Hersteller / Manufactuer</b> HUCU Solar España SL						<b>Company / Hersteller / Manufactuer</b> HUCU Solar España SL					
Keymark reg. no. (optional) 011-7S1697 F											
<b>Model</b> Bezeichnung Modèle	<b>Per module / G / F</b>					<b>Model</b> Bezeichnung Modèle	<b>Total volume</b> litres	<b>Gross diameter/width</b> Diam. / Breite (Außenmaß) Diam. / Largeur hors Tout	<b>Gross length</b> Länge (Außenmaß) longueur hors tout	<b>Back-up heated volume</b> litres	<b>El. back-up power</b> kW
	<b>Aperture area (Aa)</b> Aperturfläche (Aa) Superficie d'entrée (Aa)	<b>Gross length</b> Länge (Außenmaß) Longueur Hors tout	<b>Gross width</b> Breite (Außenmaß) Largeur hors Tout	<b>No. modules</b> min - max							
	m <sup>2</sup>	m	m	G F							
HUCUSOL	2.012	2.095	1.095	1	- 2	HDC 120	120	520	1000	--	--
10833-VP						HDC 150	150	520	1250	--	--
						HDC 200	200	580	1340	--	--
						HDC 300	300	580	1750	--	--

<b>Controller / G / F</b>			<b>Fluid / G / F</b>		
<b>Company/Hersteller/Manufacteur</b>	--		<b>Company/Hersteller/Manufacteur</b>	Baeza S.A. Calorama	
<b>Model / Bezeichnung / Modèle</b>	--		<b>Model / Bezeichnung / Modèle</b>	Solar fluid 100	
<b>Functions</b>	G -- F --		<b>Freezing point</b>	G -8 °C F --	

<b>System family overview / G / F</b>															
<b>Collector</b> G F	<b>No. collectors / G / F</b>														
	<b>Storage / G / F</b>			HDC 120			HDC 150			HDC 200			HDC 300		
HUCUSOL	1			1			1			2					
10833-VP															

<b>Testing Laboratory / Prüflaboratorium / Laboratoire d'essais</b>	Institut für Solartechnik SPF, CH-8640 Rapperswil
<b>Website</b>	www.solarenergy.ch
<b>Test report id. number / Prüberichtnummer / F</b>	S172EN / S172FAM / S173QPEN
<b>Date of test report / Datum / Date</b>	31.08.2011

<b>Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire</b>	 



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<b>Company / Firma / Société</b> <b>Street / Straße / Rue</b> <b>Postal Code, Place / PLZ, Ort / Code postal, Place</b>	<b>HUCU Solar España SL</b> <b>Centro Logistico de Antequera</b> <b>ES-29200 Antequera, Málaga</b>	<b>Country/Land/Pays</b> <b>Website</b> <b>E-mail</b> <b>Tel. / Fax</b>	<b>Spain</b> <b>www.hucusolar.com</b> <b>info@hucusolar.com</b> <b>+34 902 111 -501/-502</b>
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System family overview / G / F															
Collector type G F	Number of collectors / G / F														
	Storage type / G / F														
	HDC 120			HDC 150			HDC 200			HDC 300					
HUCUSOL 10833-VP	1			1			1			2					

Name of system konfiguration / G / F HUCUSOL TC 10833150

<b>Collector type</b> G F	<b>10833-VP</b>	<b>No. collectors</b> G F	<b>1</b>	<b>Storage type</b> G F	<b>HDC 150</b>
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Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	80			110			140			80			110			140		
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d			
	Q <sub>d</sub> MJ/y			Q <sub>L</sub> MJ/y			f <sub>sol</sub> %			Q <sub>par</sub> MJ/y								
Stockholm, SE	4'478	6'150	7'821	2'530	3'155	3'590	56.5	51.3	45.9	0	0	0						
Würzburg, DE	4'289	5'897	7'506	2'543	3'208	3'715	59.3	54.4	49.5	0	0	0						
Davos, CH	4'857	6'654	8'483	3'769	4'631	5'234	77.6	69.6	61.7	0	0	0						
Athens, GR	3'343	4'573	5'834	3'002	3'864	4'586	89.8	84.5	78.6	0	0	0						


<b>Perf. indicators</b> G F	<b>Q<sub>d</sub></b>	<b>Heat demand / G / F</b>
	<b>Q<sub>L</sub></b>	<b>Net auxiliary energy demand of the solar heating system delivered by the auxiliary heater to the store or directly to the heat distribution system / G / F</b>
	<b>Q<sub>par</sub></b>	<b>Elec. for pumps/controllers / G / F</b>

<b>Ref. conditions</b> G F	Stockholm SE					Würzburg DE					Davos CH					Athens GR					
	G	1'157					1'230					1'684					1'718				
	T <sub>a</sub>	7.5					9.0					3.2					18.5				
	T <sub>c</sub>	8.5					10.0					5.4					17.8				
	ΔT <sub>c</sub>	2.1 - 14.9					7.0 - 13.0					4.6 - 6.2					10.4 - 25.2				

G	kWh/m <sup>2</sup>	<b>Annual irradiation South, 45° / G / F</b>
T <sub>a</sub>	°C	<b>Annual mean air temp. / G / F</b>
T <sub>c</sub>	°C	<b>Annual mean cold water temp. / G / F</b>
ΔT <sub>c</sub>	°C	<b>Seasonal variation of T<sub>c</sub> / G / F</b>
T <sub>h</sub>	45°C	<b>Desired (mix. valve) temp. / G / F</b>

<b>Max. operating press. - collector side (heat exchanger)</b>	<b>150</b>	<b>kPa</b>	<b>Max. operating press. - tank side</b>	<b>800</b>	<b>kPa</b>
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<b>Testing Laboratory / Prüflaboratorium / Laboratoire d'essais</b>	<b>Institut für Solartechnik SPF, CH-8640 Rapperswil</b>
<b>Website</b>	<b>www.solarenergy.ch</b>
<b>Test report id. number / Prüberichtnummer / F</b>	<b>S172EN / S172FAM / S173QPEN</b>
<b>Date of test report / G / F</b>	<b>31.08.2011</b>
<b>Test method / G / F</b>	<b>ISO 9459-5 (DST)</b>

<b>Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire</b> The system model HUCUSOL TC 10833150 with the SPF test number S172 was tested as the medium system subtype of the Solar Keymark system family.	
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System family overview / G / F												
Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	HDC 120			HDC 150			HDC 200			HDC 300		
HUCUSOL	1			1			1			2		
10833-VP												

Name of system konfiguration / G / F HUCUSOL TC 10833120

<b>Collector type</b>	<b>10833-VP</b>	<b>No. collectors</b>	<b>1</b>	<b>Storage type</b>	<b>HDC 120</b>
G		G		G	
F		F		F	

Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	50			80			110			50			80			110		
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d			
	Q <sub>d</sub> MJ/y			Q <sub>L</sub> MJ/y			f <sub>sol</sub> %			Q <sub>par</sub> MJ/y								
Stockholm, SE	2'791	4'478	6'150	1'722	2'539	3'161	61.7	56.7	51.4	0	0	0	0	0	0			
Würzburg, DE	2'677	4'289	5'897	1'716	2'530	3'196	64.1	59.0	54.2	0	0	0	0	0	0			
Davos, CH	3'027	4'857	6'654	2'567	3'774	4'645	84.8	77.7	69.8	0	0	0	0	0	0			
Athens, GR	2'078	3'343	4'573	1'951	3'005	3'864	93.9	89.9	84.5	0	0	0	0	0	0			


<b>Perf. indicators</b> G F	Q <sub>d</sub>	<b>Heat demand / G / F</b>
	Q <sub>L</sub>	<b>Net auxiliary energy demand of the solar heating system delivered by the auxiliary heater to the store or directly to the heat distribution system / G / F</b>
	Q <sub>par</sub>	<b>Elec. for pumps/controllers / G / F</b>

<b>Ref. conditions</b> G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'718
	T <sub>a</sub>	7.5	9.0	3.2	18.5
	T <sub>c</sub>	8.5	10.0	5.4	17.8
	ΔT <sub>c</sub>	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2

G	kWh/m <sup>2</sup>	<b>Annual irradiation South, 45° / G / F</b>
T <sub>a</sub>	°C	<b>Annual mean air temp. / G / F</b>
T <sub>c</sub>	°C	<b>Annual mean cold water temp. / G / F</b>
ΔT <sub>c</sub>	°C	<b>Seasonal variation of T<sub>c</sub> / G / F</b>
T <sub>h</sub>	45°C	<b>Desired (mix. valve) temp. / G / F</b>

<b>Max. operating press. - collector side (heat exchanger)</b>	<b>150</b>	<b>kPa</b>	<b>Max. operating press. - tank side</b>	<b>800</b>	<b>kPa</b>
			G		
			F		

<b>Testing Laboratory / Prüflaboratorium / Laboratoire d'essais</b>	<b>Institut für Solartechnik SPF, CH-8640 Rapperswil</b>
<b>Website</b>	<b>www.solarenergy.ch</b>
<b>Test report id. number / Prüberichtnummer / F</b>	<b>S172EN / S172FAM / S173QPEN</b>
<b>Date of test report / G / F</b>	<b>31.08.2011</b>
<b>Test method / G / F</b>	<b>ISO 9459-5 (DST)</b>

<b>Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire</b>	
The system model HUCUSOL TC 10833120 with the SPF test numbers S173 and S172 ST1 was tested as the system subtype with the highest ratio of collector aperture area to total store volume of the Solar Keymark system family. The annual performance data is determined based on the test results of the medium subtype of the Solar Keymark system family.	



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		<b>Tel. / Fax</b>	<b>+34 902 111 -501/-502</b>

System family overview / G / F												
Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	HDC 120	HDC 150	HDC 200	HDC 300								
HUCUSOL 10833-VP	1	1	1	2								

Name of system konfiguration / G / F HUCUSOL TC 10833200

<b>Collector type</b>	<b>10833-VP</b>	<b>No. collectors</b>	<b>1</b>	<b>Storage type</b>	<b>HDC 200</b>
G		G		G	
F		F		F	

Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /											
	140	170	200	140	170	200	140	170	200	140	170	200
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Qd MJ/y			QL MJ/y			fsol %			Qpar MJ/y		
Stockholm, SE	7'821	9'492	11'164	3'551	3'901	4'131	45.4	41.1	37.0	0	0	0
Würzburg, DE	7'506	9'114	10'691	3'670	4'110	4'373	48.9	45.1	40.9	0	0	0
Davos, CH	8'483	10'281	12'110	5'149	5'624	5'897	60.7	54.7	48.7	0	0	0
Athens, GR	5'834	7'064	8'326	4'562	5'192	5'720	78.2	73.5	68.7	0	0	0


<b>Perf. indicators</b> G F	Q <sub>d</sub>	<b>Heat demand / G / F</b>
	Q <sub>L</sub>	<b>Net auxiliary energy demand of the solar heating system delivered by the auxiliary heater to the store or directly to the heat distribution system / G / F</b>
	Q <sub>par</sub>	<b>Elec. for pumps/controllers / G / F</b>

<b>Ref. conditions</b> G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR		
	G	1'157	1'230	1'684	1'718		
	T <sub>a</sub>	7.5	9.0	3.2	18.5		
	T <sub>c</sub>	8.5	10.0	5.4	17.8		
	ΔT <sub>c</sub>	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2		

G	kWh/m²	<b>Annual irradiation South, 45° / G / F</b>
T <sub>a</sub>	°C	<b>Annual mean air temp. / G / F</b>
T <sub>c</sub>	°C	<b>Annual mean cold water temp. / G / F</b>
ΔT <sub>c</sub>	°C	<b>Seasonal variation of T<sub>c</sub> / G / F</b>
T <sub>h</sub>	45°C	<b>Desired (mix. valve) temp. / G / F</b>

<b>Max. operating press. - collector side (heat exchanger)</b>	<b>150</b>	<b>kPa</b>	<b>Max. operating press. - tank side</b>	<b>800</b>	<b>kPa</b>
			G		
			F		

<b>Testing Laboratory / Prüflaboratorium / Laboratoire d'essais</b>	<b>Institut für Solartechnik SPF, CH-8640 Rapperswil</b>
<b>Website</b>	<b>www.solarenergy.ch</b>
<b>Test report id. number / Prüberichtnummer / F</b>	<b>S172EN / S172FAM</b>
<b>Date of test report / G / F</b>	<b>31.08.2011</b>
<b>Test method / G / F</b>	<b>ISO 9459-5 (DST)</b>

<b>Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire</b>	
System subtype with the SPF test number S172 ST2. The annual performance data is determined based on the test results of the medium subtype of the Solar Keymark system family.	



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System family overview / G / F						
Collector type G F	Number of collectors / G / F					
	Storage type / G / F					
	HDC 120	HDC 150	HDC 200	HDC 300		
HUCUSOL 10833-VP	1	1	1	2		

<b>Name of system konfiguration / G / F</b>				<b>HUCUSOL TC 10833300</b>			
<b>Collector type</b> G F	<b>10833-VP</b>	<b>No. collectors</b> G F	<b>2</b>	<b>Storage type</b> G F	<b>HDC 300</b>		

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	200 l/d	250 l/d	300 l/d	200 l/d	250 l/d	300 l/d	200 l/d	250 l/d	300 l/d	200 l/d	250 l/d	300 l/d
	Qd MJ/y			QL MJ/y			fsol %			Qpar MJ/y		
Stockholm, SE	11'164	13'939	16'746	6'084	6'997	7'603	54.5	50.2	45.4	0	0	0
Würzburg, DE	10'691	13'371	16'052	6'136	7'154	7'914	57.4	53.5	49.3	0	0	0
Davos, CH	12'110	15'137	18'165	9'058	10'354	11'189	74.8	68.4	61.6	0	0	0
Athens, GR	8'326	10'407	12'488	7'318	8'679	9'778	87.9	83.4	78.3	0	0	0


<b>Perf. indicators</b> G F	<b>Q<sub>d</sub></b>	<b>Heat demand / G / F</b>
	<b>Q<sub>L</sub></b>	<b>Net auxiliary energy demand of the solar heating system delivered by the auxiliary heater to the store or directly to the heat distribution system / G / F</b>
	<b>Q<sub>par</sub></b>	<b>Elec. for pumps/controllers / G / F</b>

<b>Ref. conditions</b> G F		Stockholm SE	Würzburg DE	Davos CH	Athens GR		
	G	1'157	1'230	1'684	1'718		
	T <sub>a</sub>	7.5	9.0	3.2	18.5		
	T <sub>c</sub>	8.5	10.0	5.4	17.8		
	ΔT <sub>c</sub>	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2		

G	kWh/m <sup>2</sup>	<b>Annual irradiation South, 45° / G / F</b>
T <sub>a</sub>	°C	<b>Annual mean air temp. / G / F</b>
T <sub>c</sub>	°C	<b>Annual mean cold water temp. / G / F</b>
ΔT <sub>c</sub>	°C	<b>Seasonal variation of T<sub>c</sub> / G / F</b>
T <sub>h</sub>	45°C	<b>Desired (mix. valve) temp. / G / F</b>

<b>Max. operating press. - collector side (heat exchanger)</b>	<b>150</b>	<b>kPa</b>	<b>Max. operating press. - tank side</b>	<b>800</b>	<b>kPa</b>
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<b>Testing Laboratory / Prüflaboratorium / Laboratoire d'essais</b>	<b>Institut für Solartechnik SPF, CH-8640 Rapperswil</b>
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<b>Date of test report / G / F</b>	<b>31.08.2011</b>
<b>Test method / G / F</b>	<b>ISO 9459-5 (DST)</b>

<b>Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire</b>	
System subtype with the SPF test number S172 ST3. The annual performance data is determined based on the test results of the medium subtype of the Solar Keymark system family.	