

Certificate UK-G83 issue 2

The results of the G83/2 tests are summarized in this certificate.
 Omnik New Energy Co., Ltd declares that the units installed in UK market and set for G83/2 operations are characterized by the following features:

- The internal specification and parameters are set to be compliant with: Engineering Recommendation G83 issue 2, 2012.
- All units have internal parameters setting.
- These parameters cannot be changed by user, an installer or by any person other than the manufacturer.
- All units are tested before shipping according to: Engineering Recommendation G83 issue 2, 2012.

SSEG Type reference number		PHOTO-VOLTAIC Inverter	
SSEG Type		Omniksol-SMP300 , Omniksol-SMP600	
System Supplier name		Omnik New Energy Co.,Ltd.	
Address		No.63 Weixin Road , SIP 215122, Suzhou , P.R. China	
Tel	+86 512 6956 8216	Fax	+86 512 6295 6682
E:mail	service@omnik-solar.com	Web site	www.omnik-solar.com

Maximum rated capacity	Connection Option	
	0.25	kW single phase (Omniksol-SMP300)
	0.5	kW single phase (Omniksol-SMP600)
	NA	kW three phase
	NA	kW two phases in three phase system
	NA	kW two phases split phase system
	NA	
	NA	

SSEG manufacturer/supplier declaration

I certify on behalf of the company named above as a manufacturer/supplier of Small Scale Embedded Generators, that all products manufactured/supplied by the company with the above SSEG Type reference number will be manufactured and tested to ensure that they perform as stated in this Type Verification Test Report, prior to shipment to site and that no site modifications are required to ensure that the product meets all the requirements of G83/2.

Signed	2018-4-13	On behalf of	Omnik New Energy Co.,Ltd
Report Date: 2018-4-13		www.omnik-solar.com	Page 1 of 7
File: Omniksol_SMP300&SMP600_G83-2 Certificate			
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UK-G83 issue 2 TEST RESULT DETAILS – TYPE VERIFICATION TEST SHEET

Omniksol-SMP300

Power Quality. Harmonics

SSEG rating per phase (rpp)		0.25	kW		NV=MV*3.68/rpp	
Harmonic	At 45-55% of rated output	100% of rated output				
	Measured Value (MV) in Amps	Normalised Value (NV) in Amps	Measured Value (MV) in Amps	Normalised Value (NV) in Amps	Limit in BS EN 61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
2	0.0003	0.0049	0.0005	0.0071	1.080	
3	0.0056	0.0829	0.0119	0.1746	2.300	
4	0.0001	0.0019	0.0003	0.0044	0.430	
5	0.0016	0.0237	0.0037	0.0543	1.140	
6	0.0004	0.0057	0.0003	0.0038	0.300	
7	0.0008	0.0119	0.0017	0.0243	0.770	
8	0.0002	0.0024	0.0001	0.0009	0.230	
9	0.0007	0.0107	0.0014	0.0206	0.400	
10	0.0012	0.0169	0.0001	0.0012	0.184	
11	0.0023	0.0334	0.0020	0.0297	0.330	
12	0.0013	0.0187	0.0003	0.0050	0.153	
13	0.0020	0.0297	0.0033	0.0489	0.210	
14	0.0004	0.0053	0.0002	0.0022	0.131	
15	0.0021	0.0309	0.0029	0.0430	0.150	
16	0.0002	0.0024	0.0003	0.0049	0.115	
17	0.0018	0.0265	0.0034	0.0495	0.132	
18	0.0002	0.0022	0.0003	0.0037	0.102	
19	0.0018	0.0271	0.0041	0.0599	0.118	
20	0.0001	0.0021	0.0004	0.0063	0.092	
21	0.0021	0.0302	0.0046	0.0676	0.107	0.160
22	0.0001	0.0012	0.0007	0.0096	0.084	
23	0.0024	0.0349	0.0059	0.0861	0.098	0.147
24	0.0002	0.0029	0.0003	0.0044	0.077	
25	0.0028	0.0405	0.0054	0.0798	0.090	0.135
26	0.0001	0.0009	0.0004	0.0060	0.071	
27	0.0024	0.0356	0.0005	0.0066	0.083	0.124
28	0.0001	0.0015	0.0001	0.0021	0.066	
29	0.0020	0.0293	0.0044	0.0654	0.078	0.117
30	0.0002	0.0034	0.0003	0.0041	0.061	
31	0.0016	0.0238	0.0037	0.0543	0.073	0.109
32	0.0002	0.0032	0.0003	0.0041	0.058	
33	0.0016	0.0233	0.0034	0.0502	0.068	0.102
34	0.0002	0.0034	0.0003	0.0049	0.054	
35	0.0014	0.0208	0.0032	0.0477	0.064	0.096
36	0.0002	0.0024	0.0003	0.0049	0.051	
37	0.0019	0.0278	0.0029	0.0422	0.061	0.091
38	0.0004	0.0053	0.0004	0.0057	0.048	
39	0.0014	0.0203	0.0026	0.0377	0.058	0.087
40	0.0005	0.0066	0.0005	0.0078	0.046	

Omniksol-SMP600						
Power Quality. Harmonics						
SSEG rating per phase (rpp)			0.5	kW	NV=MV*3.68/rpp	
Harmonic	At 45-55% of rated output		100% of rated output		Limit in BS EN 61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
	Measured Value (MV) in Amps	Normalised Value (NV) in Amps	Measured Value (MV) in Amps	Normalised Value (NV) in Amps		
2	0.0005	0.0034	0.0008	0.0055	1.080	
3	0.0078	0.0576	0.0204	0.1500	2.300	
4	0.0004	0.0026	0.0008	0.0056	0.430	
5	0.0047	0.0345	0.0077	0.0563	1.140	
6	0.0003	0.0018	0.0006	0.0041	0.300	
7	0.0022	0.0160	0.0035	0.0254	0.770	
8	0.0005	0.0034	0.0005	0.0040	0.230	
9	0.0019	0.0137	0.0038	0.0276	0.400	
10	0.0010	0.0077	0.0007	0.0049	0.184	
11	0.0027	0.0197	0.0051	0.0377	0.330	
12	0.0011	0.0083	0.0004	0.0030	0.153	
13	0.0042	0.0311	0.0077	0.0565	0.210	
14	0.0004	0.0030	0.0008	0.0057	0.131	
15	0.0045	0.0329	0.0076	0.0561	0.150	
16	0.0003	0.0022	0.0007	0.0054	0.115	
17	0.0041	0.0299	0.0078	0.0573	0.132	
18	0.0004	0.0027	0.0009	0.0069	0.102	
19	0.0045	0.0331	0.0092	0.0677	0.118	
20	0.0004	0.0026	0.0010	0.0074	0.092	
21	0.0047	0.0345	0.0098	0.0724	0.107	0.160
22	0.0005	0.0035	0.0004	0.0027	0.084	
23	0.0050	0.0370	0.0104	0.0767	0.098	0.147
24	0.0004	0.0030	0.0005	0.0036	0.077	
25	0.0056	0.0408	0.0110	0.0810	0.090	0.135
26	0.0005	0.0033	0.0005	0.0035	0.071	
27	0.0054	0.0398	0.0099	0.0729	0.083	0.124
28	0.0005	0.0037	0.0009	0.0067	0.066	
29	0.0048	0.0353	0.0087	0.0643	0.078	0.117
30	0.0006	0.0047	0.0001	0.0005	0.061	
31	0.0044	0.0325	0.0086	0.0630	0.073	0.109
32	0.0006	0.0043	0.0005	0.0039	0.058	
33	0.0042	0.0308	0.0081	0.0596	0.068	0.102
34	0.0006	0.0040	0.0004	0.0031	0.054	
35	0.0035	0.0258	0.0075	0.0554	0.064	0.096
36	0.0009	0.0065	0.0002	0.0013	0.051	
37	0.0037	0.0269	0.0072	0.0527	0.061	0.091
38	0.0004	0.0032	0.0003	0.0018	0.048	
39	0.0028	0.0208	0.0060	0.0444	0.058	0.087
40	0.0003	0.0024	0.0004	0.0027	0.046	

Omniksol-SMP300								
Power Quality. Voltage fluctuations and Flicker.								
	Starting			Stopping			Running	
	d_{max}	d_c	$d_{(t)}$	d_{max}	d_c	$d_{(t)}$	P_{st}	P_{lt} 2 hours
Measured Values	0.21	0	0	0.21	0	0	0.109	0.077
Normalised to standard impedance and 3.68kW for multiple units	-	-	-	-	-	-	-	-
Limits set under BS EN 61000-3-2	4%	3.3%	3.3% 500ms	4%	3.3%	3.3% 500ms	1.0	0.65
Test start date	2018-4-13			Test end date	2018-4-13			
Test location	Omnik New Energy Co.,Ltd, No.63 Weixin Road , SIP , Suzhou , China 215122							

Omniksol-SMP600								
Power Quality. Voltage fluctuations and Flicker.								
	Starting			Stopping			Running	
	d_{max}	d_c	$d_{(t)}$	d_{max}	d_c	$d_{(t)}$	P_{st}	P_{lt} 2 hours
Measured Values	-0.11	0	0	-0.11	0	0	0.064	0.064
Normalised to standard impedance and 3.68kW for multiple units	-	-	-	-	-	-	-	-
Limits set under BS EN 61000-3-2	4%	3.3%	3.3% 500ms	4%	3.3%	3.3% 500ms	1.0	0.65
Test start date	2018-4-13			Test end date	2018-4-13			
Test location	Omnik New Energy Co.,Ltd, No.63 Weixin Road , SIP , Suzhou , China 215122							

Omniksol-SMP300			
Power quality. DC injection.			
Test power level	10%	55%	100%
Recorded value	1 mA	1 mA	1 mA
as % of rated AC current	0.042%	0.042%	0.042%
Limit	0.25%	0.25%	0.25%

Omniksol-SMP600			
Power quality. DC injection.			
Test power level	10%	55%	100%
Recorded value	1mA	1mA	1mA
as % of rated AC current	0.084%	0.084%	0.084%
Limit	0.25%	0.25%	0.25%

Omniksol-SMP300				
Power Quality. Power factor.				
	216.2V	230V	253V	Measured at three voltage levels and at full output. Voltage to be maintained within $\pm 1.5\%$ of the stated level during the test.
Measured value	0.974	0.990	0.986	
Limit	>0.95	>0.95	>0.95	

Omniksol-SMP600				
Power Quality. Power factor.				
	216.2V	230V	253V	Measured at three voltage levels and at full output. Voltage to be maintained within $\pm 1.5\%$ of the stated level during the test.
Measured value	0.989	0.998	0.995	
Limit	>0.95	>0.95	>0.95	

Omniksol-SMP300&SMP600						
Protection. Frequency tests.						
Function	Setting		Trip test		"No trip tests"	
	Frequency	Time delay	Frequency	Time delay	Frequency/time	Confirm no trip
U/F stage 1	47.5Hz	20s	47.53Hz	20.65s	47.7Hz/ 25s	No trip
U/F stage 2	47Hz	0.5s	47.03Hz	0.544s	47.2Hz/ 19.88s	No trip
					46.8Hz/ 0.48s	No trip
O/F stage 1	51.5Hz	90s	51.48Hz	90.53s	51.3Hz/ 95s	No trip
O/F stage 2	52Hz	0.5s	51.98Hz	0.566s	51.8Hz/ 89.88s	No trip
					52.2Hz/ 0.48s	No trip

Omniksol-SMP300&SMP600						
Protection. Voltage tests.						
Function	Setting		Trip test		"No trip tests"	
	Voltage	Time delay	Voltage	Time delay	Voltage/ time	Confirm no trip
U/V stage 1	200.1V	2.5s	202V	2.554s	204.1V/ 3.5s	No trip
U/V stage 2	184V	0.5s	186V	0.525s	188V/ 2.48s	No trip
					180V/ 0.48s	No trip
O/V stage 1	262.2V	1.0s	260V	1.063s	258.2V/ 2.0s	No trip
O/V stage 2	273.7V	0.5s	271.5V	0.545s	269.7V/ 0.98s	No trip
					277.7V/ 0.48s	No trip

Omniksol-SMP300&SMP600						
Protection. Loss of Mains test.						
Note: Inverter tested according to BS EN 62116.						
Test Power and imbalance	33% -5% Q Test 22	66% -5% Q Test 12	100% -5% P Test 5	33% +5% Q Test 31	66% +5% Q Test 21	100% +5% P Test 10
	Trip time. Limit is 0.5s	172ms	294ms	430ms	346ms	245ms

Omniksol-SMP300&SMP600				
Protection. Frequency change, Stability test.				
	Start Frequency	Change	End Frequency	Confirm no trip
Positive Vector Shift	49.5Hz	+9 degrees		No trip
Negative Vector Shift	50.5Hz	- 9 degrees		No trip
Positive Frequency drift	49.5Hz	+0.19Hz/sec	51.5Hz	No trip
Negative Frequency drift	50.5Hz	-0.19Hz/sec	47.5Hz	No trip

Omniksol-SMP300&SMP600					
Protection. Re-connection timer.					
Test proves that the reconnection sequence starts after a minimum delay of 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 1 of the subject normative.					
Time delay setting	Measured delay	No reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
180s	185s	At 266.2V	At 196.1V	At 47.4Hz	At 51.6Hz
Confirmation that the SSEG does not re-connect.		No reconnection	No reconnection	No reconnection	No reconnection

Fault level contribution.					
Omniksol-SMP300			Omniksol- SMP600		
For a Inverter SSEG			For a Inverter SSEG		
Time after fault	Volts	Amps	Time after fault	Volts	Amps
20ms	231V	1.13A	20ms	231V	2.02A
100ms	N/A	N/A	100ms	N/A	N/A
250ms	N/A	N/A	250ms	N/A	N/A
500ms	N/A	N/A	500ms	N/A	N/A
Time to trip	43.4ms	In seconds	Time to trip	78.2ms	In seconds

Omniksol-SMP300&SMP600
Self-Monitoring solid state switching.
It has been verified that in the event of the solid state switching device failing to disconnect the SSEG, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0.5 seconds.

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