Certificate UK-G83/1

Type Approval and manufacturer/supplier declaration of compliance with the requirements of Engineering Recommendation G83/1.

SSEG Type reference number	*Zeverlution 3680*		
SSEG Type	*Photovoltaic Inverter*		
System Supplier name	*Jiangsu Zeversolar New Energy CO., LTD.*		
Address	*No. 198 Xiangyang Road, Suzhou, 215011 China*		
Tel	*+86 512 6937 0998*	Fax	*+86 512 6937 0630*
E:mail	*service.china@zeversolar.com*	Web site	*www.zeversolar.com*

Maximum rated capacity	Connection Option	
	3.68	kW single phase system (for 3680)
	N/A	kW three phase
	N/A	kW two phases in three phase system
	N/A	kW two phases split phase system

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 G83/1.

Signed		On behalf of	*Jiangsu Zeversolar New Energy CO., LTD.*

Zeversolar declares that the units installed in UK market and set for G83/1 operations are characterized by the following features:

-The internal specification and parameters are set to be compliant with: Engineering Recommendation G83/1.

- These parameters can't be changed by user, an installer or by any person other than Zeversolar (password protected)

POWER QUALITY

Harmonic current emissions as per BS EN 61000-3-2 Class A			
order	Measured Value in Amps	% of fund	Limit in Amps
2	0.0457	0.2105	1.080
3	0.1037	0.4775	2.300
4	0.0048	0.0224	0.430
5	0.0154	0.0710	1.140
6	0.0027	0.0124	0.300
7	0.0075	0.0345	0.770
8	0.0035	0.0160	0.230
9	0.0626	0.2881	0.400
10	0.0037	0.0168	0.184
11	0.0599	0.2759	0.330
12	0.0033	0.0154	0.153
13	0.0522	0.2405	0.210
14	0.0037	0.0172	0.131
15	0.0450	0.2072	0.150
16	0.0033	0.0154	0.115
17	0.0371	0.1709	0.132
18	0.0035	0.0162	0.102
19	0.0317	0.1461	0.118
20	0.0037	0.0168	0.092
21	0.0281	0.1296	0.107
22	0.0038	0.0177	0.084
23	0.0245	0.1128	0.098
24	0.0032	0.0149	0.077
25	0.0209	0.0960	0.090
26	0.0039	0.0178	0.071
27	0.0190	0.0876	0.083
28	0.0034	0.0158	0.066
29	0.0161	0.0743	0.078
30	0.0041	0.0188	0.061
31	0.0165	0.0757	0.073
32	0.0042	0.0194	0.058
33	0.0127	0.0585	0.068
34	0.0038	0.0176	0.054
35	0.0143	0.0661	0.064
36	0.0045	0.0208	0.051
37	0.0129	0.0595	0.061
38	0.0039	0.0179	0.048
39	0.0107	0.0492	0.058
40	0.0047	0.0217	0.046
41	0.0121	0.0557	N/A
42	0.0045	0.0206	N/A
43	0.0086	0.0397	N/A
44	0.0049	0.0226	N/A
45	0.0094	0.0433	N/A
46	0.0042	0.0194	N/A

47	0.0100	0.0458	N/A
48	0.0108	0.0498	N/A
49	0.0085	0.0392	N/A
50	0.0043	0.0199	N/A
Ithd	-	0.8300	5%
Note: the standard BS EN 61000-3-2 only required the limit for the harmonic order up to 40th. But the harmonic current have been extended up to and including the 50th harmonic in Engineering recommendation G5/4.			

Voltage fluctuations and Flicker as per BS EN 61000-3-3 Class A				
	Starting	Stopping	Running	
Limit	3.3%	4%	P_{st} = 1.0	P_{lt} = 0.65
Test value	1.24%	1.75%	0.316	0.284

	DC injection			Power factor *		
G83/1 limit	20mA, tested at three levels *			0.95 lag - 0.95 lead at three voltage levels at Prated		
Test level	10%	55%	100%	216.2V	230V	253V
Test value #	16mA	19mA	14mA	0.9970	0.9975	0.9980

* Indicative values are shown for minimum, medium and maximum power levels.

Insert maximum value of dc injection and worst case pf value recorded during testing.

UNDER / OVER FREQUENCY TESTS

	Under Frequency						Over Frequency					
Parameter	Frequency (Hz)			Time (s)			Frequency (Hz)			Time (s)		
G83/1 limit	47 Hz			0.5s			50.5 Hz			0.5s		
Actual setting	47.00			0.40			50.50			0.40		
Output power	10%	55%	100%	10%	55%	100%	10%	55%	100%	10%	55%	100%
Trip value	47.0	47.0	47.01	0.434	0.440	0.446	50.51	50.52	50.52	0.440	0.450	0.441

UNDER / OVER VOLTAGE TESTS

	Under Voltage		Over Voltage	
Parameter	Voltage (V)	Time (s)	Voltage (V)	Time (s)
G83/1 limit	207	1.5	264	1.5
Actual setting	207	1.4	264	1.4

Output power	10%	55%	100%	10%	55%	100%	10%	55%	100%	10%	55%	100%
Trip value	207.3	207.5	207.4	1.426	1.428	1.420	264.2	264.0	264.4	1.425	1.427	1.418

LOSS OF MAINS TESTS

Method used	Frequency shift		
Output power level	10% Prated	55% Prated	100% Prated
G83/1 limit	0.5s	0.5s	0.5s
Trip setting	-	-	-
Trip value	0.474s	0.492s	0.480s

RECONNECTION TIME MEASUREMENT

Reconnection time	Under/over Voltage	Under / over Frequency	Loss of Mains
Minimum value	180s	180s	180s
Actual setting	180s	180s	180s
Recorded value	185s	185s	185s

FAULT LEVEL CONTRIBUTION

As Photovoltaic SSEGs are inverter connected, they are deemed to automatically comply with regulations and no further tests are required

SELF MONITORING - SOLID STATE SWITCHING

Not applicable as electro-mechanical relays are used