

Harmonic Test Report

IEC 61727 4.6 Harmonics and waveform distortion

TYPE TEST SHEET

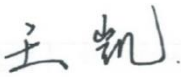

This Type Test sheet shall be used to record the results of the type testing of Generating Unit			
Type Tested reference number		SG33CX	
Generating Unit technology		Grid-connected PV Inverter	
System supplier name		Sungrow Power Supply Co., Ltd.	
Address		No.1699 Xiyou Rd., New & High Technology Industrial Development Zone, Hefei, P.R. China	
Tel	+86 551 65327834	Fax	+86 551 6532 7800
E:mail	info@sungrow.cn	Web site	www.sungrowpower.com
Maximum export capacity, use separate sheet if more than one connection option.	N/A	kW single phase, single, split or three phase system	
	30	kW three phase	
	N/A	kW two phases in three phase system	
	N/A	kW two phases split phase system	
Compiled by		On behalf of	Sungrow Power Supply Co., Ltd.
Approved by			
<p>Note that testing can be done by the manufacturer of an individual component, by an external test house, or by the supplier of the complete system, or any combination of them as appropriate.</p> <p>Where parts of the testing are carried out by persons or organisations other than the supplier then the supplier shall keep copies of all test records and results supplied to them to verify that the testing has been carried out by people with sufficient technical competency to carry out the tests.</p>			

Table 1-Current distortion limits

Odd harmonics	Distortion limit
3 rd through 9 th	Less than 4.0%
11 th through 15 th	Less than 2.0%
17 th through 21 st	Less than 1.5%
23 rd through 33 rd	Less than 0.6%
Even harmonics	Distortion limit
2 rd through 8 th	Less than 1.0%
10 th through 32 nd	Less than 0.5%

NOTE Testing harmonics is very problematic, since voltage distortion may feed to enhanced current distortion. The harmonic current injection should be exclusive of any harmonic currents due to harmonic voltage distortion present in the utility grid without the PV system connected. Type tested inverters meeting the above requirements should be deemed to comply without further testing.

Low levels of current and voltage harmonics are desirable; the higher harmonic levels increase the potential for adverse effects on connected equipment

Acceptable levels of harmonic voltage and current depend upon distribution system characteristics, type of service, connected loads/apparatus, and established utility practice.

Total harmonic current distortion shall be less than 5% at rated inverter output. Each individual harmonic shall be limited to the percentages listed in Table 1.

Even harmonics in these ranges shall be less than 25% of the lower odd harmonic limits listed.

4.6	TABLE: Harmonics and waveform distortion (Current)				P
Harmonics	Measurements (percentage of Rated Current) [%]			Limits [%]	Verdict
	33%	66%	100%		
THD (to the 33th)				5	P
2nd	0.30	0.14	0.09	1	P
3rd	0.08	0.06	0.19	4	P
4th	0.06	0.06	0.17	1	P
5th	0.84	1.09	0.14	4	P
6th	0.22	0.12	0.13	1	P
7th	0.97	0.41	0.21	4	P
8th	0.25	0.17	0.08	1	P
9th	0.11	0.07	0.07	4	P
10th	0.21	0.10	0.07	0.5	P
11th	1.19	0.25	0.31	2	P
12th	0.06	0.02	0.02	0.5	P
13th	0.86	0.11	0.28	2	P
14th	0.04	0.03	0.03	0.5	P
15th	0.07	0.06	0.04	2	P
16th	0.07	0.03	0.02	0.5	P
17th	0.28	0.28	0.15	1.5	P
18th	0.05	0.04	0.01	0.5	P
19th	0.32	0.17	0.11	1.5	P
20th	0.02	0.01	0.01	0.5	P
21th	0.02	0.03	0.03	1.5	P
22th	0.02	0.01	0.01	0.5	P
23th	0.14	0.13	0.07	0.6	P

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24th	0.01	0.01	0.01	0.5	P
25th	0.26	0.08	0.06	0.6	P
26th	0.01	0.01	0.01	0.5	P
27th	0.02	0.02	0.01	0.6	P
28th	0.02	0.01	0.01	0.5	P
29th	0.09	0.02	0.06	0.6	P
30th	0.02	0.02	0.01	0.5	P
31th	0.13	0.13	0.06	0.6	P
32th	0.01	0.01	0.01	0.5	P
33th	0.01	0.01	0.01	0.6	P
34th	0.02	0.01	0.00	---	---
35th	0.07	0.02	0.05	---	---
36th	0.01	0.01	0.00	---	---
37th	0.09	0.09	0.05	---	---
38th	0.01	0.01	0.00	---	---
39th	0.01	0.01	0.01	---	---
40th	0.01	0.01	0.00	---	---
41th	0.06	0.04	0.04	---	---
42th	0.01	0.01	0.01	---	---
43th	0.05	0.02	0.03	---	---
44th	0.01	0.01	0.00	---	---
45th	0.01	0.01	0.00	---	---
46th	0.01	0.01	0.01	---	---
47th	0.05	0.02	0.03	---	---
48th	0.01	0.01	0.00	---	---
49th	0.05	0.01	0.03	---	---
50th	0.01	0.00	0.00	---	---

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Note(s): Measured on each phase and choose the maximum value.

Additional comments