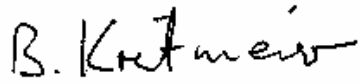





SUMMARY TEST REPORT	
AS 4777.2:2005 and AS 4777.3:2005	
Grid connection of energy systems via inverters – Grid protection requirements	
Report reference No	08TH0259-AS4777_SUM_0
Tested by (printed name and signature)	Bernd Kreitmeier 
Approved by (printed name and signature)	Andreas Aufmuth 
Date of issue	2009-10-12
Testing Laboratory Name	Bureau Veritas Consumer Product Services GmbH
Address	Businesspark A96 86842 Türkheim
	 DAT-PL-290/09-00
Applicant's Name	SMA Solar Technology AG
Address	Sonnenallee 1, 34266 Niestetal
Test specification	Summary test report
Standard	AS 4777.2:2005 and AS 4777.3:2005 – Inverter requirements.
Non-standard test method	None
Test Report Form No.	AS4777_SUM
TRF originator	Bureau Veritas Consumer Product Service GmbH
Master TRF	Dated 2009-10
Test item description	Inverter for wind turbines and water power plants
Trademark	
Manufacturer	SMA Solar Technology AG
Model and/or type reference	WB1100LV
Serial number	Prototype
Ratings	WB1100LV
Input Voltage:	21-48Vdc, max. 60Vdc
Input current:	62A max
Output Voltage:	230Vac phase to neutral, 50Hz
Output current:	4,4A
Output power:	nom. 1000W

1 Introduction

This summary test report provides the test results for the WB110LV tested at Bureau Veritas during 2nd March to 13th March 2009 for SMA Solar Technology AG for compliance to AS4777. The full test results are reported in BV report 08TH0259-AS4777.x. The testing described in this report was done according to the AS4777 (Grid connection of energy systems via inverters).



Figure 1: Test Inverter Pictures

2 Summary

The test result presented in this report relate only to the object(s) tested. This report shall not be reproduced, except in full, without the written approval of the applicant.

The unit was reviewed to AS 4777.2:2005 and AS 4777.3:2005, see section 3 of this report.

This report covers the requirements of AS 4777.2 and AS 4777.3 and documents the test results. The unit was not tested according to clause 4.1 and 4.10 of AS 4777.2. An appropriate test report must be provided by the manufacturer.

3 Compliance Test Report

3.1 Compliance to AS4777.2, clause 4

The 1000W single phase WB1100LV grid connected inverter was tested for SMA Solar Technology AG for compliance to AS4777.2:2005 – “Grid connection of energy systems via inverters” Part 2: inverter requirements.

Compliance to AS4777.2, clause 4		
Clause 4.1. General:	An applicable test report according to AS3100 must be provided by the manufacturer	Not tested
Clause 4.2. Compatibility with electrical installations:	The inverter has voltage and frequency ratings compatible with AS 60038 (230V _{AC} , 50Hz)	Complies
Clause 4.3. Power flow	The power flow during the test was from EUT to the grid.	Noted
Clause 4.4. Power factor direction:	The EUT maintained a power factor in the range of 0,997 to 0,999 (leading) over the operating range from 20% to 100% of output.	Complies
Clause 4.5. Harmonic currents:	The EUT current THD50 of 1,90% is less than the required limit of 5%. The individual harmonic current components up to the 33 rd were within the limits of AS4777.2, clause 4.5	Complies
Clause 4.6. Voltage fluctuations and flicker:	The flicker level is within the required limits under normal operation during the flicker test.	Complies
Clause 4.7. Impulse protection	After applying the impulse, the test inverter was tested for normal operation. The inverter operated normal. There is no significant change in the performance of the test inverter.	Complies
Clause 4.8. Transient voltage limits:	During the trip tests with light electronic load, the worst-case over-voltage observed was at 100% EUT output. This peak voltage of 567V had a base duration of 2,2ms, which is within the required envelope specified in the AS4777.2, Table 3.	Complies
Clause 4.9. DC current injection:	The EUT provides a 50Hz transformer at the output. Therefore no DC-injection is possible.	Complies
Clause 4.10. Data logging and communication devices:	The data logging and communication equipment of the EUT were not tested. The data communications device must conform to the appropriate requirements of AS/NZS 60950.	Not tested

3.2 Compliance to AS4777.3, clause 5

The 1000W single phase WB1100LV grid connected inverter was tested for SMA Solar Technology AG for compliance to AS4777.3:2005 – “Grid connection of energy systems via inverters” Part 3:Grid protection requirements.

Compliance to AS 4777.3, clause 5		
Clause 5.2. Disconnection device	The unit provides galvanic separation. The unit is switched off redundant by the high power bridge of the inverter and the relays in line and neutral.	Complies
Clause 5.3. Voltage and frequency limits (passive anti islanding protection)	<p>The EUT tripped at V_{min} 204,0V and V_{max} 264,0V with under voltage trip set points of 205,0V and 265,0V respectively. The ac voltage at which disconnection occurred were equal to the under/over voltage set points $\pm 5V$ as per the requirements of AS4777.3. The EUT disconnection times were less than 2 seconds.</p> <p>The EUT tripped at f_{min} 49,0Hz and f_{max} 51,01Hz with under and over frequency trip set points of 49,0Hz and 51,0Hz respectively. The frequencies at which disconnection occurred were equal to the under/over frequency set points $\pm 0.1Hz$ as per the requirements of AS4777.3. The EUT disconnection times were less than 2 seconds.</p>	Complies
Clause 5.5. Active Islanding Protection	The EUT was tested under a range of local load conditions as required for light electronic load, load match and load match plus 10%. The EUT tripped within the required time (less than 2 seconds) under all local load conditions.	Complies
Clause 5.6. Reconnection procedure	After the EUT was tripped on under/over voltage and under/over frequency, it reconnected after more than 60 seconds when voltage and frequency were returned to the nominal value.	Complies
Clause 5.7. Security of protection settings	Settings only available with password for the service personal.	Complies

End of Test Report