



## Certificate G83/1-1

### Engineering Recommendation

Manufacturer:	<b>SMA Solar Technology AG</b>
Address:	Sonnenallee 1
Postal code, place:	34266 Niestetal
Country:	Germany

Test house details:	<b>SMA Solar Technology AG</b> , R&D Department, Niestetal (D)
---------------------	--

Type reference:	Sunny Boy SB 2000HF-30 / 2500HF-30 / 3000HF-30 Windy Boy WB 2000HF-30 / 2500HF-30 / 3000HF-30
Max. AC power:	2000 VA / 2500 VA / 3000 VA
Nominal AC power:	2000 VA / 2500 VA / 3000 VA

The results of the G83/1-1 tests are summarized in this certificate. SMA declares that all devices (with G83 setting) that are shipped to the UK comply with the requirements defined in engineering recommendation G83/1-1. These settings cannot be changed by an installer, user or by any other person without the use of a tool (password protected). The complete documentation can be viewed at SMA (headquarters) after prior announcement.

#### Test details

- Power quality
- Harmonic current emissions as per BS EN 61000-3-2 A
- Voltage fluctuations and flicker as per BS EN 61000-3-3 A
- DC injection / Power factor
- Under / Over frequency switch off
- Under / Over voltage switch off
- Loss of mains test
- Reconnection time

**SMA Solar Technology AG**  
Niestetal, 22.10.2010

i. V. Frank Greizer  
Vice President T MP

## Test results

### Power quality

Harmonic current emissions as per BS EN 61000-3-2 A								
Harmonic	2 <sup>nd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>	7 <sup>th</sup>	9 <sup>th</sup>	11 <sup>th</sup>	13 <sup>th</sup>	15 <sup>th</sup> ... 39 <sup>th</sup>
Limit <sub>[A]</sub>	1.08	2.3	1.14	0.77	0.4	0.33	0.21	0.15 x (15/n)
Test value <sub>[A]</sub>	0.01	0.27	0.13	0.09	0.07	0.06	0.05	< limit BS EN 61000-3-2 A

Voltage Fluctuations and Flicker				
Harmonic	starting	stopping	running	
Limit	4 %	4 %	P <sub>st</sub> = 1.0	
Test value	0.1 %	0.1 %	0.1	
			P <sub>It</sub> = 0.65	
			0.09	

	DC injection			Power factor		
G83/1-1 Limit	20 mA, tested at three levels			0.95 lag - 0.95 lead at three voltage levels at P <sub>rated</sub>		
Test level	10 %	55 %	100 %	212 V	230 V	248 V
Test value	< 12 mA	< 12 mA	< 12 mA	0.99	0.99	0.99

### Under / Over frequency switch off

Parameter	Under frequency switch off		Over frequency switch off	
	Frequency (Hz)	Time (s)	Frequency (Hz)	Time (s)
G83/1-1 Limit	47 Hz +/- 0.5 %	5 s	50.5 Hz +/- 0.5 %	5 s
Actual setting*	47.06 Hz	4.96 s	50.44 Hz	4.96 s
Trip value	47.04 Hz	4.57 s	50.46 Hz	4.5 s

### Under / Over voltage switch off

Parameter	Under voltage switch off		Over voltage switch off	
	Voltage (V)	Time (s)	Voltage (V)	Time (s)
G83/1-1 Limit	207 V +/- 1.5 %	5 s	264 V +/- 1.5 %	5 s
Actual setting*	209.8 V	4.94 s	261.2 V	4.94 s
Trip value	210.3 V	4.97 s	263.3 V	4.97 s

### Loss of mains test

Method used	Resonant Circuit as per Annex C		
Output power level	10 % P <sub>rated</sub>	55 % P <sub>rated</sub>	100 % P <sub>rated</sub>
G83/1-1 Limit	5 s	5 s	5 s
Trip setting	-	-	-
Trip value	4.11 s	4.17 s	4.16 s

\* The settings in the user interface correspond to the limiting values of the G83/1-1 (207 V; 264 V; 47 Hz; 50.5 Hz). The voltage and frequency monitoring in the inverter takes the measuring tolerance into account resulting in the limiting values of the above mentioned tables.

## Reconnection time measurement

	Under / Over voltage	Under / Over frequency	Loss of mains
Minimum value	180 s	180 s	180 s
Actual setting	180 s	180 s	180 s
Recorded value	185 s	185 s	185 s

## Fault level contribution

As SSEGs (small-scale embedded generators) for PV or wind turbine systems 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 used.