



# Certificate G83/1

## Engineering Recommendation

**Manufacturer:** SMA Solar Technology AG  
**Address:** Sonnenallee 1  
**Postal code, place:** 34266 Niestetal  
**Country:** Germany

**Test house details:** SMA Solar Technology AG, R&D Department, Niestetal (D)

**Type reference:** Sunny Boy SB 4000TL-20  
**Max. AC power:** 4000 W  
**Nominal AC power:** 4000 W

The results of the G83/1 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. These setting cannot be changed by an installer, user or by any other person without the use of a tool (password protected). Complete documentation on test details are available at SMA on demand.

## 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

**SMA Solar Technology AG**

Niestetal, 2009-06-24

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Frank Greizer

(Director, Hardware Engineering)

## 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>	0.028	0.177	0.128	0.151	0.096	0.106	0.105	< limit BS EN 61000-3-2

Voltage Fluctuations and Flicker			
Harmonic	starting	stopping	running
Limit	4 %	4 %	$P_{st} = 1.0$
Test value	<0.7%	<1.7%	0.234

	DC injection			Power factor		
G83/1 limit	20mA, tested at three levels			0.95 lag - 0.95 lead at three voltage levels at $P_{rated}$		
Test level	10%	55%	100%	212V	230V	248V
Test value	<9mA	<12mA	<14mA	0.99	0.99	0.99

### Under / Over frequency switch off

	Under frequency switch off		Over frequency switch off	
Parameter	Frequency (Hz)	Time (s)	Frequency (Hz)	Time (s)
G83/1 Limit	47 Hz +/- 0.5%	5 s	50.5 Hz +/- 0.5%	5 s
Actual setting	47.0 Hz	5 s	50.5 Hz	5 s
Trip value	46.99 Hz	< 5 s	50.51 Hz	< 5 s

### Under / Over voltage switch off

	Under voltage switch off		Over voltage switch off	
Parameter	Voltage (V)	Time (s)	Voltage (V)	Time (s)
G83/1 limit	207 V	5 s	264 V	5 s
Actual setting	207 V	5 s	264 V	5 s
Trip value	207 V	< 5 s	264 V	< 5 s

### Loss of mains test

Method used	Resonant Circuit as per Annex C		
Output power level	10 % $P_{rated}$	55 % $P_{rated}$	100 % $P_{rated}$
G83/1 limit	5 s	5 s	5 s
Trip setting	5 s	5 s	5 s
Trip value	< 4 s	< 4 s	< 4 s

### 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	180 s	180 s	180 s

### 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 used.