



## 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>
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Type reference:	Max. AC power:	Nominal AC power:
SB 1300TL-10	1 300 W	1 300 W
SB 1600TL-10	1 600 W	1 600 W
SB 2100TL	2 100 W	1 950 W

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.

**SMA Solar Technology AG**  
 Niestetal, 2012-03-28

ppa. Frank Greizer  
 (Vice President MP T PD)

# Test Results

## Power Quality

Harmonic current emissions as per BS EN 61000-3-2								
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>
BS EN 61000-3-2 Limit [A]	1.08	2.30	1.14	0.77	0.40	0.33	0.21	0.15 x (15/n)
Test value [A] (at rated power)	SB 1300TL-10	0.01	0.10	0.07	0.06	0.03	0.01	< limit BS EN 61000-3-2 A
	SB 1600TL-10	0.01	0.10	0.08	0.06	0.04	0.02	
	SB 2100 TL	0.01	0.11	0.09	0.08	0.05	0.03	

Voltage fluctuations and flicker				
	Starting	Stopping	Running (at rated power)	
BS EN 61000-3-3 Limit	4%	4%	$P_{st} = 1.0$	$P_{lt} = 0.65$
Test value	0.1%	0.1%	0.08	0.08

	DC injection		
G83/1-1 Limit	20 mA, tested at three levels		
Test level (% of rated power)	10%	55%	100%
Test value	< 15 mA	< 14 mA	< 17 mA

	Power factor		
G83/1-1 Limit	0.95 lag - 0.95 lead at three voltage levels at $P_{rated}$		
Test level (AC voltage)	211 V	230 V	259 V
Test value (at rated power)	> 0.99	> 0.99	> 0.99

# Test Results

## Grid Monitoring and Reconnection Time

Under/over frequency				
	Under frequency switch off		Over frequency switch off	
Parameter	Frequency	Time	Frequency	Time
G83/1-1 Limit	47 Hz	5 s	50.5 Hz	5 s
Actual setting	47.05 Hz	4.7 s	50.45 Hz	4.7 s
Trip value	47.04 Hz	4.74 s	50.48 Hz	4.75 s

Undervoltage/overvoltage				
	Undervoltage switch off		Overvoltage switch off	
Parameter	Voltage	Time	Voltage	Time
G83/1-1 Limit	207 V	5 s	264 V	5 s
Actual setting	210.5 V	4.8 s	260.5 V	4.8 s
Trip value	210.55 V	4.82 s	261.19 V	4.82 s

Loss of mains tests (method used: frequency shift)				
Test level (% of rated power)	10%	55%	100%	
G83/1-1 Limit	5 s	5 s	5 s	
Actual setting	-	-	-	
Trip value	< 1.64 s	<1.23 s	<1.38 s	

Reconnection times			
Test level (% of rated power)	Undervoltage/overvoltage	Under/over frequency	Loss of mains
Minimum value	180 s	180 s	180 s
Actual setting	180 s	180 s	180 s
Recorded value	> 200 s	> 200 s	> 200 s

### Fault Level Contribution

As SSEGs (small-scale embedded generators) for PV 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.