



## Certificate G83/1

The manufacturer: **Steca Elektronik GmbH**  
**Mammostraße 1**  
**D-87700 Memmingen**  
**Germany**

Herby certifies, that its photovoltaic inverters for connection to the low voltage grid

### **StecaGrid 2000+**

is fulfilling the requirements of the Engineering Recommendation G83/1. The detailed results are summarized for both products on the following pages according to the Appendix 4 of the Engineering Recommendation.

Memmingen, the 14<sup>th</sup> of April 2009

  
**Steca**  
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## APPENDIX 4 TYPE VERIFICATION TEST SHEET

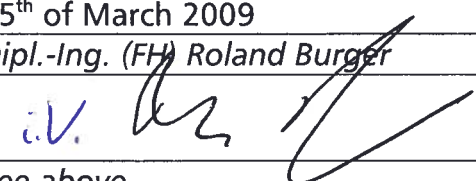
### SSEG DETAILS

SSEG Type reference: <i>StecaGrid 2000</i>		
SSEG Technology (as per Annex): <i>PHOTO-VOLTAIC (Annex C)</i>		
Manufacturer: <i>Steca Elektronik GmbH</i>	Tel: <i>+49 8331 8558-0</i>	Address: <i>Mammostrasse 1</i>
	Fax: <i>+49 8331 8558-12</i>	<i>87700 Memmingen</i>
		<i>Germany</i>
Technical file reference No: <i>MES70313</i>		
Maximum export capability (SSEG rating less parasitic load): <i>2,000 W</i>		

### TEST HOUSE DETAILS

Name and address of test house	<i>Steca R&amp;D Laboratories, Steca Elektronik GmbH, Mammostrasse 1, 87700 Memmingen, Gemany</i>
Telephone number	<i>+49 8331 8558-0</i>
Facsimile number	<i>+49 8331 8558-12</i>
E-mail address	<i>info@steca.de</i>

### TEST DETAILS

Date of test	<i>25<sup>th</sup> of March 2009</i>
Name of tester	<i>Dipl.-Ing. (FH) Roland Burger</i>
Signature of tester	
Test location if different from above	<i>See above</i>

### POWER QUALITY

Harmonic current emissions (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> ≤ n ≤ 39 <sup>th</sup>
Limit *	1.08	2.3	1.14	0.77	0.4	0.33	0.21	0.15 x (15/n)
Test value	0.015	0.16	0.14	0.041	0.115	0.058	0.021	<limit EN61000-3-2

Note \* Maximum permissible harmonic current as per BS EN 61000-3-2 Class A.

Voltage Fluctuations and Flicker				
	Starting	Stopping	Running	
Limit *	4%	4%	$P_{st} = 1.0$	$P_{lt} = 0.65$
Test value	3%	3%	0.107	0.245

Note Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100% power) and flicker. As per BS EN 61000-3-3.

	DC injection			Power factor		
G83/1 Limit	20mA, tested at three power levels *			0.95 lag– 0.95 lead at three voltage levels		
Test level	10%	55%	100%	212 V	230 V	248 V
Test value #	<i>Inverter contains transformer with galvanic separation</i>			< 0.95	< 0.95	< 0.95

Notes \* Indicative values are shown for minimum, medium and maximum power levels.  
# Insert maximum value recorded during testing

### UNDER / OVER FREQUENCY TESTS

Parameter	Under Frequency		Over Frequency	
	Frequency	Time	Frequency	Time
G83/1 Limit	47 Hz	0.5 sec *	50.5 Hz	0.5 sec *
Actual setting	47 Hz	0.2 sec	50.5 Hz	0.2 sec
Trip value	47 Hz	0.2 sec	50.5 Hz	0.2 sec

### UNDER / OVER VOLTAGE TESTS

Parameter	Under Voltage		Over Voltage	
	Voltage	Time	Voltage	Time
G83/1 Limit	207 V	1.5 sec *	264 V	1.5 sec *
Actual setting	207 V	0.2 sec	264 V	0.2 sec
Trip value	207 V	0.2 sec	264 V	0.2 sec

Note: \* For SSEG units that can withstand being re-energised from a source that is 180 out of phase with the SSEG output, it is permissible to extend the operating time of the interface protection to 5.0 seconds, as described in 5.3.1. Table 1.

## LOSS OF MAINS TEST

Method used	<i>Monitoring voltage and frequency</i>		
Output power level *	10%	55%	100%
Trip setting	0.5 sec	0.5 sec	0.5 sec
Trip value	< 0.5 sec	< 0.5 sec	< 0.5 sec

Note \* Indicative values are shown for minimum, medium and maximum power levels.

## RECONNECTION TIMES

	<b>Under/Over voltage</b>	<b>Under/Over Frequency</b>	<b>Loss of mains</b>
Minimum value	180 seconds	180 seconds	180 seconds
Actual Setting	180 seconds	180 seconds	180 seconds
Recorded value	180 seconds	180 seconds	180 seconds

## SSEG Short Circuit Test

*According to §C4.6 Photovoltaic SSEG's are deemed to automatically comply with clause 5.8 and no further tests are required.*

## SELF MONITORING – SOLID STATE SWITCHING

<b>Test</b>	<b>Yes / No</b>
It has been verified that in the event of the solid state switching device failing to disconnect the SSEG, the voltage on the output side of the switching device is reduced to a value below 50 volt within 0.5 sec.	<i>electromechanical relay used</i>

<sup>1)</sup> *Not applicable as electro-mechanical relays are used.*

## COMMENTS

*These tests have been carried out with specifications and parameters set to meet the requirements of G83/1 in the version of September 2003. It is hereby declared by the manufacturer that all units shipped to the UK will have identical parameter setting and that these parameters cannot be changed by a user, installer or by any person other than the manufacturer.*