

# 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 300 UK**

and

**StecaGrid 500 UK**

are 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 11<sup>th</sup> of September 2009



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Michael Voigtsberger,  
Division Manager Solar Electronics

## ENGINEERING RECOMMENDATION G83/1

### APPENDIX 4 TYPE VERIFICATION TEST SHEET

#### SSEG DETAILS

SSEG Type reference: <i>StecaGrid 300 UK</i>		
SSEG Technology (as per Annex): <i>PV inverter</i>		
Manufacturer: <i>Steca Elektronik GmbH</i>	Tel: <i>+49 8331 8558-0</i>	Address: <i>Mammostrasse 1 87700 Memmingen Germany</i>
	Fax: <i>+49 8331 8558-132</i>	
Technical file reference No: <i>MES90906_Idc_PF_Grid500_300_SW_V1.4.doc</i>		
Maximum export capability: 300 W (SSEG rating less parasitic load)		

#### TEST HOUSE DETAILS

Name and address of test house	<b><i>STECA ELEKTRONIK GMBH MAMMOSTRASSE 1 87700 MEMMINGEN GERMANY</i></b>
Telephone number	<b><i>+49 8331 8558 0</i></b>
Facsimile number	<b><i>+49 8331 8558 132</i></b>
E-mail address	<b><i>ROLAND.BURGER@STECA.DE</i></b>

#### TEST DETAILS

Date of test	<i>3rd of September 2009</i>
Name of tester	<i>Dipl.-Ing. (FH) Roland Burger</i>
Signature of tester	<i>i.v. [Signature]</i>
Test location if different from above	<i>same as 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	0.01	0.06	0.05	0.01	0.04	0.02	0.01	<limit EN6100-3-2

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

## ENGINEERING RECOMMENDATION G83/1

### APPENDIX 4 TYPE VERIFICATION TEST SHEET

<b>Voltage Fluctuations and Flicker</b>				
	Starting	Stopping	Running	
Limit *	4%	4%	$P_{st} = 1.0$	$P_{lt} = 0.65$
Test value	0.6%	0.6%	0.1	0.23

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

	<b>DC injection</b>			<b>Power factor</b>		
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 #	5.8	4.9	7.1	0.98 lag	0.98 lag	0.97 lag

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	47Hz	0.2 sec	50,5 Hz	0.2 sec
Trip value	47Hz	< 0.2 sec	50,5Hz	< 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	207V	0.2 sec	264V	0.2 sec
Trip value	207V	< 0.2 sec	264	< 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.

## ENGINEERING RECOMMENDATION G83/1

### APPENDIX 4 TYPE VERIFICATION TEST SHEET LOSS OF MAINS TEST

Method used	Monitoring voltage and frequency		
Output power level *	10%	55%	100%
Trip setting	-	-	-
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

Reconnection Time	Under/Over voltage	Under/Over Frequency	Loss of mains
Minimum value	180 sec	180 sec	180 sec
Actual Setting	180 sec	180 sec	180 sec
Recorded value	190 sec	190 sec	190 sec

### 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

Test	Yes / No
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.	Yes

### COMMENTS

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# ENGINEERING RECOMMENDATION G83/1

## APPENDIX 4 TYPE VERIFICATION TEST SHEET

### SSEG DETAILS

SSEG Type reference: <i>StecaGrid 500 UK</i>		
SSEG Technology (as per Annex): <i>PV inverter</i>		
Manufacturer: <i>Steca Elektronik GmbH</i>	Tel: <i>+49 8331 8558-0</i> Fax: <i>+49 8331 8558-132</i>	Address: <i>Mammostrasse 1</i> <i>87700 Memmingen</i> <i>Germany</i>
Technical file reference No: <i>MES90906_Idc_PF_Grid500_300_SW_V1.4.doc</i>		
Maximum export capability: 500 W (SSEG rating less parasitic load)		

### TEST HOUSE DETAILS

Name and address of test house	<b>STECA ELEKTRONIK GMBH</b> <b>MAMMOSTRASSE 1</b> <b>87700 MEMMINGEN</b> <b>GERMANY</b>
Telephone number	<b>+49 8331 8558 0</b>
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### TEST DETAILS

Date of test	3rd of September 2009
Name of tester	Dipl.-Ing. (FH) Roland Burger
Signature of tester	<i>i.v. [Signature]</i>
Test location if different from above	<i>same as 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>	13th	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	0.02	0.06	0.05	0.02	0.05	0.02	0.01	<limit EN6100-3-2

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

## ENGINEERING RECOMMENDATION G83/1

### APPENDIX 4 TYPE VERIFICATION TEST SHEET

<b>Voltage Fluctuations and Flicker</b>				
	Starting	Stopping	Running	
Limit *	4%	4%	$P_{st} = 1.0$	$P_{it} = 0.65$
Test value	0.7%	0.9%	0.1	0.21

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

	<b>DC injection</b>			<b>Power factor</b>		
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 #	8.0	11.2	2.8	0.99 lag	0.99 lag	0.98 lag

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 *
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### RECONNECTION TIMES

Reconnection Time	Under/Over voltage	Under/Over Frequency	Loss of mains
Minimum value	180 sec	180 sec	180 sec
Actual Setting	180 sec	180 sec	180 sec
Recorded value	190 sec	190 sec	190 sec

### FAULT LEVEL CONTRIBUTION

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