Declaration of Manufacturer

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 8000+ 3ph
StecaGrid 10000+ 3ph

fulfil in the setting "EN 50438" the requirements of the EN 50438:2007

Memmingen, the 19th of March 2013

ppa
Ralf Griepentrog
Head of R&D Department

TYPE CERTIFICATION TEST RESULTS SHEET

Micro-generator details

MICRO-GENERATOR Type reference StecaGrid 8000+ 3ph / StecaGrid 10000+ 3ph		
Rated output power 8.000 W or rather 10.000 W		
Manufacturer	Tel +49 8331 8558-0	Address Mammostrasse 1 87700 Memmingen Germany
	Fax +49 8331 8558-132	
	E-mail info@steca.de	
Technical file reference No. MES100809		

Test house details

Name and address of test house	see above
Telephone number	
Fax	
E-mail	

Test details

Date of test	see MES100809
Name of test Engineer	Dipl.-Ing. (FH) Dietmar Zeller
Signature of test Engineer	i.A. D. Zeller
Test location (if different from above)	

Power quality

Harmonic current emissions

	EVS-EN 61000-3-2 Limit (A)							
Harmonic	2nd	3rd	5th	7th	9th	11th	13th	15th ≤ n ≤ 39th
Limit	1,08	2,3	1,14	0,77	0,4	0,33	0,21	0,15·(15/n)
Test value	0,16	0,28	0,09	0,08	0,14	0,05	0,05	<limit EN61000-3-2

Voltage fluctuation and flicker

	Maximum permissible voltage fluctuation (expressed as precentage of nominal voltage at rated power) and flicker (standard EVS-EN 61000-3-3)			
	Starting	Stopping	Running (at rated power)	
Limit	3,3 %	3,3 %	P_{st} = 1,0	P_{lt} = 0,65
Test value	0,2 %	0,2 %	0,101	0,101

Power factor

Limit	+ 0,95 -0,95 at three voltage levels		
Test level (AC voltage)	210 V	230 V	250 V
Test value	0,97	0,98	0,98

Department: Research & Development

Under / Over frequency tests

	Under frequency		Over frequency	
Parameter	Frequency	Time	Frequency	Time
Protection limit	47 Hz	0,5 s	51 Hz	0,5 s
Actual setting	47 Hz	0,5 s	51 Hz	0,5 s
Trip value (test result)	47,0 Hz	0,5 s	51,0 Hz	0,5 s

Under / Over voltage tests (single stage protection)

	Under voltage		Over voltage	
Parameter	Voltage	Time	Voltage	Time
Protection limit	U_N – 15 % V	1,5 s	U_N + 15 % V	0,2 s
Actual setting	196 V	1,5 s	264 V	0,2 s
Trip value (test result)	196 V	1,5 s	264 V	0,2 s

LoM protection

Protection technique	monitoring of line-to-line voltage		
Testing method	voltage dip test		
Output power level	Min.	Medium	Max.
Trip setting clearance time	<5 s	<5 s	<5 s
Trip value clearance time	< 0,5 s	< 0,5 s	< 0,5 s

Fault level contribution

Short-circuit current at micro-generator terminals, A	see comments
Short-circuit applied to micro-generator at normal running condition 0 -2 s	

Comments

Steca inverters are line-commutated to ensure a very low harmonic distortion and a power factor very close to 1 (see above). The output current is directly controlled by the inverter and cannot exceed the maximum current, even in case of fault close to the inverter. Short circuit current cannot be a multiple of the nominal current like it can be at a synchronous generator or an induction generator.