TYPE TEST CERTIFICATION TEST RESULT SHEET

MICRO-GENERATOR DETAILS

MICRO-GENERATOR Type reference: *StecaGrid 1500 / StecaGrid 1500x / StecaGrid 1800 / StecaGrid 1800x* *StecaGrid 2000 / StecaGrid 2000x / StecaGrid 2300 / StecaGrid 2300x* *StecaGrid 2500 / StecaGrid 2500x / StecaGrid 3010 / StecaGrid 3010x* *StecaGrid 3000 / StecaGrid 3600 / StecaGrid 3600x*		
Maximum continuous rating: 1,500 W / 1,800 W / 2,000 W / 2,300 W / 2,500 W / 3,000 W / 3,000 W / 3,600 W		
Manufacturer: *Steca Elektronik GmbH*	Tel: *+49 8331 8558-0* Fax: *+49 8331 8558-132*	Address: *Mammostrasse 1* *87700 Memmingen* *Germany*
Technical file reference No: Summary_MES110630		
Maximum export capability (SSEG rating less parasitic load): 1,500 W / 1,800 W / 2,000 W / 2,300 W / 2,500 W / 3,000 W / 3,000 W or rather 3,600 W		

TEST HOUSE DETAILS

Name and address of test house	*Steca Elektronik GmbH, Mammostrasse 1, 87700 Memmingen, Germany*
Telephone number	*+49 8331 8558-0*
Facsimile number	*+49 8331 8558-132*
E-mail address	*info@steca.de*

TEST DETAILS

Date of test	*17th of September 2015*
Name of test Engineer	*Dipl.-Ing. (FH) Dietmar Zeller*
Signature of tester	i.A. D. Zeller
Test location if different from above	

POWER QUALITY

Harmonic current emission								
	Maximum permissible harmonic current as per EN 61000-3-2 Class 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 x (15/n)
Test value	0.03	0.05	0.07	0.02	0.04	0.02	0.04	< limit EN61000-3-2 A
[a] 50% of some other declared value close to the mid point between minimum and maximum.								

Voltage Fluctuations and Flicker				
	Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100 % power) and flicker as per EN 61000-3-3			
	Starting	Stopping	Running	
Limit	3.3 %	3.3 %	P_{st} = 1.0	P_{lt} = 0.65
Test value	2.83 %	2.83 %	0.1620	0.1620

	Power factor		
Protection limit	+ 0.95 – 0.95 at three voltage level		
	210 V	230 V	250 V
Test value	*1.0*	*1.0*	*1.0*
[a] 50% of some other declared value close to the mid point between minimum and maximum.			

UNDER / OVER FREQUENCY TESTS

	Under frequency		Over frequency	
Parameter	Frequency	Time	Frequency	Time
Protection limit (from Table 1 or Annex A)	48 Hz	0.5 sec	50.5 Hz	0.5 sec
Actual setting (as applied to interface protection)	48 Hz	0.5 sec	50.5 Hz	0.5 sec
Trip value (test result)	48 Hz	*0.45 sec*	50.5 Hz	*0.42 sec*

UNDER / OVER VOLTAGE TESTS (SINGLE STAGE PROTECTION)

	Under voltage		Over voltage	
Parameter	Voltage	Time	Voltage	Time
Protection limit (from Table 1 or Annex A)	207 V	0.5 sec	253 V	0.5 sec
Actual setting (as applied to interface protection)	207 V	0.5 sec	253 V	0.5 sec
Trip value (test result)	207 V	*0.44 sec*	253 V	*0.48 sec*

LOM TEST

Method used	Frequency shift with resonant circuit		
Output power level [a]	10 %	55 %	100 %
Trip setting clearance time	-	-	-
Trip value clearance time	< 0.5 sec	< 0.5 sec	< 0.5 sec
[a] Indicative values are shown for minimum, medium and maximum power levels.			

FAULT LEVEL CONTRIBUTION

Short-circuit current at micro-generator terminals
Short-circuit applied to micro-generator at normal running condition 0 – 2.0 s plot

MICRO-GENERATOR SHORT-CIRCUIT PARAMETERS

Parameter	Symbol	Value 1	Value 2	Value 3	Value 4	Value 5
Peak short-circuit current	i_P					
Initial value of aperiodic component	A					
Initial symmetrical short-circuit current	I_K					
Decaying (aperiodic) component of short-circuit current	i_{DC}					
Reactance / Resistance ratio of source	x / R					

COMMENTS

Fault level contribution: 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.