

APPLICATION FOR CONNECTION OF SMALL SCALE EMBEDDED GENERATORS TO THE LOW VOLTAGE DISTRIBUTION NETWORK

Application for the connection of Small Scale Embedded Generators (SSEG) units in parallel with the public distribution network in accordance with Stage 2 of Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence).

This information is to be provided to the Langeberg Municipality prior to the installation of a SSEG unit(s) in order that Langeberg Municipality can assess the potential impact of the connection on the network and that the installation complies with all the applicable safety regulations and quality of supply standards before the application will be approved.

The following documents must be completed and submitted immediately after the completion of the installation: Appendix 3, Appendix 4 and the Certificate of Compliance.

Appendix 5 must be completed and submitted if the installation is no longer in use.

4. DETAILS OF OWNER:

Title	
Name	
Street address	
Town	
Postal code	
Erf number	
Telephone nr. (landline)	()
Mobile number	
Email address	
Municipal account number	

2. ADDRESS WHERE THE SSEG WILL BE INSTALLED

Street address	
Town	
Postal code	
Erf number	
Telephone number (landline)	()
Municipal account number	

3. DETAILS OF INSTALLATION ELECTRICIAN

Name of business	
Registration number	
Date of registration	
Street address	
Town	
Postal code	
Telephone number	()
Mobile number	
Email address	

4. DETAILS OF SSEG

Manufacturer and model type	
Serial number of SSEG	
Serial number / version numbers of software (where appropriate)	
SSEG rating (A),kW and power factor (under normal running conditions)	
Maximum peak short circuit current (A)	
Type of prime mover and fuel source	
Location of SSEG within the installation	
Location of multipole isolator	
Single or Multi phase	
Supply voltage (AC)	
Supplier contact details: telephone numbers, web addresses ,etc.	
Manufacturing and safety standards with which the equipment complies.	

5. DETAILS OF THE DISCONNECTING DEVICE

Note: Refers to the disconnection of the public grid in the event of an unplanned power interruption.

Make/model	
Automatic	yes/no
Manufacturing and safety standards with which the equipment complies.	

6. INFORMATION TO BE ENCLOSED

Copy of system circuit diagram within the installation	Yes/no
Earthing arrangements	Yes/no
Site layout plan showing location of SSEG's (PV panels, wind turbines etc).	Yes/no
SABS certificate or any other manufacturing and safety standards of the SSEG and disconnecting devices.	Yes/no
Total weight of equipment to be installed on any existing roof on the premises.	Yes/no

Remarks (use separate sheet if necessary)

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I declare that this installation has been designed to comply with the requirements of ER G83/1 – 1 and NRS 097-2-1 (where the two disagree, NRS will take precedence)

Signed.....

Date.....

ENA G83/1-1 APPENDIX 3 – SSEG INSTALLATION COMMISSIONING CONFIRMATION

Confirmation of commissioning a SSEG unit connected in parallel with the public distribution Network – in accordance with Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence). One Commissioning Pro-forma per installation is to be submitted to the Langeberg Municipality.

Site Details	
Property address (incl. post code)	
Telephone number	
Customer business partner number	
Distribution Network Operator (DNO)	Langeberg Municipality
Contact Details	
SSEG owner	
Contact person	
Contact telephone number	
SSEG Details	
Manufacturer and model type	
Serial number of SSEG	
Serial number / version numbers of software (where appropriate)	
SSEG rating (A) and power factor (under normal running conditions)	
Maximum peak short circuit current (A)	
Type of prime mover and fuel source	
Location of SSEG within the installation	
Location of multi pole isolator	

Installer Details	
Installer	
Accreditation/Qualification	
Address (incl. post code)	
Contact person	
Telephone number	
Fax number	
E-mail address	
Information to be Enclosed	
Final copy of circuit diagram	
SSEG Test Report (Appendix 4) or web address if appropriate (not necessary if already provided e.g. under a Stage 2 connection)	
Computer printout (where possible) or other schedule of protection settings	
Electricity meter(s) make and model:	
Declaration – to be completed by the person responsible for the installation.	
The SSEG installation complies with the relevant sections of Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence).	
The loss of mains protection has been proved by a functional test carried out as part of the on-site commissioning, e.g. a momentary disconnection of the supply to the SSEG in order to prove that the loss of mains protection operates as expected.	
Protection settings have been set to comply with Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence).	
The protection settings are protected from alteration except by prior written agreement between the DNO and the Customer or his agent.	
Safety labels have been fitted in accordance with section 6.2 of Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence).	
The SSEG installation complies with the relevant sections of SANS 10142-1 and an installation test certificate is attached.	
Comments (continue on separate sheet if necessary)	
Names:	Signature: Date:

ENA G83/1-1 APPENDIX 4 – TYPE VERIFICATION TEST SHEET [In accordance with Engineering Recommendation G83/1-1 and NRS 097-2-1 (where the two disagree, NRS will take precedence).]

SSEG DETAILS

SSEG Type reference:		
SSEG Technology (as per Annex):		
Manufacturer:	Tel:	Address:
	Fax:	
Technical file reference No:		
Maximum export capability		

TEST DETAILS

Date of test	
Name of tester	
Signature of tester	
Test location if different from above	

POWER QUALITY

Harmonic current distortion (%)

Harmonic	Limit *	Test value
THD	<5%	
2 nd	1.0%	
3 rd	4.0%	
4 th	1.0%	
5 th	4.0%	
6 th	1.0%	
7 th	4.0%	
8 th	1.0%	
9 th	4.0%	
10 th	0.5%	
11 th	2.0%	

* Maximum permissible harmonic current. As per IEC 61727:2004

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

* Maximum permissible voltage fluctuation (expressed as a percentage of nominal voltage at 100% power) and flicker. As per BS EN 61000-3-3 and NRS 048-2 (IEC 61000-4-45).

	DC injection			Power factor		
G83/1-1 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 #						

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

insert maximum value of dc injection and worst case pf value recorded during testing

UNDER / OVER FREQUENCY TESTS

	Under Frequency		Over Frequency	
Parameter	Frequency	Time	Frequency	Time
NRS 097-2-1 Limit	47.5 Hz	0.5 sec *	52 Hz	0.5 sec *
Actual setting				
Trip value				

UNDER / OVER VOLTAGE TESTS

	Under Voltage		Under Voltage	
Parameter	Voltage	Time	Voltage	Time
NRS 097-2-1 Limit	115 V	0.2 sec	195 V	2 sec
Actual setting				
Trip value				

	Over Voltage		Over Voltage	
Parameter	Voltage	Time	Voltage	Time
NRS 097-2-1 Limit	253 V	2 sec	276 V	0.16 sec
Actual setting				
Trip value				

NOTE: * For SSEG units that can withstand being re-energised from a source that is 180 degrees out of phase

with the SSEG output, it is permissible to extend the operating time of the interface protection to 5

seconds, as described in 5.3.1 Table 1 of G83/1-1

LOSS OF MAINS TEST

Method used			
Output power level *	33%	66%	100%
Trip setting			
Trip value			

* Indicative values are shown for minimum, medium and maximum power levels (IEC 62116 Ed .1) NRS 097-2-1 in 4.2.2.4.5 stipulates that the embedded generator shall cease to energise the utility network within 2 seconds.

RECONNECTION TIMES

Reconnection Time	Under/Over voltage	Under/Over frequency	Loss of mains
Minimum value	60 seconds	60 seconds	60 seconds
Actual setting			
Recorded value			

FAULT LEVEL CONTRIBUTION**SSEG Short Circuit Test**

This test should determine the value of short circuit current at the SSEG terminals as described in clause 5.7 in Engineering Recommendation G83/1-1.

For rotating machines and linear piston machines the test should produce a 0 – 2.0 second plot of the short circuit current as seen at the SSEG terminals.

SSEG Short Circuit Parameters

Parameter	Symbol	Value
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	

* Values for these parameters should be provided where the short circuit duration is sufficiently long to enable interpolation of the plot

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.	

COMMENTS

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APPLICATION FOR THE CONNECTION OF SMALL SCALE EMBEDDED GENERATION

Application completed by:

Name:	Title:

ECSA registered professional

Name:	Reg. no:	Registration category:

(Note: Sign-off by an ECSA registered professional is optional at application stage, however it is recommended that an ECSA registered professional engineer or professional technologist that is familiar with the technical details of the intended generation technology, complete this application form)

Signed (Applicant):

Date:

Signed (property owner):

Telephone number:	

Date:

ENA G83/1-1 APPENDIX 5 – SSEG DECOMMISSIONING CONFIRMATION

Site Details	
Property address (incl. post code)	
Telephone number	
Customer business partner number	
Distribution Network Operator (DNO)	
SSEG details	
Manufacturer and model type	
Serial number of SSEG	
SSEG rating (A)	
Type or prime mover and fuel source	

Decommissioning Agent Details		
Name		
Accreditation/Qualification		
Address (incl. post code)		
Contact person		
Telephone number		
Fax number		
E-mail address		
Names:	Signature:	Date: