



Engineering Recommendation G83

Issue 2-~~1~~-2 (~~July 2018~~TBA)

Recommendations for the Connection of Type Tested
Small-scale Embedded Generators (Up to 16A per Phase) in
Parallel with Low-Voltage Distribution Systems

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Amendments since publication

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Issue 2-1	01 \July 2018	RoCoF and VS immunity requirements – amendments to; I5.3.1, 5.3.3, Appendix 4
<u>Issue 2-2</u>	<u>TBA</u>	<u>Note added to section 2 to make it clear that generation connected on or after 27 April 2019 must comply with G98.</u>

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1 Foreword

This Engineering Recommendation (EREC) is published by the Energy Networks Association (ENA) and comes into effect from 1 December 2012¹.

It has been prepared and approved under the authority of the **Great Britain Distribution Code Review Panel**. The approved abbreviated title of this engineering document is “EREC G83”, which replaces the previously used abbreviation “ER G83”.

The purpose of this Engineering Recommendation is to simplify and standardise the technical requirements for connection of **Small Scale Embedded Generators (SSEGs)** for operation in parallel with a public low-voltage **Distribution System**, by addressing all technical aspects of the connection process from standards of functionality to site commissioning.

The procedures described are designed to facilitate the connection of **Type Tested SSEGs** whilst maintaining the integrity of the public low-voltage **Distribution System**, both in terms of safety and supply quality.

This Engineering Recommendation provides sufficient information to allow:

- a) **SSEG Manufacturers** to design and market a product that is suitable for connection to the public low-voltage **Distribution System**;
- b) **Users, Manufacturers and Installers of SSEGs** to be aware of the requirements that will be made by the **Distribution Network Operator (DNO)** before the **SSEG** installation will be accepted for connection to the **DNO's Distribution System**.

Legal Aspects

In accordance with **ESQCR** Regulation 22(2)(c) the **Installer** is to ensure that the **DNO** is made aware of the **SSEG** installation at or before the time of commissioning. The **DNO** may not refuse to accept the connection providing the installation complies with the requirements of **ESQCR** Regulation 22. However under the terms of **ESQCR** Regulation 26 the **DNO** may require a **SSEG** to be disconnected if it is a source of danger or interferes with the quality of supply to other consumers.

In August 2008 an exemption to **ESQCR** Regulation 22(2) (c) was granted by the Health & Safety Executive to the person or persons installing the source of energy from the requirements imposed by **ESQCR** Regulation 22(2)(c) as long as that person or persons installing the source of energy informed the **DNO** of the intention to use that source of energy in parallel with the network no later than 28 days (inclusive of the day of commissioning) after commissioning the source (see Appendix 6)

In addition to the requirements specified in this document which allows connection to the GB electricity Distribution System, the SSEG and all of its components shall comply with all relevant legal requirements including European Directives and CE marking.

¹ Distribution Code Guidance Note 2/4 - December 2012. - <http://www.energynetworks.info/the-distribution-code/>

For all Small Scale Embedded Generators (SSEG) of up to 16A per phase, until 1 March 2014 it is permissible to connect to the general requirements of previous versions of G83 provided this is through an Inverter or Controller with a protection/control system that has either been fully type tested in accordance with G83/1-1, G83/2, G83/2-1 or in accordance with G59/2.

After 1 March 2014 it will only be allowable to connect SSEG of up to 16A per phase that complies with G83/2 or G83/2-1 .

2 Scope

This Engineering Recommendation provides guidance on the technical requirements for the connection of **Type Tested Small-Scale Embedded Generators (SSEGs)** in parallel with public low-voltage distribution networks. For the purposes of this Engineering Recommendation a **SSEG** is a source of electrical energy rated up to and including 16 Ampere per phase, single or multi-phase, 230/400 V **AC**.

This corresponds to 3.68 kilowatts (kW) on a single-phase supply and 11.04 kW on a three-phase supply. The kW rating shall be based on the nominal voltage (ie 230V) as defined in BS EN 50160 and the Electricity Supply Quality and Continuity Regulations (ESQCR).

SSEGs commissioned on after 27 April 2019 must comply with EREC G98. EREC G83 is not applicable to generation commissioned on or after that date.

Where the **SSEG** includes an **Inverter** its rating is deemed to be the **Inverter's** continuous steady state rating.

There are two connection procedures described in this document.

The first connection procedure covers the connection of one or more **SSEG** systems, either single or multi-phase within a single **Customer's Installation**.

Multiple **SSEG** systems shall be accepted within a single **Customers Installation** provided that the aggregate rated capacity of the systems is not greater than 16A per phase².

The second connection procedure covers the connection of multiple **SSEGs** (other than within a single **Customer's Installation**) in a **Close Geographic Region**, under a planned programme of work.

This Engineering Recommendation only specifies the connection requirements applicable to those **SSEG** installations that are designed to normally operate in parallel with a public distribution network. Those installations that operate in parallel with the **DNO's Distribution System** for short periods (ie less than 5 minutes) or as an islanded installation or section of network are considered to be out of scope, on the basis that it is not possible to devise generic rules that will ensure safe operation under all operating conditions.

The generic requirements for all types of **SSEG** systems are defined in the main text of this Engineering Recommendation, whilst the generic and technology specific type testing requirements are defined in the annexes. The generic requirements relate to the connection, installation and network design requirements for connection of a **SSEG** to a public low-voltage **Distribution System**. **SSEGs** that are not **Type Tested** to conform to the requirements of this document can only be connected via the guidelines laid down in Engineering Recommendation G59.

Annexes A and B describe a methodology for testing the particular types of electrical interface between the **SSEG** and the **Distribution System** whilst Annex C describes a methodology for testing technology specific **SSEG** requirements. The purpose of the type tests is to demonstrate compliance with the generic requirements of this Engineering Recommendation. By satisfying the test conditions in the relevant annex the **SSEG** can be considered an approved **SSEG** for

² The manufacturer may restrict the rating of the SSEG by applying software settings provided these settings are not accessible to the customer