

Requirements for Generators (RfG)

Fact Sheet

RfG is seen as one of the main drivers for creating harmonised solutions and products necessary for an efficient pan-European (and global) market in generator technology. The purpose of the code is to bring forward a set of coherent requirements in order to meet these challenges of the future.

The requirements under RfG are similar to the existing GB Grid Code for larger generators. For generators below 10MW there are differences; and the requirements go all the way down to 800W.

The Requirements

Technical requirements in RfG are arranged in four types A-D based on the connection voltage and MW capacity. The maximum levels allowed are as follows:

Type A and B requirements are close to a product standard; type C and D requirements need active generator management.

Type	Connection Voltage	Capacity
A	< 110kV	800W – 1MW
B	< 110kV	1MW – 10MW
C	< 110kV	10MW – 50MW
D*	> 110kV	50MW +

*Any Generator connecting at 110kV or higher is classified as Type D regardless of capacity.

Type A - A basic level necessary to ensure capability of generation over operational ranges. It has limited automated response and minimal system operator control.

Type B - Type B provides for a wider range of automated dynamic response, with greater resilience to more specific operational events

Type C - Provide for a refined, stable and highly controllable (real-time) dynamic response, aiming to provide principle ancillary services to ensure security of supply.

Type D - Requirements specific to higher voltage connected generation with an impact on entire system control and operation. They ensure the stable operation of the interconnected network, allowing the use of ancillary services from generation Europe-wide.

Am I affected?

It applies to 'new' generators which are defined as those that are not currently connected to the system, and do not let contracts for the main plant items by **17 May 2018**.

When?

RfG entered into force as European law on **17 May 2016**. If you are classed as a 'new' generator then compliance with the code is required no later than **27 April 2019** or the generator's connection date.

How?

GB implementation of RfG took place through industry workgroups established under the Grid and Distribution Codes. The main task is to align the existing GB codes such that anyone planning to connect to the electricity system can be confident that by satisfying the GB codes they are also fulfilling the requirements of any relevant European legislation. The workgroup set the parameters for the parts of the code which were left to national discretion.

All changes to GB codes were consulted on and approved by Ofgem.

Summary of Requirements

Technical Requirements	Type A	Type B	Type C	Type D
Operation across a range of frequencies	●	●	●	●
Limits on active power output over frequency range	●	●	●	●
Rate of change of frequency settings applied (likely to be at least 1Hz/sec)	●	●	●	●
Logic interface (input port) to cease active power output within 5 secs	●	●	●	●
Ability to automatically reduce power on instruction		●	●	●
Control schemes, protection and metering		●	●	●
Fault Ride Through requirements		●	●	●
Ability to reconnect		●	●	●
Reactive capability		●	●	●
Reactive current injection		●	●	●
Active power controllability			●	●
Frequency response			●	●
Monitoring			●	●
Automatic disconnection			●	●
Optional Black start			●	●
Stable operation anywhere in operating range			●	●
Pole slipping protection			●	●
Quick resynchronisation capability			●	●
Instrumentation and monitoring requirements			●	●
Ramp rate limits			●	●
Simulation models			●	●
Wider Voltage ranges / longer minimum operating times				●
Synchronisation on instruction				●
Enhanced Fault Ride through				●

For more information

Please read our [European Connection Codes Customer Letter](#) to find out more about the process for notifying National Grid of your purchase contract.

Please watch our [webinar](#) to find out more about some of the new System Management and Compliance requirements resulting from the European Connection Codes.

The Grid Code and Distribution Code workgroups implementing the RfG requirements were via [GC0100](#) (Banding, Scope and Applicability, Fast Fault Current Injection and Fault Ride Through), [GC0101](#) (Voltage, Reactive and Frequency requirements) and [GC0102](#) (System Management and Compliance).