

Pre-saturated Core Fault Current Limiter

The Product



- A fault current limiter (FCL) suppresses the damaging currents which result from electricity network faults
- GridON's FCL uses a direct current coil to magnetically saturate the iron core – providing a very low impedance during normal operation and high impedance to limit faults
- Unlike previous technologies, this design offers the advantages of a pre-saturated core type fault current limiter without the need for superconducting components
- The design is based on combining industry standard, proven transformer technology with GridON's unique and proprietary magnetic saturation technology
- GridON's FCL is commercially available now

The Benefits

- Removes fault level constraints without costly network upgrades
- Enables more distributed generation, with shorter connection times and reduced costs
- Enables smart networks with increased efficiency, flexibility, reliability and resilience
- It is fully scalable for use on both distribution and transmission systems
- Provides – instant, self-triggering response to a fault – immediate recovery following clearance of a fault without network interruption – suppression of multiple consecutive faults
- Enhanced fault limiting capability relative to other pre-saturated core fault current limiters
- Breakthroughs in design removes the need for superconducting components and associated cryogenic systems
- GridON's is the first such fully tested, commercially viable, non-superconducting pre-saturated fault current limiter
- Will potentially help to minimise the costs of upgrading electricity distribution and transmission networks over the next 20 to 30 years
- The product's inherent cost-effectiveness, ease of installation, reliability and minimal maintenance requirements should cut capital expenditure and operating costs and extend the useful life of existing network assets

Martin Wilcox, Head of Future Networks, UK Power Networks:

“High fault levels impact both how we operate our network and the connection offers we are able to provide to generation customers. GridON's fault current limiter looks to be a good solution to avoid having to replace switchgear prematurely or unnecessary interruptions to our customers supplies.

The similarity in design to our existing transformer fleet minimises additional impact on our operation and maintenance teams. It should also enable us to better work with generation customers to provide the best value solution on fault level constrained parts of our network.”

Project Achievements to Date

- We commissioned and funded this development and demonstration project to drive the technology to a point at which network operators could deploy
- Our funding and project management has allowed GridON to develop new capability and to build and test the device
- It has been comprehensively tested at a certified high power laboratory in Australia with excellent results in over 50 stringent fault tests
- UK Power Networks has fully approved the design and testing and is acting as the network operation customer during this latest demonstration phase
- The FCL was commissioned into service in May 2013 at a UK Power Networks main substation in Newhaven, East Sussex



Next Steps

- The device is now in service on the 11kV distribution network and it will be further demonstrated in operation for the next two years
- ETI member E.ON is providing technical assurance expertise and network modelling support

The ETI's Energy Storage & Distribution Programme

The programme aims to support the adaptation of the UK's energy networks, to enable a higher penetration of renewable and distributed generation, to improve flexibility between energy supply and demand, and to reduce the CO₂ and environmental impact of existing networks.

Contact

- Nick Eraut, Project Manager – nicholas.eraut@eti.co.uk – 01509 202022
- Phil Proctor, Programme Manager – phil.proctor@eti.co.uk – 01509 202063

Andrew Ellis, Head of Electrical Power Engineering at E.ON New Build & Technology:

“High fault levels in distribution networks are increasingly becoming a constraint for the connection of environmentally friendly distributed generation. Active fault current management through fault current limiters is an ideal way forward in mitigating this risk, both technically and commercially. We expect that the fault current limiter device that has been developed under this project will take us much closer to the realisation of a viable solution for our distribution networks and distributed generation projects”