

36 kV Superconducting Fault Current Limiter Magnet System (SFCL)



MAGNETS FOR FUSION



MAGNETS FOR HIGH ENERGY PHYSICS



MAGNETS FOR MEDICAL APPLICATIONS



SYSTEMS FOR ENERGY



SERVICES & REPAIRS

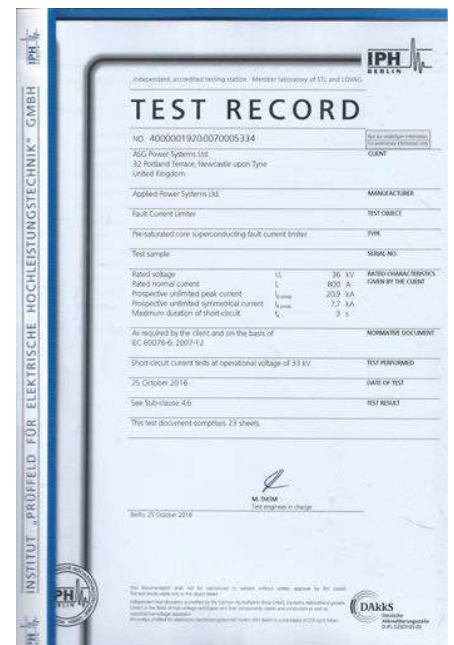
ASG Superconductors has manufactured a cryogen free magnet system based on the usage of magnesium diboride, for its subsidiary ASG Power Systems Ltd, to be used in a Superconducting Fault Current Limiter.

The magnet is a dipole measuring 2,5 m of diameter, weighing 10 t and generating a magnet field of 1 T.

The system, and therefore the magnet, has been positively "type tested" (i.e. tested to be qualified for usage in standard energy networks in the United Kingdom) at the IPH Laboratories in Berlin in October 2016, thus demonstrating to successfully filter currents at 21 kA (at 36 kV), peak prospective limited to 13.8 kA, peak value for pulses duration up to 3s (far above the duration of a real world current duration in fault conditions).



SFCL in IPH test vault, the coils are visible around the reactor tank



Test report certifying the positive outcome of the qualification



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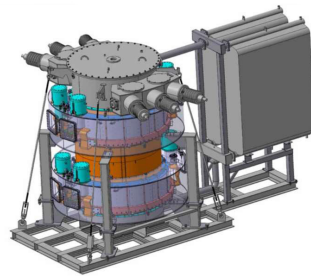
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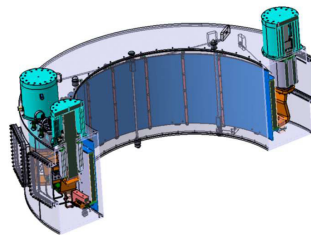
SYSTEMS
FOR ENERGY



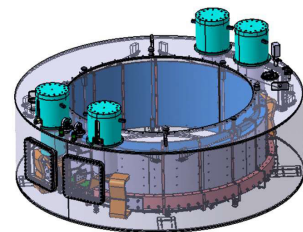
SERVICES & REPAIRS



Cooled by natural convection of oil and air, limiters with normal current capacities of 1250A have undergone network trials for 3 years. Higher ratings are achievable. Using oil for insulation allows limiters for operation at 36kV to be available now, with higher voltage ratings in development.



Saturated core technology provides Fault Current Limiters capable of reducing currents flowing into network faults by 40+%, of withstanding faults of up to 3 seconds duration and of recovering immediately following a fault, to continue to supply customers with electricity. The operation is entirely autonomous and fail-safe.



The ac reactor coil cores are driven into saturation by magnetic flux generated by a Helmholtz pair of superconducting solenoids which are enclosed in toroidal stainless steel vacuum vessels. The coils are cooled by conduction through a copper heat-exchange system, which is cooled by Gifford-McMahon cryocoolers.