

# Protection of the 16 T EuroCircol dipoles

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As a part of the Future Circular Collider (FCC) project, the European Circular Energy-Frontier Collider Study (EuroCirCol) is aiming to design a 16 T Nb<sub>3</sub>Sn accelerator dipole magnet that could be used in a 100 km 100 TeV hadron collider. In addition to provide the required magnetic field, the design aims for a compact and cost-effective magnet. To select the most suitable cross-section type, three options are being explored and compared: Cos $\theta$ , Block, Common-Coil. The pursuit for compactness leads to higher energy density magnets, which are more challenging to protect against the effects of quench. The requirements from magnet protection have been considered throughout the magnet design phase. In this paper we present a quench protection system design for all the three magnets, and compare the magnets from the point of view of performance and technical realization of the quench protection system. The magnet protection design is based on a hybrid system including the Coupling Loss Induced Quench system (CLIQ) and quench heaters. The configurations of CLIQ and heaters are designed to complement each other in an optimal way, including the redundancy.

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