

Development of high-current power supplies for the TCABR tokamak

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An upgrade is being conducted on the TCABR tokamak, which is a small-size tokamak ($R_0 = 0.62$ m and $a = 0.2$ m) operated at the University of São Paulo, Brazil. An important part of this upgrade is the installation of additional poloidal field coils to allow for the generation of various divertor configurations such as single-null, double-null, snowflake and x-point target divertors. The control of these various magnetic configurations requires the development of 15 robust and high-performance power supplies. To identify the most appropriate solution, different power electronic topologies are being considered such as thyristor-based, IGBT full-bridge, and resonant converter power supplies. In this work, a comparison between these topologies in terms of controllability, complexity and cost will be presented.

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