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P4.083 Concept design of high power quench protection circuit on China Fusion Engineering Test Reactor

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The Quench Protection Circuit (QPC) can provide a fast and reliable protection for superconducting magnet. According to the conceptual design of China Fusion Engineering Test Reactor (CFETR), a high power QPC with mechanical-static hybrid switch is proposed, which is designed for the superconducting Toroidal Field (TF) magnets. The rated currents and maximum reapplied interruption voltages for QPC are 70 kA and 15 kV. The QPC is mainly composed of a innovative mechanical main switch with three levels contacts for conducting the continuous current, a Solid-State Switch (SSS) in parallel for current transferring, a high power resistor for dumping energy stored in the coils, and a pyrobreaker for providing backup. The design principles and preliminary results of each part are given respectively.

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