High Current, Low Voltage Power Converter
[\text{20 kA, 6 V}] - LHC Converter Prototype,
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superconducting LHC accelerator requires high currents
(\sim 12.5 \text{kA}) and relatively low voltages (\sim 10 \text{V}) for its
magnets. The need to install the power converters
underground is the driving force for reduced volume and
high efficiency. Moreover, the LHC machine will require a
very high level of performance from the power converters,
particularly in terms of DC stability, dynamic response and
also in matters of EMC. To meet these requirements soft-
switching techniques will be used. This paper describes the
development of a \text{[20 kA, 6 V]} power converter intended
as a stable high-current source for DCCT calibration and an
evaluation prototype for the future LHC converters. The
converter is made up using a modular concept where five
current sources \text{[4 kA, 6 V]} are placed in parallel. The
4 \text{kA} sources are configured in plug-in modules: a diode
rectifier on the AC mains with a damped L-C passive filter,
a Zero Voltage Switching inverter working at 20 kHz and
an output stage (high frequency transformers, Schottky
rectifiers and output filters). The obtained performance (DC
stability, bandwidth, efficiency, EMC, ...) is presented and
discussed.