

A full bridge converter with LC low pass filter is used as a power circuit of a 1 kW continuous and 2 kW peak switching dc servo amplifier, which can operate either as a voltage source or a current source. The output voltage or output current is controlled via an inductor current using current programmed mode technique. The operating frequency is fixed at 20 kHz. The limited unipolar mode is used in normal operation. The operating sequence of the four switches of the converter is arranged so as to minimize the difference of the losses of the four switches, when the amplifier is operating as a dc amplifier. The M-G set is used to test the performance of the dc servo amplifier. Because of the four quadrant nature of converter, the output voltage of the amplifier can be varied between +/- 100 volts with a peak current of +/- 20 amperes, and maximum continuous current of +/- 10 amperes. The maximum efficiency of the dc servo amplifier is 86% at continuous rated voltage and current. The step response of the dc servo amplifier working in a voltage and current mode without current limiting; the output voltage and output current rise times are 0.6 ms and 5 ms, respectively.