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## Design and simulation of a cascaded four-quadrant 24- pulse converter based on 6-phase pulsed motor-generator

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This paper designs a cascaded four-quadrant 24-pulse converter fed by a 6-phase pulsed motor-generator (M-G) aiming at the requirements of HL-2M tokamak, which is mainly used for the control of vertical instability of plasma. The optimally designed four-quadrant 24-pulse converter cascaded by four-quadrant converters is able to balance the loads of the double Y of M-G. Owing to the fact that the control of the four-quadrant converters are relatively independent and logical controlled with circulating current, it is available to work under high current in four-quadrant. The output current transits smoothly and continuously over the zero crossing point. In addition, the circular reactors can be saved by taking full advantage of the large inductance of the M-G to restrain circulating current. This paper designs a four-quadrant 24-pulse converter satisfied with the requirements and makes MATLAB simulations to verify the performances of current following, the adjustability of voltage source fluctuating, the smoothness of current passing zero and the presentation of circulating current.

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