



AK Tech Training and Placements

Transform Dreams into Reality

A New Modular Multilevel AC/AC Converter Using HF Transformer

This project proposes a new modular multilevel AC/AC converter using High-Frequency (HF) transformer, which has the advantages of modular design, easy expansion, high power density, no circulation current, and good output voltage waveform quality and low cost. This converter has broad application prospects in the fields of high-voltage and high-power wind power generation, Fractional Frequency Power Transmission (FFTS) and power electronic transformer. The proposed converter topology can connect two three-phase AC systems with different frequencies and amplitudes directly. By introducing HF transformer, the direct series connection of input and output modules can be realized simultaneously, and the expensive industrial frequency transformer with large volume and weight can be removed. In order to achieve HF electrical isolation, the HF inversion of the output pulse is carried out at the inverter side to realize the HF output of the fundamental wave. After passing the HF transformer, the pulse is restored to the low-frequency output wave by the cyclo converter. Aiming at the problem of freewheeling of HF link, the method of common state conduction is introduced, which can effectively reduce the switching loss. The modulation scheme, control strategy and typical parameter design are developed. Furthermore, the feasibility of the proposed converter is verified by simulation results.

Domain: Power Systems _ HVDC

Technology: Electrical