

ABSTRACT

The present invention relates to a power converting apparatus and a power converting method for driving a high voltage AC motor at a variable speed. Conventional inverter systems cannot solve technical subjects such as energy conservation, resource conservation, miniaturization, efficiency promotion and voltage and current waveform distortion suppression for improvement in environment needed by the market, and cannot solve another technical subject of improvement in redundancy such that, upon failure, operation is performed with a normal part. In the present invention, a power converting apparatus of a multiple three-phase pulse width modulation cycloconverter system for driving a high voltage AC motor at a variable speed is used, and bidirectional semiconductor switches (11 to 16) are controlled so that voltages of AC outputs to be outputted to single-phase AC terminals (u, v) of three-phase/single-phase pulse width modulation cycloconverters (1 to 9) may have a same phase in each of units but electric angles of basic wave voltage phases may be different by 120 degrees from each other among the three units to drive a high voltage AC motor (10). If one of the cycloconverters (1 to 9) fails, then the single-phase AC terminals (u, v) of the failed cycloconverter are short-circuited and three sets of switches each

consisting of two bidirectional semiconductor switches connected to three-phase AC terminals (r, s, t) of the cycloconverters of the other two units in the same group as the failed cycloconverter are successively rendered conducting one by one set at equal time intervals to short-circuit the three sets of the bidirectional semiconductor switches to drive the high voltage AC motor at a variable speed.