

A Different Voltage-Source Power Inverter with Carrier Based SPWM for Open-End Connection Loads

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Abstract	<p>This paper presents a new configuration of voltage source inverter with a simplified circuit for generating five-level pulse width modulation (PWM) voltage waveform. Compared with conventional inverter configuration, this circuit is drastically able to simplify the structure and reduce the required number of active switch components. The new inverter circuit is very suitable for the use of open-end connection loads such as open-end winding ac motor drive application. Instead of using separated dc power sources, the new inverter circuit configuration is also possible to utilize only one dc voltage source, so the power supply circuits can be made simpler. Furthermore, to reduce ripples of dc capacitor voltages, the voltage stabilizing circuit of capacitors at the input side was proposed and applied. The stabilizing circuit is capable to work reducing the size of dc capacitors, and maintaining voltage stability of capacitors through charging and discharging operation modes. The working principles of inverter circuit were evaluated and examined by means of computer simulations using PSIM software. In addition, experimental test results of the prototype were also provided. Test results proved that the new five-level PWM inverter operated well generating five-level output waveform with smaller distortion and less voltage ripples of dc capacitors.</p>
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