

Digital Signal Processor Implementation of a Novel Sinusoidal Pulse Width Modulation Algorithm for a Reduced Delta Inverter

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Abstract : The delta inverter is considered as the reduced three-phase dc/ac converter topology. It contains only three two-quadrant power switches compared to six in the conventional one. This reduced power conversion topology is widely considered in many industrial applications, such as electric traction and large photovoltaic systems. This paper is focused on a new sinusoidal pulse width modulation algorithm (SPWM) developed for the delta inverter. As an unconventional inverter's structure, irregular modulating functions waveforms of the SPWM switching technique are generated. The performances of the proposed SPWM technique was proven through computer simulations carried out on a delta inverter feeding a three-phase RL load. Digital Signal Processor (DSP) implementation of the novel SPWM algorithm have been realized on a laboratory prototype of the delta inverter feeding an RL load and a squirrel cage induction motor. Experimental results have highlighted its high performances under the proposed SPWM method.

Keywords : delta inverter, SPWM, simulation, DSP implementation

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