Abstract

Fuel cells have been considered as the primary energy source for the distributed power generation as they are highly efficient, modular and clean. The main drawback is that the dc voltage generated by a single fuel cell varies from 0.7V to 1V. Due to the low input voltage in fuel cells, a suitable power conditioner is required to interface to the utility grid or local loads. To meet this requirement, this paper presents the design, development and performance of a hybrid cascaded multilevel inverter. The advantage of the proposed topology is that the modulation, control and protection requirements of each bridge are modular and it requires only a single dc source in each phase leg. A two-level H-bridge inverter using variable frequency inverted sine wave carrier modulation technique has been studied for total harmonic distortion (THD) and switching losses for fuel cell applications. A detailed study of the technique was carried out through MATLAB/SIMULINK for switching losses and THD. The results were verified
experimentally. It was noticed that the proposed modulation strategy results in lower switching losses for a chosen THD as compared to the conventional strategies.

Reference


Index Terms
Hybrid Multilevel Inverter using ISPWM Technique for Fuel Cell Applications

Computer Science

Power Systems

Key words

Hybrid Multilevel Inverter

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Variable frequency

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