

## Direct Power Control Applied on 5-Level Diode Clamped Inverter Powered by a Renewable Energy Source

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**Abstract :** This paper presents an improved Direct Power Control (DPC) scheme applied to the multilevel inverter that forms a Distributed Generation Unit (DGU). This paper demonstrates the performance of active and reactive power injected by the DGU to the smart grid. The DPC is traditionally operated by the hysteresis controller with the Space Vector Modulation (SVM) which is applied on the 2-level inverters or 3-level inverters. In this paper, the DPC is operated by the PI controller with the Phase-Disposition Pulse Width Modulation (PD-PWM) applied to the 5-level diode clamped inverter. The new combination of the DPC, PI controller, PD-PWM and multilevel inverter proves that its performance is much better than the conventional hysteresis-SVM based DPC. Simulations results have been presented to validate the performance of the suggested control scheme in the grid-connected mode.

**Keywords :** direct power control, PI controller, PD-PWM, and power control

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