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OPTIMISED PV-DVR FOR POWER QUALITY ADVANCEMENT IN GRID

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Abstract

Rapid advancements in technology have significantly increased the integration of power electronic components into our daily lives. However, this proliferation has also brought about Power Quality (PQ) challenges like voltage swell/sag, flickers, harmonics etc. Among these issues, voltage sag emerges as a prominent concern within distribution networks. In response, various voltage restoration solutions have been introduced. Among those, Dynamic Voltage Restorers (DVRs) gaining popularity due to their swift response capabilities. In this context, a novel approach is presented, proposing a cutting-edge topology for a DVR that utilizes a seven-level inverter with a streamlined switch configuration, aiming to optimize performance. This innovative DVR design draws power from a photovoltaic (PV) system. To ensure effective control, a PI Controller is employed as the regulating unit. To assess its effectiveness, the performance of this DVR configuration is evaluated through simulation using MATLAB software. Diverse fault scenarios are simulated within a standalone system to gauge the device's performance. The simulation outcomes affirm that the suggested DVR model outperforms conventional counterparts in terms of both efficiency and speed of voltage sag compensation.

Key words: DVR, MPPT, Multilevel Inverter, PV

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