

DECOUPLED ACTIVE AND REACTIVE POWER CONTROL FOR LARGE-SCALE GRID-CONNECTED PV SYSTEMS

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ABSTRACT

This paper presents a grid connected PV system in large scale with cascaded multilevel inverters. A decoupled active and reactive power control is proposed to achieve power distribution for each PV module, as well as improve the system power quality, overmodulation and reliability. A CFDAB converter implemented specially for its degree of freedom in DC-DC conversion. This system also enhances the independent MPPT for PV system. The control system includes PLL controller, voltage and current controller, voltage distribution and synthesization by which effective reactive power control is achieved. Hence by this system the effective reactive power flow in the PV systems can be eliminated. Finally, a 3MW/12kV system with PV system and cascaded multilevel inverter is simulated in MATLAB and the simulation results are presented to verify the validity of the proposed technology.

KEYWORDS: Photovoltaic (PV) System, MPPT (Maximum Power Point Traction) High Voltage High Power(HVHP), Grid Connected Inverter, Decoupling Power Control Technique.

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