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A High Step-Up DC-DC Converter for Renewable Energy System Applications

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Abstract : This paper proposes a high step-up DC-DC converter topology for renewable energy system applications. The proposed converter employs only a single power switch instead of using several switches. Compared to the conventional DC-DC step-up converters the higher voltage gain with small output ripples can be achieved by using the proposed high step-up DC-DC converter topology. It can step up the low input voltage (20-50Vdc) generated from the photovoltaic modules to the high output voltage level approximately 600Vdc in order to supply the three-phase inverter fed the three-phase motor drive. In this paper, the operating principle of the proposed converter topology and its control strategy under the continuous conduction mode (CCM) are described. Finally, simulation results are shown to demonstrate the effectiveness of the proposed high step-up DC-DC converter with its control strategy to increase the voltage step-up conversion ratio.

Keywords : DC-DC converter, high step-up ratio, renewable energy, single switch
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