

PERFORMANCE EVALUATION OF MULTI-PORT SOLAR AND PMSG WIND BASED PFC BOOST CONVERTER WITH DTC FUZZY LOGIC SCHEME FOR FOUR SWITCH INVERTER FED INDUCTION MOTOR APPLICATIONS

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Abstract

This paper proposes the multi port power electronics PFC boost converter has attracted special interest in four-switch three-phase inverter (FSTPI) drives by induction motor drives application. The proposed FSTPI scheme is used to eliminating two switches of the conventional six- switch three-phase inverter (SSTPI), which is controlled by using Direct Torque Control (DTC) with fuzzy logic controller. Multi-port power electronic converter has integrating solar with MPPT based boost converter for high step-up application and PMSG wind based three-phase, single switch, power-factor-correction (PFC) rectifier is can achieve less total harmonic distortion (THD) power conversion system. The single switch based PFC converter has higher efficiency and low common-mode EMI noise due to soft switching operation. FSTPI approach has been adopted in the design of the vector selection table of the proposed DTC strategy which considers a subdivision of the Clarke plane into six sectors. The fuzzy logic controller is implemented using the Direct Torque Control technique as it provides better control of motor torque with high dynamic performances are verified by using various tool boxes in MATLAB.

Keywords: PV array, MPPT, PMSG wind , Boost converter, power factor correction, THD , induction motor (IM), direct torque control (DTC), four-switch three- phase inverter (FSTPI), fuzzy logic control.