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Investigation of AC-AC Converter Technology for Electric Vehicle Motor Control and Fast Battery Charging

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Mohammad Asif Iqbal ; Virendra Sangtani All Authors ...

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Abstract:

A new converter technology 3*1 Matrix converter (MC) for 3-Ph induction motor control is presented in this paper for Electric & Hybrid cars. In the projected approach, the MC straightforwardly changes over the lower order frequency (50/60 Hz, 3-ph) contribution to a high order frequency (6 kHz, one stage) AC output without a dc-interface. The MC output is then prepared through a PWM rectifier through a high frequency (HF) isolation transformer to interface with the EV battery. The MC-PWM rectifier system is made to work like a double dynamic extension (DDE), working with bi-directional power appropriate for fast battery charging and 3 stage induction motor Control application. The computerized system control guarantees that the in-flows are working properly in both charging and discharge situation. Because of the shortfall of dc-connect electrolytic capacitors, power thickness of the advanced rectifier is relied upon to be higher. Investigation, design model and expanded results of simulation are introduced for a 3-ph induction motor, 50kW Battery charger.

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Mohammad Asif Iqbal

Department of Electrical Engineering, Vivekananda Global University, Jaipur, India