Abstract

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Four-Arm Three-Phase Modular Multilevel Converter (4A-TPMMC)

In this paper a Four-Arm Three-Phase MMC (4A-TPMMC)-based DC–AC converter is proposed. The proposed converter generates a three-phase output voltage using a lower number of components, which reduces the converter complexity and cost. The concept of the proposed approach is presented in this paper. A comparison between the conventional Six-Arm Three-Phase MMC (6A-TPMMC) and the proposed 4A-TPMMC is conducted. Two simulation models are built, one for the 6A-TPMMC, and the other for the proposed 4A-TPMMC. The simulations are carried out for the same number of submodules per arm and the same AC output voltage magnitude. Moreover, a case study using the proposed 4A-TPMMC, as a three-phase medium voltage motor drive, is considered. Finally, an experimental validation for the proposed 4A-TPMMC is presented to prove the viability of the claimed contributions.