**A THREE-PHASE MODULAR MULTILEVEL DC–DC CONVERTER FOR POWER ELECTRONIC TRANSFORMER APPLICATIONS**

**ABSTRACT**

A three-phase modular multilevel dc–dc converter is proposed and analyzed for power electronic transformer (PET) applications. Similar to a dual active bridge converter, the proposed converter comprises two three-phase inverters/rectifiers, coupled via a medium frequency (MF) transformer. The modular multilevel converter structure is used in the medium-voltage side to meet the high-voltage requirements and to reduce the dv/dt stress on the MF transformer. The frequency of the voltage through MF transformer (isolation frequency) is the same as the switching frequency of the power semiconductor devices, and zero-voltage switching-ON can be achieved for all the devices. With only one three-phase MF transformer, the proposed topology can greatly simplify the transformer design compared with the existed input-series output-parallel dc–dc converter structures for PET applications. A dual-phase-shift method is presented to control the output power and to balance the submodule capacitor voltages. Simulations and experimental results are provided to validate the theoretical analysis.

**BLOCK DIAGRAM FOR PROPOSED SYSTEM**

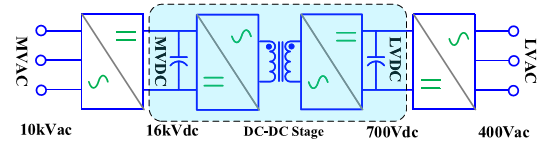


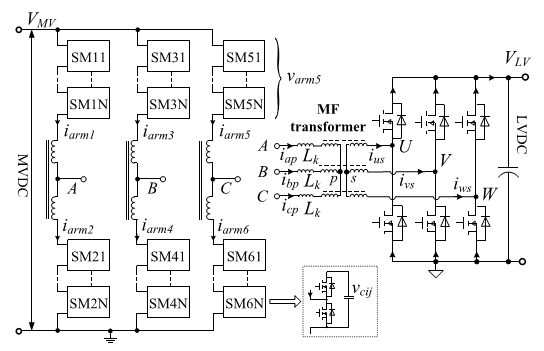
Fig. 1. Three-stage PET.

Fig. 2. Schematic of the proposed three-phase modular multilevel dc/dc converter.

**DESIGNG SOFTWARE AND TOOLS:**

MAT LAB /SIMULATION Software and simu power systems tools are used. Mainly control system tools, power electronics and electrical elements tools are used.