

## **HIGH VOLTAGE MULTI-LEVEL CONVERTER WITH REGENERATION CAPABILITY**

This paper presents a multilevel converter with regeneration capability. This converter is based on the series connection of several power cells, each working with reduced voltage and with an active front end at the line side. This paper presents the control method of each cell, the use of phase-shifting techniques to reduce current distortion and criteria to select the connection of the cells. Multilevel converters have been an alternative for medium and high power drives. Multilevel converters have been continuously developed in recent years due to the necessity of increase in power level of industrial applications especially high power applications such as high power AC motor drives, active power filters, reactive power compensation, FACTS devices, and renewable energies . By increasing the number of levels in the converter, the output voltage has more steps generating a staircase waveform which has a reduced harmonic distortion .However, a high number of levels increases the control complexity and introduces voltage unbalance problems. The converter generates practically sinusoidal currents at the load and the input and works with very high power factor.

