

Improved Multilevel Inverter with Hybrid Power Selector and Solar Panel Cleaner in a Solar System

Authors : S. Oladoyinbo, A. A. Tijani

Abstract : Multilevel inverters (MLI) are used at high power application based on their operation. There are 3 main types of multilevel inverters (MLI); diode clamped, flying capacitor and cascaded MLI. A cascaded MLI requires the least number of components to achieve same number of voltage levels when compared to other types of MLI while the flying capacitor has the minimum harmonic distortion. However, maximizing the advantage of cascaded H-bridge MLI and flying capacitor MLI, an improved MLI can be achieved with fewer components and better performance. In this paper an improved MLI is presented by asymmetrically integrating a flying capacitor to a cascaded H-bridge MLI also integrating an auxiliary transformer to the main transformer to decrease the total harmonics distortion (THD) with increased number of output voltage levels. Furthermore, the system is incorporated with a hybrid time and climate based solar panel cleaner and power selector which intelligently manage the input of the MLI and clean the solar panel weekly ensuring the environmental factor effect on the panel is reduced to minimum.

Keywords : multilevel inverter, total harmonics distortion, cascaded h-bridge inverter, flying capacitor

Conference Title : ICEPE 2016 : International Conference on Electronics and Power Engineering

Conference Location : Boston, United States

Conference Dates : April 25-26, 2016