



Single Stage Three Phase Grid Tied Pv System with Universal Filtering Capability Applied to DG Systems and AC Microgrids

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ABSTRACT

Generally, one of the custom power devices in FACTS called unified power quality conditioner, which is used to compensate the voltage and current-related Power Quality issues in the distribution systems. In this paper it proposes a 3-phase system using single stage conversion for a 4-wire, grid connected PV system. It operates with dual compensating strategy. The system uses a feed forward control loop. Apart from active power injection into the grid, the system works as a UPQC. For harmonics current reduction and reactive power compensation. so that output is harmonics free voltage. As well as variable and balance one. UPQC works as a dual compensator. In this as sinusoidal current source act by a series converter and sinusoidal voltage perform by a parallel converter. The flawless conversion can be done for different modes like interconnected and islanding modes. Moreover, solar irradiation variations give problems.

KEY WORDS: UPQC, Series Controller, Shunt Controller, Current Controller, Microgrid and Harmonics.

1. INTRODUCTION

In the advancement of power semiconductor devices, such as thyristors, Gate Turn off thyristors, Insulated Gate Bipolar Transistors and many more devices, which are used to control electric power.

In three phase systems, the power electronics devices could also cause unbalances in voltage and draw excessive neutral currents due to their disturbances. Due to because of these injected harmonics, reactive power burden, unbalance, and excessive neutral currents causes efficiency reduction

and poor power factor. Therefore, improvement of power quality is one of the important issues since many loads at various distribution ends. Basically, the term Power Quality mainly deals with problems occurred in the system like improvement of voltage levels at the Point of Common Coupling (PCC) for various distribution voltage levels irrespective of voltage fluctuations, maintaining near unity power factor power drawn from the supply, blocking of voltage and current unbalance from passing upwards from various distribution levels, reduction of voltage and current harmonics in the system and suppression of excessive