



# Power Quality Problems Compensation using Fuzzy based Unified Power Quality Conditioner

<sup>1</sup>D. Dhana Prasad, <sup>2</sup>M. Swathi, <sup>2</sup>B. Chetana, <sup>2</sup>G. Bhaskar Rao, <sup>2</sup>A.S.S.PavanKumar

<sup>1</sup>Assistant Professor, Dept of EEE, Avanthi Institute of Engineering and Technology, Visakhapatnam

<sup>2</sup>Dept of EEE, Avanthi Institute of Engineering and Technology, Visakhapatnam

## To Cite this Article

D. Dhana Prasad, M. Swathi, B. Chetana, G. Bhaskar Rao and A.S.S.PavanKumar. Power Quality Problems Compensation using Fuzzy based Unified Power Quality Conditioner. International Journal for Modern Trends in Science and Technology 2022, 8(05), pp. 344-347. <https://doi.org/10.46501/IJMTST0805051>

## Article Info

Received: 07 April 2022; Accepted: 12 May 2022; Published: 15 May 2022.

## ABSTRACT

Generally, this paper proposes technique of FACTs based controller called as unified power quality conditioner, which is used to mitigate problems in power system and improving the transferring power based voltage and currents in the distribution systems. Reducing the rating of dc-link voltage without compromising the compensation technique is one of the advantage of unified power quality conditioner technique used in this paper. The series and shunt controllers as series connection with the combination of capacitor and inductor for filtering process, and the system neutral is also considered and directly connected to neutral of distribution system for avoiding the utilization of fourth leg in the shunt converter voltage source inverter. The simulation results are compared for both PI and FUZZY controller.

**Key Words:** UPQC Controller, Power Quality and THD

## 1. INTRODUCTION

In the advancement of power electronic devices, such as thyristors, GTO thyristors, Insulated Gate Bipolar Transistors and many more devices, which are used to control electric power [1].

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 current harmonics and changes in reactive power, unbalances, and excessive neutral currents causes' efficiency reduction and poor power factor. Therefore, improvement of power quality is one of the important issue since occurring of varying loads at distribution centers. Basically, the term Power Quality mainly deals with problems occurred in the system like

improvement of voltage levels under variations in load or distribution levels at point of common coupling, maintaining of unity power factor from the supply, reducing the unbalances in current or voltages, harmonics in currents [2]. Conventionally, generally, passive filters has been used but these filters have the disadvantages of fixed compensation, large size, ageing and resonance. By providing added flexibility, Flexible AC transmission system has the capability to maintain the line power at its thermal ratings. These facts can certainly overcome the any of stability limits.