

PIC Based Controller Single Phase AC/DC Converter for Harmonic Control

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“May Allah bless and reward them for their generosity”.

ABSTRACT

PIC Based Controller Single Phase AC/DC Converter purposely deals to control harmonic current components. The purposes of the study are to convert single phase AC to DC for using in non-linear loads. The feedback from non-linear loads will create a harmonic current. This current will affect other surrounding equipment where using same sources and courses damage to electronic part. Proportional–integrative (PI) controller is used to control the Pulse Width Modulation (PWM) signal generated. By using PWM technique, the input current will be forced to follow the generated current created by the Active Power Filter (APF) in order to maintain low harmonic distortion while supplying the non-linear load. One-level two pulses PWM circuit topology was used in this study. Computer simulation was implemented to confirm the operational circuit. Comparison in harmonic percentage before and after the implementation of APF will be presented.

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CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

Owing to the growth of non-linear loads, such as switching mode power supplies and computers used in the utility side, serious power pollution is produced and reflected into the distribution and transmission networks. All of this contribute current harmonic and result is an increase in losses and interference with power equipment.

One of the most important issues for the power electronic designer is to reduce current or voltage harmonics created by the converters. Harmonics actually have a negative effect on the operation of the electrical system and, therefore, increasing attention is paid to their generation and control [9]. Yet, recent research efforts have shown that this field of investigation, with different lies of thought, first idea is using power passive filter, which are basically consisted of capacitors and inductors with constant values.

Some disadvantages such as constant reactive power independent on the load and resonance effect between the filter and source impedance [1] have been limited the application of these filters and become continuously remaining unresolved question.

Owing new technology active poser filter (APF) was introduced. References [1-10] illustrate an example of parallel active power filter in able to reduce harmonic distortion.