

**MITIGATION OF HARMONIC DISTORTION USING SHUNT
ACTIVE POWER FILTER**

**This thesis is presented in partial fulfillment for the award of the
*Bachelor of Electrical Engineering (Hons.)***

of

**UNIVERSITI TEKNOLOGI MARA
MALAYSIA**



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ACKNOWLEDGEMENTS

In the name of Allah, the most Compassionate and the Most Merciful

I would like to express my sincere gratitude and endless thanks to my supervisor, Associate Profesor Wan Norainin Wan Abdullah for her guidance, encouragement, and continuous support throughout the completion of this thesis. Her extensive knowledge, advice and creative thinking have been an invaluable help to this research work.

I also would like to extend my appreciation towards lecturers at the Faculty of Electrical Engineering, Universiti Teknologi MARA (UiTM) for their assistance and cooperation. My thanks are also reserved to persons who involve in this project directly and indirectly towards completion of this thesis. Another group to be appreciated are my friends which have been continuously providing me help and guidance, whether in personal or formal matters.

Finally, my deepest gratitude and special thank you are for my family for their support, understanding, and encouragement.

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ABSTRACT

In recent years, the usage of power electronics equipments continues to increase, due to the increased usage of nonlinear loads and distributed power sources. These nonlinear loads draw non sinusoidal current from the mains to generate harmonics and reactive currents, which lead to low power factor, low energy efficiency, low power capacity, and harmful disturbance to other appliances. These harmonic and reactive currents will distort the voltage at the point of common coupling, reducing the quality of power delivered on the network. This paper presents a Shunt Active Power Filter (APF) which focuses on mitigating the harmonic distortion. The proposed method uses harmonics current injection to compensate the harmonics in the power line by injecting equal but opposite harmonic compensation current. An optimal injection current is achieved in order to obtain an input current of sinusoidal waveforms. The compensation current reference for the proposed topology is obtained by using fixed-band hysteresis current control. This work describes the design of circuit topology, control system, low pass filter and compensation current reference estimation. The performance of the Shunt APF is illustrated using PSIM simulation package.

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