

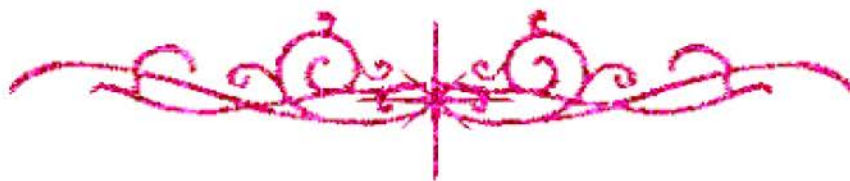
بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

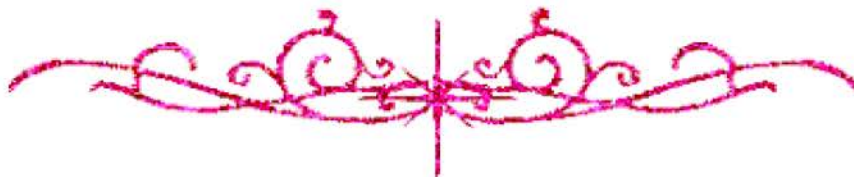
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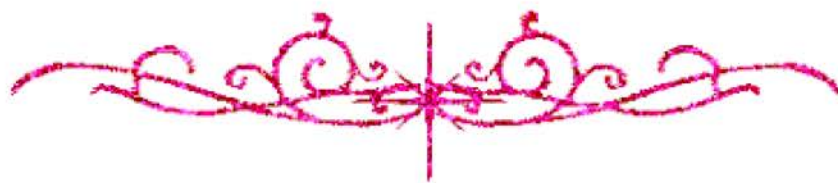
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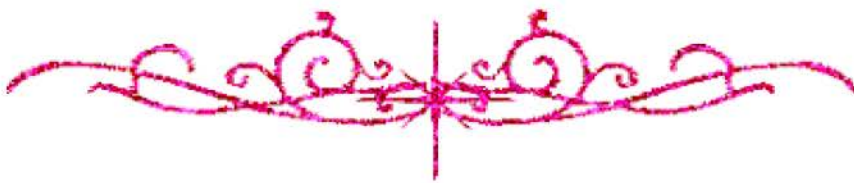


بالرسالة صفحات
لم ترد بالأصل





بعض الوثائق الأصلية تالفة



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Minoufiya University
Faculty of Engineering
Electrical Engineering Department

Active Power Filter Control Using Voltage- Source Pulse Width Modulated Converter

A Thesis submitted by

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International Steel Rolling Mill (ISRM), Sadat, Egypt

For the Award of the Degree of Master of Science
In
Electrical Engineering

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ABSTRACT

Solid state control of ac power using thyristors and other semiconductor devices is in an extensive use in a number of applications such as AC-DC adjustable speed drives, arc furnaces, traction, welding, computer power supplies, lighting, heating, air conditioning and asynchronous AC-DC-AC links.... etc. The power converters behave as nonlinear loads to AC supply system and cause harmonic injection, and lower power factor. The current drawn from these converters is non-sinusoidal and generate a serious number of harmonics and disturbances in the supplying net and deform the output waveforms. Using passive filters generally reduce the pervious harmonics and disturbances but the solution with passive output filters has many disadvantages such as: slow dynamic response and dependence on the source impedance and load. Recently, because of the rapid progress in modern power electronic devices and state-of art electronics circuit technology, the presented work was oriented mostly on the active filters instead of passive filters to overcome the passive one disadvantages. This work presents a shunt active power filter to compensate reactive power and reduce the unwanted harmonics. A shunt active filter is realized employing voltage source inverter (VSI) contains; a three-phase bridge IGBT anti-parallelizing the diodes. Two different proposed control methods to determine the reference compensating currents of shunt active power filter; Proportional- Integral (PI) controller and Artificial Neural Network (ANN). Current controller based on hysteresis current controller is used to generate the firing pulses of the shunt active filter. The shunt active filter acts as a current source, which is connected in parallel with a nonlinear load and controlled to generate the required compensation currents. The proposed system is implemented using a high speed Digital Signal Processor (DSP). Simulation and experimental results of different nonlinear loads are presented to prove the effectiveness of the design and control strategy.

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