الآية

بسم الله الرحمن الرحيم

قال تعالى :((فَتَعالَى اللَّهُ الْمَلِكُ الْحَقُّ وَلا تَعْجَلْ بِالْقُرْآنِ مِنْ قَبْلِ أَنْ يُقْضى إِلَيْكَ وَحْيُهُ وَقُلْ رَبِّ زِدْنِي عِلْماً))

صدق الله العظيم

طه (114)

DEDICATION

To our parents, and anyone who lived his whole life as an unknown engineer.

Acknowledgement

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ABSTRACT

The project is designed to control AC power to the load by using firing angle control of thyristor. Efficiency of such power control is very high compared to any other method.

The project uses zero crossing point of the waveform which is detected by a comparator whose output is then fed to the microcontroller.

The microcontroller provides required delayed triggering control to a pair of SCRs through opts isolator interface. Finally the power is applied to the load through SCRs in series. This project uses a microcontroller pic 16f73 which is interfaced through a push button switch for increasing or decreasing the AC power to the load.

المستخلص

يهدف هذا المشروع الى التحكم على التيار المتردد عن طريق زاوية اشعال الثايرستور حيث تعتبر هذه الطريقة من أكثر طرق التحكم كفاءة مقارنة مع الطرق الأخرى. يتم تنفيذ المشروع عبر تغذية المتحكم الدقيق الذي يوفر الاشعال لزوج من الثايروستر من خلال عوازل الخرج حيث يتم تغذية الحمل عن طريق الثايرستور بالتوالي. استخدم متحكم دقيق من النوع(pic 16f73) الذي يتم ربطه بمفاتيح تحكم لزيادة او تقليل تيار الحمل.

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LIST OF SYMBOLS

Ns	Synchronous speed
F	Frequency
P	Number of poles
Rs	Stator resistance
Rr	Rotor resistance
Lsl	Stator inductance
Lrl	Rotor inductance
Lm	Magnetic inductance
Rm	Copper losses resistance
Im	Magnetic part current
Vs	Voltage source
Is	Input current
Pg	Air gap power
P_{CUs}	Stator copper losses
Piron	Core loss
P_{lr}	Rotor copper losses
Vm	Magnetic part voltage
Po	Output power
Pin	Input power
Te	Development torque
ω_m	Rotor angular speed
S	Slip
ω_e	Synchronous angular speed
Ψ_m	Air gap flux
ω_{sl}	Synchronous angular speed
N_r	Rotor speed

LIST OF ABBREVATION

AC	Alternating Current
DC	Direct Current
V	Volt
I	Ampere
HZ	Hertz
LED	Light Emitting Diode
ZCD	Zero Crossing Diode
PMDC	Permanent Magnet Direct Current
SCR	Silicon Controlled Rectifier
GTO	Gate Turn-Off thyristor