

APFC (automatic power factor control) unit



Bs Electrical Engineering

Submitted by:

Umar draz khan	13018019112
Muhammad Ali Faraz	13018019059
Waheed Arshad	13018019117
Nida Iqbal	13018019131

Supervised by: **ENGR. Waseem Iqbal**

Department of Electrical Engineering
University of Management & Technology
Lahore

Declaration

We hereby declare that the project work entitled “Implementation of APFC System” submitted to the “University of Management & Technology”, is record of an original work done by us under the guidance of “**ENGR. Waseem Iqbal**”, **Faculty Member**, and this project work has not performed the basis for the award of any Degree or diploma/ associate ship/ fellowship and similarly project if any.

Umar draz khan 13018019112

Muhammad Ali Faraz 13018019059

Waheed Arshad 13018019117

Nida Iqbal 13018019131

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List of Abbreviations

APFC	Automatic Power Factor Control
AC	Alternating Current
DC	Direct Current
EEPROM	Electrically Erasable Programmable Read-Only Memory
E	Enable
FTDI	Future Technology Devices International
LCD	Liquid Crystal Display
LED	Light Emitting Diode
PC	Personal Computer
PF	Power Factor
PWM	Pulse Width Modulation
PFC	Power Factor Correction
RAM	Random Access Memory
ROM	Read-Only Memory
SCADA	Supervisory Control and Data Acquisition
SCR	Silicon-Controlled Rectifier
SRAM	Static Random Access Memory
TCS	Thyristor switched capacitor
TTL	Transistor Transistor Logic
USB	Universal Serial Bus
VIN	Voltage Input
VSI	Voltage Source Inverter
VCC	Voltage Common Collector
VDD	Voltage at Drain
VSS	Voltage Source supply
VEE	Voltage Emitter

Preface

The main goal of this research is Power Factor Correction of industrial load by reducing the total harmonic problems using static capacitors. The main reason for low power factor is due to inductive load. Thus in this thesis we research to improve anteceding control techniques for improved power quality and better performance.

In this thesis first chapter is introduction. It includes elementary overview of the study, problem statement and goal of research. The second chapter is designated as Literature Survey encompassing detailed analysis of Induction Motor, Inductive chock, Arduino and SCADA interfacing. In chapter three we elucidate our recommended design with the help of tools to comprehend our research. The fourth chapter detailed evaluation of simulation and results achieved. Chapter five covers conclusion and an overview of anticipated future work.

Abstract

In the present innovative insurgency, power is valuable that is the reason we have to discover the reasons for power lose. The venture is intended to limit punishment for modern by utilizing programmed power factor Correction gadget.

Power factor is characterized as the proportion of genuine energy to clear power. It can be scientifically spoken to as kW/KVA. Where the numerator is the dynamic (genuine) control and the denominator is the (dynamic + receptive) clear power. Receptive power is the non-working force created by the attractive and inductive burdens, to produce attractive flux. The expansion in receptive power expands the evident power, so the power factor additionally diminishes.

In this framework the time slack between the zero voltage heartbeat and zero current heartbeat created by zero intersection identifier circuits. Arduino (mega 2560) use to play out all operation in the framework. Supervisory control and information allegation (SCADA) application use for consequently turn ON and OFF mechanical load and screen all parameters of the heap and supply area.

The program assumes control to impel proper number of thyristor from its yield to bring shunt capacitors into the heap circuit to get the power factor till it comes to close solidarity. Facilitate the venture is upgraded by utilizing thyristor control switches rather than hand-off control to maintain a strategic distance from contact setting regularly experienced by exchanging of capacitors because of high in surge current.

Watchwords—Three stage control supply; Static capacitors; Induction Motor; Arduino and SCADA

Chapter 1

Introduction

1.1 Problem Statement:

In the present situation of innovative upset, it has been watched that the power is valuable. The industrialization is basically expanding the inductive stacking; the Inductive burdens influence the power factor so the power framework misfortunes its productivity. There are sure associations creating items and minding R&D take a shot at this field to improve or repay the power factor . In the present pattern the plans are likewise moving advances the smaller than normal design; this can be accomplished in an item by utilizing programmable gadget. At whatever point we are considering any programmable gadgets then the installed innovation comes into compel front.