Department of Electrical and Computer Engineering
North South University

Senior Design Project Report

Automatic power factor measurement & improvement

Md. Sajidur Rahman **ID # 1811179043**

Afroza Memy **ID # 1811254643**

Md. Ashik Mahmud **ID # 1811845043**

Faculty Advisor:

DR. SHAHNEWAZ SIDDIQUE

Assistant Professor

ECE Department

Spring, 2022

DECLARATION

We hereby declare the project work entitled "Automatic power factor measurement and improvement" is a record of an original work done by our team under the guidance of Dr. Shahnewaz Siddique. The result embodied in this project have not been submitted to any other university or institute previously for the purpose of any other degree or program. Any material reproduced in this project has been properly acknowledged.

Student Name & Signature:

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Md. Sajidur Rahman
ECE Department
North South University

……..
Afroza Memy
ECE Department
North South University

……
Md. Ashik Mahmud
ECE Department
North South University

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APPROVAL

We, Md. Sajidur Rahman (1811179043), Afroza Memy (1811254643) and Md. Ashik Mahmud (1811845043), members of EEE499 (Senior Design) from the Electrical and Computer Engineering department of North South University, have worked on the project entitled "Automatic power factor measurement and improvement “under the supervision of Dr. Shahnewaz Siddique as a partial fulfillment of the requirement for the degree of Bachelors of Science in Electrical & Electronic Engineering and has been accepted as satisfactory.

Supervisor’s Signature

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Dr. Shahnewaz Siddique
Assistant Professor
Department of Electrical and Computer Engineering
North South University
Dhaka, Bangladesh.

Department Chair’s Signature

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Dr. Rezaul Bari
Associate Professor
Department of Electrical and Computer Engineering
North South University
Dhaka, Bangladesh.

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT By the mercy of Almighty, we have completed our project entitled "Automatic power factor measurement and improvement". Firstly, we would like to express our sincere gratitude to our teacher Dr. Shahnewaz Siddique whose valuable guidance worked like a pole star for us during the journey in the research by his instruction, support, encouragement and positive criticism.
We express our deep regard to him for the successful completion of this work. His ideas and suggestions were greatly effective. His instruction and suggestions were helpful for the timely accomplishment of the target aimed. We want to extend our gratitude to all the teachers of our department for their affection and support. We are also very thankful to all our classmates and friends whose encouragement and provided suggestions at various steps in completion of this work. Our sincere gratitude also goes to ECE department, North South University for delivering such a precious opportunity in the curriculum which enabled us gathering professional level experience as part of our academic requirement.
Last but not the least, we would like to thank our family as their inspiration and support kept us motivated during our work.

ABSTRACT

In this electric power era, efficient and utilization of energy is now considered as one of the primary motives in any electrical power sector. Due to large use of AC power and different kind of loads such as inductive type of load there's concern about power factor of the AC power system. Less power factor gives less efficiency and less utilization of electric machines power. To get the higher efficiency we need the power factor value close to unity. A power factor correction system can improve the power factor value and can maintain it close to unity power factor with some compensation method. In this proposed system, we used current and voltage transformer as input, two zero detection circuit to determine zero crossing point of any signal, an Adriano mega which is control the power factor measurement, compensating and shows output.

Moreover, we used inductive load and resistive load in this system as a load and to compensate the power factor problem we used a capacitive bank with relay module. Which gives leading capacitive KVAR to cancel the lagging inductive KVAR of the system due to use of lagging loads. It will increase the efficiency and reduce losses as well.