BUSITEMA UNIVERSITY
PURSUING EXCELLENCE

FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

FINAL YEAR PROJECT REPORT

TITLE: LOAD PROTECTING SWITCHGEAR

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A project Report submitted to the Department of Electrical and Computer Engineering in Partial Fulfillment of the Requirement for the Award of a Diploma Electrical and Electronics Engineering at Busitema University

January 2021

Declaration

We APASU BEN and **BAMWISE ERIEZA** second year students of Busitema University declare that, the information in this proposal is the original of our work done and has never been submitted in any higher institute of learning for any award.

Signature: .....

Signature.....

Date: 29th · 01 · 2021

Approval

This proposal has been compiled, organized and written by APASU BEN and BAMWISE ERIEZA during and after our thorough research.

Approved by the following

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Dedication

This report is dedicated to parents Mr. ELAMU JOREM and Mrs. IYANU JOYCE MARY, and Mrs. MUTESI IRENE for their endless love care and also my brothers for the financial support rendered. May the lord grant them happiness and more years in future.

Acknowledgement

First and foremost, we would love to thank almighty God for the grate health and strength that has enabled us to successfully complete this project proposal

In a special way, we would like to acknowledge our supervisor, Mr. Mugwanya Patrick for the tireless work he has ensured so that we succeed in our research

We thank our colleagues of BCT who have helped us and guided us so that this research proposal goes successfully

We would also like to acknowledge our parents for all the financial support given to us so that this exercise goes through successfully

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Abstract

This project monitors voltage and provides breakpoint based low and high voltage tripping mechanism that avoids any damage to the load, various industrial and domestic systems consist of fluctuation in the AC mains. In tripping system, a quad comparator IC is used with two more comparator to be used as window comparator to it. When system deliver error the input voltage falls out of the window range. This trigger then operates a relay that cut off the load to avoid any damage to it. The lamp is used as load

The effects of voltage fluctuations to electric equipment in general and motors specifically are serious and can't be ignored. Overheating and insulation failure might happen when electric equipment's are subjected to under or overvoltage conditions.

The protection circuit can be used to protect the costly electrical appliances from abnormal conditions like sag, swell, under voltage and overvoltage and avoid appliances being affected from harmful effects

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CHAPTER ONE

1.1 INTRODUCTION

Background

Over and under voltage protection circuit protects refrigerator, IM and other electrical appliances from abnormal voltage conditions. Our project monitors voltage and provides breakpoint based low and high voltage tripping mechanism that avoids any damage to the load, various industrial and domestic systems consist of fluctuation in the AC mains. In tripping system, a quad comparator IC is used with two more comparator to be used as window comparator to it. When system deliver error the input voltage falls out of the window range. This trigger then operates a relay that cut off the load to avoid any damage to it. The lamp is used as load [7].

As the demand of electrical energy increases, more generating units, transmission lines, power and distribution transformers and so forth are added to the system which in turn will increase its complexity; faults and quality problems will increase.

Now days, greater demands have been placed on the transmission network, and these demands will continue to rise because of the increasing number of non-utility generators and greater competitions among utilities themselves.[1] Increased demands on transmissions, absence of long-term planning, and the need to provide open access to generating companies and customers have resulted in less security and reduced quality of supply.

Over voltage.

When the voltage in a circuit or part of it is raised above its upper design limit, this is known as overvoltage. The conditions may be hazardous. Depending on its duration, the overvoltage event can be transient a voltage spike or permanent, lea ding to a power surge.[2]

Under voltage.

Sag or under voltage is a temporary decrease in power lasting up to over a minute. Sag or an under voltage typically happens whenever heavy machinery is turned on.[2] A great amount of power is used by the heavy machinery during start up, leaving a small amount of power available for other equipment to use. Voltage sags also happen when the main source of power is affected by natural events like lightning strikes, strong winds and power lines getting hit by falling tree branches. Sag or an under voltage may affect equipment within 100 miles of the main power line grid of a utility company.

Several types of power enhancement devices have deployed over the years to protect equipment from power disturbances, but these devices can also fail or malfunction some times. Hence there is need for more security is always wanted.

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