



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER AND ELECTRICAL ENGINEERING

PROGRAM: DIPLOMA IN ELECTRONICS AND ELECTRICAL ENGINEERING

ELECTRICAL ENGINEERING FINAL YEAR PROJECT REPORT FOR
CONSTRUCTION OF AN AUTOMATED WATER LEVEL CONTROLLER FOR BOTH
OVERHEAD AND UNDERGROUND TANKS WITH A SOLAR POWER SUPPLY

BY

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This report concept submitted to the Department of Computer and Electrical Engineering as partial fulfillment for the award of Diploma in Industrial Electronics and Electrical Engineering at Busitema University.

CERTIFICATION

This is to certify that this project “Construction of an automatic water level controller for both overhead and underground tank with a solar power supply” was carried out by Kantono Milly and submitted to the department of Computer and Electrical Engineering, Faculty of Engineering, Busitema University. For the award of Diploma in Industrial Electronics and Electrical Engineering.

The construction has been under the supervisor Eng. Butime Eric and has been duly approved.

Eng. Butime Eric Signature-----

Project Supervisor Date-----

Eng. Kigozi John signature -----

Head of Department Date-----

DEDICATION

This project is dedicated to God Almighty for His infinite mercy and love, my dear supervisor Eng. Butime Eric, my parents and relatives, friends, mentors and colleagues who have been supportive in all conditions during the project construction journey.

ACKNOWLEDGEMENTS

I sincerely appreciate my distinguished parents for their love and parental care, my honorable Head of department, Eng. Kigozi John, I want to appreciate Eng. Butime Eric for his tremendous contributions to this work and advice he gave me during the course of this work, and not forgetting all our lecturers Mr. Mugwanya Patrick. We pray that God will keep you strong for your families

Finally, I appreciate all my course mates, all my friends who have in one way or the other contributed immensely to the construction of this project. May God bless us all?

ABSTRACT

Automatic water level controller for both overhead and underground tank with a solar supply system is designed to monitor the level of water in a tank. It displays the level of water and when it is at the lower level; a pump is activated automatically to refill the tank. When the tank is filled to its maximum capacity, the pump is automatically de-energized. The system is equipped with a solar panel to provide power, making it eco-friendly and reducing costs.

- The controller uses sensors to detect the water level in the tank and automatically controls the motor to turn on or off, ensuring that the water level is maintained.

- The system also features an LCD display that shows the water level in the tank and various other parameters, making it easy for users to monitor the water supply. Several circuits are put together to ensure proper working of this design, and the block diagram includes the supply unit, the micro-processor unit, the sensor unit, the display unit and the pump drives unit. The power unit is responsible for turning on the entire circuit. The sensor unit is responsible for sensing the level of water and transfer the current position of water to the microprocessor. The display unit in the circuit is use to physically show the current position of water in the tank, the properties of seven segment display are been used.

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CHAPTER ONE

1.1 INTRODUCTION

An automatic water level controller for overhead tanks can be used to maintain the water level in the tank at a pre-determined level. It allows the user to automate the process of filling or emptying the tank, thus saving time and effort. Additionally, using solar power to supply electricity to the controller can be both environmentally friendly and cost-effective. Therefore, this literature review focuses on reviewing the design of automatic water level controllers and the use of solar power in supplying electricity to the controller.

Design of Automatic Water Level Controller:

An automatic water level controller consists of four main components: a sensor, a controller unit, a motor, and a power source. The sensor is usually a float switch or a liquid level sensor that is placed inside the tank. The sensor sends a signal to the controller unit when the water level reaches a pre-determined level. The controller unit then activates the motor, which fills or empties the tank until the water level reaches the desired level. Some automatic water level controllers are designed to use a pressure sensor instead of a float switch or a liquid level sensor. The pressure sensor is placed in the pipe that supplies water to the tank. When the water level reaches the pre-determined level, the pressure sensor detects an increase in pressure and sends a signal to the controller unit to stop the water flow.

Use of Solar Power:

Solar power can be used to supply electricity to the automatic water level controller. A solar panel can be installed to convert sunlight into electricity. The electricity produced by the solar panel is stored in a battery, which provides power to the controller unit and motor.

The use of solar power in automatic water level controllers has many advantages. Firstly, it is environmentally friendly as it does not emit any harmful pollutants. Secondly, it is cost-effective as it reduces the need for grid electricity, which can be expensive. Finally, it provides autonomy as it allows the controller to continue working even during power outages.

1.2 BACKGROUND

Water is a precious and scarce resource in many parts of the world. The efficiency of water usage can be improved by controlling the water level in overhead and underground tanks in a building or home. The automatic water level controller is a device that provides an efficient and automatic way of filling and controlling the water level in tanks. It helps to save water, energy, time, and money. Traditionally, water level controllers were operated by electricity, which would require a steady power supply. However, the advent of solar power has made it possible to supply water level controllers with electricity using solar panels. This has made the systems more reliable and efficient, especially in areas where power outages are common. The automatic water level control system can control water levels in both overhead tanks. The system has sensors that detect the water level in the tanks and turn on or off the water pump to fill or stop filling the tank as required. The solar panels supply the energy to the system, reducing the dependence on the electricity grid. Implementing an automatic water level controller with a solar system supply has many benefits. It eliminates the need for manual intervention in controlling water levels in tanks, saving time and effort. It also reduces wastage of water and energy, leading to cost savings. The use of solar power makes the system more environmentally friendly and sustainable, reducing the carbon footprint. Overall, the automatic water level controller with the solar

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