e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

AUTOMATIC WATER LEVEL CONTROLLER SYSTEM

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ABSTRACT

In this Project Worked on automatic water level controller. it is a device which can control the water level of all water tankor that like similar Water Storage system. In this project, that means Automatic Water level controller System we are using AT mega 8a microcontroller chip. The Circuit we design for to indicate/detect the water leveland control the water level in Water storage system. This system reduce/Decrease the wastage of water. We are controlling the level of water controlling While filling the overhead tank. It indicates that the level of water and when it is at the lowest level. Then the sensors will detect the level and this circuit gives signal to the device. Then this system is controlling the supply submersible pump. Then this pump is operated automatically to filling waterto the water tank. After that this water fill up in high level this system is indicate that the pump is automatically turn off or water filling stop in the water tank. The aim of this project to overcome or reduce the wastage of waterproblem. and improve accuracy. The drinking water crisis in Africais reaching proportion nowadays. hence it theimportant to water to preserve. An Automatic water level indicator system it gives the solution of this problems.

Keywords: Atmega-8a, Microcontroller, Submersible Pump.

I. INTRODUCTION

Water position regulators that automatically acclimate the water position save energy. They do it by automatically turning off the motor when the tank is full and when there's no water inflow to the tank. This means that lower water and energy are employed to control a water force. The water position regulator we propose to make in our design depends on two discovery points in the OHT. The water position must be controlled at these two points. To grease this, we use detectors. In our case, these detectors are metallic connections with space between them present at each discovery point. When water reaches a detector, a proper circuit must be present similar that the presence of wateris detected, and a signal is produced. This signal must pass through sense circuits to give the correct selector affair. Also,it must be strong enough to spark the selector. An analogous action must take place when water reaches another detector.Our circuit basically uses the high and low countries of a NAND gate to spark or kill the selector. Simply put, we calculate on the ON and OFF countries of the selector. The automatic water position regulator system is used to descryor control the water position of the water storehouse tank. This system using the AT mega 8A microcontroller to coverthe position of water in the water storehouse tank. By using this system water position are controls by controlling the input force of the pump. While the position of the water is at the smallest position of the tank, also the pumps are automatically turned on and fill the water tank. In this system, for relating the position of water detectors is use. When water is filled up to maximum capacity of the tank, also the pump is automatically turned off. In this system the detectorsare placed at different situations of the overhead water tank to identify the situations of water. In that system there are the factors are used, like center tapped step down motor, relays, AT mega 8A IC, ground therapy, diodes, and detectors.This system is useful for artificial as well as domestic and marketable purposes. To automatically control the inflow ofwater and destruction of water inflow.

II. LITERATURE REVIEW

Automatic water position regulator can be used in hospices, Manufactories, Homes Apartments, Commercial Complexes, Drainage, etc. Automatic water position regulator wills automatically “START ON” the pump set as soon as the water position falls below the predetermined position and shall “SWITCH OFF” the pump set as

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soon as tank is full. It can be used to prognosticate flood tide liquid position index in the huge holders in the companies. Energy positionindex in vehicles (1).

Sensor is a device that responds to a physical encouragement (as heat, light, sound, pressure, captivation, or a particular stir) and transmits a performing impulse (as for dimension or operating a control). Detector is important for taking inputfrom the terrain to the microcontroller. The specific input could be light, heat, stir, humidity, pressure, or any one of a great number of other environmental marvels. The affair is generally a signal that's converted to mortal- readable displayat the detector position or transmitted electronically over a network for reading or farther processing (2).

In our design, we've used 'Reed switch' as a detector. A switch is like a drawbridge in an electric circuit. When the switch is closed, the" ground" is over and no current overflows. So, the purpose of a switch is to spark or kill a circuit at a time of our choosing (3).

The wimp switch is an electrical switch operated by an applied glamorous field. It was constructed at Bell Telephone Laboratories in 1936 by W.B. Ellwood. It consists of a brace of connections on ferromagnetic essence doormats in a sealed glass envelope. The connections may be typically open, closing when a glamorous field is present, or typically closed and opening when a glamorous field is applied. The switch may be actuated by a coil, making a wimp relay, or by bringing a attraction near to the switch. Once the attraction is pulled down from the switch, the wimp switch will goback to its original position (4).

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III. BLOCK DIAGRAM

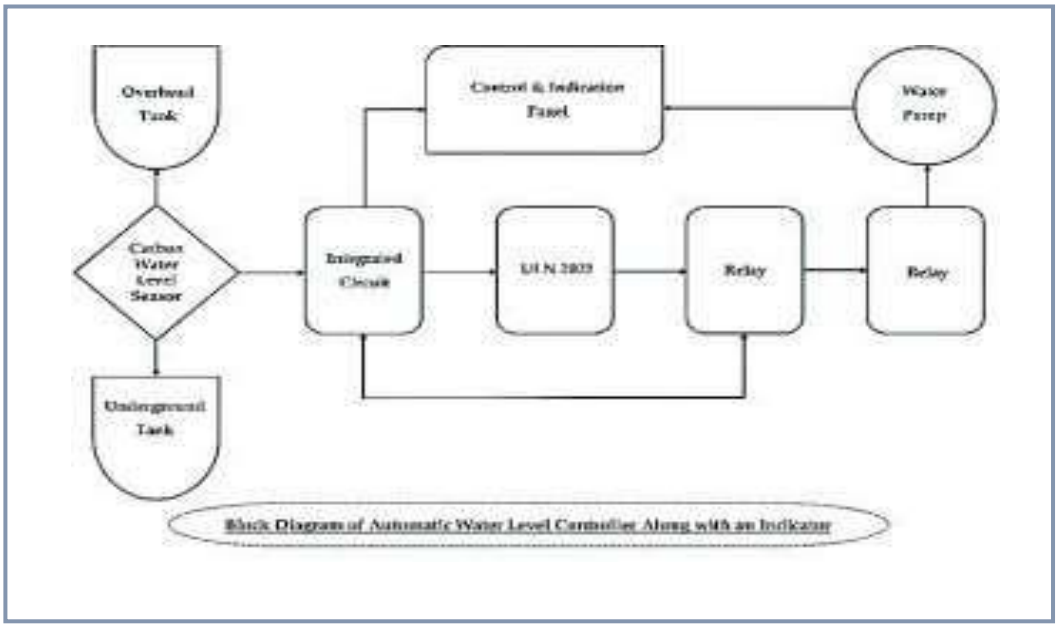

Fig 1. Block Diagram

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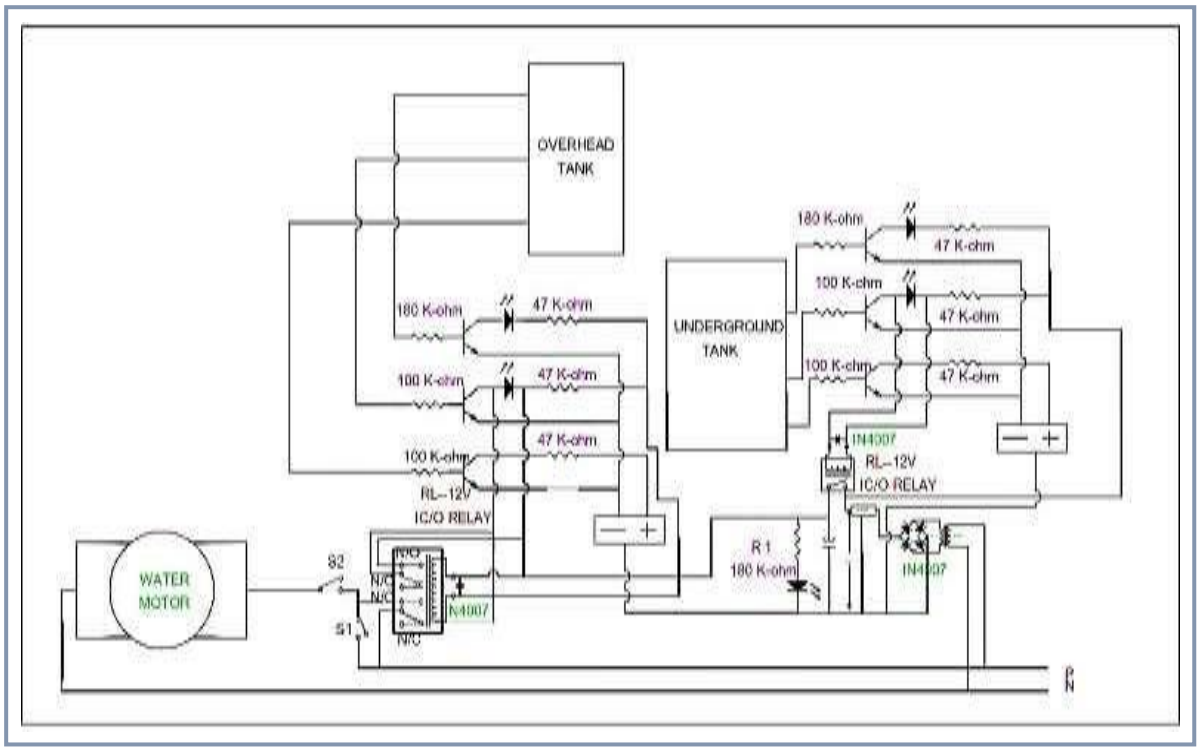

Fig 2. Circuit Diagram

IV. WORKING

In automatic water level controller system, there are two modes operation.

Manual mode: in this mode the operation of the circuit is working as a non-automatic system. That means the operationof pump is controlling by manually by using start and stop switch. The pump is start by pushing start switch, and then pump is started to be filling the water in the water tank. And when stop switch are in operating condition, then pump isturn off.

Auto mode: in this mode the operation of the circuit is working as an automatic system. That means the operation of the pump is control by the circuit. When the level of the water is at lowest level of the tank. Then sensor is identifying this condition, and then the pumps are automatically turned on. And then water is filling into the water tank. When the level of the water is at the highest level of the water tank. Then sensor is identifying this condition and then the pump isautomatically turned off.

Fig 3. Connected Hardware in Simple Manner

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V. HARDWARE REQUIREMENTS

1) Micro-controller AT MEGA-8A
2) Transformer
3) Sensors
4) Rectifier
5) Relay
6) Resistors
7) Light Emitted Diode

Micro-controller at mega-8a:

ATMEL ATmega8A is a low-power CMOS 8-bit microcontroller based on the AVR RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega8A achieves throughputs approaching 1 MIPS per MHz, allowing the system designed to optimize power consumption versus processing speed.

Fig 4. AT MEGA-8A

Transformer:

A center-tapped step-down transformer is used to provide a suitable voltage to the full-wave rectifier. We specifically selected this transformer so that the device could be connected directly to the wall outlet. Also, the Centre tapping helpsus to generate a positive polarity voltage required for the circuit. Rating: 230/15 V AC, 50 Hz.

Fig 5. Step Down Transformer

A Centre Tapped transformer works in the same way as a usual transformer. The difference lies in just the fact that its secondary winding is divided into two parts, so two individual voltages can be acquired across the two-line ends. When an additional wire is connected across the exact middle point of the secondary winding of a transformer, it is called a center tapped transformer. The wire is adjusted such that it falls in the exact middle point of the secondary winding and is thus at zero volts, forming the neutral point for the winding. This is called the “center tap” and this thingallows the transformer to provide two separate output voltages which are equal in magnitude, but opposite in polarity to each other. In this way, we can also use a few turn ratios from such a transformer.

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Sensors:

Fig 6. Water level sensors

Level sensors are used to detect the level of substances that can flow. Such substances include liquids, granular material and powders. Level measurements can be done inside containers, or it can be the level of river or lake.

Rectifier:

The full wave rectifier consists of four 1N4007 diodes and two 1000μF capacitors. It is used to convert the AC supply of the wall outlet to DC supply which will run majority of the circuit elements. It converts an ac voltage into a pulsating dc voltage using both half cycles of the applied ac voltage. For this purpose, it uses two diodes of which one conducts during one half cycle while the other conducts during the other half cycle of the applied ac voltage.

Relay:

Relays are defined as remote controlled electrical switches that are controlled by another switch e.g. - a horn switch. Relays allow a small current flow in a circuit to control a higher current circuit. The relay used here is a SinglePole Double Throw (SPDT) relay whose magnetizing coil terminals operate on 6V DC supply.

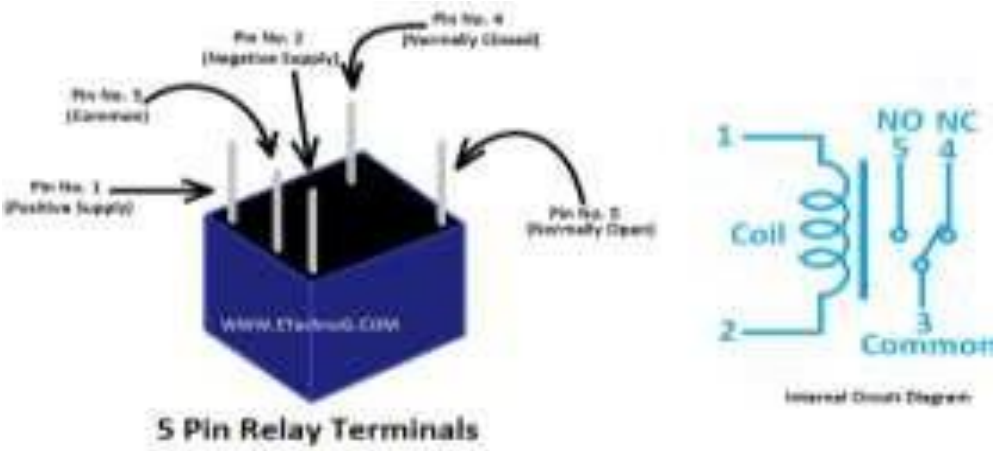

Fig 7. 5 Pin Relay Terminal

Resistors:

A resistor is a two-terminal electronic component designed to oppose an electric current by producing a voltage drop between its terminals in proportion to the current, that is, in accordance with Ohm's law:

V = IR

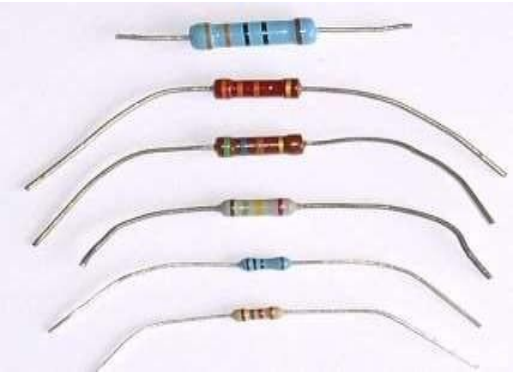

Fig 8. Resistors

Resistors are used as part of electrical networks and electronic circuits. They are extremely commonplace in most electronic equipment. Practical resistors can be made of various compounds and films, as well as resistance wire (wire made of a high-resistivity alloy, such as nickel/chrome).

VI. RESULT

When water touches the carbon sensor that the carbon sensor creates a sensing pulse and triggers the LED light to Turn ON and send a signal to Turn OFF an automatic water pump after refilled the water tank and back to the water level control circuit. Due to the carbon level sensor signal and relay operation, the output of these data reveals that the tank is filled by reaching Level 3 in the water tank, which instantly cuts the motor off.

VII. ADVANTAGES

1. Low maintenance
2. Low cost
3. Fully Automatic
4. Saves Water
5. Saves energy.
6. Compact and good design
7. Increases pump life.

VIII. DISADVANTAGES

1. Water level controls need to be replaced every 3 years.
2. The rust, foul and deteriorate.
3. Electronics are usually built separately.
4. No LED indicator lights.

IX. CONCLUSION

This system is very beneficial in rural as well as urban areas. It helps in the efficient utilization of available water sources. If used on a large scale, it can provide a major contribution in the conservation of water for us and the future generations. In these days, when Earth's reserve of consumable water is decreasing every moment, every drop has its value. Water level controller is a simple yet effective way to prevent wastage of water. Its simplicity in design and low-cost components make it an ideal piece of technology for the common man.

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