

AUTO WATER PUMP SWITCHER

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Abstract -Water overflow many time from the tank. Because of overflow sometimes we face shortage of water,loss of water, loss of electricity. So we have designed auto water pump switcher using 555 IC timer.The pump will turn on whenever the water is in bottom level and turn off automatically when the tank is full.the relay act as a switch turn on and turn off the switch.

Key Words:555 Timer IC, 12v relay, Led, BC547 Transistor, 7805 voltage regulator.

1.INTRODUCTION (Size 11, Times New roman)

This project was designed because to control overflow of water from the tank and to reduce electricity bill. every time we have to monitor the water till the tank is full.

So we designed auto water pump switcher, which will switch off the water pump when the water level is high, and switch on the water pump when the water level is low, from this we will save the electricity bill and wastage of water.

the project will be used in factories, hostel, apartments, house, every day they have to switch on the pump and monitor until the tank was full, some if we not monitor it leads to waste of water due to overflow and raise in electricity bill.

By installing auto water pump switcher we control the tank and switch on and switch off the pump whenever required.

2. Components Required

- 555 IC timer

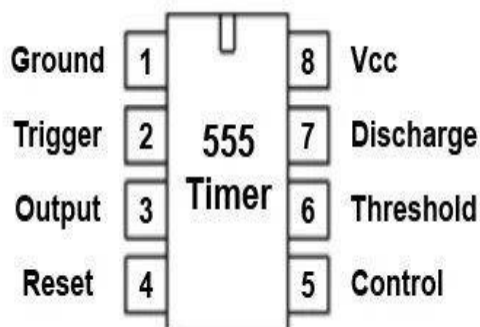


Fig-1: 555 IC Timer.

555 IC timer is a monolithic IC, with 8 pin. It is the monostable mode, it is consist of SR flip-flop, two comparators, discharge transistor, it has a trigger input.

- BC547 Transistor

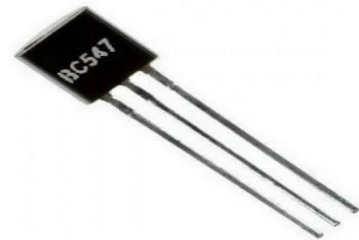


Fig-2: BC547 Transistor

BC547 is the npn transistor, it is acts as amplifier, as well as switch, in this project it is act as a switch. Output of 55 IC timer connected to its base and emitter to ground and collector to relay.

- Relay



Fig-3: 12v Relay

Relay is a switching device,12v relay have 5 pin, 2 coil end, 1 COM, 1 NC, 1 NO. when the circuit is on the supply is connected to pin NO,when it is off it is connected to NC.

- IN4007 Diode



Fig-4: IN4007 Transistor

It is semiconductor device, used for convert to AC to DC. In this project the IN4007 is used for to drive the relay properly.

- **5v Voltage Regulator**



Fig-5: 7805 Voltage Regulator

In this project used the 7805 voltage regulator for to convert 12 v input voltage to 5v voltage. 5v is used as power supply of 5v DC submersible water pump.

- **LED**



Fig-6: LED

In this project the led is used as indicator, it will turn on when the pump is on, turn off when the pump is off.

- **Resistor**



Fig-7: Resistor

- A resistor is a electrical component, it monitor the flow of current in an electrical circuits. It also used for provide specific voltage for an active devices. The resistor can defined as it is a two terminal passive component.



Fig-8: Capacitor

In this project we used 103 capacitor, it's one pin connected to the voltage control pin of 555 IC Timer.

- **Submersible Water Pump**



Fig-9: Submersible Water Pump

This DC 3-6 V Mini Micro Submersible Water Pump is a low cost, small size submersible pump motor which can be operated from a 2.5 ~ 6V power supply. This component is composed of a miniature centrifugal pump, and of a DC motor.

RELATED WORK

- [1]. Nevon projects design the auto water pump switcher which work on the 555 IC timer which switch on the water pump when the water supply is sensed, switch will turn off when the water supply is off.
- [2]. Author K. m. mostafizur rahman sobuj. Designed Automatic switch for water pump. Author designed the automatic switch for water pump using jk filpflop and relay.
- [3]. Electronic projects designed the auto water pump switcher using 555 IC timer here automatically switch on and off the water pump according to the water level in the water. they given 12 volt dc input and separate dc power supply for the pump.

PROPOSED WORK

- **CIRCUIT DIAGRAM**

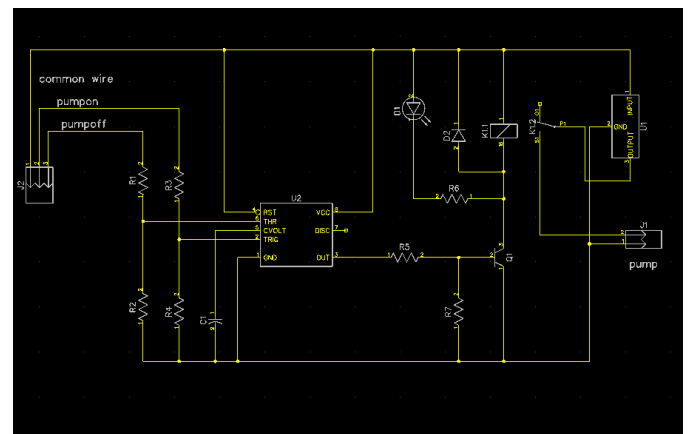


Fig-10: Circuit Diagram of Auto Water Pump Switcher

- **AUTO WATER PUMP SWITCHER MODEL**



Fig-11: Model of Auto Water pump switcher

We designed auto water pump switcher using 555 IC timer, BC547 transistor, 12 volt relay, we use 5v mini submersible water pump, we used 5v voltage regulator, to convert 12v dc power supply to 5v dc power supply, to give power supply for a pump instead of giving separate power supply for the water pump.

WORKING

Select a point inside the water tank where maximum and minimum level of water is allowed. Attach the strip or two terminals inside the tank and common wire to bottom of the water tank and make sure that the distance between the terminals is about 1 inch. When the water level of tank is low the relay switch on the water pump will on automatically, and relay will switch off the water pump when the water level high.

RESULT

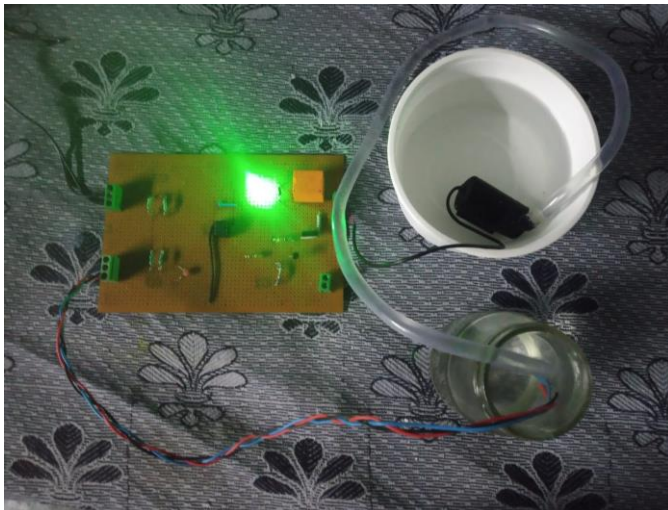


Fig-12: Result of Experiment

Above picture is result of the project, it is show that pump will turn on when the water level is low, the led will indicate that the water supply is on.

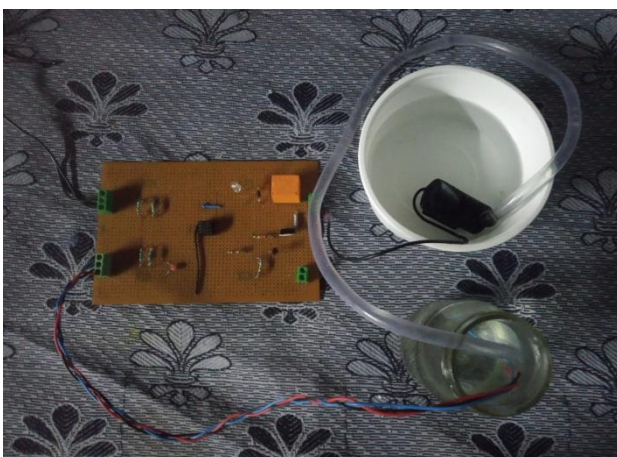


Fig-13: Result of Experiment

Above picture result of the project, it is shows that the pump will turn off when the water level is high up to the mark.

ADVANTAGES

- i. Saves water because when water tank is full it will off hence there is no waterfall occurs hence there is no waste of water is happens.
- ii. Saves energy because it will off automatically when tank is full.
- iii. Increases pump life.
- iv. Fully automatic.
- v. Low maintenance.
- vi. Low cost.
- vii. Compact and good design.

APPLICATIONS

- i. Auto water pump switcher is used in agriculture area.
- ii. It can be used in apartments, factories, hostel, commercial complex, home etc.
- iii. It can be used to predict the flood.
- iv. Low power consumption.

3. CONCLUSIONS

Using 555 IC timer, build the circuit and the relay switching device, It will automatically turn on, turn off the water pump as requirement, transistor we used it is acts as switch. We did not need to monitor tank to turn off the tank, by this reduce in the wastage of water, reduced the electricity bill, save the electricity

REFERENCES

- 1. K. M. Mostafizur Rahman Sobuj(april 2015)
- 2. <https://nevonprojects.com>
- 3. <https://easyelectronicprojects.com>