Project Title: VIT Hostels-Automatic **WA**ter **LE**vel Con**T**roller for Overhead **Tanks**

Abstract: Automatic water-level controller for overhead tanks that switches on/off the pump motor when water in the tank goes below/above the minimum/maximum level. The water level is sensed by two floats to operate the switches for controlling the pump motor.

Specific Objectives :

The water crisis is reaching alarming proportions; hence, it is of utmost importance to preserve water. In many areas there is unnecessary wastage of water due to overflow in Overhead Tanks due to negligence or any other technical reasons. In order to save water in ample quantities, it is essential to use a water level controller, while filling the water tank. But to reduce the waste of excessive water, when the water tank is overloaded, a device must be assembled or inbuilt in a tank to start the water supply when the water level reduces to pre-set value. Also, to stop the water supply when the water tank is overloaded with water reached to a specific preset level.

This will reduce the manual efforts to start or stop the system or motor, whenever necessary. The only solution to arrest this, Automatic Water Level Controller can provide a solution to this problem. The operation of the water level controller works upon the fact that water conducts electricity. So water can be used to open or close a circuit. As the water level rises or falls, different circuits in the controller send different signals. These signals are used to switch ON or switch OFF the motor pump as per our requirements. This system is very beneficial in Hostels as well as other academic and administrative blocks. It helps in the efficient utilization of available water sources. It can provide a major contribution in the conservation of water. Fully automatic water level controller for tank sump this model will automatically switch on and automatically switch off the motor. Has auto on and auto off operation. Auto on occurs when the tank level is low confirming water is present in the sump. Auto off when tank is full or when sump is empty suitable for motor pump upto 2 HP operated by a normal on/off switch / mcb. also suitable for electronic starter. Suitable for sump to tank set up (underground tank or ground level tank to overhead tank set up) has LED indications for motor on. also has high and low level LED indications to know the level of both tank there will be one low level LED indication for sump. It has manual mode and auto mode functions. In Auto mode, Auto on and Auto off operation occurs. In manual mode, the motor pump will be constantly running. This controller unit has a fully automatic function (manual on and auto off function). Just keep the controller in manual mode for the motor to get switched on and then

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change it to auto mode for automatic off. long life. Easy to install. Advanced embedded technology.

Working Prototype:(write 200 words)

Three sensors and a relay are being used along with Arduino UNO(as shown in the circuit diagram).The relay is used to control the water pump through an external circuit(Circuit-1).

Sensors used:

- Liquid level sensor Float Switch: One of the two sensors is placed in the sump/Groundwater tank. It is used only to turn OFF the pump in case the sump is near empty. Only when the Float switch returns LOW to the Arduino UNO, the pump is turned OFF via the relay and contractor.
- Liquid level sensor Float Switch: The other sensor is placed in the overhead tank. When the tank is near full or full it sends signals to the Arduino UNO to turn OFF the pump. When the tank is near empty or empty it sends signals to the Arduino UNO to switch on the pump.
- Contactless level sensor: It is used only as a fail safe for the Float switch sensor. It is placed at the top of the tank at a pre-set level so that even if the float switch does not turn the motor OFF, this sensor will turn it OFF.

Selector Switch: It is used to switch between MANUAL/OFF/AUTO states of the circuit and can be changed as per the user needs.

Miniature Circuit Breaker: It stands for MCB. It automatically switches OFF the complete circuit when an overload or short circuit occurs.

Magnetic Contactor: It is used in electric motors to balance the change in frequency of the motor or the state of the motor which can be termed as the switching of the motor from ON and OFF state. It acts as a safeguard to protect power supply and the motor.

Relay: It is the only device connecting the motor and Arduino UNO. It also acts as a switch.

LEDS: These help indicate high and low water level in the tank, Motor ON or OFF state and low level indication for the sump

Circuit diagram:

The complete circuit can be broken down to two circuits for better understanding. The Ist circuit controls the Manual/Auto switch for the operation of the pump. The 2nd circuit has the controller for all devices in the circuit. Connect the relay of Ist circuit to the Arduino UNO board (as shown in the 2nd circuit, doing so the circuit is complete. **LEDS will be added to the circuit later**

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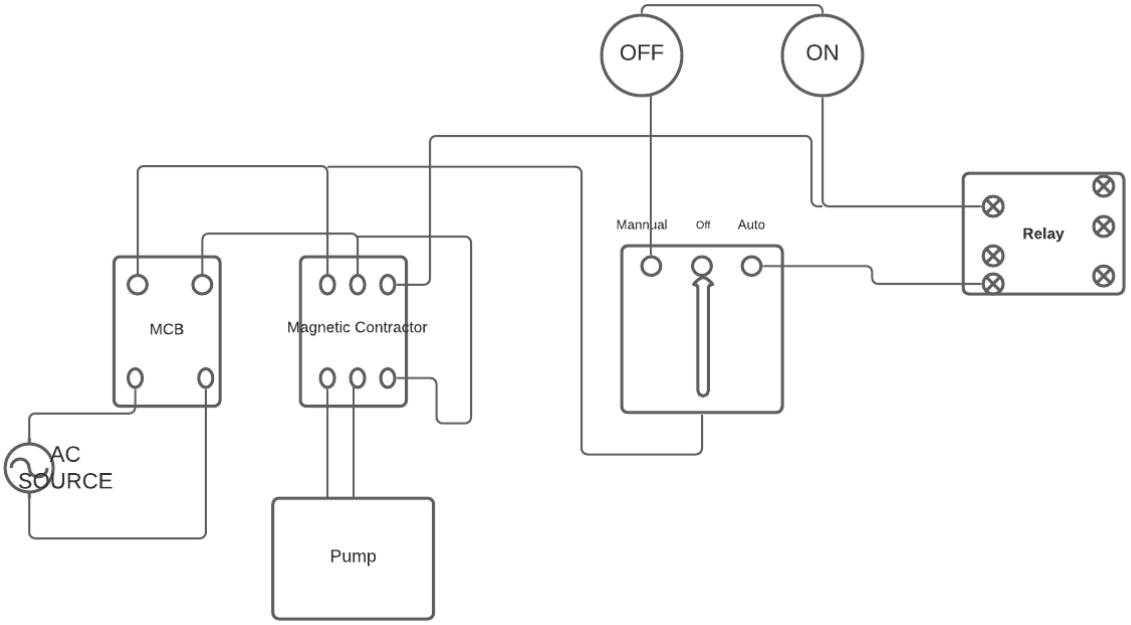

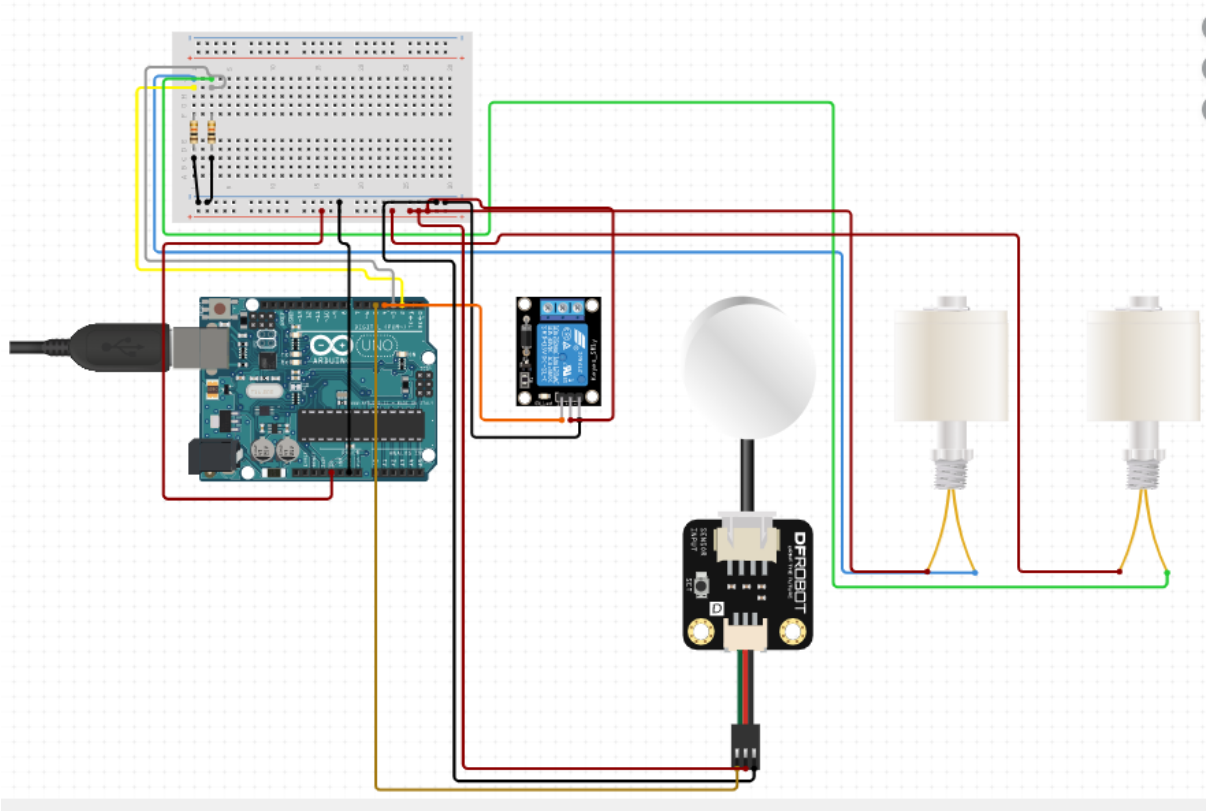

Expected Completion Time(in Months):

I expect to complete the project in 4 months.