

■ **A. SHAFEEK AHAMED**

As water is consumed, the water

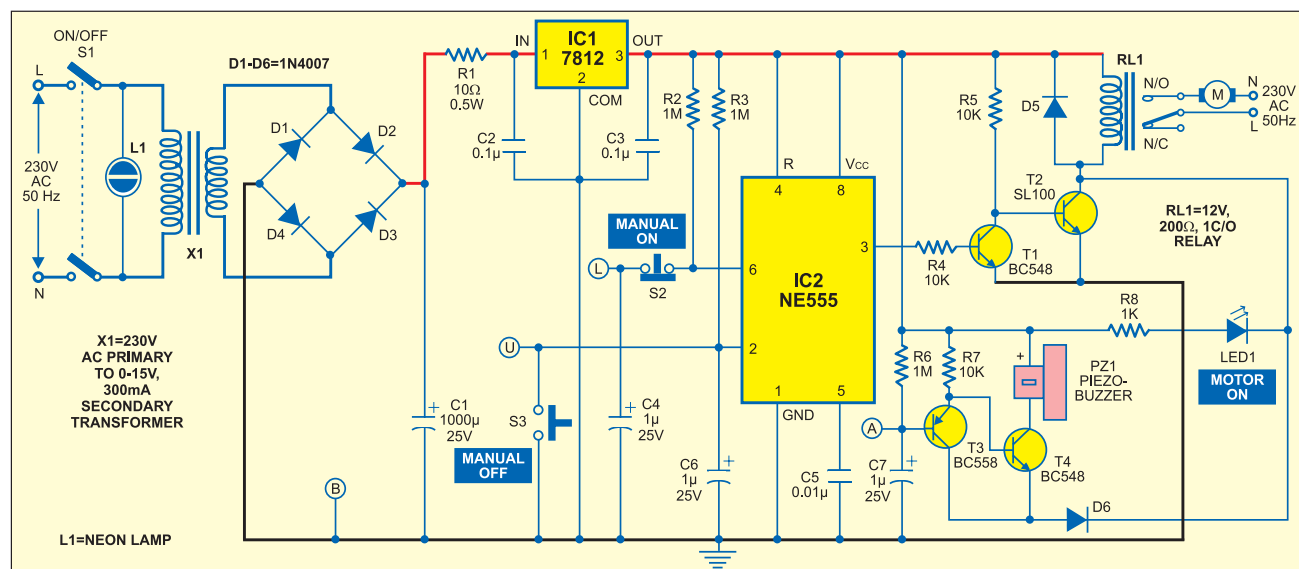


Fig. 1: Circuit of water-level controller

As the values of resistors R2 and R3 are very high, corrosion of electrodes is very little. Capacitors C2 through C7

filter out unwanted noise. Switches S2 and S3 can be used to manually switch on and off the motor pump, respectively, when water is in between the upper and lower levels. Switch S1 is used to disable the unit during dry pump run or while flushing the tank.

For the sensor electrodes, use a moulded-type AC chord (used for tape recorders) with its pair of wires sleeved at the end and connected together to form the electrode. Other electrodes can be made similarly. These three AC chords are suspended inside the tank from a longitudinally cut PVC pipe (used for electrical wiring).

The arrangement for the dry pump sensor is shown in Fig. 3. A moulded-type AC chord with its pair of wires sleeved at the end can be attached firmly to the delivery pipe such that water falls onto the plug leads. The sleeved ends are connected to points A and B of the water-level controller circuit.

The circuit for dry-run alarm comprises transistors T3 and T4, piezobuzzer PZ1, resistors R6 and R7, and capacitor C7. When points A and B of the dry-running sensor (see Fig. 3) are bridged by water being delivered by the pipe, transistor T3 conducts to drive transistor T4 into cut-off state and therefore the DC buzzer remains silent.

When the pump runs dry, points A and B are electrically apart causing transistor T3 to cut off because of pull-up resistor R6. Transistor T4 conducts due to the emitter drop of transistor T3, which activates the DC buzzer to

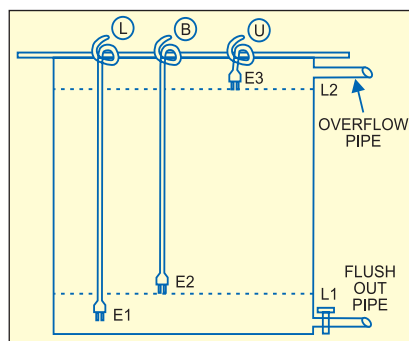


Fig. 2: Water-level electrodes set-up for over-head tank

sound an alarm indicating dry running of the pump.

The alarm circuit is enabled only when transistor T2 conducts, i.e., only when the motor pump runs. Diode D6 isolates the relay driver circuitry to prevent transistor T3 from extending ground to the relay through transistor T3 and water being delivered. As soon as the pump is switched on, the alarm sounds until water reaches the delivery port.

House the controller circuit (including the power supply) in a cabinet. Use a four-core shielded cable for wiring the tank electrodes to the controller unit fixed near the motor switch.

To test the circuit, proceed as follows:

1. Switch on power to the circuit.
2. LED1 glows and relay RL1 energises to produce an alarm from piezobuzzer PZ1, indicating that none of the circuit points A, B, U and L is shorted through water (i.e., water in the tank is below the lowest limit). The

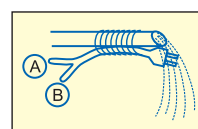


Fig. 3: Dry pump sensor set-up

energised relay indicates 'on' status of the motor.

3. Immerse points A and B in water. The buzzer stops sounding to

indicate that water is flowing out of the pipe to short points A and B. This confirms no dry run.

4. Immerse points B and L in water, as would be the case when the water level rises. Momentarily touch point U to water. LED1 goes off and the relay de-energises to turn the pump 'off.' This would be the case when water touches the overflow limit.

5. Remove points A and B from water assuming that the flowing water that was shorting points A and B has stopped. Now, although water is not flowing, the buzzer does not sound as the relay is already de-energised.

6. Remove points U and B from water, assuming that water has fallen below the lowest limit because of consumption. Two seconds later, LED1 glows and the relay energises.

**Precautions.** 1. Make sure that water being delivered from the water pipe doesn't touch any of the suspended water-level sensors.

2. Mount the alarm sensor firmly onto the water pipe such that electrodes A and B are shorted by water flowing out of the pipe.

3. Use a properly shielded cable to carry signals from the tank to the water-level controller unit. ●