GOVERNMENT TECHNOLOGICAL COLLEGE

MAGWAY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

CONSTRUCTION OF AUTOMATIC TANK FILLING CUM PUMP HOUSE SYSTEM

BY
GROUP(3)
A.G.T.I. SECOND YEAR
NOVEMBER, 2005

GOVERNMENT TECHNOLOGICAL COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

This is to certify that the students in the attached list have been on the job training and are recommended for acceptance of the paper entitled " **AUTOMATIC TANK FILLING CUM PUMP HOUSE SYSTEM** " in partial fulfillment of the requirements for the diploma of A.G.T.I.

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We wish to express owe deepest gratitude to our supervision, Daw Su Su Ko and U Nay Wonn Soe, for their close supervision, hurtful suggestion, provision of facilities with kind guidance.

Finally, thank our colleague for their encourage throughout the period of this project.

INTRODUCTION

" Construction of Automatic Tank filling Cum Pump House System " is submitted to Electronic Department favour of acting Magway (G.T.C) Electronics certificate if A.G.T.I Diploma of students in second year (2005) of Electronic Engineering.

This project has been begun on 4. 10. 05 and finished at 9.11.05. This circuit can control automatically water level in the tank and filling operation by using with sensor metal rods. So, it can be used effectively in the houses and industries as " AUTOMATICALLY WATER FILLING ", without human manners.

OBJECTIVE

After completing, construction of this project is intended to understand,

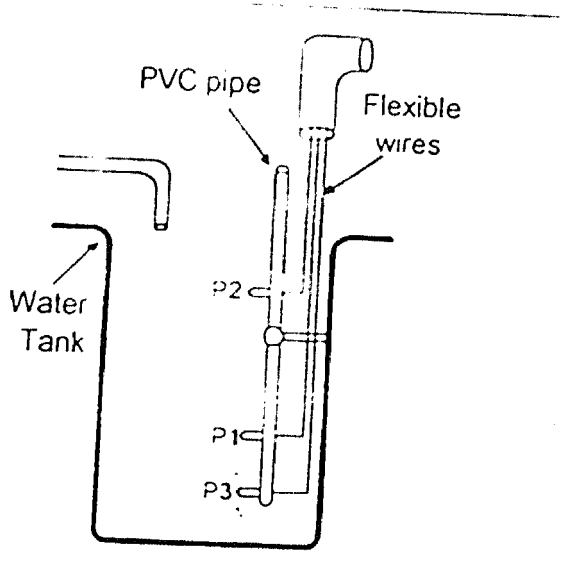
- Basic Electronic components,
  (such as diode, resistor, capacitor, transistor, IC,...)

- Construction of power supply system
  (Full wave rectifier, half wave rectifier)

- Theory and construction of transformer
  Such as step-down transformer, (220V to 12V)

CONSTRUCTION

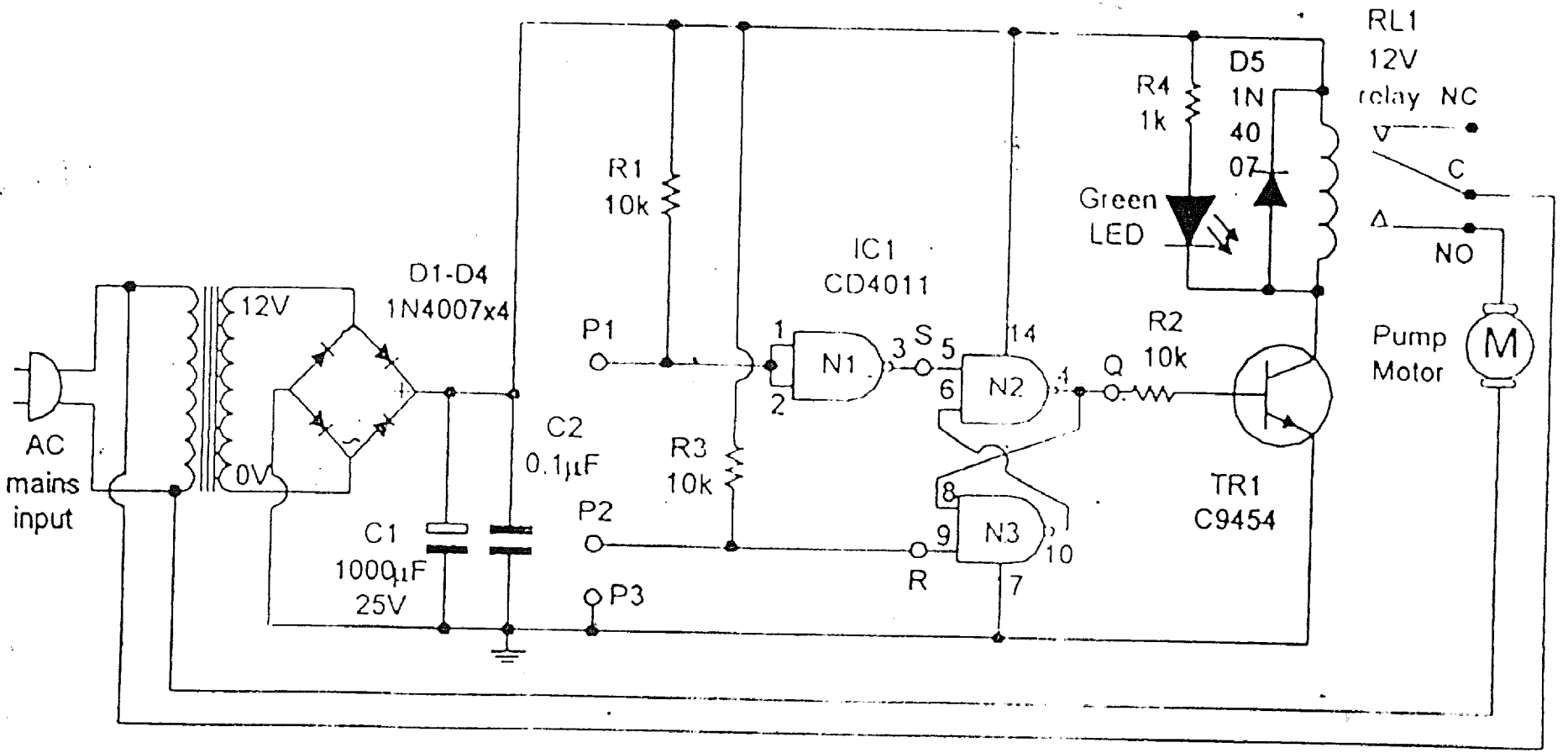
This circuit is Automatic water tank filling circuit. The components in the circuit were connected correctly was shown in figure. Then, in the water tank, electronic sensor (aluminium rod) as P_1, P_2 and P_3 were applied. A hard and strong PVC pipe was tied tightly with aluminium rods as shown in figure. Each rod is connected with flexible wire, and then soldered at the corresponding point on the circuit. Electronic circuit and power supply are placed at the suitable place in the box and then motor power supply is connected with NO contact of relay.



P1,P2,P3- metal rods

P2- Maximum water level sensor

P1- Minimum water level sensor


AC
mains
input
12V
0V
D1-D4
1N4007x4
C1
1000µF
25V
C2
0.1µF
R1
10k
P1
P2
P3
R3
10k
IC1
CD4011
1
2
3
S
5
6
14
N1
N2
8
9
10
N3
R
7
Q
R2
10k
R4
1k
Green
LED
D5
1N
40
07
TR1
C9454
RL1
12V
relay
NC
C
NO
Pump
Motor
M

PARTS LIST

Semiconductor:

IC1	- CD4011, 2-inputs quad NAND gate
T1	- C945 or SL100 NPN transistor
D5	- 1N4001 rectifier diode
D6	- 5-mm light emitting diode

Resistor:

R1-R3	- 10 kilohm, ¼ watt carbon

Miscellaneous:

RL1	- 12 V relay (400 ohm)

Printed circuit board, the flexible wire, aluminium rods

THEORY OF OPERATION

As shown in figure 1 NAND gate N2 and N3 are connected as R-S flip-flop. Input terminals are S (set) and R(reset). The output terminal is Q.

SET

If Q output is high (logic 1), this condition is called SET. In R-S flip-flop, when the input S is low (logic 0), the flip-flop is SET and the output Q is high.

RESET

If the output Q is low (logic 0), this condition is called RESET. When the input R is low (logic 0), the flip-flop is RESET and the output Q is high. In logically, high (logic 1) is approximately equal to the supply voltage and low (logic 0) is approximately equal zero.

If S=0, Q is high. Although S changes to 1, Q does not change.

Only if R=0, Q is low. Although R is changed back to 1, Q output is not change. So Q output is low.

The true table of R-S flip-flop is below.

Inputs		Output	Remark
S	R	Q	
0	1	1	SET
1	1	1	No change
1	0	0	RESET
1	1	0	No change

When the water level in the tank reaches below the aluminium rod P_1, P_1 that is input terminal of NAND gate N1 received supply voltage from resister R1, therefore, it is high. So, output of N1, input of N2 S=0, the output of Q reaches high and the transistor TR1 is saturated. Therefore the relay is energized. So the motor makes running and filling the water into the tank.

When water level is reached under the P3, P1 and P3 are short. So P1 reaches low level and the output of N1 (S) reaches high. But, without changing the output of Q, is still high. Therefore, the relay is energized and running the motor.

When reaching the water level up to P2, P2 and P3 are short. So, the input of N3 (R) is low (RESET). By changing the output of Q, the transistor TR1 is cut off and the relay is de-energized. So, the motor is turn off.

After using the water, the water level down back toward P2, so that, P2 does not contact and it reaches back to high. Although reaching this level, the output Q (low level) does not change, the motor does not run ON.

When the water level down below P1, it is high level and S is low level. So the output Q reaches high and then the motor is turn on and filling the water.

Therefore, this circuit is operated when the water level reaches minimum the motor automatically turn on. When the water level reaches maximum the motor automatically turn off. If the motor turns on, the RED LED activates.