►THE MINOR PROJECTS

TOPIC :- Water Level Indicator Circuit For Home

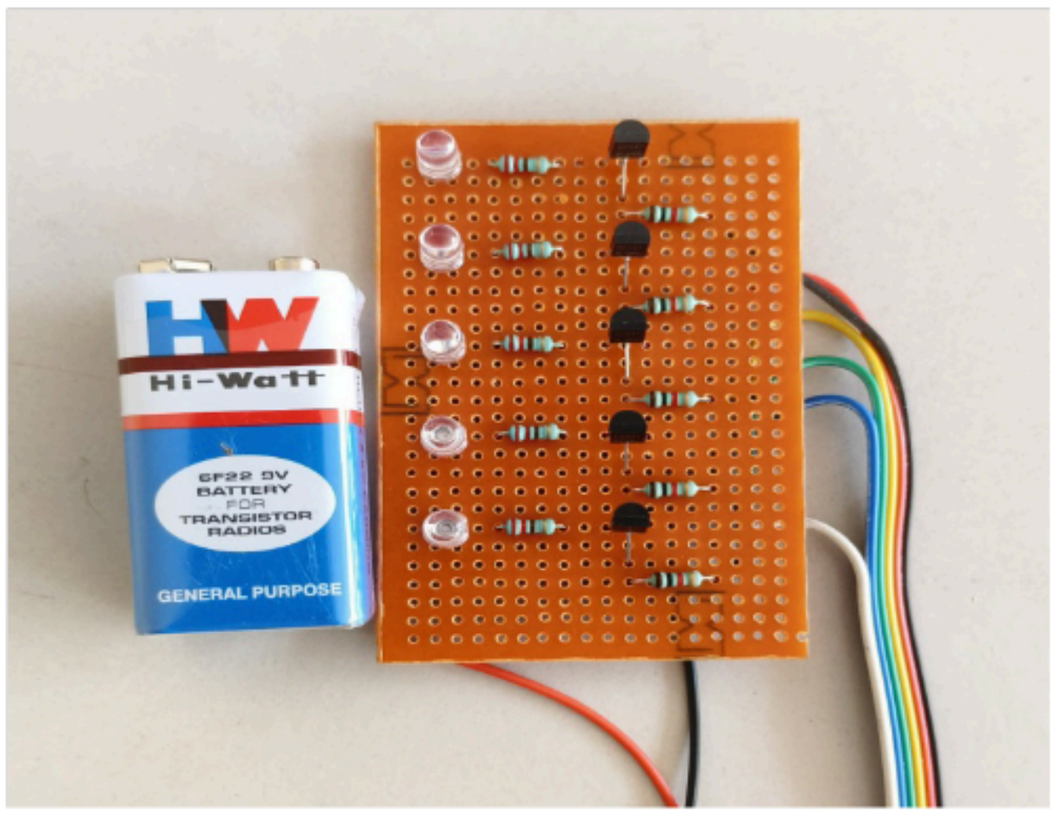
To design and implement a simple yet effective water level monitoring system that displays water levels using LEDs and alerts overflow using a 5V buzzer, without using any microcontroller.

INTRODUCTION:- This project presents a basic water level indicator system using BC547 transistors, LEDs, and a buzzer.

The system indicates water levels at five points (Low to Full) and gives an alert using a 5V buzzer when the tank is full.

This circuit works entirely on simple electronics principles and does not require any programming or microcontroller, making it ideal for beginners and educational purposes. It is useful for household water tanks, agricultural irrigation, and industrial liquid monitoring systems.

The circuit is energy-efficient, low-cost, and reliable.



Applications:

Water level monitoring in household tanks

Overflow alert system for schools and buildings

Underground water tank supervision

Smart farming irrigation setups

Mini-projects and demonstrations in electronics labs

Circuit Description:

5 metallic probes (wires) are placed inside the tank at various heights.

Each probe is connected to the base of a BC547 transistor via a 1k resistor.

When water touches a probe, a small current flows into the base, turning ON the transistor.

This allows current to pass through an LED (with a 220-ohm resistor) from +9V, glowing the LED.

For the top-level probe, in addition to the LED, a 5V buzzer is connected to give an overflow alert.

The emitter of each transistor is connected to ground, and the collector goes to the LED and/or buzzer.

Components Used (with Ratings):

1. BC547 Transistor (NPN) 100mA, 45V 5

2. LED 5mm (Any color) 5

3. Resistor 220 Ohm (for LEDs) 5

4. Resistor 1k Ohm (for base) 5

5. 5V Buzzer Piezo buzzer 1

6. PCB Board (Zero Hole) General purpose board 1

7. 9V Battery Power Supply 1

8. Connecting Wires - As required

9. Probes (Metal wires) Stainless steel/copper 5

Working Principle:

- The working is based on the conductive property of water:

Each metal probe is inserted at different tank levels.

When water touches the probe, it completes the circuit via the water path.

A small current reaches the transistor base, activating it.

The transistor conducts, allowing current to flow through an LED, which glows to show the level.

When water reaches the top-most probe, both the LED and the 5V buzzer get activated, giving a visual and audible alert for overflow.

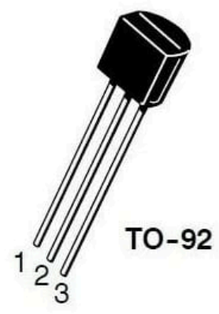
Key Component Descriptions:

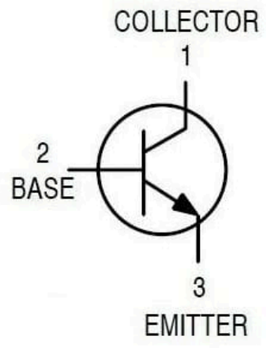
Transistor (BC547):

NPN general-purpose transistor

Used here as an electronic switch

Turns ON when a small base current flows from the water probe





LEDs:

Glows when transistor conducts

Connected with a 220 Ohm resistor for current protection

One LED per water level

5V Buzzer:

Gets activated only when the highest water level is reached

Draws power via transistor like the LED

Adds an audio alert for overflow condition

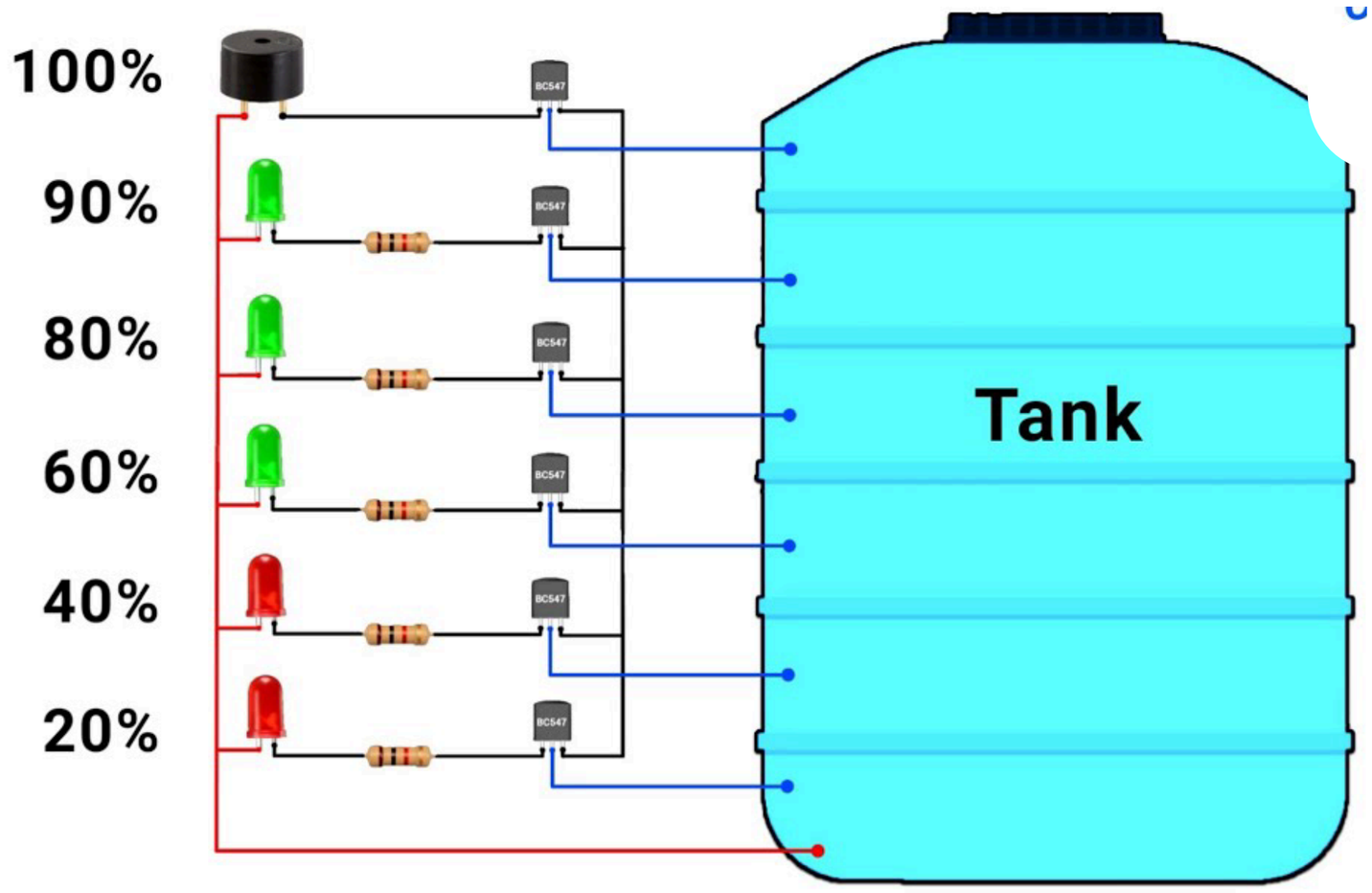
Power Supply:

9V battery or DC adapter (6V-9V) can be used

Low current requirement, so battery lasts long

Can be made solar-powered with small modifications

Circuit Diagram:



Conclusion:

This project is a practical, low-cost, and non-programmable solution for tank water level monitoring.

It uses basic electronics components and can be built easily at home or in a lab.

The addition of a 5V buzzer increases its utility by alerting when the tank is full.

It is an excellent learning project to understand the working of transistors as switches, water conductivity, and simple circuit design.