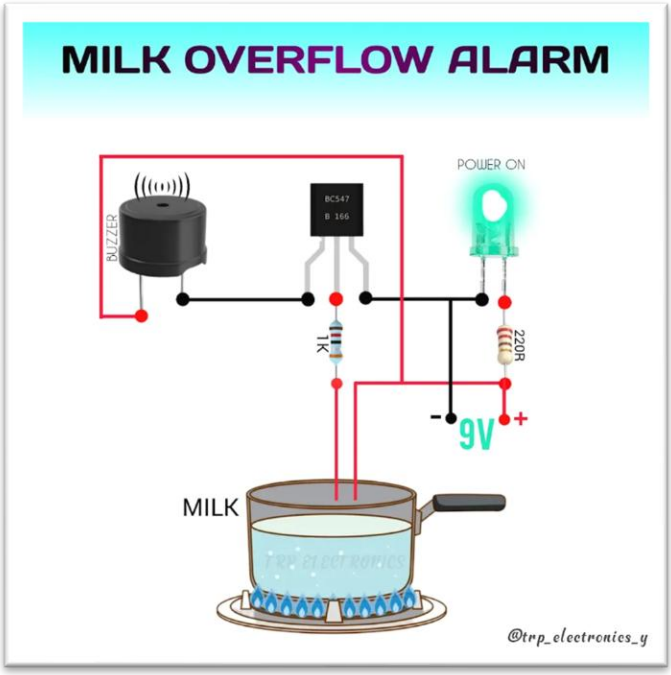
Project 1

Milk Overflow Alarm

Components Required

- 1 × BC547 Transistor
- 1 × Buzzer (5V/9V)
- 1 × Indicator LED (Red or Green)
- 1 × Resistor (220Ω for LED, 10kΩ for base bias)
- 1 × 9V Battery + Battery Clip
- Connecting Wires
- 2 × Crocodile Clips (to attach with milk container)
- Small Base/Board to mount the circuit

Circuit Diagram



🔹 Working Principle

The **Milk Overflow Alarm** works on the **conductivity of milk**.

- Two wires with crocodile clips are placed in the milk container.
- One wire is attached slightly lower, and the other wire is placed at the top level where you want to detect overflow.
- When the milk rises and touches both wires, a **small current flows through the milk** (since milk is a conductor).
- This current goes to the **base of the BC547 transistor**, turning it **ON**.
- As a result, the **buzzer and LED get activated**, giving an alarm that the milk is about to overflow.

🔹 Connections

Connections (Step by Step)

1. **Battery (9V)** → Connect negative terminal to ground (common line).
2. **Transistor BC547**
    - **Emitter (E)** → Connect to ground.
    - **Collector (C)** → Connect one end of the buzzer + LED.
    - **Base (B)** → Connect with one end of the sensing wire (via 1kΩ resistor).
3. **Buzzer + LED**
    - Other end of **buzzer and LED** → Connect to +9V supply.
    - (Use 220Ω resistor in series with LED).
4. **Sensing Wires with Crocodile Clips**
    - One clip → Connect directly to +9V battery.
    - Second clip → Connect to transistor base (through 1kΩ resistor).
    - Mount clips in milk container:
        - First wire (grounded) at bottom/side.
        - Second wire just above the desired milk level.
5. When milk touches both wires → small current flows → transistor turns ON → LED + buzzer activate.

🔹 Applications

- Useful in homes to prevent milk overflow while boiling.
- Can also be used for **liquid level detection** in tanks.

🔹 Advantages

- Very simple and low-cost project.
- Easy to build for beginners.
- Runs on a 9V battery (safe to use).

🔹 Possible Upgrades / Modifications

- Along with buzzer and LED, you can connect a **relay + small water pump**.
    - When milk reaches the top level, instead of just giving an alarm, the circuit can automatically activate the pump to **drain excess milk** and prevent overflow.
- You can replace the buzzer with a **flashing high-brightness LED** for silent indication.
- You can power the circuit using a **USB 5V adapter** instead of a 9V battery for long-term usage.
- Add a **latching circuit** so that even if the milk level drops, the buzzer keeps ringing until manually reset.
- Upgrade using a **microcontroller (Arduino)** to display “Milk Overflow” on an LCD screen.