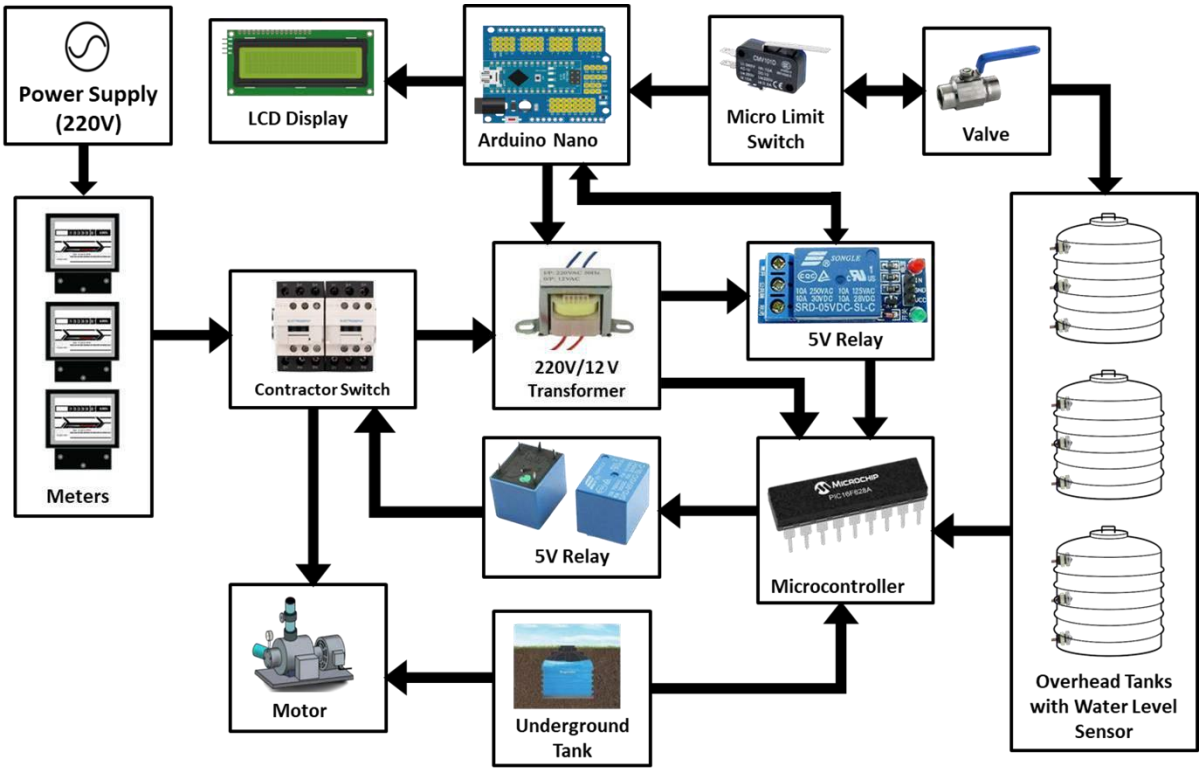
Proposed Methodology

3.1 Project Implementation – Block Diagram



Block Diagram of Proposed Model

The proposed methodology is divided in two parts based on the two major constraints as mentioned below:

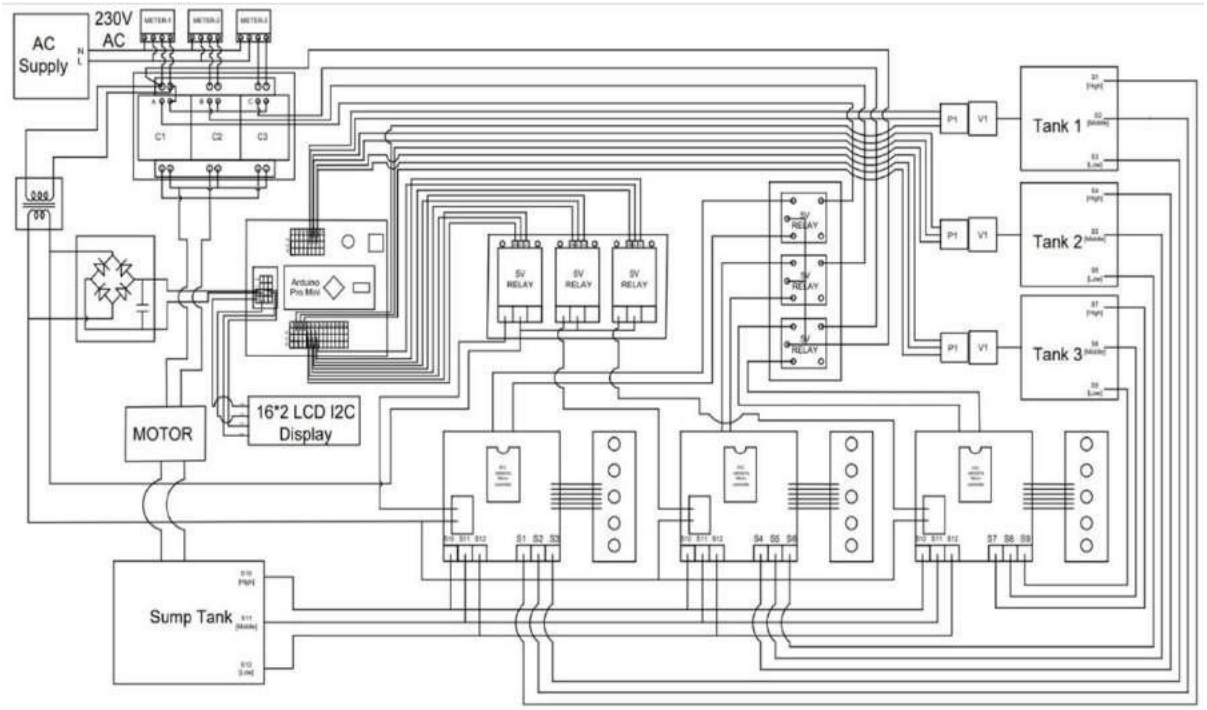
i. **The first constraint is to achieve systematic/transparent billing mechanism for respective individual connections.**

ii. **The second constraint is the automation of water distribution in overhead tanks by switching control to avoid overflow of water and to restrict the filling of water in alternate tanks.**

The **first constraint** is achieved by connecting contractors that are monitored and controlled by the Arduino Pro-Mini and PIC microcontroller, combined with all the individual meters, so as to generate the separate electricity bill for the respective individual, further the **second constraint** of automation is achieved by designing a controller enclosure box which

consist of PIC microcontroller, indicator valves and displayer which is controlled by isolately connected valve and micro limit switch and water level sensors in the overhead tanks to avoid overflow of water and filling of water in alternate or undesired tank.

3.2 Project Implementation – Wiring & Connection Diagram

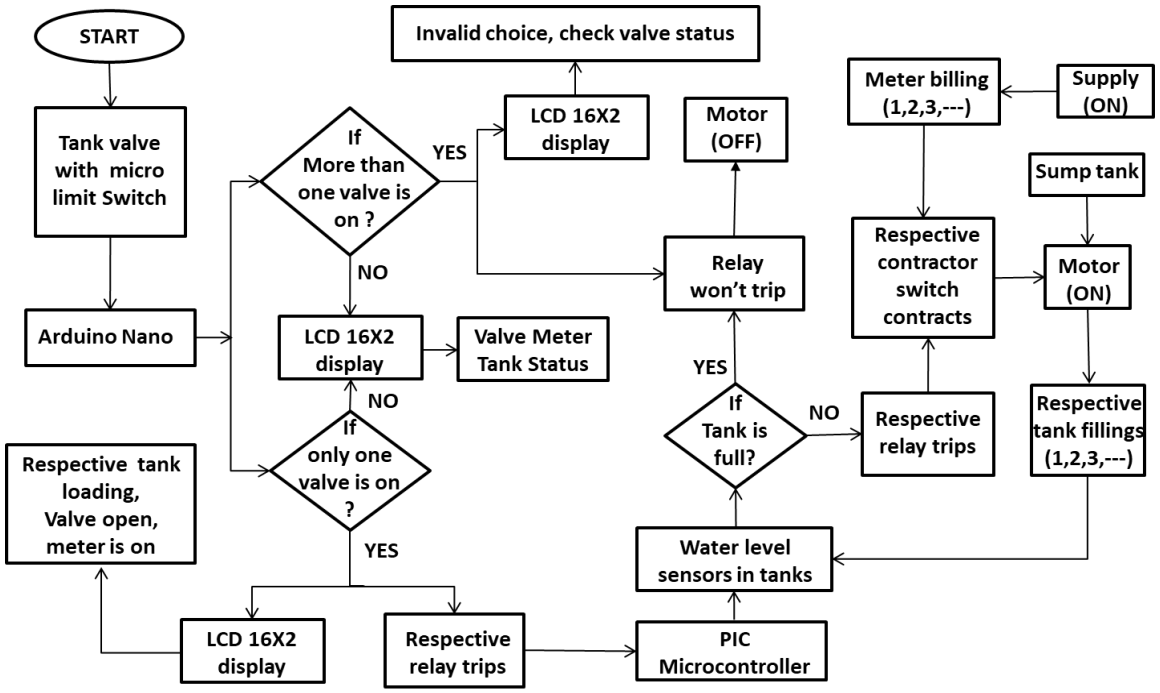


Wiring & Connection of Proposed Model

The wiring & connection starts with the 1-phase AC supply which connects 3 individual electric meters to the respective contractors. A common point from the output of the contractor is given to the AC motor (18W). An auxiliary 12 V transformer is connected at input side of one of the contractors. One of the outputs of the transformer is connected to the Arduino through bridge rectifier; other output is connected to the PIC microcontroller which consists of inbuilt bridge rectifier. Arduino Pro Mini is fixed in the Arduino expansion adapter set; it consists of 3 interlinked connections of Arduino pins with other components. A set of connection from roller micro switch is connected to the analog (input) pins of Arduino. Second set of connection consists of connection between digital (output) pins of Arduino and DC 5V relay. Lastly the Arduino is connected with the interfaced I2C LCD. The output of relays is connected to the respective PIC microcontroller; which consists of water level sensors in the overhead tanks at the input of the PIC microcontroller. The output of

microcontroller is connected to another set of auxiliary DC 5V relay. Further the outputs of the relays are connected to input of contractor.

3.3 Project Implementation – Methodology



Flowchart of Proposed Model

The First step up of the methodology begins with opening of the valve. The valve is isolately connected to the roller micro switch which senses the position of the valve and sends the analog signal to the Arduino. As Arduino is connected with I2C LCD which displays the respective valve is on, meter billing and tank loading. The monitoring and controlling action of the Arduino sends its digital output signal to the respective relay for tripping action. Once the relay gets tripped the respective microcontroller gets activated. Based on the water level in the overhead tanks, microcontroller sends signal to the respective auxiliary relay for tripping action.

Once the relay gets tripped, the respective contractor will contract and then the motor is turned ON. The electricity bill is obtained only from the respective meter.