Automatic Water Filling of Two Tanks by a Single Motor with Two Different Services Mains

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ABSTRACT: An automated method for efficiently filling two water tanks is proposed here, utilizing a single motor linked to two distinct service mains. The technology uses tiny relays, solenoid valves, and floats to regulate water flow and ensure proper tank filling without the need for additional pumps. The technique uses a single motor to boost efficiency while reducing expenses and complexity. Both tanks' water levels are switched, and the motor and any necessary solenoid valves are turned on to relay the action. The system ensures that there is a steady supply of water in the tanks by alternating between main sources to keep the balance and avoid overflow. In order to prevent overfilling or system errors, safety precautions are also enforced. When resources are limited and multiple tank filling is required, this approach offers an effective means of automating water management.

INTRODUCTION

Capable of efficiently filling several tanks simultaneously with the least amount of resources and at the lowest possible cost is a standard requirement in many water management systems. It is often difficult to accomplish this goal in these situations without using unduly redundant technologies. By use a single engine and two distinct services mains to automatically fill Two tanks with water, this design offers an inventive solution to this issue. Challenges in these kinds of settings. By use a single engine and two distinct services mains to automatically fill two tanks with garbage, this design offers an inventive solution to this issue. Need extra equipment or increase the complexity of the system. As a solution to this problem, this idea offers a novel approach to automatically fill two tanks with water using two different services mains and a single motor. Traditionally, filling many tanks meant utilizing multiple motors or pumps for every tank, increasing complexity, energy consumption, and costs considerably. Even yet, this technique uses a single engine and carefully controls the water flow from two separate service mains in an effort to maximize the process while maintaining efficiency. Solenoid valves, which regulate water flow by making decisions based on real-time monitoring, sensors that monitor the water levels in each tank, and the proper amount of water extracted from the main sources are the essential components of the proposed system. The technology, which automatically regulates the water flow and switches between the two service mains, prevents waste and overfilling. The addition of safety features that lessen risks like overflow and equipment failure also strengthens and increases the dependability of the system. All things considered, the goal

of this project is to address the need for affordable and effective water management solutions by offering creative and useful ways to fill several tanks simultaneously using a single engine and two distinct services mains. By fusing complex control mechanisms with sensor technologies, this system offers a versatile solution that may be used in a range of scenarios, from agricultural irrigation to industrial water delivery.

II. PROPOSED METHODOLOGY

The suggested solution automates the filling of two tanks with water using two different services mains and a single motor. To regulate the water flow into each tank and manage the switching between the main sources, relays will be replaced with float switches.

Component Selection:

Relays Select the appropriate relays to control the voltage and current needed by the solenoid valves and the motor.
Motor: Select a motor that fits the needs and has sufficient flow of water to fill the tanks.
Solenoid Valves: Pick solenoid valves that are compatible with the primary water sources and have the ability to regulate the flow into each tank.
Float Switches: The motor and solenoid valves are controlled by the float switches, which also serve to check the water level in the tanks.

Circuit Design:

To connect the motor, float switches, and solenoid valves, build a circuit using relays. Relay logic responds to information from the float switches by controlling motor activity and switching between the two main sources. Ensure that the parts are adequately shielded and isolated to prevent damage.

Float Switch Placement:

Place float switches in the appropriate places so that you can keep an eye on each tank's water level. It is crucial to inspect a sturdy installation and precise float switch calibration to make sure the switches activate at the right water levels.

Relay Logic:

To ensure that you can monitor the water levels in every tank, install float switches in the proper locations. For the switches to operate at the appropriate water levels, a reliable installation and accurate float switch calibration are essential.

Testing and Calibration:

Test the float switches and the circuit to ensure proper operation. By calibrating the system, make sure the solenoid valves and motor are working with each main supply. Make sure that tank filling is trustworthy and efficient by carrying out thorough testing.

Installation and Integration:

When putting the system in place, make sure the motor, solenoid valves, relays, and float switches are all in the proper places. If the plumbing and electrical systems are already in place, connect the system to them. Make one last check to confirm that all connections are secure and the system is up and running.

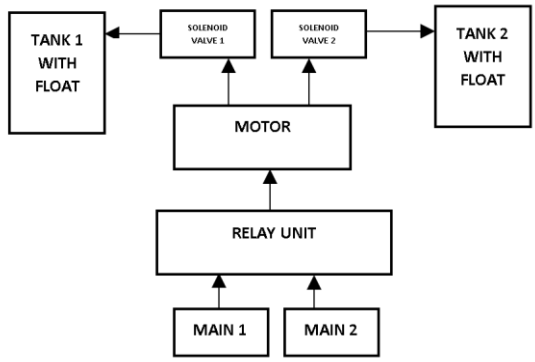
Operational Monitoring and Maintenance:

Regularly check if the system is operating as intended by keeping an eye on it. Carry out regular maintenance, such as cleaning switches, verifying relay contacts, and looking for loose connections. In order to guarantee a consistent flow of water to the tanks, address any problems or anomalies as soon as you can.

If this suggested technique is followed, the microcontroller in the automatic water filling system—which employs relays and float switches to run the motor and switch between two main sources-can be spared.

III.WORKING AND EXPLANATION

This block diagram illustrates the basic components and their interactions of the automatic water filling system. Simple relay logic and float switches are used in place of a relays to control the filling process and maintain optimal water levels in the tanks.



Float Switches: Float switches are positioned in each tank to keep track of the water level. The way these switches function is through a float mechanism that adjusts its height in reaction to variations in the water's level, turning on a switch when a set level is achieved. These mechanical switches are incorporated inside every tank. A float switch consists of a buoyant float attached to a lever mechanism. The float moves in tandem with variations in the water's level. When the water level hits a certain point, the float presses a lever to activate or deactivate the switch. The float switches are the primary sensors in this system that measure the water levels in the tanks.

Relays: Connected to the float switches are relays, which act as switches controlled by the signals from the float switches. The relays control how the motor operates, switching back and forth between the two primary sources based on the water levels that the float switches sense.

Electrical circuits can be opened or closed by relays, which are electromechanical switches, in response to signals from floating switches. A relay is connected to a floating switch. Under this configuration, relays receive signals from the float switches and control how the motor operates, switching between the two main sources.

Motor: Water is pumped into the tanks from the mains using a single motor. Relays are responsible for controlling the engine and starting it since water must be pushed into the tanks. Water is pumped into the tanks from the mains by a single motor. Because of its link to the motor, the relays have the ability to turn it on and off as needed. The relay connected to the corresponding float switch initiates the motor to pump water from the mains into the tank until the desired water level is attained when the level in either tank drops below a certain threshold.

Solenoid Valves: Solenoid valves are connected to the primary water sources, controlling the flow of water in each tank. The relays control the solenoid valves, which open and close in response to demand in order to fill the tanks with the designated mains supply.

The pipelines leading to the primary water sources have these valves put in them. Each tank's water flow is managed via solenoid valves. By connecting the relays to the solenoid valves, it is possible to program them to open or close in response to signals from the float switches. Until it shows that the required water level has been reached, a tank's float switch may allow water to enter. This happens when the relay on the tank is turned on.

Mains Sources: There are two different principal water sources connected to the solenoid valves. The motor draws water from multiple sources to fill the tanks. The relays choose which of the primary sources to use based on signals from the float switches. The two main water sources are connected to the system. These primary sources provide the water that is pumped into the tanks. Relays use the signals they get from float switches to select one of the main sources. When a specific tank's relay detects low water levels, it turns on the motor and selects the best mains source to fill the tank.

Tanks: The water is stored in two tanks. The float switches sense the water level in the tanks and relay the information to control the motor's operation and the switching between major sources. There are two distinct tanks used to hold the water. The water levels in

the tanks are observed by the float switches. The float switches send signals to the relays when the water level changes. To make sure the tanks are filled to the proper levels, they employ these signals to regulate the principal source switching and the motor's functioning.

Manual Switches (Optional): These switches may be integrated into the system to allow for manual control of the filling operation. Using manual switches, operators can manually choose the mains source, override the signals from the float switches, and, if needed, control the motor's functioning.

CONCLUSION

Float switches, as opposed to microcontrollers, are used in the suggested system, which automatically fills two tanks with water using a single motor and two separate services mains. This provides a useful and economical way to manage water supply. Without the use of complicated electronic components, the system can automatically control the filling process thanks to relay logic and float switches.

Exact control over the filling process is ensured by the inclusion of float switches, which enable consistent monitoring of the water levels in the tanks. Because the float switches activate the relays, which control the motor and solenoid valves, the system is able to pump water from the selected mains source into the tanks until the necessary water levels are reached. To maximize resource usage and provide a steady flow of water to the tanks, relays are employed to seamlessly switch between the two main sources. The absence of a microprocessor also simplifies the system's construction and lowers its total cost for a range of scenarios and uses. All things considered, this system provides a trustworthy and effective automatic water filling solution that may be used in agricultural, industry, and residential water management. The system minimizes human engagement and resource waste by maintaining proper water level management in several tanks through the use of dependable mechanical components and an intuitive interface.

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