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WATER LEVEL CONTROLLER USING PLC

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ABSTRACT

PLC proposed automated water distribution system is used to distribute the municipal water equal to all street pipe line. So we get the equal amount of water. The set point is fixed for all pipe line. Level sensor sense water level in tank.Flow rate of water is sense by flow sensor. Solenoid valve is used to open and close automatically. If the flow rate reaches at bottom, it will be turn on &it gets turn off when it reaches its set point. Here we also identify the water theft accurately during the distribution time period. This system consists of PLC.PLC gives the signal to the solenoid valve according to the set point written in the program. PLC is used to control the distribution of water. The overall system is connected to PLC with the help of RS-232 cable.

KEYWORDS: Automation, PLC, Tank-level control, high level sensor, low level sensor ,manual switch ,pump, alarm(buzzer), sensor etc.

INTRODUCTION

The PLC is designed for multiple inputs and output arrangements, increases temperature ranges, freedom to electrical noise, and resistance to vibration and impact. Programs to control operation (machine) are naturally saved in battery backed up or memory (non-volatile). The proposed system will control and check the liquid level of the tank forever & will ensure that a sufficient level of water is maintained. This system can be used all around in industrial application. It can be used to prevent industrial accident. The high number of the input& output port of the PLC will enables this single system to control large number of tanks single. Leakage can also be monitored.

MATERIALS AND METHODS

1) PLC
2) Sensor
3) Motor
4) Relay

Figure:-

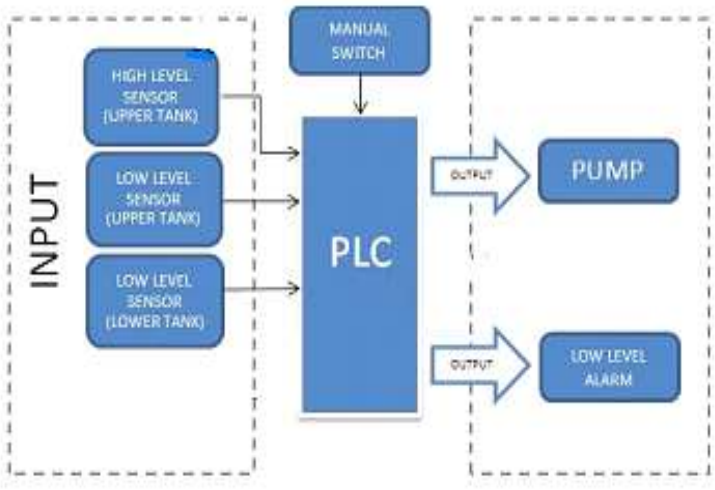

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Fig. a Block diagram of water level control using PLC

System component Description:

Level Sensor:

Three sensors were used to sense presence of water. The sensors are Low Level Sensor (Underground tank), low Level Sensor (Overhead tank), High Level Sensor (Overhead tank) are placed.

PLC (Programmable Logic Controller):

This distributes as the main control unit of the system. The ladder logic is prewritten on a memory. The ladder logic was implemented in 'OMRON SYSMAC CP1E' manager. On basis of this logic the PLC takes its decisions.

Relay and Motor:

A relay is an electrically operated. The relay considered in our system uses an electromagnetic to operate a mechanism mechanically. Any compatible relay can be used with our system. The motor on the other hand was used to pump the water to the overhead tank from the underground tank. The relay converts the DC output of the PLC into a signal proper to forcefully control the motor being used.

RESULTS AND DISCUSSION

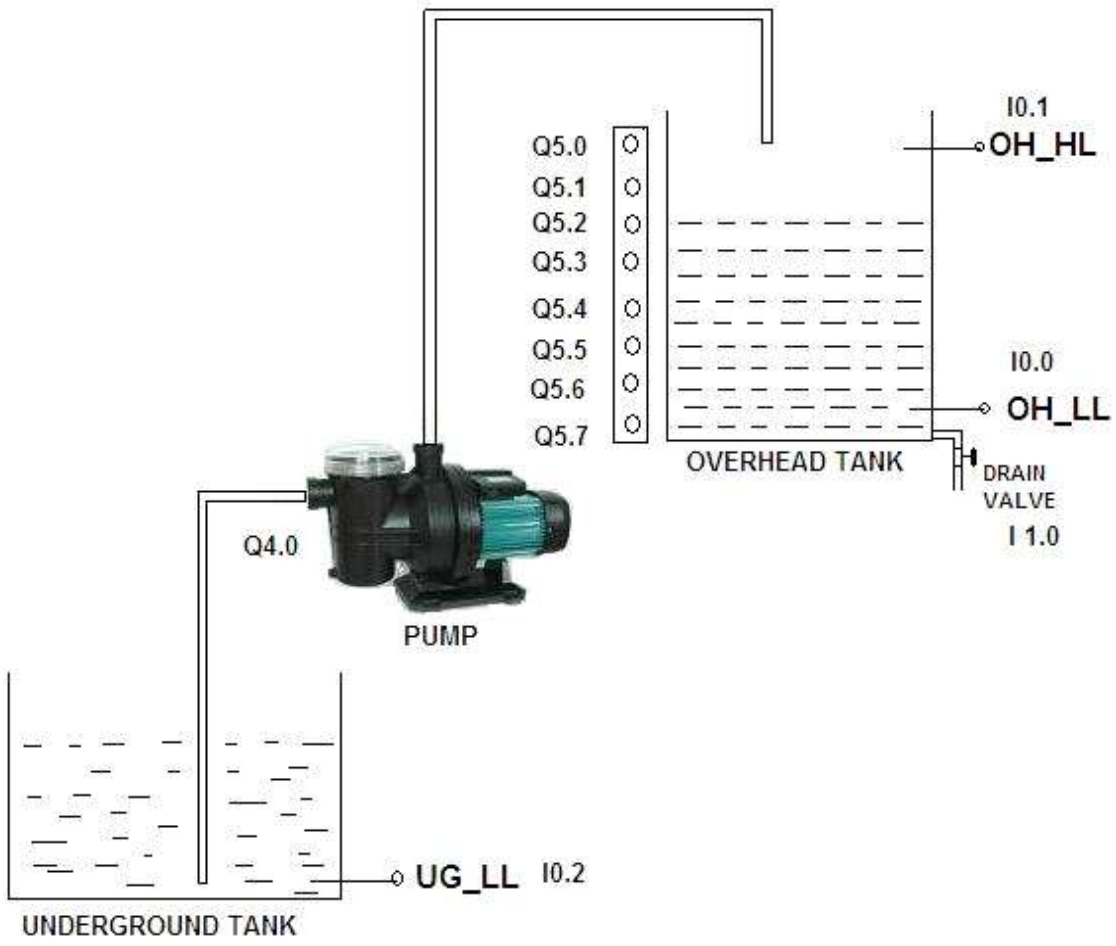

Fig. b schematic design of system

The Tank is to be filled by pump. The pump will accordingly start when the water level of tank reaches below low level & stop when the level reaches High level. Dry run is check by the low level sensor which is in the underground tank in that case other pumps will not run. Run time monitoring of the pump in second is recorded & reset switch is also provided in program. Provision of manual start stop switch is united which will totally override the automatic system.

ADVANTAGES OF PLC

i. Ruggedand designed to with stand vibrations, temperature, humidity, and noise.
ii. Have interfacing for inputs and outputs already inside the controller.
iii. Easily programmed and have an easily understood programming language.

APPLICATION

I. To measure the water level
II. This system can be used ubiquitously in industrial application.
III. Their high speed switching & compact size make them indispensable in automation application.

FUTURE SCOPE

i. Faster system response.
ii. Monitoring facilities available.

CONCLUSION

Our project is achieved it aim of automating the level control process. Human supervision was not necessary. Float sensors is not use in this system. Therefore the short coming of the float sensors that is unwanted vibrations and high cost was easily overcome. The PLC also offers many Input& Output ports. Hence this single system can single-hand control as several as 55 tanks making it good and low cost.

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