

Microprocessor
based water level
controller
communications
essay



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A microprocessor incorporates almost all of the functions of a CPU on a single integrated circuit . The first of the microprocessors emerged in the early 1970 since then they are being used for electronic calculators.

Computer were for a long period constructed out of small and medium-scale Integrated circuits containing the equivalent of a few to a few hundred transistors. The integration of the whole CPU onto a single chip helped a lot and therefore greatly reduced the cost of processing capacity. Other embedded uses of 4 Bit & 8-bit microprocessors, such as printers, various kinds of automation etc, followed rather quickly. Affordable 8-bit microprocessors with 16-bit addressing also led to the first general purpose microcomputers in the mid-70s.

From their humble beginnings continued increases in microprocessor capacity have rendered other forms of computers almost completely obsolete with one or more microprocessor as processing element in everything from the smallest embedded systems and handheld devices to the largest mainframes and supercomputers.

Since the early 1970, the capacity of microprocessors have increased which suggests that the complexity of an integrated circuit, with respect to minimum component cost, doubles every two years. In the late 1990s, and in the high-performance microprocessor segment, heat generation due to switching losses, static current leakage.

What is a Water Level Controller?

It ia a Product which makes you tension free. It Avoids wastage of water, microprocessor based water level controller is technically advanced and

simple to use, It switches ON when the water in the over tank drops down below level and puts OFF the pump when the water level rises above level. When the sump reaches valve level the system switch OF the pump automatically and switches ON the pump when the water reaches full level,

BASIC INTRODUCTION:

The circuit described here control the water level inside a tank. There are two different modes of operation.. The first is empty mode and it will take the water out of the tank, the pump will be used to suck the water until the water level drop below the lower level. The second is fill mode. Here the pump will be used to fill the tank, the pump will be activated until the water level reach the upper limit. Here is the schematic diagram of the water level controller circuit:

The circuit uses NOR logic gates, only one integrated circuits package and one transistor is needed for the active components, very simple design. The default position of SW1 is empty mode, just switch to other position to make the water level controller works in fill mode operation. The relay can be used to control almost any type of water pump motors. Please be aware that this circuit works only with water or other electrically conductive liquids.

MICROPROCESSOR BASED WATER LEVEL CONTROLLER:

The water level Controller is a trustworthy circuit. it takes over the task of checking and Controlling the level of the water in the water tanks. The water level is displayed in the LED graph. The cu probes are used to detect the water level, These are inserted into the tank which is to be monitored.

This water-level Controller-cum-alarm circuit is configured around the 8 bit Microprocessor 8085, It continuously monitors the overhead water level and display it and it will automatically switch On and off.

All the input and output functions are done through the Programmable Peripheral Interface IC 8255.

Basic block Diagram:

Features

- very stable.
- Easily adjusted for operating requirements.
- Instant reversion to emergency.
- microprocessor basePID/Fuzzy controller.

Principle

The Autonics Water Level Modulating controlsystem is a single element Electro-pneumatic control with a pneumatic Positioner and PID/Fuzzysystem, The system comprises a Transmitter, converter module float chamber, a feedline modulating control valve and an electronicmicroprocessor based PID/FUZZY controllers.

LEVEL TRANSMITTER

Description

The Autonic Water Level Modulating control system is a single element Electro-pneumatic control with a positioner and PID auto tuning system.

- A Level Transmitter with double-float chamber mounted on the boiler shell, fitted with a coil which can be make according to the requirement.

- A flanged mount fully stainless steel Control valve, fitted with a positioner and pneumatic actuator, which is mounted in the boiler feedline.
- A microprocessor-based PID/FUZZY Level controller is mounted on the control panel.
- An electronic Converter module is also mounted on the control panel.

Operation

A positive change of water level in the boiler alters the level transmitter inductance value of coil causing an imbalance in the system; This signal is transmitted through the electronic control box and connected to PID controller. Then the microprocessor-based PID level controller transmitted an electrical signal to the pneumatic positioner to position and adjusts the position of control valve.

A additional low/high water level alarm or burner cut out contact are also provided in the microprocessor-based level controller with the adjustable setting position.

Control valve

The V control valve has many different inserts for precision throttling control. The inserts are pinned to the END CAPS and are used in conjunction with any of our standard seats. They are designed to change the flow characteristics of the valve and are offered in different shapes to meet a variety of modulating application. For very low C v applications. a specially designed “Soft” V insert incorporate both the flow element and the ball seal into one component, and maintains continuous contact with the ball. This

arrangement provides excellent low end accuracy (EQ%) and repeatability
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ADVANTAGES OF WATER LEVEL CONTROLLER:

- Saves electricity
- Can be used any type of pumps
- Protection to the pump,
- LED Indication to monitor the water level in the over had tank and sump
- Low voltage and High voltage cut off (Working Range: 160v to 260v)
- Motor control: Direct switching up to 1 HP, through starters for ranges above.

Application of water level controller:

Residential buildings, Apartments, Hospitals, Educational Institutions, Hostels, Hotels, etc.

In maximum homes water is first stored in an underground tank and from there it is pumped up to the tank located at the roof. People normally switch on the pump when their taps go dry and switch off the pump when the tank starts overflowing, which results in the unnecessary wastage and sometimes non-availability of water in the case of emergency which is to be controlled and corrected.

The author used a piece of non-metallic conduit pipe (generally used for domestic wiring) slightly longer than the depth of the overhead tank. The common wire C goes up to the end of the pipe through the conduit. The wire for probes L and H goes along with the conduit from the outside and enters the conduit through two small holes bored into it as shown in Fig. 2.

Care has to be taken to ensure that probes H and L do not touch wire C directly. Insulation of wires is to be removed from the points shown. The same arrangement can be followed for the underground tank also. To avoid any false triggering due to in

terference, a shielded wire may be used.

This water level sensor is good or appropriate for liquids that have a conductivity of equal to or more than 25m Siemens, not only this It is your best choice for a water level switch. The system is economical. The level probe and the evaluation unit can be connected using a long cable. Two point sensors for independent switching and automatic control of pump

TECHNICALLY

Housing : aluminium, Weather-proof enamel painted suitable for back panel

Cable Entries : 3 Nos. of ½' BSP

Mains 110 or 230 Volts AC (-15 to + 10%) 50 Hz.

Relay Output 50Hz for non-inductive load

Power Consumption 5 VA .

Fail-Safe Mode High or Low field selectable

Response Time 0. 5 secs

Switching Delay 0. 5 to 20 seconds

Indication Red LED for Alarm, Green LED for Normal

Operating Temp. : -20° C to + 60° C

Weight ~2 Kg.