Automatic Tap Changing Transformer with Temperature Protection

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Abstract

The On Load Tap Changing Transformer(OLTC)are widely used in power system. It gives good regulation for the output voltage in large variation of the input voltage in lesser period of time. In Present & past scenario mechanical type of On Load Tap Changing(OLTC) were in operation. They had considerable limitation and drawbacks like arcing, slow operation in time, service cost and high maintenance. In order to overcome these drawbacks the Automatic On Load Tap changing Transformer is developing by using Arduino. By using power semiconductor device i.e. triac will used has switch the tapping of the transformer. And also protect the transformer from temperature by using cooling devices (i.e. fans).

By innovating major idea for Automatic Tap changer is that solid-state switches with quick and frequent operate during the tap changing process instead of mechanical switches which reduces the arc during the tap changing process.

Alternating Current Solar Generator

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Abstract

Conventional energy sources are limited and their consumption has been increasing with day by day. Also it is hazardous for environment. To overcome this solar energy plays vital role as it is clean and renewable energy source. To utilize this energy solar panels are used and to store this dc power the batteries are required. This power has to be converted into ac form which is quite expensive and suffers from losses.

Here is the new scheme to generate ac power from solar energy without using inverter. In this scheme standard solar cells are arranged into a circular pattern mounted on a base. The spinning disk is mounted above the solar cells which is rotate by dc gear motor. The disk has portal cuts into it allowing light to pass through every solar cell below it. As disk rotates each of the banks of solar cells is alternately exposed to light and alternately produced the power. The generated power is in alternating nature.

Automatic Load Management of Transformer Using Microcontroller

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Abstract

The main aim of the project is to protect Transformer under overload condition by load sharing and shedding. Due to overload of the Transformer, the winding may get overheated and also drops in efficiency. Thus by sharing load on the Transformers, each of the Transformer is efficiency can be improved and also protected. The sharing of load is done on the basis of Time, Priority of load and change in the Load .This will be done by connecting another Transformer in parallel through a Microcontroller. The Microcontroller compares the load on first Transformer with reference value. When the load exceeds the reference value, the second Transformer shares the extra load. A GSM modem is also used to inform the control station about switching. The main objectives are Transformer protection, uninterrupted power supply and Short circuit protection.

Improvement in Operation of STP by Automation

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Abstract

Now a days automation is widely used for various purposes. Automation increases productivity as well as improves quality. In automation, Programmable Logic Controller (PLC) is used for various applications. It's main advantage is that it can be used in extreme environmental conditions. In this project, PLC based automation of Sewage Treatment Plant(STP) located at VPM's Maharshi Parshuram College of Engineering, Velneshwar will be done. To reduce human efforts in operation of Sewage Treatment Plant, automation is needed. It becomes easy to operate all the equipment in STP such as submersible pumps, blowers, filters etc. as per STP schedule. Use of PLC reduces the human interface as well as operator get status of each equipment used for STP. Thus the operator can monitor entire functionality of Sewage Treatment Plant through personal computer.

Automatic Synchronization of Alternator

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Abstract

Synchronization of alternator to the power system must be done carefully to prevent damage to the machine and disturbances to the power system. Automated synchronization unit has been developed where Peripheral Interface Controller (PIC) is used to compare voltage, frequency and phase sequence of the incoming alternator and reference alternator. Once all conditions are satisfied both alternators get synchronised automatically. The system doesn't required additional measuring tools for monitoring and control processes. The method overcomes the drawbacks of manually operating synchronization.

Unsymmetrical Fault Analysis

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Abstract

The supply of power gets cut off due to fault occurring in the transmission line. There are basically three type of fault which will majorly hamper the equipments connected and distributes throughout the whole power system. L-L fault, L-G fault and L-L-G fault are the major types of unsymmetrical faults which will be either temporary or permanent faults. This project will help to Sense these faults and protect the equipment from damage by disconnecting the supply of power system to avoid large scale of damage. The project consists of three single phase transformer which are connected in star input, and three single phase transformer connected in delta at the output. Input of this transformer is 220 volt and output will be 12 volt. The 555 timer is used to identify short duration and long duration fault condition switch are used to create the faults such as L-L, L-G, L-L-G on the low voltage side. When there is short duration fault the system will be again connected to the load immediate after clearing a fault, while for long duration of fault the system will lead to permanent tripping.

Speed Control of BLDC Fan Motor

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Abstract

The main objective of this project is controlling speed of BLDC motor and display its speed using an IR sensor. The dc motor has various application used in industries like lathes, drilling, spinning. The user can increase or decrease the speed as per the requirement and motor will run at that exact speed.

The project is divided into three stages Input, Processing unit and Output stage. The input stage consists of required speed through switches. The processing stage provides RPM reference of the motor, by a shaft mounted IR sensor interfaced to the microcontroller in the circuit.

The microcontroller develops pulse width modulation(PWM) pulses which are varied by switches to regulate DC power to the motor such that desired speed. Data related to speed sensed by the sensor is given to the microcontroller which is in turn displays it on a LCD display. The above operation carried out by using one opto-isolator and MOSFET for driving the BLDC motor IR sensing is used for getting the speed reference to the microcontroller.

The user can enter desired speed and the motor will run at that speed. Desired RPM entered through matrix keyboard & speed of motor displaying.

Design & Fabrication of Wind Generation By Using Ceiling Fan

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Abstract

The Aim of this project is to generate power by Wind generation by using Ceiling Fan at college site. Wind turbines are devices that convert the wind's kinetic energy into electrical power. Ceiling Fan typically works on Induction Motor. Ceiling fan is mostly driven by the single induction motor with an efficiency of 30%. World is the storehouse energy. Energy can neither be created nor be destroyed but can be transformed from one form to another. Wind-generated electricity can be used for battery charging and for connection with the power grid. The main object is that the use of old ceiling fan. This is very economical to generate more electricity. Ceiling fan motors are easier to convert than automobile alternators because of the static coils. In order to convert this to a generator you just replace the steel rotor with a set of permanent magnets. We can generate the power in AC & also DC by connecting Rectifier in series with Permanent Magnet Generator. Wind generation continuously generate the power with respect to speed of wind. The method of making blades are connected to the ceiling fan with fabricated flange plates for fixing blades & by using neodymium permanent magnet the ceiling act as a generator. A neodymium magnet (also known as NdFeB, NIB or Neo magnet), the most widely used type of rare-earth magnet, is a permanent magnet made from

an alloy of neodymium, iron and boron to form the $Nd_2Fe_{14}B$ tetragonal crystalline structure. The main moto of design & fabrication of blades by using PVC (Polyvinyl Chloride).

High Voltage Line Wire Detector

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Mr.Satyavijay Kadam Mr.Hrishiket Patil

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Abstract

The term high voltage usually means voltage above a particular threshold which is high enough to inflict harm or even death upon living things,equipments and conductors that carry high voltage warrant particular safety requirements and procedures. Reliably detecting and measuring high voltage on distribution and transmission voltage power lines is vitally important to jobs performed by electric utility linemen. This task can be done more quickly and safely when voltage reduction and measurement equipment are also convenient and easy to use. The most convenient equipment is usually a single terminal device which operates without a direct connection to ground. In this work we have presented a device which is uniquely design to fit into safety helmets which accurately detects the presence of high voltage lines from distance range as high as 3-4meter.This miniature device consists IC4017,capacitor,buzzer which would help maintenance and installation works of substation and power plants.