Microcontroller Based Automated Voltage Pulse Tester

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Abstract: - This paper surveys on microcontroller based automated voltage pulse tester which is used to increase the efficiency and reduce errors by providing the proper voltage to system. This system reads the voltage pulse automatically and accordingly provide the voltage to the system

Keywords: - Voltage Pulse Tester, Voltage Controller, Variable Pulse Width for Programming, High Voltage Measurement.

I. INTRODUCTION

In the various elctroctrics components manufacturing industries the voltage regulator operates manually because of the manual processing it may occur error. So basically our automated voltage pulse tester is used to reduce this error.

It test the voltage pulse automatically and according to the pulse value it will set the voltage. So because of the automated system accuracy of the system is high.

II. OVERVIEW

It takes the very high voltage pulse which is of 2000V as the input and accordingly set the voltage for the system which is in the range of 0-230V by varying the variac voltage and takes the feedback of the output. The fluctuation in the output voltage mainly occurs due to the variation in the input pulse. Pulse tester continuously test the input pulse and changes the variac voltage

III. VOLTAGE PULSES TESTER

Voltage regulator is used to vary voltage. Input for the voltage regulator is fluctuating voltage regulator changes then into constant voltage variation in the load may cost fluctuation in voltage. Equipment of power system may damage due to variation in the voltage. the voltage control equipment is used to control the variation in the voltage which may used at several places likes near the transformer, generator, feeders, etc. For controlling the voltage variation voltage regulator is provided in more than one point in the power system. Compound generator is used the DC supply system for voltage control. Various methods like shunt condenser, Induction regulator is used the ac system to control the voltage. Voltage regulator is design maintain a constant voltage level. Negative feedback for simple feedforward design is may be used by voltage regulator. The automatic voltage regulator used in generators, power station, ship electrical power production to stabilize their voltages on the generator series. Computer power supplies used the voltage regulator to stabilize the dc voltage. Voltage regulator controls the automobile automobiles and central power station generator. It may be installed at a substation or along distribution lines. Automatic voltage regulator is used as a feedback control system which measures the output of the generator and generate error signal which is used to exist the excitation of regulator. Terminal voltage increases as the current in the field winding of the generator increases by using power electronic devices the automatic voltage regulator recontrol the current. To provide the current for the field winding a small part of generator are used. The automatic voltage regulator system has the circuit to ensure all generators operate on same power factor.

IV. PULSE GENERATOR

Control of the pulse repetition rate allow by the simple bench pulse generator with respect to an external and internal trigger, high and low voltage level of the pulse. Rise time and the fall time of the pulses is controlled by the more-sophisticate pulse generator. Pulse generator can generate the output pulse having width range from minutes down to under 1ps. It may use digital technic analog technic or both technics generate the output pulses. Analog circuitry is the output stage of the pulse generator determine the pulse amplitude, rise and fall time. Pulse repetition rate and duration is digitally control pulse generator can produce 50% duty cycle square wave with correct adjustment.

V. MICROCONTROLLER (ATMEGA 328)

Atmega 328 is advance virtual risk microcontroller. It has 1KB EEPROM and 28 IO pins. Electrical supply of the microcontroller by the EEPROM. By providing electrical supply it can store the data and provide result it has a 2Kb static random memory. Its operating voltage of microcontroller ranging from 3.3 to 5.5 volt. It is a four port PORT A, PORT B, PORT C, PORT D. PORT A consist of 8 pins A0 to A7. Which serve as analog input to ADC if ADC is not used PORT A act as a 8 bit bidirectional port. PORT B consist of 8 pins(PB0-PB7). it has a internal pullup resistor this port is an 8bit bidirectional port. PORT C consist of 8 pins(PC0-PC7). It has symmetrical drive characteristics with source capability at a output buffer. PORT D consist of 8pins (PD0-PD7). it has a internal pullup resistor this port is an 8bit bidirectional port.

Fig 1

VI. VARIABLE PULSE WIDTH

To reduce the total verification time variable pulse width for programming, program pulse width is increased and the repetition of verification decreased. The instant program repeated about 400 times to program slowest bit with the programming time of 10ms. First the program pulse width set to 15ps to detect the threshold voltage of the fastest bit an accuracy of 0.3v. pulse width is increasing accordingly the repetition of the verification the threshold voltage of the memory cell depends on the program time. Then program pulse increases twice the former pulse width. The program read sequence is repeated 10 times. Pulse width is easily generated by using binary counter and related logic circuit.

Fig 2:- High voltage resistor divider probe.

To scale down the very high voltage voltage divider are used. It can be measure by the voltmeter. Special high voltage resistor are used in a such probes as the must be able to tolerated high input voltage and generate accurate result. High voltage resistor divider probe design specially for this purpose can be used to measure voltages upto 100kv. The high voltage across the divider and the divider output which outputs the lower voltage that is within the meters input range is measure by the meter. For voltages above 100kv capacitive divider probes are used. As the heat caused by power losses in resistor divider probes at such high voltages could be excessive. Volume: several HPC systems have each the process memory (RAM) and disk storage to handle terribly massive amounts of information. Terabytes of RAM and petabytes of storage area unit out there for analysis comes. Efficiency: several HPC systems operate a pool of resources that area unit drawn on by a several users In most cases once the pool is massive and numerous enough the resources on the system area unit used virtually perpetually. Cost: Bulk getting and government funding mean that the price to the analysis community for victimization these systems in considerably less that it'd be otherwise. Convenience: perhaps your calculations simply take a protracted time to run or area unit otherwise inconvenient to run on your pc. There's no have to be compelled to hold up your own laptop for hours once you will use somebody else's instead.

VII. LIMITATIONS

It can regulate the voltage up to 230V

VIII. ADVANTAGES

This automated voltage pulse tester is used to reduce the errors and increase the efficiency of the system

IX. CONCLUSION

In this paper we have surveyed various papers related to Voltage pulse tester written by number of authors. Various methodologies like voltage pulse tester, voltage controller, variable pulse width for programming, high voltage measurement is surveyed in this paper. Each methodology is having its application in its own specific area with some advantages as well as some disadvantages.

We can conclude our survey with a statement that all methodologies discussed above are going to change the technology in near future.

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