

High Voltage Transformer Testing Auto Machine

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ABSTRACT- The system that has the specifications and performances of an electrical power transformer that has to pass many testing procedures. The two main types of transformer testing – Type test and Routine test of transformer are being performed before providing the transformer. When transformers are manufactured from the factory or transferred from another place, it is necessary to see that every transformer is dry, no harm during shipping, internal connections haven't been untangled, the transformer's magnitude relation, polarity, and impedance agree with its nameplate, its major insulation structure is undamaged. Many need special component and capability that the electricians do not have and are not expected to provide. Some tests are done by an assembly team, while other tests are performed by the people making the previous electrical tests on the transformers.

KEYWORDS- Auto Transformer, High Voltage Transformer, Oil Tank, Digital Temperature Monitor, LABVIEW Software.

I. INTRODUCTION

High Voltage Testing of electrical components covers a various range of procedures depending on the quality of the components and the type of test mandatory. This is basically performed to qualify the device to work safely during testing electrical environments, a way to test the efficiency of its insulation. The required high voltage testing will limit the type and amount of voltage applied and the suitable current flow.

When we observe the breakdown voltage, the point where the dielectric fails permitting much current to flow, it is a Dielectric Breakdown Test, and this high voltage testing is a destructive test. When the test checks the leakage current is under the given safety limit for an well-known voltage rate, which is a non-destructive high voltage testing, and through which we examine the insulation integrity of the module. High voltage testing is sometimes denoted to as hi-pot (high potential) testing, but related testers differ much according to the test objective and whether they are on factory or on It is typically the use of high voltage testing on transformers to confirm performance. The other high voltage tests are insulation resistance, lightning, switching impulse tests, partial discharge, etc being made by the manufacturer to meet the essential standards, quality and reliability. One of the most typical is the withstand voltage measure, to find if the transformer dielectric strength is in an appropriate condition for service, or throughout maintenance process to exhibit the device is capable of enduring overvoltage's while in operation.

The over voltage will frequently work for 60 seconds, between primary winding and secondary winding of the transformer, or between secondary winding and ground. This high voltage testing is effective if the calculated current does not cause the insulation to break, being lesser than the maximum leakage current allowable so that the device will be safe to use under normal operating situations.

II. EXPERIMENTAL SETUP

The high voltage typically means electrical energy at voltages high harm living organisms. The device that transmit high voltage allows certain protection measures.

In some industries, high voltage means voltage over a certain threshold. Industrial, military and scientific applications use electrical power distribution in cathode ray tubes to generate X-rays and particle beamsto demonstrate ignition in photomultiplier tubes. The high power amplifier vacuum tubes require High voltage supply. Electrostatic generators like Van Delaware Graaff generators and Wimshurst machines will produce voltages approaching megavolts however generally produce low currents.

Induction coils operate on the flyback effect leading to voltages greater than the turns ratio increased by the input voltage. They generally produce higher currents than electrostatic machines, however, each multiplying of desired output voltage doubles the load because of the number of wire required within the coil. So measuring them to higher voltages by adding additional turns of wire will become impractical.

The Cockcroft-Walton multiplier maybe can multiply the voltage produced by a coil. It generates DC using diode switches to charge more number of capacitors. A positive lightning stroke is usually one event. However, the larger peak current may flow for long time, provide more energy than negative lightning.

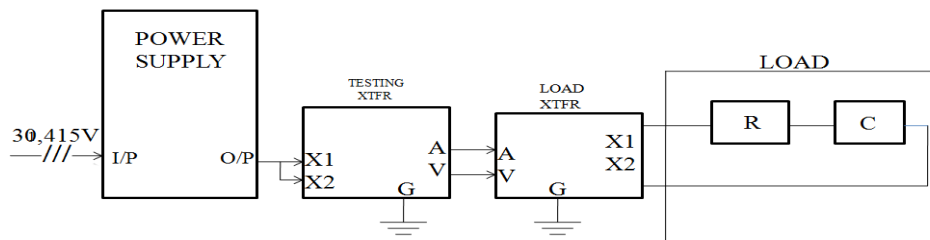


Fig. 1. Block Diagram of High Voltage Transformer

III. CONCLUSION

Knowledge of the construction of high voltage test transformers, their design and use in high voltage testing system provides the answer of the foremost adjustment transformer in respect of limitations and amounts.

HV (High Voltage) testing are the main advantages of safety, higher effectiveness, lower price, savings of energy, avoiding failures, troubleshooting for failure detection, accurate detection and quality assurance.

A corona discharge generator for surface treatment is projected while not without of a transformer with a high voltage secondary. The voltage multiplication is achieved by using only an LC series resonator. benefits of the proposed methodology compared to different known methods are analyzed. Closed-form design expressions for the key parts of the proposed generator are provided. To prove the capability of the proposed system, a prototype generator was constructed for 1-kW input power. The operating frequency is 30 kHz. The main components of the prototype generator is provided.

REFERENCES

- [1] "Softal Electronic: Corona Pretreatment for wettability and Adhesion," Tech. Rep. 102e [online].
- [2] L. A. Rosenthal and D. A. Davis, "Electrical characterization of a corona discharge for surface treatment," IEEE Trans. Ind. Appl., vol. IA-11, no. 3, pp. 328-335, May/Jun. 1975.
- [3] L. A. Rosenthal, "Method for the Surface Treatment of Thermoplastic Materials," U.S. Patent 4 145 386, Mar. 20, 1979.
- [4] P. B. Sherman, "Corona discharge treatment," in Proc. IEEE Ind. Appl. Soc. (IAS) Conf., Oct. 1993, pp. 1669-1685.
- [5] H. Fujita and H. Akagi, "Control and performance of a pulse density modulated series-resonant inverter for corona discharge process," IEEE Trans. Ind. Appl., vol. 35, no. 3, pp. 621-627, May/Jun. 1999.
- [6] N. Burány, P. Odry, and L. Veréb, "High voltage generator for corona surface treater," in Proc. 4th Int. Symp. Appl. Electrostat., May 1996.