

FINAL YEAR PROJECT REPORT
DIPLOMA IN ELECTRICAL ENGINEERING (ELECTRONICS)
SCHOOL OF ENGINEERING
MARA INSTITUTE OF TECHNOLOGY

HIGH VOLTAGE INSULATION TESTER

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NOVEMBER 1986

ACKNOWLEDGEMENT

It is a pleasure to have the opportunity to thank all those who is kindly involved in their contribution towards the success of our project.

We would like to express our most sincere and heartfelt gratitude to our project supervisor, En. Md Mahfudz B. Md. Zan who has contributed many valuable suggestions, constructive comments and encouregent during the course of accomplishing our project.

Our heartfelt gratitude too, to our course tutor, Encik Ahmad Fauzi Bin Ibrahim and project co-ordinator, Encik Hassan Bin Alias for co-operation to allow us using the electronics laboratory throughout the project.

We are very grateful to many individuals and organisations who have generously provided their guidance and facilities. Last but not least, we wish to express our deep sense of gratitude to lecturers and technicians for their technical contribution during the project.

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1.0 Introduction.

The problem with using a multimeter to perform insulation tests is that it only tests at 1.5v DC. Very few components operate at this very low voltage so it really is not valid.

It may easily give an open circuit reading when tested between the active leads and the frame. The peak voltage of the 240v AC mains is 340v which increases the chances of insulation breakdown enormously. Add to that the strong possibility of spike voltages rising on top of the mains voltage and you can see why mains operated appliances have to have such good insulation.

The same arguments apply when testing transformers, capacitors, high voltage semiconductors and other components, so there is a real need for a convenient self-contained insulation tester which can test at a voltage at least as high as that will be present in the circuit under normal operating conditions. The voltage most commonly used in tests of this kind are 500v and 1000v.

A disadvantage of the majority of multimeters is their lack of resolution when measuring large resistances. Most multimeters simply read infinity (open circuit) when the resistance is above a few tens of megohms.

500v is selected as the most suitable test voltage, since it provides a reasonable margin over the typical mains voltages present in electronic equipment while keeping the design of the inverter as