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Design and Fabrication of Modified, Digitalised Fuse and MCB Testing Control Panel

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ABSTRACT: The aim of this research work is to design and fabricate a Modified and Digitalized Fuse and MCB Testing Control Panel that offers a more efficient, accurate, and user-friendly method for testing low-voltage protective devices such as fuses and miniature circuit breakers (MCBs). Conventional testing setups are typically manual, time-consuming, and lack real-time monitoring and data logging capabilities. To overcome these limitations, this research work introduces a redesigned testing panel incorporating modern digital technologies.

KEYWORDS: MCB Testing, Control Panel Design, Digitalised Testing System, Electrical Protection Devices, Automation in Electrical Testing, Microcontroller-based Testing, Over current Protection, Electrical Safety.

I. INTRODUCTION

Control Panels are a vital component of many industrial and commercial systems, as the allows operator to monitor and control various aspects of systems operation. They can take many forms, ranging from simple mechanical switches to advanced digital interfaces. One of the key benefits of control panels is that they provide a centralized location for operators to monitor and control multiple aspects of a system. Another important benefit of control panels is that they can be customized to meet the specific needs of a given system [4]. Electrical control panel are combination of electrical devices, which are used in electric power system to control and test the various mechanical and electrical function

II. METHODOLOGY

To overcome the problems in Analog control panels, digitalized and modified control panel is proposed in this researcher work. In this panel switches, meters, indicators, terminals are modified and digitalized to get accurate readings for MCB and Fuse testing. Research work proposed with movable panel, so that it can be used for different testing's also.

Sr.No.	Name Of Component	Quantity
1	ICDP SWITCH SINGLE PHASE (0-230V, 40 AMP)	01
2	AC VOLTAGE REGULATOR SINGLE PHASE (0 – 230 V, 10 AMP)	01
3	DIGITAL INDICATOR	01
4	DIGITAL VOLTMETER (0-230 V)	01
5	DIGITAL AMMETER (0- 60 Amp)	01
6	SINGLE PHASE WATT-HOUR METER (0-230 V)	01
7	INCANDESCENT LAMP HOLDER (6 AMP, 230 V)	09
8	PIANO SWITCH (6 AMP, 230 V)	09
9	INCANDESCENT LAMP (100 WATT, 230 VOLT)	09

10	1.5 SQMM MULTISTRANDED COPPER WIRE	3 METER
11	SANMICA PLYWOOD (90 CM* 60 CM)	01

Table II :- List of Component used in Research Project work.

Fuse and MCB are Thermal protection devices used widely in Residential, Commercial and Industrial applications. These are also used in institutional laboratories for practical purpose. These devices are available with different current carry capacity as per requirement. The working in this device to break the circuit in condition of overload and short circuit condition. Below schematic diagram is basic presentation of control panel circuit used for testing the Fuse, MCB

III. EXPERIMENTAL RESULTS

Below schematic experimental result diagram is basic Design and Fabrication of Modified, Digitalised Fuse and MCB Testing Control Panel

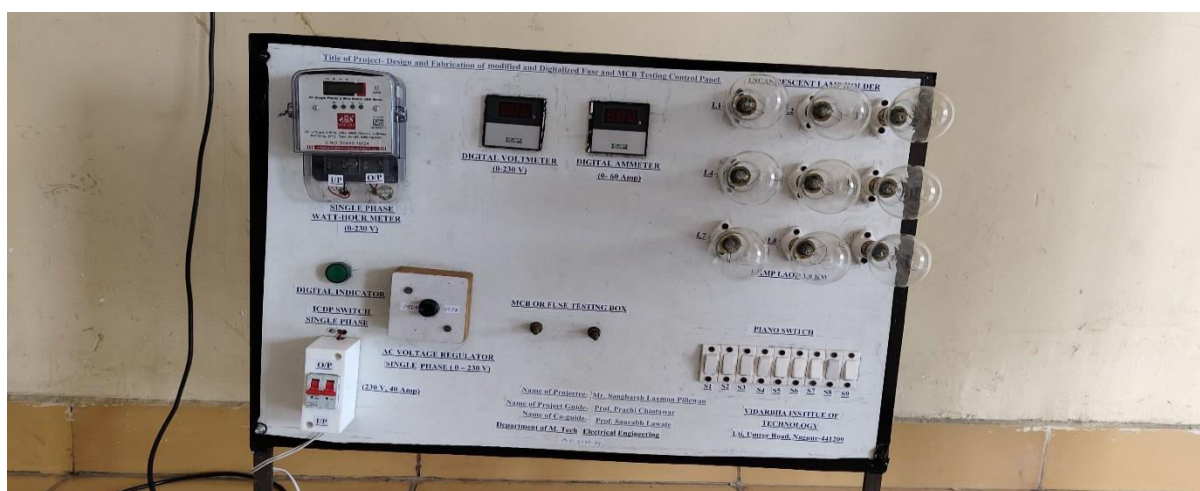


Fig. III :- Experimental Result diagram is basic Design and Fabrication of Modified, Digitalised Fuse and MCB Testing Control Panel

IV. CONCLUSION

Control panels provide a critical interface between man and machine. By consolidating components like switches, indicators, relays, circuit breakers, transformers, and terminal blocks into one unit, they enable efficient control of complex machinery or systems. Understanding the different types of components. With this knowledge, engineers, and operators can better equipment themselves to ensure the safe, reliable, and efficient operation of their systems.

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