

DGJ-E3 Electric Technology Lab System

Technical Description

DGJ-E3 is designed for the experiments covering courses of “Electrical Circuit Analysis”, “Fundamentals of Electric Technology”, “Electrical Engineering”, “Digital/Analogue Electronics”, “Motor Control”, “PLC Control and Relay Control”, which addresses the requirements of colleges or vocational schools. This equipment consists of basic unit, optional experimental units and a desk with metal framework. The basic unit is equipped with functional blocks, which are power supply panel, instruments and timer & alarm recorder with the functions of lab service supervision. The optional experimental units are designed to perform different experiments in accordance with the curriculum and teaching programs. The equipment adopts modular concept, which makes it possible to configure and further extension to satisfy needs of individual requirements. Each unit is fully enclosed and with mimic diagrams on front panel to simplify the experimental connections. Choice of conventional analogue instruments or advanced intelligent instruments is provided. Safety has been paramount during the development of this equipment and every effort has been made to protect both the user and instruments.

Specification

- Power supply: 3-phase 380V \pm 10% 50Hz
- Environment temperature: -10 $^{\circ}$ C~+40 $^{\circ}$ C
- Power capacity: <200VA
- Weight: 200kg
- Dimensions: 176 \times 80 \times 163cm

Experiments

Basic experiments

- Usage of instruments and calculation of measuring error
- Means of error reduction in V/I measurements
- V-I characteristic plotting of linear & nonlinear circuit components
- Potential & voltage measuring and potential diagram plotting
- Proof of the Kirchhoff's Law and troubleshooting

- Proof of Superposition principle and troubleshooting⁺
- Equivalent transform between voltage source and current source ⁺
- Proof of Thévenin Theorem⁺
- Proof of Norton Theorem⁺
- Two-port network ⁺
- Proof of the Reciprocity Theorem⁺
- Observation & measurement of the typical electrical signal ⁺
- Response testing of first-order RC circuits⁺
- Response testing of Second-order dynamic circuit ⁺
- Impedance characteristic measurement of RLC components⁺
- Characteristic measurement of RC series/parallel frequency selective network ⁺
- Research on RLC series resonant circuit ⁺
- Equivalent parameters measurement of AC circuits using three-meter method ⁺
- Research on the vector of sinusoidal steady-state AC circuits (fluorescent lamp power factor improvement) ⁺
- Mutual inductance⁺
- Characteristic measurement of single-phase iron-core transformer ⁺
- Voltage and current measurement of 3-phase AC circuits⁺
- Power measurement of 3-phase circuits⁺
- Verification of the single-phase wattmeter ⁺
- Measurement of power factor and phase sequence ⁺

Extended experiments⁺

- Digital circuits⁺
- Analog circuits⁺
- Motor characteristics⁺
- Motor and drive⁺