

BASIC ELECTRICAL ENGINEERING BOX

Mod. CBE-1/EV

MS

INTRODUCTION

This equipment is designed for an easy basic learning of general electrical engineering, of electrical installations and measurements.

It supplies the means for testing basic laws and principles thanks to the available electrical components that can be connected with each other in different configurations.



Symbols and wiring diagrams of each component are clearly represented on the fore panel of the equipment for an easy reference. Connections are made easier by standardized terminals and by very flexible leads of different colours.

All the necessary supply voltages for tests are available in the equipment and they all are safety extra-low voltages to avoid any risk of electrical accident.

Main experiments that can be carried out:

Measurement of voltages, currents and power

- Diode rectifiers and filters
- Ohm's law
- Kirchhoff's and Thévenin's laws
- Ohmic / inductive / capacitive circuits
- Studying transformers
- Essential lighting installations
- Sound and light signalling installations

TRAINING PROGRAM:

GENERAL ELECTRICAL ENGINEERING AND MEASUREMENTS

- Measurements of alternating current and voltage
- Connecting diodes with various configurations
 - half-wave rectifier
 - full-wave rectifier
 - Graetz bridge rectifier
 - Voltage doublers
- Measurements of direct current and voltage
- Connecting resistors with various configurations
 - measurements of resistance
 - testing Ohm's law
 - resistors in series, voltage divider
 - resistors in parallel, current divider
 - resistors in series and in parallel
 - maximum power transfer
 - Kirchhoff's laws
 - Superposition principle
 - Thévenin's theorem

- Measurements of power
 - measurement of DC power
 - Joule's law
 - AC power
- Connecting capacitors with various configurations
 - charging and discharging a DC capacitor
 - DC capacitors in series
 - DC capacitors in parallel
- Electromagnetic phenomena
 - inductance of a coil
 - coils in series
 - coils in parallel
- Ohmic / inductive / capacitive circuits
 - RC circuit
 - RL circuit
 - Series resonant circuit
 - Parallel resonant circuit
 - Q-factor
 - Coupled circuits
 - attenuators
- Transformers
- Smoothing filters
 - inductive input
 - capacitive input
 - LC filter

ELECTRICAL INSTALLATIONS

- Lighting a lamp by switch
- Lighting more lamps by changeover switch
- Lighting a lamp by two-way switches
- Lighting a lamp by two-way switches and inverters
- Lighting system of a hotel room
- Lighting system of archives
- Lighting one or more lamps by switch relay
- Changeover switch relay
- Sound signalling
- Light signalling
- Sound/light signalling
- Impulse remote control of a power consuming device by relay
- Self-holding remote control

TECHNICAL SPECIFICATIONS:

Framework is made of press formed sheet steel chemically treated and painted with several coats of epoxy varnish. The panel of schematic diagram is made of insulating material. The equipment is also provided with a key-locked drawer that includes all the accessories.

Main components installed:

Main switch, fuse and warning light

- 1 single-phase safety transformer – 115-230 V / 6-12-24 Vac 1 A
- 2 fuse-holders with fuses type 6x30 of 1 A
- 1 moving-iron ammeter with ranges of -0.5 – 1 A ac/dc
- 1 moving-iron voltmeter with range of -25 Vac/dc
- 10 resistors of different values (2 Ω , 4 Ω , 8 Ω , 16 Ω , 31 Ω , 5 Ω , 63 Ω , 250 Ω , 500 Ω , 1000 Ω , 2000 Ω)
- 1 linear rheostat of 100 Ω - 25 W
- 4 diodes of 6 A – 100 V
- 2 lamp-sockets with warning lights of 24 V
- 1 ringer of 24 Vac
- 1 electrolytic capacitor of 100 μ F – 25 Vdc
- 2 electrolytic capacitors of 500 μ F – 25 Vdc
- 2 coils of 60 mH – 0.5 A
- 2 pushbuttons of general use
- 2 two-way switches of general use
- 1 inverter of general use
- 1 two-exchange contact relay, coil of 24 Vac
- 1 stepper relay, coil of 24 Vac

Dimensions: 495 x 430 x 130 mm

Net weight: 10 kg

SUPPLIED ACCESSORIES:

- 25 cables of various size with plugs of 4 mm
- 1 single-phase power cord with socket and plug

POWER SUPPLY:

230 V single-phase 50-60 Hz - 25 VA

THEORETICAL-EXPERIMENTAL HANDBOOKS

Application handbook with exercises.