CPE-EO2300

Electric Circuit & Electrophysics Trainer

FEATURES

- Designed to give effective hands-on practice on basic principles of physics and electrical engineering
- Focuses on realistic experiments to verify theories instead of numerical expression and explanation of complex physical phenomena
- Capable of verifying basic principles of electrophysics through the circuit configuration practices
- Modularized structure with a module rack for easy attachment and detachment of modules
- Highly durable and rigid worktable in steel beam structure
- Light weight and durable experimental modules based on the plastic injection mold
- Module storage box allowing user convenience in keeping the experimental modules safe
- Low-noise locking casters for convenient relocation of the training system
- Supports easier circuit configuration by the circuit diagrams printed on each module
- Provides power for circuit practices through the power supply module

INTRODUCTION

The CPE-EO2300 Electric Circuit & Electrophysics Trainer not only enhances learning the basic concepts in physics but also treats broad topics of electrical engineering such as interpretation of the AC and DC circuits, electrostatic induction phenomenon, characteristics of rectifier circuit, and single-phase inverter and 3-phase inverter.

The CPE-EO2300 Electric Circuit & Electrophysics Trainer does not focus on expression of numerical formula nor explanation of complex physical phenomena. It is designed to give effective hands-on practice on principles and applications of electricity in linkage with theories.

EXPERIMENTAL CONTENTS

- Charging/discharging curve of capacitors
- Characteristics of capacitors in series or parallel connection
- Characteristics of capacitors in AC and DC
- Characteristics of DC voltmeter and ammeter
- Ohm's Law
- Characteristics of resistors in series or parallel connection
- Wheatstone bridge circuits
- Shunt resistance
- Maximum power transmission
- Internal resistance of power source
- Characteristics of power source in series or parallel connection
- Characteristics of transformers
- Single-phase transformer and low-voltage transformer
- Autotransformer
- Permanent magnet
- 3-phase transformer
- Wire connection (Y, △) on transformer
- Uniform and non-uniform loads of transformer
- 3-phase rectifier circuit
- Full wave rectifier circuit
- RC / RL / RLC circuit in series or parallel connection
- Coil in series or parallel connection
- RL and RC filters
- Magnetic field effects
- Characteristics of electromagnetism
- Magnetic induction
- Point effects
- Magnetoconductance
- Screen effects
- Uniform and non-uniform magnetic fields
- Capacitor effects

SPECIFICATIONS

I. Experimental table set

- Structure: Steel beam (painted)
- Dimension: 1600(W) x 750(D) x 820(H)mm
- Casters with a lock: 4ea (noise-reduction type)
- AC 220 power outlet: Installed on the surface of the table (flush type)
- Module rack: Double-deck structure enabling attachment and detachment of modules
- Module storage box: With hinged door and module storage slots

II. Power supply

- Variable DC power output: 0 ~ 30V 2A
  With built-in overload protection circuit
- Fixed DC power output: +5V, +15V, -15V
- Fixed AC power output: +6V, -6V, +7.5V, -7.5V, +9V, -9V, +12V, -12V
- Speaker : 0.25W
- Variable resistor: 4ea
- Input voltage: AC 220V
- 3Φ 380V power output (R, S, T, N), max. 5A

III. Experimental modules

- Number of modules: Standard type (M1~M9, OP1~OP4) - 13ea
- Dimension: 380(W) x 110(D) x 285(H)mm [standard type]

EXPERIMENTAL MODULES

List of Modules		Experimental Contents
	**CPE-EO2300-M01** **Capacitor**	Charging/Discharging curves of the capacitor
		Capacitor in series/parallel connection
		Characteristics of capacitor in AC/DC Circuit
	**CPE-EO2300-M02** **DC Circuit-1**	DC voltmeter
		DC ammeter
		Special resistance
		Wheatstone Bridge
		Ohm's Law
		Resistor in series/parallel connection
	**CPE-EO2300-M03** **DC Circuit-2**	Voltage divider
		Shunt resistor
		Maximum power transmission
		Voltage source in series/parallel connection
		Internal resistance of voltage sources
	**CPE-EO2300-M04** **Magnetic Induction - 1**	Principle of transformer
		Single-phase/Low-voltage transformer
		Current/Economy transformer
		Magnetic coupling
		Voltage generation with permanent magnets
	**CPE-EO2300-M05** **Magnetic Induction - 2**	High voltage transformer
		Voltage doublers with diodes
		Single-phase/Half-wave rectifier
		Center tap/Bridge rectifier
	**CPE-EO2300-M06** **Magnetic Induction - 3**	3-phase transformer
		Delta-Star connection
		Symmetrical/Non-symmetrical load
		3-phase/ Mid-phase rectifier circuit
		Full-wave rectifier circuit
	**CPE-EO2300-M07** **AC Circuit**	RC/RL/RLC series-parallel connection
		Coil series-parallel connection
		RL-RC High pass / Low pass
		Phase shift
	**CPE-EO2300-M08** **Magnetism-1**	Permanent magnets
		Magnetic force effects
		Principles of magnetism and electromagnet
		Self induction

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	**CPE-EO2300-M09** **Magnetism-2**	Point effect/Screening effect
		Homogeneous/Inhomogeneous electric fields
		Magnetic conductivity
		Capacitor effect
	**CPE-EO2300-OP1** **Power Supply**	Fixed DC power: +5V, +15V, -15V
		Fixed AC power: ±6V, ±7.5V, ±9V, ±12V
		Variable DC power: 0~30V
		3-Phase 380V power
		Speaker: 2.25 inches, 8 Ω, 0.25W
		Variable resistor: 4ea
	**CPE-EO2300-OP2** **Analog Meter**	DC Voltage meter: 5V/15V (FS: 1mA)
		DC Ammeter: 10mA/100mA (FS: 1mA)
		AC Voltage meter: 20V
		AC Ampere meter: 500mA
		AC voltage meter: 400V
		Galvano meter
	**CPE-EO2300-OP3** **High Voltage Output**	DC input voltage: 15V
		Output voltage: 2kV, 4kV, 6kV, 8kV, 10kV (5 steps)
		Power switch
	**CPE-EO2300-OP4** **Electrometer**	DC input voltage: 15V
		Power selector switch: 5V, 10V, 50V, 100V
		Input impedance: $\geq 10^{12}\Omega$
		Output capacitance: ≤ 100pF
		BNC cable

* Note: The CPE-2300-OP1 Power Supply Module is required for conducting experiments with one of three modules: CPE-EO2300-M4, CPE-EO2300-M5 or CPE-EO2300-M6 module.

STANDARD ACCESSORIES

- Power cord: 1set
- 3-phase power cord: 1ea
- Insulated connection cable: 1set
- Non-insulated connection cable: 1set
- Aluminum case for static experiments: 1set
- User's guide manual & experimental manual : 1set

OPTIONS

- Oscilloscope (CPM-1005BE)
- Function generator (CPM-8210)
- Digital LCR meter (CPM-2840)
- Digital multimeter (CPM-8302A)