Order Code – 24257587.7
Power Electronics Trainer (Modular)

The Power Electronics Trainer is a versatile, modular training system designed to provide hands-on experience with a wide range of power electronics components and circuits. Ideal for educational institutions, this trainer allows students to explore and experiment with different power electronics configurations, offering a comprehensive understanding of both theoretical and practical aspects.

Power Supplies:

- **Fixed AC Supply:**
  - **18V-0V-18V and 12V-0V-12V on a single device:** This dual-output supply is perfect for driving AC circuits requiring balanced voltage inputs.
  - **Additional Outputs:**
    - **18V-0V-18V:** Standard output for various AC applications.
    - **0V-36V:** Adjustable output suitable for higher voltage AC experiments.
    - **12V-0V-12V:** Commonly used for low voltage AC circuits.
    - **0V-24V:** Provides flexibility for medium voltage applications.
    - **0V-220V:** Ideal for high voltage experiments, allowing for real-world simulation.
- **Fixed DC Supply:**
  - **DC Output Voltage:**
    - **+12V, -12V:** Bipolar DC supply for circuits requiring dual polarity.
    - **+5V:** Standard logic-level voltage supply, often used in digital circuits and microcontroller projects.

Digital Voltmeter:

- **DC Voltage Range:**
  - **200mV, 2V, 20V, 200V (up to 1000V):** A wide range of measurement capabilities, allowing for precise voltage readings across various DC circuits, from low signal levels to high voltage applications.
- **AC Voltage Range:**
  - **0V to 600V:** Designed to measure standard and higher AC voltages, making it suitable for both low and high-power applications.

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

Digital Ammeter:

- **DC Current Range:**
  - **200mV, 2V, 20V, 200V:** Capable of measuring a wide range of currents in DC circuits, from low power to high power applications.
- **AC Current Range:**
  - **0V to 400V (up to 1000V):** Suitable for current measurement in AC circuits, covering standard operational ranges as well as high current scenarios.

Components Mounted on the Panels:

- **SCR Assembly:**
  - **6 SCRs, 600V, 2A:** High-voltage silicon-controlled rectifiers ideal for controlling power in AC circuits.
- **MOSFET Assembly:**
  - **6 MOSFETs:** Metal-oxide-semiconductor field-effect transistors for high-efficiency switching in DC circuits.

Power Devices:

- **IGBT, MOSFET, and UJT:** Key semiconductor devices for exploring different switching and amplification characteristics in power electronics.
- **DIAC, TRIAC, and SCR:** Essential components for controlling AC power, enabling students to experiment with various triggering and control techniques.
- **Power Transistor:** A fundamental component for studying transistor-based power amplification.
- **Power Diode:** 8A diodes for high-current rectification and power management applications.

Capacitors on Board:

- A range of capacitors with different capacitance values, crucial for studying filtering, timing, and energy storage in power circuits.

Inductors on Board:

- Multiple inductors for examining inductance effects in AC circuits, including resonance and energy transfer in transformers.

Resistance on Board:

- Various resistors available to study voltage division, current limiting, and power dissipation in circuits.

Potentiometer:

- Adjustable resistors for fine-tuning circuit parameters, allowing for precise control over voltage and current settings.

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Load:

- **Lamp:** Provides a visual indication of power delivery in circuits, useful for basic load testing and demonstration.
- **DC Motor:** 12V motor for studying mechanical output and control in power electronics applications, particularly in motor drive experiments.

Firing Circuit on Board:

- **Line Synchronization Firing Control Circuit:** Ensures precise timing of thyristor triggering in AC circuits, synchronized with the AC supply.
- **PWM Firing Control Circuit:** Pulse-width modulation control for regulating power delivery in DC circuits, with frequency control options.
- **Triac Firing Control Circuit:** Dedicated circuit for experimenting with Triac triggering, commonly used in AC power control applications.

Documentation:

- **Teacher and Student Manual:** Comprehensive guides with detailed instructions and experiment setups, covering all possible experiments with the trainer. These manuals are designed to facilitate both teaching and self-learning, ensuring that users can fully utilize the trainer's capabilities.

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