

# Modular Basic Electricity Training System



Model: 400-000

DAC Worldwide's Modular Basic Electricity Training System (400-000) examines basic AC and DC electrical principles. Learners will explore how electricity is used for power and control in various sectors, including industrial, commercial and residential applications. The system covers industry-relevant skills, such as installing, operating, and troubleshooting AC and DC electrical circuits in a variety of applications.

This basic electrical training system includes voltage regulators, resistors, capacitors, inductors, toggle switches, indicator lamps, and much more. Learners will use these components to study topics such as voltage measurement, resistor circuits, power supply filters, and troubleshooting. This system utilizes industry-grade components, providing durability to stand up to frequent use, and to aid learners in becoming better prepared for the tasks they will encounter on the job.

## **Practice Hands-On Electrical Skills for Various Applications**

This Modular Basic Electricity Training System features a durable, flexible system mount, including a steel modular panel and rack/frame system, instrumentation, and component mounting surface. It includes a built-in circuit breaker and internal power supply and transformer, which creates working voltages of 24VAC/24VDC, as well as individual application panel assemblies and solderless, breadboard panels. Learners will use these components to practice hands-on skills, such as operating a clipper circuit, calculating voltage in an AC circuit, operating the full-wave bridge rectifier, using a potentiometer, and troubleshooting a DC voltage using a voltmeter.

In addition, the training system comes with instructor fault switches, allowing students to practice real-time troubleshooting skills, as well as over-sized primary components, which improves durability and provides protection from over-current accidents.

## **Hands-On Exercises and Learning Activities Lead to Realistic Results**

DAC Worldwide's Modular Basic Electricity Training System also features exercises and learning activities that focus more on results and less on secondary academic background information. This comprehensive training system offers more than 40 hours of instruction in basic electrical principles, circuits, and components, including topics on terminology, circuit design, component examination and testing, and background theory. The integrated course includes 43 activities, all of which include background information on the topic, hands-on experiments, and

related review questions.

## **Expand Training with Additional Electrical Options**

The Basic Electricity Training System is only one of DAC Worldwide's expansive electrical training products, including Electrical Generation Fundamentals Trainer ([490-000](#)), Motor Control Circuit Troubleshooting Trainer (440), and the Basic Analog Application Panel (460-192).

## **Student Training Manual and Textbook Included to Enhance Learning**

A copy of this course's Student Training Manual and Textbook are included with the training system. Sourced from the Exercises and Learning Activities, the Student Training Manual takes the technical content contained in the learning objectives, and combines it into one perfectly-bound book. The textbook, called *Electricity & Electronics*, presents clear objectives and performance standards for learners. If you would like to inquire about purchasing additional Student Training Manual or Textbooks for your program, please contact your local DAC Worldwide Representative for more information.

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## **FEATURES & SPECIFICATIONS**

- Modular panel and rack/frame system facilitating alternate module locations and allowing for system expansion in the future
- Each component panel assembly includes: a 1/8" aluminum panel face; epoxy silk-screened component nomenclature and symbols; riveted, 16-gauge, formed-steel enclosures; powder coating and instructor fault switches
- Provision for mounting of system on standard DAC mounting structures, or any standard 19" rack system
- On-board circuit breaker, internal power supply, and transformer, creating working voltages of 24VAC center tapped, or 24VDC
- Primary electrical components over-sized to improve durability and provide protection from over-current accidents
- Crating for shipment via motor freight

## **Package Includes:**

- #400 - Basic Electricity Training System
- #410-001 - Standard Patch Cord Set
- #600-102 - Sweep/Function Generator
- #400-113 - Oscilloscope

## **PRODUCT DIMENSIONS**

- **Product Dimensions**  
(L x W x H)

18 1/8in. x 14in. x 17 1/2in. (460 x 355 x 444 mm)  
25 lbs. (12 kg) approximate

**UTILITIES** 110/220 VAC, 50/60 Hz

**ACCESSORIES**

- Loose component kit including: (2) bar magnets, (1) component storage box, (1) magnetic reed switch, (1) nail, (1) spool of bell wire, (1) sealed box of iron filings, (1) D cell holder, (1) compass, (1) 6" acrylic rod, (1) rubbing cloth, (1) 6" wood dowel, (1) solderless breadboard (2" x 3"), (2) NPN transistors, (2) PNP Transistors, and (10) assorted resistors
- Banana plug patch cords
- Use/Activity Guide
- Textbook, *Electricity & Electronics, 10th Edition (Gerrish, Dugger, & Roberts)*

**OPTIONS**

- #945 - Sample Panel Support Assembly
- #050-E10 - Video series, 3-part, titled "Multimeters Explained" (Delmar/Thomson).
- #400-500 - Use/Activity Guide (additional copies)
- #560-037 - Electricity & Electronics, 10th Edition (additional copy)

**COURSE CONTENT** Topics include:

- Introduction to the DAC #400 Electricity Fundamentals Trainer
- Use of Digital Multimeter
- Calculation and Measurement of Voltages in Series and Parallel
- Identification of Resistors Values Using the Resistor Color Code
- Calculation and Measurement of Resistance in Series
- Calculation and Measurement of Resistance in Parallel
- Calculation and Measurement of Resistance in Series-Parallel
- Calculation and Measurement of Voltages, Current, and Power in a Series DC Circuit
- Calculation and Measurement of Voltages, Currents, and Power in a Parallel DC Circuit
- Calculation and Measurement of Voltages, Currents, and Power in a Series-Parallel DC Circuit
- Use of a Potentiometer to Vary Circuit Voltage
- Use of a Rheostat to Vary circuit Current

- Troubleshooting a Series DC Circuit Using a Voltmeter
- Troubleshooting a Series-Parallel Circuit Using a Voltmeter
- Observation of Magnetic Lines of Force
- Observation of Induced Magnetism
- Use of Oscilloscope
- Use of the Function Generator
- Observation of the Voltage and Current in Inductive DC Circuits
- Determination and Observation of the Time Constant of an Inductive DC Circuit
- Observation of the Voltage and Current in Capacitive DC Circuits
- Determination and Observation of the Time Constant of Capacitive DC Circuits
- Calculation and Measurement of the AC Parameters
- Observation of the Voltage and Current in Resistive AC Circuits
- Observation of the Voltage and Current in AC Circuits with Resistance and Inductance
- Observation of the Voltage and Current in AC Circuits with Resistance and Capacitive
- Calculation and Measurement of the Voltages, Currents, and Power in Series RLC AC Circuits
- Calculation and Measurement of the Voltages, Currents, and Power in Parallel RLC AC Circuits
- Calculation and Measurement of the Voltages, Currents, and Power in Series-Parallel RLC AC Circuits
- Use of RC Circuits in Pulse Shaping
- Design and Operation of Series and Parallel Resonant Circuits
- Determination of the Turns-Ratio of a Transformer
- Plotting the Characteristic Curve of a Diode
- Operation of a Clipper Circuit
- Operation of a DC Resistor Circuit
- Operation of an Amplitude Discriminator Circuit
- Operation of a Half-Wave Rectifier
- Operation of a Full-Wave Rectifier
- Operation of the Full-Wave bridge Rectifier
- Use of the Power Supply Filter
- Observation and Calculation of Voltage Regulation

- Operation of the Voltage Doubler Circuit

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