

Basic Power Electricity

The JobMaster® Basic Power Electricity Training teaches the specialized skills required for today's industrial technicians.

JobMaster provides a superior blended learning solution for automated manufacturing training by combining industrial-grade components with engaging e-learning content.

JobMaster courses are entirely skill-based, consisting of individual exercises that reproduce essential tasks performed by maintenance technicians, equipment operators, and machine repairmen.



Course List

Electrical Circuits

Electrical Circuits introduces students to concepts including lockout/tagout and safety; connecting circuits and measuring electrical quantities like voltage and current.

Course Outline

- Performing Lockout/Tagout
- Connecting a Basic Circuit
- Identifying Switches
- Connecting a Momentary Switch
- Connecting a Toggle Switch
- Identifying Sources of Electricity
- Measuring DC Voltage
- Constructing a Series Circuit
- Constructing a Parallel Circuit
- Applying DC Voltage Principles
- Testing an Electrolytic Cell
- Testing a Battery
- Testing a Thermocouple
- Testing a Photovoltaic (PV) Cell

Materials Required (sold separately)

JobMaster Learning Station
Power Control Panel: (120V)*

* International step-down transformer package (Order #10-PC09-0000) required for international applications.

Materials Included

Electrical Circuits, LearnMate course, Lab
Teachers' Guide

Digital Multimeter

(5) Flexponent™ panels:

- ◇ Panel E040: Switch, Lamp and Buzzer
- ◇ Panel E045: Sources of Electricity
- ◇ Panel E047: Heat and Light Source
- ◇ Panel E151: Series/Parallel Lamp Circuits
- ◇ Panel E152: Adjustable Power Supply

Hardware Specifications

■ Digital Multimeter

- ◇ True-rms
- ◇ CAT III 600 V safety rated
- ◇ AC/DC volts, millivolts, amps
- ◇ Continuity
- ◇ Resistance
- ◇ Diode test
- ◇ Capacitance
- ◇ Hz (V or A input)

■ Panel E040: Switch, Lamp and Buzzer

- ◇ Panel type: Single
- ◇ 1 87dB Piezo pulse buzzer
- ◇ 1 12V jumbo lamp
- ◇ 1 SPST toggle switch
- ◇ 1 DPDT toggle switch
- ◇ 1 NO pushbutton switch
- ◇ 1 NC push button switch

■ Panel E045: Sources of Electricity

- ◇ Panel type: Single
- ◇ 1 Encapsulated PV cell
- ◇ 1 J-type surface thermocouple
- ◇ 1 Battery box
- ◇ 4 D-cell batteries

■ Panel E047: Heat and Light Source

- ◇ Panel type: Single
- ◇ 1 Heat gun
- ◇ 1 Flashlight

■ Panel E151: Series/Parallel Lamp Circuits

- ◇ Panel type: Single
- ◇ 6 Miniature bulb sockets
- ◇ 3 3.7V@0.30A bulbs
- ◇ 3 6.3V@0.30A bulbs

■ Panel E152: Adjustable Power Supply

- ◇ Panel type: Single
- ◇ 1 8V/16V/24V transformer
- ◇ 1 1000uF 50V 20% axial-lead electrolytic capacitor
- ◇ 1 4A 50PIV bridge rectifier
- ◇ 1 100-ohm rheostat

Resistors & Conductors

Resistors and Conductors teaches circuit troubleshooting and testing skills including measuring resistance, calculating wire size and determining losses in a wire.

Course Outline

- Measuring Resistance
- Measuring Resistance in Series Circuits
- Measuring Resistance in Parallel Circuits
- Drawing and Reading Resistor Symbol
- Testing an Adjustable Resistor
- Measuring Wire Size
- Applying Resistance and Wire Size
- Calculating Wire Size
- Determining Losses in a Conductor

Materials Required (sold separately)

JobMaster Learning Station
Power Control Panel: (120V)*

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Prerequisite Courses

Electrical Circuits (EA01A)

Materials Included

Resistors and Conductors, LearnMate
course, Lab

Teachers' Guide

(1) Flexponent™ panel:

- ◇ Panel E042: Resistance

Hardware Specifications

■ Panel E042: Resistance

- ◇ Panel Type: Double
- ◇ 1 Wire gauge, US standard
- ◇ 1 Resistance coils package
- ◇ 1 Rheostat, 100ohm
- ◇ 1 5K-ohm linear taper potentiometer
- ◇ 1 10K-ohm linear taper potentiometer
- ◇ 1 50K-ohm linear taper potentiometer
- ◇ 1 Knob, hexagon
- ◇ 1 Resistor, wire wound, 10ohm, 5%, 5W, ceramic
- ◇ 1 Resistor, wire wound, 400ohm, 5%, 5W
- ◇ 1 Resistor, wire wound, 900ohm, 5%, 5W
- ◇ 1 Resistor, wire wound, 10kohm, 5%, 5W, ceramic
- ◇ 1 Resistor, carbon film, 15kohm, 5%, 1/4W

Industrial Power Electronics (continued)

LCR Circuits

LCR Circuits teaches the relationships between electrical properties such as inductance, capacitance and reactance.

Course Outline

- Discharge a Capacitor
- Testing a Capacitor
- Determining Capacitance
- Applying Capacitance Principles
- Applying Magnetic Principles
- Inducing a Magnetic Field
- Assembling an Electromagnet
- Applying Electromagnetic Principles
- Inducing Voltage
- Inducing DC Voltage
- Assembling & Operating Transformers
- Applying Inductance Principles
- Operating Electromagnets
- Drawing Inductance Symbols

Materials Required (sold separately)

JobMaster Learning Station
Power Control Panel: (120V)*

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Prerequisite Courses

Resistors and Conductors

Materials Included

LCR Circuits, LearnMate course, Lab Teachers' Guide

(5) Flexponent™ panels:

- ◇ Panel E029: Magnetism
- ◇ Panel E043: Capacitance
- ◇ Panel E044: Inductance
- ◇ Panel E057: Motor/Generator
- ◇ Panel E150: Relay/Contactor

Hardware Specifications

■ Panel E029: Magnetism

- ◇ Panel type: Single
- ◇ 1 Current meter, 100-0-100, 3.5" x 3.5"
- ◇ 1 Mini compass, 1-1/2" diameter

■ Panel E043: Capacitance

- ◇ Panel type: Single
- ◇ 1 Start capacitor, 88-106MFD, 110-125V
- ◇ 1 Capacitor, 100uf, 50V, axial, aluminum
- ◇ Capacitor, 2200uf, 25V, axial, aluminum
- ◇ 1 Capacitor, 3.3uf, 10V, axial, ceramic
- ◇ 1 Capacitor, 47uf, 25V, axial, aluminum
- ◇ 1 Run capacitor, 12.5 MFD, 370V

■ Panel E044: Inductance

- ◇ Panel type: Single
- ◇ 1 Primary-secondary coil
- ◇ 2 Bar magnets, 2"

■ Panel E057: Motor/Generator

- ◇ Panel type: Single
- ◇ 1 Motor/Generator
- ◇ 1 Cover, clear, 3.5" depth

■ Panel E150: Relay/Contactor

- ◇ Panel type: Single
- ◇ 1 Contactor, mini, 6A, 24V
- ◇ 1 Relay, 8 pin DPDT
- ◇ 1 Socket, relay, 8 pin
- ◇ 1 Solenoid, 24V, box frame

Ordering Information

Electrical Series - Curriculum & Panels (2 Student Packs)

Electrical Circuits	16-EA01A-1000
Electrical Circuits Additional Panels	16-EA01A-1001
Resistors & Conductors	16-EA01B-1000
Resistors & Conductors Additional Panels	16-EA01B-1001
LCR Circuits	16-EA01C-1000
LCR Circuits Additional Panels	16-EA01C-1001
Motors & Generators	16-EA01D-0000

Electrical Series - Hardware

JobMaster® Learning Station	10-LS00-0200
Single phase power control panel 120V	10-PC04-0000
Power Control Panel (220V) 3-Phase	10-PC06-0000
Portable Panel Storage rack	10-PPSU-0001

Electrical Series - Bundles

Basic Electrical Two-Sided Bench, includes content and panels	JM-BASE-ELEC
Electrical Control Systems Two Sided Bench, includes content and panels	JM-CTRL-SYSM
Industrial Power Electronics Two Sided Bench, includes content and panels	JM-POWR-ELEC
Complete Industrial Electronics Program, includes content and panels	JM-CMPL-ELEC

Motors and Generators

Motors and Generators delivers a complete understanding of phase relationships and the practical operation of motors and generators through activities including operating AC and DC generators, operating a series motor and demonstrating reactance and impedance.

Course Outline

- Operating a PMDC Motor
- Operating a DC Generator
- Operating an AC Generator
- Operating a Series Motor
- Demonstrating Principles of Reactance and Impedance
- Applying Phase Relationship Principles
- Illustrating Three-Phase Power
- Measuring AC Voltage

Materials Required (sold separately)

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Prerequisite Courses

LCR Circuits

Materials Included

Motors and Generators, LearnMate course, Lab Teachers' Guide

Contact Us:

intelitek 

Toll Free: 800-221-2763
Phone: 603-625-8600
Fax: 603-625-2137

Email:
info@intelitek.com
www.intelitek.com