



INDUSTRIAL WIRING TRAINING SYSTEM, MODEL 46102



Model 46102 - Shown with optional equipment

GENERAL DESCRIPTION

The Industrial Wiring Training System, Model 46102, is a hands-on training tool designed to train students for careers as electricians and electrical maintenance technicians. The system, which uses high-quality UL-listed components, faithfully reproduces an industrial environment where students can develop their skills in the installation and wiring of industrial electrical equipment, in compliance with the National Electrical Code® (NEC®). The system can also be used to teach students how to adjust and maintain industrial electrical equipment as well as enforce the safety rules to be followed when working at industrial sites.

The Industrial Wiring Training System is divided into two levels, each level being further divided into specific topics that deal with various aspects of industrial electrical equipment installation. The Industrial Wiring Training System – Level 1, Model 46102-20, provides the student with complete basic training as an electrician. It consists of the Mobile Workstation, Model 46801, the Three-Phase Power Bus, Model 46802, and the following three training equipment packages: Enclosures and Conduits, Electrical Wiring, and Electrical Power Distribution (Models 46810, 46811, and 46815, respectively).

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The Mobile Workstation is the basis of the system. It is a versatile bench where up to four training equipment packages can be used at the same time. This allows up to four students to work at the same time on a single workstation. The Three-Phase Power Bus is installed on the workstation to supply power to the training equipment that requires electrical power. Each of the training equipment packages provides hands-on training on a particular topic (e.g., enclosure and conduit installation).



Mobile Workstation with the Three-Phase Power Bus installed.

The Industrial Wiring Training System – Level 2, Model 46102-30, adds on to Level 1 to provide training in motor control equipment installation as well as a solid introduction to the maintenance of industrial electrical equipment. It consists of the following three training equipment packages: Three-Phase Motor Starters, AC Motor Drive, and DC Motor Drive (Models 46812 to 46814, respectively). Two optional industrial application packages, the Inertia Load, Model 46830, and the Blower Application, Model 46831, can be added to the Level-2 system to make it even more representative of the industrial environment. An optional Power Quality Analyzer, Model 46832, can also be added to analyze the performance of the AC motor controllers implemented.

Specialized tools not included with Level 1 and Level 2, such as hand benders of various sizes, a pipe threader, knock-out punches, a fish tape, a phase sequence indicator, etc., are required to perform the various tasks requested in the courseware. The Lab-Volt Enclosure and Conduit Tools, Model 46840, and Electrical Wiring Tools, Model 46841, are recommended. A set of basic tools (see list below) is also required. It must be purchased separately or supplied by the student.

- Safety Glasses and Leather Gloves
- Measuring Tape and Felt Pen
- Calculator
- Hacksaw and File
- Hammer
- Screwdriver Set
- Allen Key Set
- Diagonal Cutters
- Adjustable Wrenches (0-1")
- Ratchet Wrench and SAE Socket Set
- Electric Drill and Drill Set
- Level

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Courseware

The courseware for each of the training equipment packages consists of a student manual, supported by an electrical drawing set in most cases, and an instructor guide. A reference book from the National Center for Construction Education and Research (NCCER) is also included when required. Each student manual consists of a series of job sheets or work orders that ask the student to carry out different tasks performed by electricians. The corresponding instructor guide provides the lists of points that should be checked to assess the student work as well as notes that indicate how to conduct the course. All student manuals and instructor guides as well as the NCCER books are fully illustrated and color printed. All Lab-Volt student manuals, instructor guides, and electrical drawing sets are available as pdf files on a CD-ROM (P/N 37866-A0).



Typical courseware supplied with each training equipment package.

The student manuals and instructor guides are also available in three eLearning formats for users who prefer a computer-based approach:

- eSeries, facilitated by the Mind-Sight eLearning System¹.
- SCORM-based, designed to be hosted by a third-party, SCORM 1.2 compliant Management System.

- Stand-alone, available on CD-ROM. This format runs on a web browser and does not require any management system.

Consumables

Consumable goods such as outlet boxes, conduit, electric wire, etc. are required to perform the various tasks requested in the courseware. Lab-Volt offers a specific package of consumable goods for each of the training equipment packages of the Industrial Wiring Training System. Each specific package includes the consumable goods required for a student to complete the job sheets or work orders in the student manual of the corresponding training equipment package.

System's Modularity

Each of the training equipment packages contains all the electrical components and courseware required to cover a certain topic (e.g., enclosure and conduit installation) and is independent of the other training equipment packages. This modular approach allows the system to be configured so as to fit various training needs. The table below indicates the required and optional equipment for each training equipment package.

Required and Optional Equipment for Each Training Equipment Package

TRAINING EQUIPMENT PACKAGE	REQUIRED AND OPTIONAL EQUIPMENT						
	Model 46801 Mobile Workstation	Model 46802 Three-Phase Power Bus	Model 46840 Enclosure and Conduit Tools	Model 46841 Electrical Wiring Tools	Model 46830 Inertia Load	Model 46831 Blower Application	Model 46832 Power Quality Analyzer
Model 46810, Enclosures and Conduits	X		X				
Model 46811, Electrical Wiring	X	X	X	X			
Model 46812, Three-Phase Motor Starters	X	X	X	X	O		O
Model 46813, AC Motor Drive	X	X	X	X		O	O
Model 46814, DC Motor Drive	X	X	X	X			
Model 46815, Electrical Power Distribution	X		X				

X = Required

O = Optional

¹ See Product –> Mind-Sight at www.labvolt.com for more information about the Mind-Sight eLearning System.

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Basic Industrial Wiring Training System

The Basic Industrial Wiring Training System, Model 46102-10, is a simplified version of the Level-1 system described above. It consists of the Mobile Workstation, Model 46801, and the following two training equipment packages: Enclosures and Conduits, and Electrical Power Distribution (Models 46810 and 46815, respectively). This basic system allows the student to learn, via hands-on manipulations, how to perform the

basic tasks carried out by electricians working at industrial sites, such as enclosure installation, conduit bending, conductor installation, main distribution panel wiring, equipment grounding, etc. The basic system provides a totally safe training environment since no electric power is applied to the equipment, as is the case when electric power distribution equipment is installed in a new building. The basic system is truly ideal for students who begin studying to become electricians.

TABLE OF CONTENTS OF THE STUDENT MANUALS²

LEVEL 1

Total estimated lab time: 90 hours

Enclosure and Conduits (37866)

Estimated lab time: 30 hours

- Installing Metal Struts on the Mobile Workstation
- Installing Enclosures and Boxes on the Mobile Workstation
- Making Holes for Conduit Connections in Enclosure Walls
- Installing Flexible Metal Conduit
- Installing Liquidtight Flexible Nonmetallic Conduit
- Conduit Bending – 90° Bends
- Conduit Bending – Offsets
- Conduit Bending – Saddle Bends
- Installing Electrical Metallic Tubing
- Cutting, Reaming, and Threading Rigid Metal Conduit
- Installing Rigid Metal Conduit
- Feeding Conductors into Conduit
- Feeding Conductors into Conduit Using a Pulling Point

Electrical Power Distribution (38530)

Estimated lab time: 20 hours

- Installing a Main Distribution Panelboard
- Conduit Installation
- Conductor Installation
- Wiring of the Main Distribution Panelboard
- Installing a Downstream Distribution Panelboard

Electrical Wiring (37867)

Estimated lab time: 40 hours

- Over Head Door Installation – Part I
- Over Head Door Installation – Part II
- Enclosure and Box Installation
- Reading Electrical Drawings
- Wiring of the Motor Control Circuit
- Conduit Installation

- Conductor Installation
- Installation of the Safety Switch Handle on the Motor Control Enclosure
- Installation of the Motor Overload Reset Button on the Motor Control Enclosure
- Wiring of the Over Head Door Simulator
- Connection of the Over Head Door Simulator to the Power Lines
- Testing the Over Head Door Simulator

LEVEL 2

Total estimated lab time: 90 hours

Three-Phase Motor Starters (38527)

Estimated lab time: 50 hours

- Building a Magnetic Starter for a Three-Phase Induction Motor
- Adding Maintenance Control to the Magnetic Starter
- Adding Remote Control to the Magnetic Starter with Maintenance Control
- Installing a Soft Starter for a Three-Phase Induction Motor

AC Motor Drive (38528)

Estimated lab time: 25 hours

- Installing a Manual Starter for a Three-Phase Induction Motor
- Replacing the Manual Starter with an AC Motor Drive

DC Motor Drive (38529)

Estimated lab time: 15 hours

- Installing a DC Motor Drive

² All student manuals in the Industrial wiring Training System – Level 1 are available in both the job-sheet and work-order formats. All student manuals in the Industrial Wiring Training System – Level 2 are available in the work order format only.

LISTS OF EQUIPMENT

INDUSTRIAL WIRING TRAINING SYSTEM – LEVEL 1, MODEL 46102-20

QTY	DESCRIPTION	ORDERING NUMBER ³
1	Mobile Workstation with Three-Phase Power Bus	46801-10
1	Enclosures and Conduits	46810-00
1	Electrical Wiring	46811-00
1	Electrical Power Distribution	46815-00

INDUSTRIAL WIRING TRAINING SYSTEM – LEVEL 2, MODEL 46102-30

QTY	DESCRIPTION	ORDERING NUMBER
1	Three-Phase Motor Starters	46812-00
1	AC Motor Drive	46813-00
1	DC Motor Drive	46814-00

ADDITIONAL EQUIPMENT REQUIRED

QTY	DESCRIPTION	ORDERING NUMBER
1	Enclosure and Conduit Tools	46840-00
1	Electrical Wiring Tools	46841-00
1	Basic Tool Set (see General Description)	N/A ⁴

CONSUMABLES

QTY	DESCRIPTION	ORDERING NUMBER
1	Enclosure Consumables	46850-00
1	Conduit Consumables	46851-00
1	Electrical Wiring Consumables	46852-00
1	Electrical Power Distribution Consumables	46853-00
1	Three-Phase Motor Starter Consumables	46854-00
1	AC Motor Drive Consumables	46855-00
1	DC Motor Drive Consumables	46856-00

BASIC INDUSTRIAL WIRING TRAINING SYSTEM, MODEL 46102-10

QTY	DESCRIPTION	ORDERING NUMBER
1	Mobile Workstation	46801-00
1	Enclosures and Conduits	46810-00
1	Electrical Power Distribution	46815-00

OPTIONAL EQUIPMENT

QTY	DESCRIPTION	ORDERING NUMBER
1	Three-Phase Power Bus	46802-00
1	Inertia Load	46830-00
1	Blower Application	46831-00
1	Power Quality Analyzer	46832-00

³ The model numbers shown apply to the English 120-V version. Other versions are available. Refer to the Ordering Numbers section.

⁴ N/A = Not applicable.

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AVAILABLE eLEARNING COURSES AND FORMATS

QTY	DESCRIPTION	ORDERING NUMBER
1	eSeries Industrial Wiring Training System (requires Mind-Sight LMS)	46849-E0
1	SCORM Industrial Wiring Training System (requires third-party LMS)	46849-F0
1	Stand-alone Industrial Wiring Training System CD-ROM (no LMS)	46849-G0

MODULE DESCRIPTION

Model 46801 – Mobile Workstation

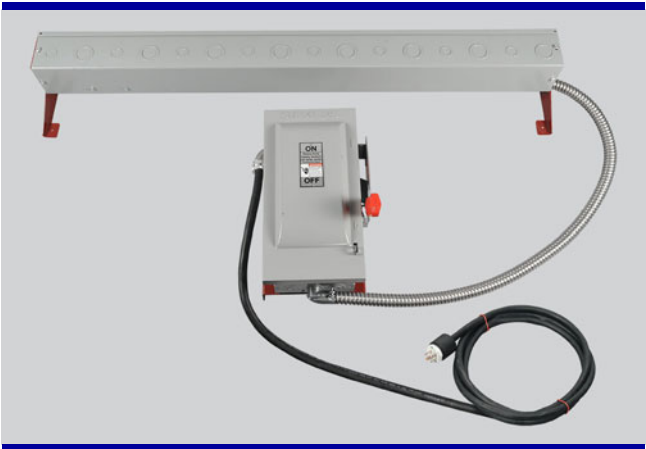


The Mobile Workstation is a versatile bench where up to four training equipment packages can be used at the same time, thereby allowing up to four students to be trained at the same time. It is constructed from heavy-duty metal struts and painted using powder-coated paint for durable surface. The unit is mounted on four swivelling casters with a lock mechanism to allow easy motion as well as stable operation, and sized to fit through standard door openings. The Mobile Workstation is provided with sufficient galvanized metal struts to allow installation of the electrical equipment (enclosures, conduits, outlet boxes, etc.) from four training packages.

Four identical training equipment packages can be installed on a Mobile Workstation dedicated to train students on a particular topic. On the other hand, four different training equipment packages can also be installed to provide training on various topics using a

single workstation. Any other combination of training equipment packages can also be used.

Model 46802 – Three-Phase Power Bus



The Three-Phase Power Bus is designed to be installed on the Mobile Workstation. It provides a source of three-phase power where the students can connect the electrical equipment setups they built. The Three-Phase Power Bus mainly consists of an input power cable, a three-pole safety (disconnect) switch, and a wiring trough.

The input power cable has 5 conductors of size No. 12 AWG, a 90°C temperature rating, water resistant insulation, and is terminated with a NEMA L21-20 plug.

The three-pole safety switch is of the heavy duty type, has a NEMA Type-1 enclosure, and has a built-in three-pole fuse holder. The safety switch handle has provision for the installation of a lockout/tagout device, included with the safety switch. Five padlocks and five danger tags are also included.

The wiring trough has a hinged cover, is made of steel painted grey as per ANSI 61 standard, and is approved as a NEMA Type-1 enclosure. It has a hinged cover and is provided with a grounding terminal block made of copper and four 5-port wire connectors.

The Three-Phase Power Bus also includes the flexible metal conduit (FMC), fittings, and conductors required to interconnect the three-pole safety switch and the wiring trough.

Model 46801-10 – Mobile Workstation with Three-Phase Power Bus



Mobile Workstation with the Three-Phase Power Bus installed.

This model includes the Mobile Workstation, Model 46801 and Three Phase Power Bus Model 46802. The Mobile Workstation comes already assembled with the Three Phase Power Bus installed.

Model 46810 – Enclosures and Conduits



The Enclosures and Conduits is a training equipment package that enables the student to learn, via hands-on manipulations, how to perform basic tasks carried out by electricians working at industrial sites, such as enclosure installation, conduit bending, conductor installation, etc.

The Enclosures and Conduits package includes dummy enclosures, dummy boxes of two different sizes, electric wire, and lengths of the following four types of conduit in sizes of both 1/2" and 3/4": flexible metal conduit (FMC), liquidtight flexible nonmetallic conduit (LFNC), electrical metallic tubing (EMT), and rigid metal conduit (RMC). The package also includes all the fittings and hardware required for the installation of these enclosures, boxes, and conduits.

The courseware for the Enclosures and Conduits package consists of a student manual, an instructor guide, the Electrical Level One – Trainee Guide (reference book) from the National Center for Construction Education and Research (NCCER), and a copy of the National Electrical Code® (NEC®).

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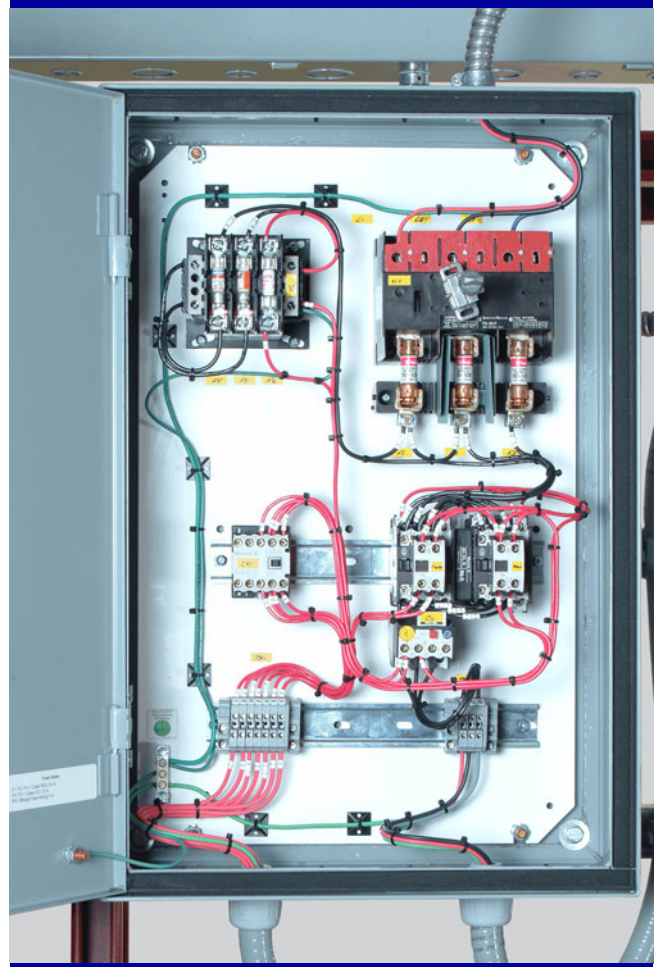
Model 46811 – Electrical Wiring



Electrical Wiring package shown with required Three-Phase Power Bus.

The Electrical Wiring is a training equipment package that consists of a project where the student is required to install, wire, and test a completely functional over head door simulator. This allows the student to greatly improve skills as an electrician as well as to learn and correctly execute the lockout/tagout procedures required by the Occupational Safety and Health Administration (OSHA) to ensure the safety of electricians working at industrial sites. The simulator provides a realistic simulation of a typical over head door system by means of a miniature wooden panel that slides up and down in a metal chassis mounted in an upright position on the Mobile Workstation.

The Electrical Wiring package includes the following main elements: a wooden door panel, a metal chassis, a door motor, all the electrical components required to build the door motor control circuit (industrial-type contactors, relays, terminal blocks, etc.), a motor control enclosure, upper and lower limit switches, a safety limit switch, a push-button control station, and a local junction box. The package also includes all the conduits, electric wire, fittings, and hardware required to build the over head door simulator.



Door motor control circuit assembled and wired.

The courseware for the Electrical Wiring package consists of a student manual, an instructor guide, and the Electrical Level Three – Trainee Guide (reference book) from the National Center for Construction Education and Research (NCCER). The student manual is supported by a set of 3D mechanical drawings that shows how to assemble the over head door simulator, as well as a complete set of electrical drawings including a schematic diagram, a motor control circuit connection diagram, an interconnection diagram, and a riser diagram.

Model 46812 – Three-Phase Motor Starters

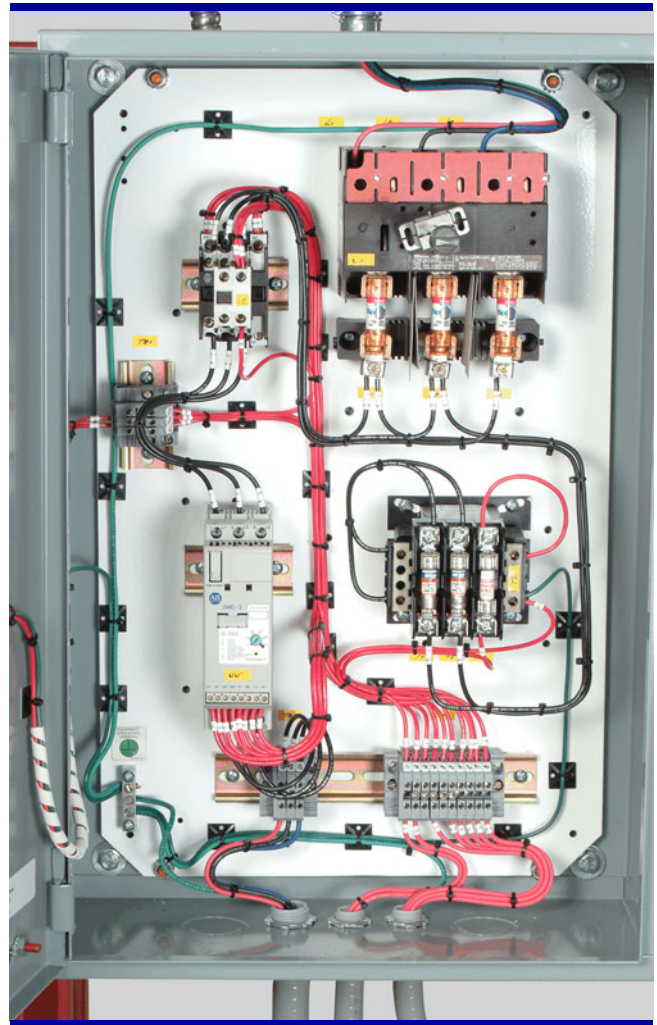


Three-Phase Motor Starters package shown with required Three-Phase Power Bus.

The Three-Phase Motor Starters is a training equipment package that provides the student with a basic knowledge of AC motor starters and a solid introduction to electrical equipment maintenance. The courseware of this package requests the student to install, wire, and test a completely functional magnetic starter for a three-phase induction motor, and then modify this starter to successively add maintenance control and remote control. The student is also instructed to install, wire, program, and test a soft starter for a three-phase induction motor.

The Three-Phase Motor Starters package includes a three-phase induction motor, all the electrical components required to build and modify the magnetic starter (industrial-type contactors, relays, terminal blocks, etc.), a soft starter, a motor control enclosure, two different push-button control stations, and an emergency-stop push-button. The package also includes all the

conduits, electric wire, fittings, and hardware required to build the magnetic starter and install the soft starter.



Soft starter assembled and wired.

The courseware for the Three-Phase Motor Starters package consists of a student manual and an instructor guide. The student manual is supported by a complete set of electrical drawings which includes schematic diagrams, motor control circuit connection diagrams, interconnection diagrams, and riser diagrams.

The Three-Phase Motor Starters package can be enhanced by adding the optional Inertia Load, Model 46830, and the Power Quality Analyzer, Model 46832. This additional equipment allows the student to measure the transient (starting) and steady-state motor's parameters and learn about the behavior of an induction motor driving a high-inertia load. This also enables the student to learn how to correctly adjust motor overload relays and the various operating parameters of soft starters.

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Model 46813 – AC Motor Drive



AC Motor Drive package shown with required Three-Phase Power Bus.

The AC Motor Drive is a training equipment package that provides the student with a basic knowledge of AC motor drives and a solid introduction to electrical equipment maintenance. The courseware of this package requests the student to install, wire, and test a manual starter for a three-phase induction motor. The student is then asked to replace the manual starter with an AC motor drive (a typical equipment maintenance case), program the AC drive, and test the system for correct operation.

The AC Motor Drive package includes a three-phase induction motor, a manual AC motor starter, an AC motor drive, a three-pole safety switch, a motor overload relay, two motor control enclosures, and various push-button switches. The package also includes all the conduits, electric wire, fittings, and hardware required to install the manual starter and the AC motor drive.



AC motor drive assembled and wired.

The courseware for the AC Motor Drive package consists of a student manual, an instructor guide, and the Electrical Level Four – Trainee Guide (reference book) from the National Center for Construction Education and Research (NCCER). The student manual is supported by a complete set of electrical drawings including schematic diagrams, motor control circuit connection diagrams, interconnection diagrams, and riser diagrams.

The AC Motor Drive package can be enhanced by adding the optional Blower Application, Model 46831, and the Power Quality Analyzer, Model 46832. This additional equipment allows the student to learn about the behavior of an induction motor driving a variable torque load, such as a blower, by measuring the transient (starting) and steady-state motor's parameters. This also enables the student to learn how to correctly adjust motor overload relays and various operating parameters of AC motor drives.

Model 46814 – DC Motor Drive



DC Motor Drive package shown with required Three-Phase Power Bus.

The DC Motor Drive is a training equipment package that provides the student with a basic knowledge of DC motor drives. The courseware of this package requests the student to install and test a DC motor drive.

The DC Motor Drive package includes a permanent magnet DC motor, a pulse-width modulated (PWM) DC motor drive, various electrical components (single-pole safety switch, fuse holder, Start/Stop switch, potentiometer, terminal blocks, etc.), and a motor control enclosure. The package also includes all the conduits, electric wire, fittings, and hardware required to install the DC motor drive.



DC motor drive assembled and wired.

The courseware for the DC Motor Drive package consists of a student manual and an instructor guide. The student manual is supported by a complete set of electrical drawings which includes a schematic diagram, a motor control circuit connection diagram, an interconnection diagram, and a riser diagram.

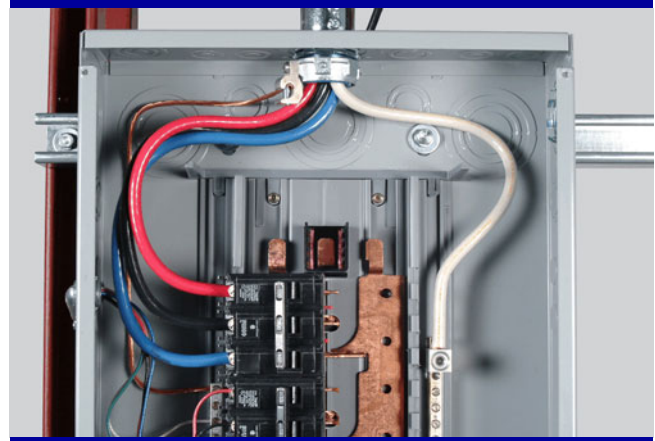
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Model 46815 – Electrical Power Distribution



The Electrical Power Distribution is a training equipment package that allows the student to learn, via hands-on manipulations, how to perform various tasks carried out by electricians when they install electric power distribution equipment (e.g., main distribution panel installation, conduit and conductor installation, main distribution panel wiring, equipment grounding, AC power outlet installation, subpanel installation, etc.).

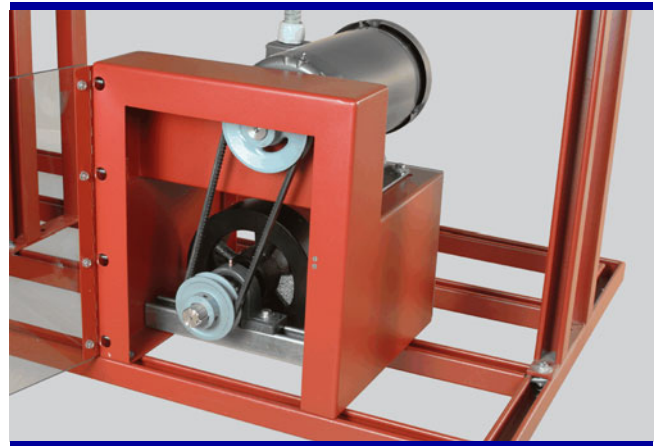
The package includes a main distribution panelboard, a downstream distribution panelboard (subpanel), conventional single-pole and three-pole circuit breakers, a Ground-Fault Circuit Interrupter (GFCI) single-pole circuit breaker, outlet boxes, single-phase and three-phase receptacles, conduits, and electric wire of different types and sizes. The package also includes all the fittings and hardware required for the installation of this equipment on the Mobile Workstation.



Wired main distribution panel.

The courseware for the Electrical Power Distribution package consists of a student manual, an instructor guide, and the Electrical Level Two – Trainee Guide (reference book) from the National Center for Construction Education and Research (NCCER). The student manual is supported by a complete set of electrical drawings which includes schematic diagrams, interconnection diagrams, and riser diagrams.

Model 46830 – Inertia Load



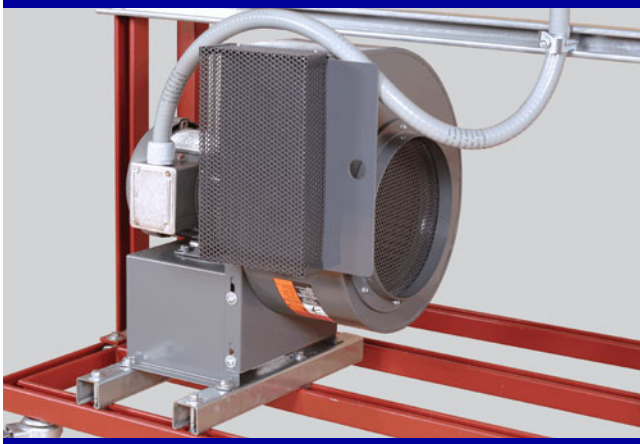
Inertia Load coupled to a drive motor.

The Inertia Load is an optional equipment that consists of a inertia wheel which can be coupled to a drive motor using a rubber belt. For safety purposes, the inertia wheel is enclosed in a metal case with a transparent front door that can be locked. The metal case also serves as a support for the drive motor. The Inertia Load comes with a set of 3D drawings that shows how to assemble the unit.

When used with the Three-Phase Motor Starters training equipment package, Model 46812, and the optional Power Quality Analyzer, Model 46832, the Inertia Load allows the student to measure the transient

(starting) and steady-state motor's parameters and learn about the behavior of an induction motor driving a high-inertia load. Optional manipulations in the student manual supplied with the Three-Phase Motor Starters package indicate how to mechanically couple the Inertia Load to the three-phase induction motor. Optional manipulations using the Inertia Load and the Power Quality Analyzer are also suggested in the instructor guide supplied with the Three-Phase Motor Starters package.

Model 46831 – Blower Application



Blower coupled to a drive motor.

The Blower Application is an optional equipment that consists of a high flow-rate blower like those used in ventilation systems of commercial and industrial buildings. The blower wheel is designed for direct coupling to the drive motor. For safety purposes, the inlet and outlet ducts of the blower are fitted with metallic screens. The outlet duct is also provided with a restriction plate that allows manual control of the air flow rate. The Blower Application comes with a set of 3D drawings that shows how to assemble the unit.

When used with the AC Motor Drive training equipment package, Model 46813, and the optional Power Quality Analyzer, Model 46832, the Blower Application allows the student to learn about the behavior of an induction motor driving a variable torque load, such as a blower, by measuring the transient (starting) and steady-state motor's parameters. Optional manipulations in the student manual supplied with the AC Motor Drive package indicate how to mechanically couple the blower to the three-phase induction motor. Optional manipulations using the Blower Application and the Power Quality Analyzer are also suggested in the instructor guide supplied with the AC Motor Drive package.

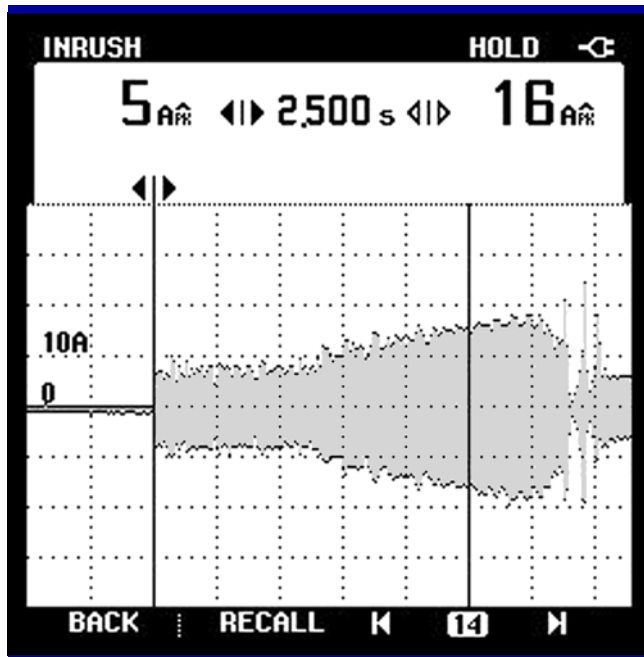
Model 46832 – Power Quality Analyzer



The Power Quality Analyzer is a sophisticated, easy-to-use, portable instrument that combines a power quality analyzer with a multimeter and an oscilloscope. It can be used to measure various motor parameters, such as the RMS voltage, peak starting current, power factor, current inrush duration, etc., as well as perform time and frequency domain analysis.

When used with the Three-Phase Motor Starters package and the Inertia Load (models 46812 and 46830, respectively) or the AC Motor Drive package and the Blower Application (models 46813 and 46831, respectively), the Power Quality Analyzer allows the student to learn about the behavior of an induction motor driving a mechanical load by measuring the transient (starting) and steady-state motor's parameters.

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Motor inrush current recorded with the Power Quality Analyzer.

The Power Quality Analyzer comes with an instruction manual that explains how to use it.

Model 46840 – Enclosure and Conduit Tools



This package contains specialized tools required to install enclosures and conduits as well as pass conductors into conduits. The following industrial-quality tools are provided.

- 1/2" and 3/4" conduit knockout punches
- flexible metal conduit (FMC) cutting tool
- liquidtight flexible nonmetallic conduit (LFNC) cutting tool
- 1/2" EMT hand bender with handle
- 3/4" EMT, 1/2" RMC hand bender with handle
- 1" EMT, 3/4" RMC hand bender with handle
- pipe vise
- pipe cutter
- hand reamer
- hand-operated ratchet threader with 1/2" and 3/4" NPT dies
- metal fish tape
- 1/4", 1/2", and 3/4" wire grips

The Enclosure and Conduit Tools package is required to perform the work orders in the student manual provided with the Enclosures and Conduits training equipment package, Model 46810. Several tools in this package are also required to perform the work orders in the student manuals provided with the other training equipment packages.

Model 46841 – Electrical Wiring Tools



This package contains specialized tools required to wire and test industrial electrical equipment. The following high-quality tools are provided.

- digital multimeter with clamp-on ammeter
- phase sequence indicator
- Pozidriv screwdriver #2

The Electrical Wiring Tools package is required to perform the work orders in the student manual provided with the Electrical Wiring training equipment package, Model 46811. This tool package is also required to perform the work orders in the student manuals provided

with all other training equipment packages except the Enclosures and Conduits package, Model 46810.

Model 46850 – Enclosure Consumables

This package contains the dummy enclosures and boxes required for a student to perform the work orders in the student manual provided with the Enclosures and Conduits training equipment package, Model 46810. Refer to the Specifications section for the quantity of each item supplied.

Model 46851 – Conduit Consumables

This package contains sufficient lengths of the various types of conduits (FMC, LFNC, EMT, and RMC) required for a student to perform the work orders in the student manual provided with the Enclosures and Conduits training equipment package, Model 46810. Refer to the Specifications section for the quantity of each item supplied.

Model 46852 – Electrical Wiring Consumables

This package contains the various consumable goods required for a student to build the over head door simulator described in the work orders of the student manual provided with the Enclosures and Conduits training equipment package, Model 46811. It includes sufficient lengths of conduit and copper wire, a retractile cord, crimped lugs, cable ties, cable tie mounts, a wire marking tape set, a label sheet, a motor control enclosure (MCE) mounting plate, a DIN rail, terminal block element identifiers, and MCE blank plates. Refer to the Specifications section for the quantity of each item supplied.

Model 46853 – Electrical Power Distribution Consumables

This package provides the various consumable goods required for a student to perform the work orders in the student manual provided with the Electrical Power Distribution training equipment package, Model 46815. It includes sufficient lengths of conduit, copper wire, and metal-clad cable, grounding clips, cable ties, and a label sheet. Refer to the Specifications section for the quantity of each item supplied.

Model 46854 – Three-Phase Motor Starter Consumables

This package provides the various consumables goods required for a student to perform the work orders in the student manual provided with the Three-Phase Motor Starters training equipment package, Model 46812. It includes sufficient lengths of conduit and copper wire, crimped lugs, cable ties, cable tie mounts, a wire marking tape set, spiral wrap, a label sheet, an MCE mounting plate, a DIN rail, and terminal block element identifiers.

Refer to the Specifications section for the quantity of each item supplied.

Model 46855 – Electrical Wiring Consumables

This package provides the various consumables goods required for a student to perform the work orders in the student manual provided with the AC Motor Drive training equipment package, Model 46813. It includes sufficient lengths of conduit and copper wire, crimped lugs, cable ties, cable tie mounts, a wire marking tape set, spiral wrap, a label sheet, an MCE mounting plate, a DIN rail, a terminal block rail, and a terminal block element identifier strip. Refer to the Specifications section for the quantity of each item supplied.

Model 46856 – Electrical Wiring Consumables

This package provides the various consumables goods required for a student to perform the work order in the student manual provided with the DC Motor Drive training equipment package, Model 46814. It includes sufficient lengths of conduit, copper wire, and four-wire shielded cable, crimped lugs, insulating sleeve, cable ties, cable tie mounts, a wire marking tape set, spiral wrap, a label sheet, an MCE mounting plate, a DIN rail, and terminal block element identifiers. Refer to the Specifications section for the quantity of each item supplied.

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SPECIFICATIONS

Model 46102 – Industrial Wiring Training System		
Power Requirement	Voltage/Frequency	120/208 V - 60 Hz
	Current	17.5 A
Electrical Distribution System		20 A, 3 phases, 5 wires, star (wye) configuration, including neutral and ground wires
Physical Characteristics	Space Required	15 m ² (160 ft ²)
	Net Weight (approximative)	TBE
Model 46801 – Mobile Workstation		
Physical Characteristics	Dimensions (H x W x D)	1830 x 1980 x 800 mm (72 x 78 x 31 1/2 in)
	Net Weight	TBE
Model 46802 – Three-Phase Power Bus		
Three-Pole, Fused Safety Switch	Rating	240 V - 30 A - AC, 3 HP @ 240 V AC (3 phases)
	Fuses	RK5, 17.5 A, 250 V
Wiring Through Dimensions (H x W x D)		102 x 1220 x 102 mm (4 x 48 x 4 in)
Wire Connectors	Wire Size	No.4 to No.14 AWG
	Maximum Voltage	600 V
Model 46810 – Enclosures and Conduits		
Conduit Sizes		13 and 19 mm (1/2 and 3/4 in)
Model 46811 – Electrical Wiring		
Door Panel Dimensions (H x W x D)		464 x 254 x 19 mm (18 1/4 x 10 x 3/4 in)
Metal Chassis Dimensions (H x W x D)		880 x 280 x 32 mm (34 5/8 x 11 x 1 1/4 in)
Door Motor	Type	industrial, three-phase, gear induction motor
	Rating	1/2 HP, 208 V, 60 Hz, 43 r/min
	Full-Load Current	2.2 A
	Enclosure	totally enclosed fan-cooled (TEFC)
	Shaft Diameter	19 mm (3/4 in)
Motor Control Enclosure	Type	NEMA Type 1
	Dimensions (H x W x D)	600 x 400 x 200 mm (23 1/2 x 15 3/4 x 7 3/4 in)
Three-Pole, Fused Safety Switch	Rating	600 V - 30 A - AC, 10 HP @ 230 V AC (3 phases)
	Fuses	RK5, 3.5 A, 250 V
Three-Pole Contactors	Main Contact Rating	20 A @ 600 V AC, 3 HP @ 230 V AC (3 phases)
	Auxiliary Contact Rating	15 A @ 600 V AC
	Coil Rating	120 V, 60 Hz
Control Relay	Contact Rating	10 A @ 600 V AC
	Coil Rating	120 V, 60 Hz
Thermal Overload Relay Current Setpoint Range		1.6 to 2.4 A AC
Control Voltage Transformer Rating		208/120 V, 80 VA, 60 Hz
Upper and Lower Limit Switches	Contact Rating	5 A @ 130 V AC
	Contact Arrangement	1 normally open, 1 normally closed
Safety Limit Switch	Contact Rating	15 A @ 125 V AC
	Contact Arrangement	1 normally open and 1 normally closed in SPDT configuration
Push-Button Station	Contact Rating	5 A @ 240 V AC
	Enclosure	NEMA Type 1

Model 46812 – Three-Phase Motor Starters		
Three-Phase Induction Motor	Type	industrial
	Rating	3 HP, 208 V, 60 Hz, 1750 r/min
	Full-Load Current	8.3 A
	Enclosure	totally enclosed fan-cooled (TEFC)
	Shaft Diameter	29 mm (1 1/8 in)
Motor Control Enclosure	Type	NEMA Type 1
	Dimensions (H x W X D)	600 x 400 x 200 mm (23 1/2 x 15 3/4 x 7 3/4 in)
Three-Pole, Fused Safety Switch	Rating	600 V - 30 A - AC, 10 HP @ 230 V AC (3 phases)
	Fuses	RK5, 15 A, 250 V
Three-Pole Contactors	Main Contact Rating	20 A @ 600 V AC, 3 HP @ 230 V AC (3 phases)
	Auxiliary Contact Rating	15 A @ 600 V AC
	Coil Rating	120 V, 60 Hz
Control Relay	Contact Rating	10 A @ 600 V AC
	Coil Rating	120 V, 60 Hz
Thermal Overload Relay Current Setpoint Range		6 to 10 A AC
Control Voltage Transformer Rating		208/120 V, 80 VA, 60 Hz
Soft Starter	Rating	16 A, 480 V, AC, 3 phases, 50/60 Hz
	Modes of Operation	soft start, current-limit start, kick start, soft stop
	Built-In Protections	motor overload, phase reversal, phase loss, phase imbalance, device over temperature
Push-Button Switch Contact Rating		10 A @ 600 V AC
Selector Switch Contact Rating		10 A @ 600 V AC
Emergency-Stop Push-Button Switch Contact Rating		10 A @ 600 V AC
Model 46813 – AC Motor Drive		
Three-Phase Induction Motor	Type	industrial, inverter duty
	Rating	1/2 HP, 208 V, 1800 r/min
	Full-Load Current	2.3 A
	Constant-Torque Speed Range	10 to 1
	Enclosure	totally enclosed fan-cooled (TEFC)
	Shaft Diameter	13 mm (1/2 in)
Motor Control Enclosure	Type	NEMA Type 1
	Dimensions (H x W X D)	600 x 270 x 175 mm (23 1/2 x 10 5/8 x 7 in)
Three-Pole, Fused Safety Switch	Rating	240 V - 30 A - AC, 3 HP @ 240 V AC (3 phases)
	Fuses	RK5, 3.5 and 6.25 A, 250 V
Manual Starter	Rating	240 V - 2.5 A - AC, 1/2 HP @ 240 V AC (3 phases)
	Thermal Overload Current Setpoint Range	1.6 to 2.5 A AC
AC Motor Drive	Rating	230 V - 3 A - AC, 1/2 HP @ 230 V AC (3 phases)
	Type	pulse width modulation (PWM)
	Current Overload Rating	150% for 60 s, 250% peak
	Output Frequency Range	1.5 to 400 Hz
	Controlled Frequency Range	40 to 1
	Frequency Resolution	0.01 Hz (with digital reference)
	Frequency Accuracy	0.01% (with digital command)
	Efficiency	95%
Displacement Power Factor		0.98

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Model 46813 – AC Motor Drive (cont'd)		
	Main Features	V/f control, 79 digitally programmed parameters, motor and drive overload protection
Thermal Overload Relay Current Setpoint Range		1.6 to 2.4 A AC
Push-Button Switch Contact Rating		10 A @ 600 V AC
Selector Switch Contact Rating		10 A @ 600 V AC
Model 46814 – DC Motor Drive		
DC Motor	Type	industrial, permanent magnet
	Rating	1/2 HP, 90 V, 1750 r/min
	Full-Load Current	5.2 A
	Enclosure	totally enclosed fan-cooled (TEFC)
	Shaft Diameter	16 mm (5/8 in)
Motor Control Enclosure	Type	NEMA Type 1
	Dimensions (H x W x D)	600 x 400 x 200 mm (23 1/2 x 15 3/4 x 7 3/4 in)
Single-Pole Safety Switch Rating		600 V - 12 A - AC, 1 HP @ 115 V
DC Motor Drive	Input Rating	115 V - 15 A - AC
	Output Rating	10 A @ 90 V DC, 1.2 HP
	Type	pulse width modulation (PWM)
	Operating Frequency	>16 kHz
	Speed Range	50 to 1
Fuse Holder	Rating	30 A, 600 V
	Fuses	class CC, 12 A, 600 V
Selector Switch Contact Rating		10 A @ 600 V AC
Speed Control Potentiometer Rating		4.7 kΩ, 0.5 W, 250 V
Model 46815 – Electrical Power Distribution		
Main Distribution Panel Rating		100 A, 240 V, 3 phases, wye, 4 wires + ground
Downstream Distribution Panel Rating		125 A, 240 V, 3 phases, wye, 4 wires + ground
Conduits	Type	electrical metallic tubing (EMT)
	Sizes	13, 32, and 38 mm (1/2", 1 1/4", and 1 1/2")
Single-Pole Circuit Breaker Rating		15 A, 240 V, AC
Single-Pole, GFCI Circuit Breaker Rating		15 A, 240 V, AC
Three-Pole Circuit Breaker Rating		15 A, 60 A, and 100 A, 240 V, AC
Dual Receptacle Rating		15 A, 120 V, AC
Three-Phase Receptacle Rating		20 A, 120/208 V, 3 phase, wye (NEMA L21-20)
Model 46830 - Inertia Load		
Inertia Wheel	Diameter	215 mm (8 1/2 in)
	Thickness	57 mm (2 1/4 in)
	Shaft Diameter	29 mm (1 1/8 in)
	Moment of Inertia	0.066 kg·m ² (0.049 lb·ft·s ²)
Physical Characteristics	Dimensions (H x W x D)	430 x 380 x 380 mm (17 x 15 x 15 in)
	Net Weight	TBE
Model 46831 – Blower Application		
Blower Wheel	Diameter	230 mm (9 in)
	Shaft Bore Diameter	13 mm (1/2 in)
Air Inlet Diameter		230 mm (9 in)
Air Outlet Dimensions (H x W)		275 x 165 mm (10 3/4 x 6 1/2 in)
Physical Characteristics	Dimensions (H x W x D)	495 x 450 x 430 mm (19 1/2 x 17 3/4 x 17 in)

Model 46831 – Blower Application (cont'd)		
	Net Weight	TBE
Model 46832 – Power Quality Analyzer		
Functions		multimeter, power meter, oscilloscope, harmonic analyzer, transients and inrush current recorder
Input	Impedance	1 M Ω , 20 pF
	Maximum Voltage	600 V rms, CAT III
Multimeter	True RMS Voltmeter Ranges	5.000 V, 50.00 V, 500.0 V, 1250 V
	True RMS Voltmeter Accuracy	$\pm(1\% + 10 \text{ counts})$
	True RMS Ammeter Ranges	50.00 A, 500.0 A, 5.000 kA, 50.00 kA
	True RMS Ammeter Accuracy	$\pm(1\% + 10 \text{ counts})$
	Frequency Meter Ranges	10.0 Hz to 15.0 kHz
	Frequency Meter Accuracy	$\pm(0.5\% + 2 \text{ counts})$
	Ohmmeter Ranges	500.0 Ω , 5.000 k Ω , 50.00 k Ω , 500.0 k Ω , 30.00 M Ω
	Ohmmeter Accuracy	$\pm(0.6\% + 5 \text{ counts})$
	Capacitance Meter Range	50.00 nF, 500.0 nF, 5.000 μ F, 50.00 μ F
	Capacitance Meter Accuracy	$\pm(2\% + 10 \text{ counts})$
Power Meter	Ranges	250 W to 1.56 GW
	Accuracy (fundamental)	$\pm(4\% + 4 \text{ counts})$
	Accuracy (total power)	$\pm(2\% + 6 \text{ counts})$
	Power Factor Meter Range	0 to 1
	Power Factor Meter Accuracy	$\pm 0.04\%$
Oscilloscope	Time Base	20 ns/DIV to 60s/DIV
	Vertical Sensitivity	5 mV/DIV to 500 V/DIV
	Voltage Measurement Bandwidth	20 MHz
	Current Measurement Bandwidth	15 kHz
Harmonic Analyzer	Ranges	fundamental to 51st harmonic
	Accuracy (fundamental)	VA $\pm(3\% + 2 \text{ counts})$, W $\pm(5\% + 2 \text{ counts})$
	Accuracy (2nd to 31st harmonics)	VA $\pm(5\% + 3 \text{ counts})$, W $\pm(10\% + 10 \text{ counts})$
	Accuracy (32nd to 51st harmonics)	VA $\pm(15\% + 5 \text{ counts})$, W $\pm(30\% + 5 \text{ counts})$
	Fundamental Frequency Range	40 to 70 Hz
	Fundamental Frequency Accuracy	$\pm 0.25 \text{ Hz}$
Transients Recorder	Minimum Pulse Width	40 ns
	Useful Bandwidth	1 MHz
Inrush Current Recorder	Time Range	1 s, 5 s, 10 s, 50 s, 100 s, 5 min
	Current Range	1 A, 5 A, 10 A, 50 A, 100 A, 500 A, 1000 A
Physical Characteristics	Dimensions (H x W x D)	232 x 115 x 50 mm (9 1/8 x 4 1/2 x 2 in)
	Net Weight	1.1 kg (2.4 lb)
Model 46850 – Enclosure Consumables		
Dummy Enclosure		3
Dummy Box		1
Dummy Box (small)		1
Model 46851 – Conduit Consumables		
1/2" Flexible Metal Conduit		1.0 m (3.0 ft)
3/4" Flexible Metal Conduit		3.0 m (10.0 ft)
1/2" Liquidtight Flexible Nonmetallic Conduit		1.0 m (3.0 ft)
3/4" Liquidtight Flexible Nonmetallic Conduit		3.0 m (10.0 ft)

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Model 46851 – Conduit Consumables (cont'd)	
1/2" Electrical Metallic Tubing (1.5-m/5-foot length)	6
3/4" Electrical Metallic Tubing (1.5-m/5-foot length)	10
1/2" Rigid Metal Conduit (1.5-m/5-foot length)	2
3/4" Rigid Metal Conduit (1.5-m/5-foot length)	4
Model 46852 – Electrical Wiring Consumables	
MCE Mounting Plate	1
MTW Wire No. 14 AWG (black)	6.0 m (19.7 ft)
MTW Wire No. 16 AWG (red)	12.0 m (39.4 ft)
MTW Wire No. 16 AWG (green)	2.0 m (6.6 ft)
XHHW Wire No. 14 AWG (black)	7.6 m (25.0 ft)
XHHW Wire No. 14 AWG (red)	30.5 m (100 ft)
XHHW Wire No. 14 AWG (green)	12.2 m (40.0 ft)
XHHW Wire No. 14 AWG (blue)	7.6 m (25.0 ft)
6-ft (1.8-m) Retractable Cord (3 x No. 16 AWG)	1
Wire Marking Tape Set	1
3.5" (90-mm) Cable Tie (black)	100
6" (150-mm) Cable Tie (black)	2
Adhesive Back Cable Tie Mount	10
Terminal Block Element Identifier Set	1
36" (0.9-m) DIN Rail	1
Small-Size Label Sheet	1
7/32" Round Lug	6
9/32" Round Lug	2
1/2" Liquidtight Flexible Nonmetallic Conduit	6.1 m (20.0 ft)
3/4" Liquidtight Flexible Nonmetallic Conduit	2.4 m (8.0 ft)
1/2" Flexible Metal Conduit	2.0 m (6.6 ft)
Model 46853 – Electrical Power Distribution Consumables	
XHHW Wire No. 14 AWG (green)	2.4 m (8.0 ft)
THHN Wire No. 4 AWG (red)	1.5 m (5.0 ft)
THHN Wire No. 4 AWG (black)	1.5 m (5.0 ft)
THHN Wire No. 4 AWG (blue)	1.5 m (5.0 ft)
THHN Wire No. 4 AWG (white)	1.5 m (5.0 ft)
Bare Copper Wire No. 8 AWG	5.0 m (16.4 ft)
Metal-Clad Cable (3x No. 14 AWG)	4.0 m (13.1 ft)
Metal-Clad Cable (5x No. 14 AWG)	2.0 m (6.6 ft)
13.5" (34-cm) Cable Tie (white)	6
Grounding Clip	4
Large-Size Label Sheet	1
1/2" Electrical Metallic Tubing (1.5-m/5-foot length)	1
Model 46854 – Three-Phase Motor Starter Consumables	
MCE Mounting Plate	1
MTW Wire No. 14 AWG (black)	14.0 m (45.9 ft)
MTW Wire No. 16 AWG (red)	40.0 m (131 ft)
MTW Wire No. 16 AWG (green)	6.0 m (19.7 ft)
XHHW Wire No. 14 AWG (black)	13.7 m (45.0 ft)

Model 46854 – Three-Phase Motor Starter Consumables (cont'd)	
XHHW Wire No. 14 AWG (red)	67.0 m (220 ft)
XHHW Wire No. 14 AWG (green)	18.3 m (60.0 ft)
XHHW Wire No. 14 AWG (blue)	13.7 m (45.0 ft)
Wire Marking Tape Set	1
3.5" (90-mm) Cable Tie (black)	100
Adhesive Back Cable Tie Mount	10
1/4" Spiral Wrap	0.3 m (1.0 ft)
Terminal Block Element Identifier Set	1
36" (0.9-m) DIN Rail	2
Small-Size Label Sheet	1
7/32" Round Lug	2
9/32" Round Lug	2
1/2" Liquidtight Flexible Nonmetallic Conduit	7.6 m (25.0 ft)
3/4" Liquidtight Flexible Nonmetallic Conduit	2.4 m (8.0 ft)
1/2" Flexible Metal Conduit	2.0 m (6.6 ft)
Model 46855 – AC Motor Drive Consumables	
MCE Mounting Plate	1
MTW Wire No. 14 AWG (black)	12.0 m (39.4 ft)
MTW Wire No. 16 AWG (red)	14.0 m (45.9 ft)
MTW Wire No. 16 AWG (green)	4.0 m (13.1 ft)
XHHW Wire No. 14 AWG (black)	9.1 m (30.0 ft)
XHHW Wire No. 14 AWG (red)	9.1 m (30.0 ft)
XHHW Wire No. 14 AWG (green)	13.7 m (45.0 ft)
XHHW Wire No. 14 AWG (blue)	9.1 m (30.0 ft)
Wire Marking Tape Set	1
3.5" (90-mm) Cable Tie (black)	100
Adhesive Back Cable Tie Mount	10
1/4" Spiral Wrap	0.6 m (2.0 ft)
36" (0.9-m) DIN Rail	1
Small-Size Label Sheet	1
Terminal Block Metal Rail	1
Terminal Block Element Identifier Strip	1
1/8" Round Lug	2
7/32" Round Lug	4
9/32" Round Lug	2
1/2" Liquidtight Flexible Nonmetallic Conduit	1.8 m (6.0 ft)
3/4" Liquidtight Flexible Nonmetallic Conduit	1.8 m (6.0 ft)
1/2" Flexible Metal Conduit	2.0 m (6.6 ft)
Model 46856 – DC Motor Drive Consumables	
MCE Mounting Plate	1
MTW Wire No. 14 AWG (black)	2.5 m (8.2 ft)
MTW Wire No. 14 AWG (green)	4.0 m (13.1 ft)
MTW Wire No. 14 AWG (white)	1.0 m (3.1 ft)
MTW Wire No. 16 AWG (black)	2.0 m (6.6 ft)
MTW Wire No. 16 AWG (red)	5.0 m (16.4 ft)

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Model 46856 – DC Motor Drive Consumables (cont'd)	
MTW Wire No. 16 AWG (green)	3.0 m (9.8 ft)
XHHW Wire No. 14 AWG (black)	6.1 m (20.0 ft)
XHHW Wire No. 14 AWG (red)	2.4 m (8.0 ft)
XHHW Wire No. 14 AWG (green)	6.1 m (20.0 ft)
Four-Wire Shielded Cable, No. 22 AWG	4.0 m (13.1 ft)
1/16" (1.6-mm) Insulating Sleeve	0.3 m (1.0 ft)
1/4" (6-mm) Heat-Shrinkable Insulating Sleeve	0.3 m (1.0 ft)
Wire Marking Tape Set	1
3.5" (90-mm) Cable Tie (black)	100
Adhesive Back Cable Tie Mount	10
1/4" Spiral Wrap	0.3 m (1.0 ft)
Terminal Block Element Identifier Set	1
36" (0.9-m) DIN Rail	1
Small-Size Label Sheet	1
1/8" Round Lug	2
7/32" Round Lug	2
9/32" Round Lug	2
5/8" Round Lug	2
1/4" Female Lug	3
1/2" Liquidtight Flexible Nonmetallic Conduit	1.8 m (6.0 ft)
1/2" Flexible Metal Conduit	2.0 m (6.6 ft)

ORDERING NUMBERS

120 V – 60 Hz			220 V – 50 Hz			240 V – 50 Hz
ENGLISH	FRENCH	SPANISH	ENGLISH	FRENCH	SPANISH	ENGLISH
37866-20	TBE	TBE	N/A ⁵	N/A	N/A	N/A
37866-30	TBE	TBE	N/A	N/A	N/A	N/A
37866-60	TBE	37866-62	N/A	N/A	N/A	N/A
37866-70	TBE	37866-72	N/A	N/A	N/A	N/A
37867-20	TBE	TBE	N/A	N/A	N/A	N/A
37867-30	TBE	TBE	N/A	N/A	N/A	N/A
37867-60	TBE	37867-62	N/A	N/A	N/A	N/A
37867-70	TBE	37867-72	N/A	N/A	N/A	N/A
38527-60	TBE	38527-62	N/A	N/A	N/A	N/A
38527-70	TBE	38527-72	N/A	N/A	N/A	N/A
38528-60	TBE	38528-62	N/A	N/A	N/A	N/A
38528-70	TBE	38528-72	N/A	N/A	N/A	N/A
38529-60	TBE	38529-62	N/A	N/A	N/A	N/A
38529-70	TBE	38529-72	N/A	N/A	N/A	N/A
38530-20	TBE	TBE	N/A	N/A	N/A	N/A
38530-30	TBE	TBE	N/A	N/A	N/A	N/A
38530-60	TBE	38530-62	N/A	N/A	N/A	N/A
38530-70	TBE	38530-72	N/A	N/A	N/A	N/A
46102-10	TBE	46102-12	N/A	N/A	N/A	N/A
46102-20	TBE	46102-22	N/A	N/A	N/A	N/A
46102-30	TBE	46102-32	N/A	N/A	N/A	N/A
46801-00	46801-00	46801-00	46801-00	46801-00	46801-00	46801-00
46801-10	TBE	46801-12	N/A	N/A	N/A	N/A
46802-00	TBE	46802-02	N/A	N/A	N/A	N/A
46810-00	TBE	46810-02	46810-00	N/A	46810-02	46810-00
46811-00	TBE	46811-02	N/A	N/A	N/A	N/A
46812-00	TBE	46812-02	N/A	N/A	N/A	N/A
46813-00	TBE	46813-02	N/A	N/A	N/A	N/A
46814-00	TBE	46814-02	N/A	N/A	N/A	N/A
46815-00	TBE	46815-02	N/A	N/A	N/A	N/A
46830-00	TBE	46830-02	N/A	N/A	N/A	N/A
46831-00	TBE	46831-02	N/A	N/A	N/A	N/A
46832-00	46832-00	46832-00	N/A	N/A	N/A	N/A
46840-00	46840-00	46840-00	46840-00	46840-00	46840-00	46840-00
46841-00	46841-00	46841-00	N/A	N/A	N/A	N/A
46849-E0	TBE	TBE	N/A	N/A	N/A	N/A
46849-F0	TBE	TBE	N/A	N/A	N/A	N/A
46849-G0	TBE	TBE	N/A	N/A	N/A	N/A
46850-00	46850-00	46850-00	46850-00	46850-00	46850-00	46850-00
46851-00	46851-00	46851-00	46851-00	46851-00	46851-00	46851-00
46852-00	46852-00	46852-00	N/A	N/A	N/A	N/A
46853-00	46853-00	46853-00	N/A	N/A	N/A	N/A
46854-00	46854-00	46854-00	N/A	N/A	N/A	N/A
46855-00	46855-00	46855-00	N/A	N/A	N/A	N/A
46856-00	46856-00	46856-00	N/A	N/A	N/A	N/A

Table 1. Equipment Ordering Numbers

⁵ N/A = Not applicable.

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The Industrial Wiring Training System is supported by exhaustive courseware.

Reflecting Lab-Volt's commitment to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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