

# SOLAR PV INSTALLATION LEARNING SYSTEM

950-SPF1



950-SPF1 shown with 95-SPA1 Solar PV Array Station, 41207 Solar PV Hand Tool Package, and 20180 Consumables Package

## CURRICULUM IS THE KEY TO LEARNING

### Learning Topics:

- Mechanical Installation
- Electrical Installation
- Stand-alone PV Systems
- Grid Interactive PV Systems
- Site Assessment and Permitting
- Array Site Analysis
- Circuit Voltage and Current
- Wire Selection and Sizing
- Electrical Connectors
- Conduit and Enclosures
- Inverters
- Converters
- Charge Controllers
- Combiner Boxes
- Power Meters
- Surge Arrestors

The demand for qualified Solar Technicians is rising, as more consumers and businesses apply solar energy in their communities. Many employers are requesting NABCEP (North American Board of Certified Energy Practitioners) certification or equivalent skills as a condition of employment. Amatrol's Solar Photovoltaic Installation Learning System supports the learning necessary to prepare for portions of NABCEP certification and helps to prepare students for successful employment in the solar photovoltaic industry field.

The 950-SPF1 Solar Photovoltaic Installation Learning System teaches students the installation and commissioning of grid interactive and stand-alone photovoltaic systems for commercial and residential applications. Students will learn how to develop and implement a site layout; calculate PV circuit voltage and currents; select and install wiring; and install real world components in PV systems, just as they would do on the job.

The 950-SPF1 includes a mobile workstation with solar photovoltaic components, PC-based interactive, multimedia student curriculum; installation manual, and teacher's guide. The mobile workstation is equipped with silkscreened labels for component identification; storage/inventory of clamp meter; digital meter; and storage for consumables, including wire and conduit, directly at the workstation.



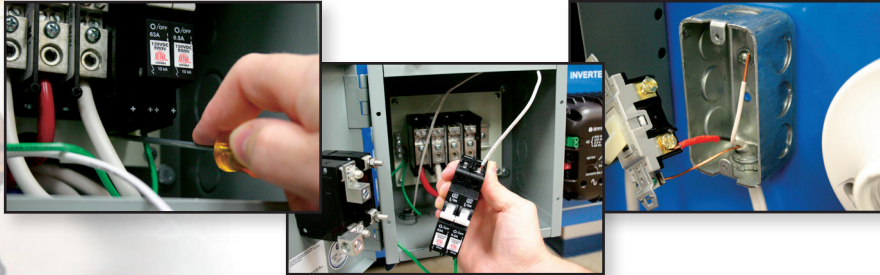
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# DESIGNED FOR LEARNING

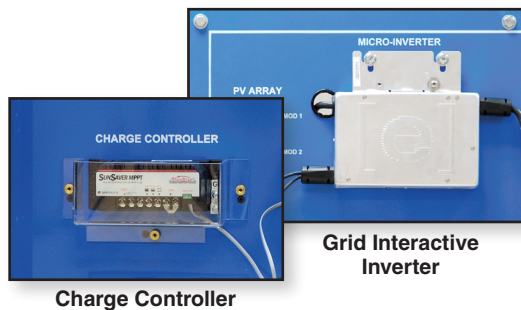
## Installation Skills Practice

The 950-SPF1 provides a platform where students install real world systems using components commonly found in commercial and residential environments. Students identify and analyze sites for array locations; develop and implement a site layout; calculate PV circuit voltage and currents; choose, cut, strip, and connect wire; install real world components in a PV system; and install stand-alone and grid interactive PV systems, just as they would do on the job. These skills are part of the preparation process for getting NABCEP certification.



## Two Real-World Installation Processes

This system has the unique ability to teach installation and commissioning of both grid interactive and stand-alone photovoltaic systems for commercial and residential systems. While grid interactive is the most popular PV application, both types of systems are common. The photovoltaic stand alone system is configured with battery backup; teaches DC to AC output (more popular) and DC to DC output, which continues to grow in popularity.



## Interactive Multimedia Curriculum

The 950-SPF1 includes interactive, multimedia curriculum that can be used for self-paced student learning or in a traditional class setting as a presentation tool. The interactive, multimedia curriculum uses a competency-based instructional design that teaches industry standard skills. Eye popping graphics, 3D animations, video, audio and complete text explanations combine with strong interactivity to engage students and appeal to a variety of learning styles. Students can practice real world skills at their own pace, speeding overall student learning and retention.

## Efficient, Effective, and Safe Training

This 950-SPF1 workstation has been designed to be an effective, self-contained, and durable learning device. Installation skills are performed quickly and all-inclusive at the workstation with the use of clamp-on meter, digital meter, wire consumables storage, and vertical component installation panel.



Wire Consumables Storage



PV Array & AC Disconnects

## TECHNICAL DATA

### Workstation

- Welded and braced steel tube frame
- Designed to mount component panels vertically
- Battery bank
- Dimensions: 72in (183 cm) L x 72in(183 cm) H x 28in (71 cm) W

### Component Panels

- DC disconnect switch with fuse
- AC safety switch between wall receptacle and components, lockable
- AC disconnect switch with fuse
- Battery bank disconnect switch with fuse
- Stand-alone inverter
- Remote display for stand-alone inverter and charge controller
- Grid interactive inverter (w/o battery) plus power/energy display
- Charge controller
- Combiner box
- Bypass diodes
- DC distribution panel with breakers
- AC distribution panel with breakers
- AC distribution panel with main and branch breakers
- Utility power meter, 3 phase digital
- Ground Fault Detection and Interruption Device
- Surge arrester
- AC lamps (3)
- DC lamps (3)
- Manual switches (2)
- Receptacle-duplex outlet
- Battery bank interface connection panel
- Batteries, AGM sealed type, 12 volt (2)
- Lockout / tagout kits (2)
- Interface connector to separate PV array
- Wire set with supply of wire - 1 set of exercises
- Junction box
- Access to PV module terminals

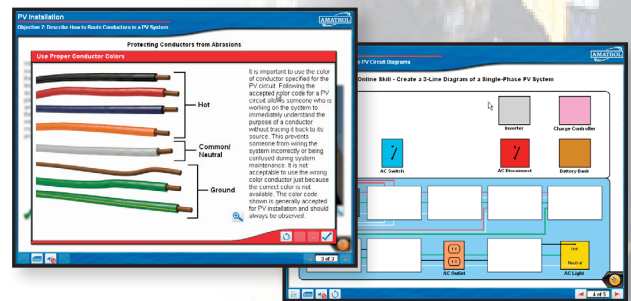
### Instructor's Assessment Guide, C20105

### Installation Manual, D20105

### Multimedia Courseware, M20105

### Additional Requirements

- 95-SPA1 Solar PV Array Station
- 41207 Solar PV Hand Tool Package
- 20180 Consumables Package
- Utility grid connection - may require approval from utility company to make connection



The 950-SPF1 workstation has been designed with safety in mind to give students a safe experience and teach key safety skills. Safety features include: AC Safety Switch from wall outlet to workstation; DC Safety switch from battery to workstation; emergency stop pushbutton; and lockout/tagout.