

Solar/Wind Energy Training Systems 46120

FESTO

LabVolt Series

Datasheet



* The product images shown in this document are for illustration purposes; actual products may vary. Please refer to the Specifications section of each product/item for all details. Festo Didactic reserves the right to change product images and specifications at any time without notice.

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General Description

The Solar/Wind Energy Training Systems form complete hybrid-energy training systems. These training systems demonstrate how wind turbines and solar cells are being used in the consumer and industrial markets to supplement the world's power needs. They constitute a modular program that covers the history, fundamentals, installation, operation, maintenance, and servicing of solar energy and wind energy systems.

The program explores sunlight and wind as energy sources that can be used to help reduce dependence on non-renewable fuel sources. It helps students gain a complete perspective of the field by studying the economics, efficiency, and low-environmental impact of producing energy from non-polluting, renewable sources.

All Solar/Wind Energy Training Systems are made from real-world components that are used in industry. These are the same components that students see in their homes, schools, and workplaces. All training systems are engineered for both ease of use and durability, and are manufactured to the highest quality standards.

Courseware

The courseware for each of the topics consists of a student manual and an instructor guide, as well as textbooks titled Photovoltaic Systems, by James P. Dunlop, and Wind Power, by Paul Gipe. Each student manual consists of a series of job sheets. The job sheets include a description of the objectives, a list of required equipment, a list of safety procedures, and a list of steps required to attain the objectives. To obtain detailed information about covered topics, students should refer to the textbooks or ask their instructor to guide their learning process.

All student manuals, instructor guides, and textbooks are fully illustrated and color printed. All student manuals, instructor guides, and electrical drawing sets are available as .PDF files on a CD-ROM (P/N 86514-A0). A Facilitator PowerPoint Presentation and a Facilitator Guide containing instructional strategies and activities are also available as options.

Topic Coverage

- Energy Fundamentals
- Trainer Familiarization and Safety
- Solar Module
- Wind Turbine
- Solar/Wind Systems
- Going Green

Features & Benefits

- Includes everything required to operate as a stand-alone, hands-on training system
- Made with high-quality components currently used in residential, commercial, and industrial applications
- Easy and safe to use, durable, and manufactured to the highest quality standards
- Perforated work surfaces to allow custom configurations
- Comprehensive curriculum consisting of fully illustrated student manuals and instructor guides
- CSA/UL certified version available
- Identified wires allow students to save time
- Networked data acquisition available as an option

Description

**Manual
number**

Courseware

| Qty | Description | Model number |
|-----|---|-------------------|
| 1 | Solar/Wind Energy Training System (Manuals on CD-ROM) _____ | 580560 (86514-A0) |

Optional Equipment

| Qty | Description | Model number |
|-----|---|-------------------|
| 1 | Outdoor Solar Module _____ | 580186 (46120-B0) |
| 1 | Outdoor Wind Turbine Module with tower _____ | 580187 (46120-C0) |
| 1 | Outdoor Wind Turbine Module with Air-Guyed Tower _____ | 580188 (46120-E0) |
| 1 | Networked Data Acquisition System _____ | 580197 (46120-J0) |
| 1 | Solar/Wind Energy Training System (Manuals on CD-ROM) _____ | 580560 (86514-A0) |

Optional Equipment Description

Outdoor Solar Module (Optional) 580186 (46120-B0)

The Outdoor Solar Module is an add-on to the Solar/Wind Energy Training System. It consists of a photovoltaic panel being able to produce up to 90 W of electrical power at a nominal voltage of 12 V.

Specifications

| Parameter | Value |
|-----------------------------------|--|
| Electrical Characteristics | |
| Nominal Voltage | 12 V |
| Maximum Power | 90 W |
| Maximum Power Voltage | 18.3 V |
| Maximum Power Current | 5.04 A |
| Short Circuit Current | 5.38 A |
| Open Circuit Voltage | 22.2 V |
| Efficiency | 13.27 % |
| Physical Characteristics | |
| Dimensions (H x W x D) | 67.0 x 101.5 x 3.5 cm (26.4 x 40.0 x 1.4 in) |
| Net Weight | 14.5 kg (32 lb) |

**Outdoor Wind Turbine Module with tower (Optional)
580187 (46120-C0)**



The Outdoor Wind Turbine Module A is an add-on to the Solar/Wind Energy Training System. It consists of a Wind Turbine Generator, and a 8.84 m (29 ft) EZ Tower Kit. The tower kit comprises all the hardware required to erect the tower, such as pipes, anchors, and cables.

**Outdoor Wind Turbine Module with Air-Guyed Tower (Optional)
580188 (46120-E0)**



The Outdoor Wind Turbine Module with Air-guyed tower is an add-on to the Solar/Wind Energy Training System. It consists of a Wind Turbine Generator, and a 8.23 m (27 ft) Air-Guyed Tower Kit. The tower kit comprises all the hardware necessary to erect the tower, except anchors, pipes, and concrete.

Networked Data Acquisition System (Optional) 580197 (46120-J0)



The Networked Data Acquisition System is an add-on to the Solar/Wind Energy Training System, Model 46120, that comprises the Networked Data Acquisition Interface, Model 46540. This interface allows remote monitoring of the power and energy levels measured in the training system. The measured data is transmitted using a wide area network (WAN) or a local area network (LAN).

The Networked Data Acquisition System allows users to view real-time electrical, environmental, and ecological data via an internet or an intranet connection from most common web

browsers. Up to 30 users can access the data simultaneously.

Additional sensors are required to make environmental measurements. A pyranometer is provided to measure shortwave solar radiation, or irradiance. An anemometer is provided to measure average wind speeds.

Manual

| Description | Manual number |
|---|-------------------|
| Networked Data Acquisition (User Guide) _____ | 580596 (87655-E0) |

Optional Equipment

| Qty | Description | Model number |
|-----|--------------------------|-------------------|
| 1 | Temperature Sensor _____ | 579817 (46543-00) |

Solar/Wind Energy Training System (Manuals on CD-ROM) (Optional) 580560 (86514-A0)

List of Manuals

| Description | Manual number |
|--|-------------------|
| Energy Fundamentals (Workbook) _____ | 591982 (86514-20) |
| Energy Fundamentals (Workbook (Instructor)) _____ | 591984 (86514-30) |
| Trainer Familiarization and Safety (Workbook) _____ | 591986 (86515-20) |
| Trainer Familiarization and Safety (Workbook (Instructor)) _____ | 591988 (86515-30) |
| Solar Module (Workbook) _____ | 591990 (86516-20) |
| Solar Module (Workbook (Instructor)) _____ | 591992 (86516-30) |
| Wind Turbine (Workbook) _____ | 591994 (86517-20) |
| Wind Turbine (Workbook (Instructor)) _____ | 591996 (86517-30) |
| Solar/Wind Systems (Workbook) _____ | 591998 (86518-20) |
| Solar/Wind Systems (Workbook (Instructor)) _____ | 592000 (86518-30) |
| Going Green (Workbook) _____ | 592002 (86519-20) |
| Going Green (Workbook (Instructor)) _____ | 592004 (86519-30) |
| Grid-Tied Systems (Workbook) _____ | 592021 (86903-20) |
| Grid-Tied Systems (Workbook (Instructor)) _____ | 592023 (86903-30) |

Reflecting the commitment of Festo Didactic 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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