2 kW Electric Power Transmission Training Systems
8059

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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Table of Contents

General Description

The 2 kW Electric Power Transmission Training Systems are part of a program designed to teach through hands-on exercises the principles of electric power transmission, a subject which is usually taught in a strictly theoretical way.

The exercises show how changes in the source, load, and transmission line affect the overall performance of a system. In particular, they illustrate the meaning of active and reactive power, how the voltage at the end of a line can be lowered or raised, how power can be forced to flow over one transmission line instead of another, and how a system behaves when subjected to disturbances. The tests relating to switching transients, sudden overloads, and momentary short-circuits dramatically demonstrate the mechanical swing of generator poles and the concurrent surges of power over the transmission line. More than any amount of theory could show, these exercises convey the meaning of power stability and the limits to power flow.

Alternator, motor, capacitors, reactors, resistors, regulating autotransformer, series compensator, and transmission lines are employed. Despite their small size, these components are designed to act in exactly the same way under steady-state and transient conditions, as their larger counterparts in industry. This practical, hands-on course is presented in a way that is readily understandable by anyone who has foundational knowledge of electricity.

Courseware

The courseware of the 2 kW Electric Power Transmission Training Systems consists of a student manual and an instructor guide. The student manual contains exercises designed to present the subject matter in convenient instructional segments. In each exercise, principles and concepts are presented first, followed by a step-by-step, hands-on procedure to complete the learning process. The exercises in the student manual are written to be performed using the Data Acquisition Interface module. However, for those who are using a system with analog meters, the connection diagrams are included in the appendix.

The instructor guide contains the practical results and the answers for each hands-on exercise and review question.

Features & Benefits

- Sturdy workstations and modules constructed of heavy-gauge steel, finished in baked enamel
- Comprehensive curriculum includes a student manual and an instructor guide with all the necessary theory taught prior to the hands-on experiments
- Inductive, resistive, and capacitive load components are included
- Symbols and diagrams representing the electrical components in each module are clearly silk-screened on the front panel
- Safe: all electrical components can be interconnected without electric shock hazard, as all live parts of the plugs are concealed and insulated

Description	Manual number

Additional Equipment Required to Perform the Exercises (Purchased separately)

Qty	Description	Model number
1	Three-Phase Transformer (750 VA)	586498 (8372-05) [1]

[1] Can be removed if 2 systems are shared for some exercises.

Qty	Description	Model number
1	Variable Power Supply	586715 (8525-25) [2]

Optional Equipment Description

Three-Phase Transformer (750 VA) (Optional) 586498 (8372-05)

This Three-Phase Transformer module is high-power version of the Three-Phase Transformer, Model 8348, that is designed for operation in a 2 kW training system.

Variable Power Supply (Optional) 586715 (8525-25)

The Power Supply module is the primary component of the system. All associated equipment is powered by this power supply. A flexible, 5-wire power cord, terminated with a 5-prong, twist-lock plug and line cap, feeds the module. A mechanical interlock on the line cap prevents the removal of an energized Power Supply from its locked position in the workstation. The Power Supply requires a 3-phase, wye-connected, 5-wire service installation including ground and neutral.

The Power Supply provides fixed and variable ac and dc voltage sources all terminated with 4 mm safety jacks. They can be used simultaneously, up to a total load current equal to the rating of the fixed 3-phase output. Independent circuit breakers, reset at the front panel, protect the Power Supply input and outputs. Indicator lamps monitor the presence of input voltage in each phase. When a phase leg of the site power service is out, the lamp goes off to reflect this condition. A voltmeter, connected through a selector switch, monitors the outputs.

The Variable Power Supply is available in different variants depending on ac power network voltages and frequencies. Because of this, the actual module may vary from the one shown in the picture.

Manual

Description	Manual number
Power Supply (User Guide)	590043 (27452-D0)

[2] Can be removed if 2 systems are shared for some exercises.

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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