Nacelle - Wind Turbine Learning System
610873 (46122-20)

LabVolt Series

Datasheet

Festo Didactic
en 120 V - 60 Hz
07/2023

* 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.

Table of Contents

General Description

The station

The Nacelle – Wind turbine Training System is a complete scaled-down version of commercial wind turbine nacelles, making it an excellent substitute for expensive real-life equipment. Space efficient and affordable the machine fully interacts with users, thus enhancing the learning experience.

Fully loaded

The training system consists of a complete drive train that includes the main shaft, a gearbox with a transparent side cover, speed sensors, a hydraulic brake, and an asynchronous generator. The yaw system is fully operational and features a 61 cm (24 in) slewing bearing, a gear motor, a drive, a position sensor, and fail-safe hydraulic brakes. A manual hydraulic pump and an accumulator, as found in real-world wind turbines, are also included. A PLC controls the different functions of the nacelle and is located in an electrical enclosure together with all the other electrical components.

Simulating Reality – working for real

A wind vane and an anemometer are located in a transparent enclosure on top of the training system to monitor wind speed and wind direction. Although they are not measuring actual wind, the control system managed by the user simulates the process, causing the weather sensors to react and send signals to the control system which take the simulated parameters into account.

Generate electricity to expand learning

The Nacelle – Wind Turbine Learning System features a three-phase induction generator that can produce power. It can be considered a mechanical load unless it is connected to a grid. The optional Power generator creates such a connection, enabling the system to produce electricity. Students can then measure and monitor several actual (not simulated) electrical parameters, such as VAR, W, VA, power factor, etc.

Features

- Demonstrates how a wind turbine nacelle operates:

– Touch-screen HMI and industrial PLC (SIEMENS)

– Fully operational yaw system

– Complete drive train with gearbox, main shaft, speed sensors, disk brake and generator

– Electrical panel with frequency drives, breakers, and power supplies

– Weather sensors to monitor wind speed and direction

- Helps practice maintenance and troubleshooting skills in a safe environment

– Full electrical schematics provided

– Fault panel to enable teachers to insert faults

– Emergency buttons and protective guards with limit switches for safe operation

- Cost-effective, realistic training solution

– Large-scale, proportional components perfect for an educational environment

- Safe working environment

- Faultable through the HMI

- Full hands-on training with rugged equipment

- Comprehensive curriculum and lab exercises

- Grid-Tie prepared (add-ons required)

- Electrical hub prepared (add-ons required)

- Hydraulic hub prepared (add-ons required)

Topic Coverage

- Nacelle familiarization, safety, and control system
- User interface and wind simulation
- Gearbox, coupling, and alignment
- Basic hydraulic circuit
- Hydraulic brakes
- Electrical circuit and panel
- Troubleshooting

Features & Benefits

- Complete representation of the nacelle of an horizontal-axis wind turbine for realistic training
- Helps practice maintenance and troubleshooting skills
- Safe working environment
- Industrial, rugged equipment
- Faults can be inserted through the HMI
- Turnkey, comprehensive course material

Manual

Description	Manual number
Nacelle (Drawing Set)	8164384 (81643-84)

Optional Equipment

Qty	Description	Model number
1	Isolating transformer 230 V/50 HZ	8064358 (52910-0C) [1]

Specifications

Parameter	Value
Weight	417 kg
Nominal current	12 amp.
Hydraulic reservoir	4 litres
Hydraulic pressure	60 Bars
Dimensions (H x W x D)	166 x 212 x 76 cm (65 x 83 x 30 in)

[1] Required if the electricity supply has 30 mA residual current circuit breakers, which is the norm in some countries.

Module Options Description

Isolating transformer 230 V/50 HZ 8064358 (52910-0C)

The isolation transformer eliminates high leakage currents and prevents undesired tripping of residual current devices (RCDs). A fuse protects this device and a thermal protection prevents overheating.

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.

Festo Didactic SE

Rechbergstrasse 3
73770 Denkendorf
Germany

P. +49(0)711/3467-0
F. +49(0)711/347-54-88500

Festo Didactic Inc.

607 Industrial Way West
Eatontown, NJ 07724
United States

P. +1-732-938-2000
F. +1-732-774-8573

Festo Didactic Ltée/Ltd

675 rue du Carbone
Québec QC G2N 2K7
Canada

P. +1-418-849-1000
F. +1-418-849-1666

www.labvolt.com

www.festo-didactic.com