

Nacelle - Wind Turbine Learning System

610873 (46122-20)

FESTO

LabVolt Series

Datasheet



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Festo Didactic
en 120 V - 60 Hz
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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)

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)

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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