ERC100

ENERGY PRODUCTION TRAINER WIND TURBINE AND SOLAR PANELS

Experimental capabilities

- **Identification of the components of an electricity production installation by wind turbine and photovoltaic solar panels**
- **Commissioning and use of an energy production facility**
- **Understanding how it works**
- **Study of the relationship between the speed of rotation of the wind turbine and the electrical power produced**
- **Analysis of the operation of the system (calculations of electrical powers, efficiencies of components)**
- **Comparison of three renewable energy production systems**
- **Comparison of two solar panel technologies**
- **Use of connected mobile applications for monitoring.**

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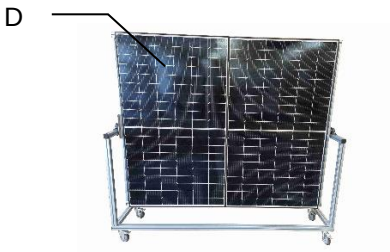
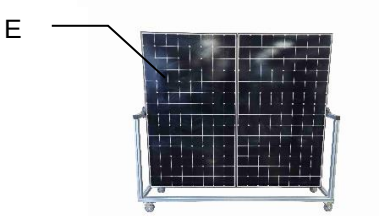
Operating principle

The ERC100 trainer allows the study of solar or wind energy production. Wind energy comes from a wind turbine mated to a motor and solar energy from photovoltaic solar panels.
Students will first need to identify the components of the system to perform commissioning. When the system is in operation, they will have to make measurement readings to characterize it. They will thus be able to make the overall energy balance of the installation. Production systems are connected with dedicated mobile applications.

The robust design of this equipment makes it perfectly suited for use in schools.
Its anodized aluminum structure on wheels makes it extremely robust as well as great flexibility of integration into your premises.
The manufacturing of this equipment meets the European machine directive

Illustrations





Technical details

1. A wind module comprising a variable speed motor (B) with potentiometer control and a Silentwind (A) wind turbine (24VDC-400W).
The motor and wind turbine are coupled directly to simulate rotation. The support chassis is equipped with 4 directional castors with brake.

2. An energy production and storage module (C) divided into three parts comprising:

WIND ZONE
-a fast connector type Harting for the electrical connection between the wind turbine and this module
-Two batteries to store energy (24VDC/55Ah) with protective trays
-a connected charge controller
-an inverter (24VDC/240VAC-5 00W)
-a 500W convector for the dissipation of the energy produced
-measuring points by double well socket and current measuring wire.

SOLAR INJECTION ZONE WITH STORAGE
-a fast connector type Harting for the electrical connection between the panel and this module
-a 2.4KWH lithium battery
-a 5KW connected hybrid inverter
-two boxes of specific electrical protection
-measuring points by double well socket and current measuring wire.

SOLAR INJECTION ZONE
-a fast connector type Harting for the electrical connection between the panel and this module
-two micro-inverters
-a connected communication gateway
-a specific electrical protection box
-measuring points by double well socket and current measuring wire.

3. A solar panel module comprising (D):
-2 Monocrystalline photovoltaic solar panels (power: 375 W each)

4. A solar panel module comprising (E):
-2 Monocrystalline photovoltaic solar panels (power: 430 W each)

5. The bench is supplied with the following instrumentation:
-a portable multimeter with AC/DC clamp to measure the voltages and currents at the terminals of the different elements
-a portable solarimeter

6. Structure
The system is installed on an anodized aluminum profile chassis equipped with four brake directional castors

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Services required

- Electrical supply : 230 Vac – 50 Hz – 16 A
- Electrical network : 1phase(s) + Neutral + Earth.
- Dimensions: (LxWxH mm):
  Main unit : 1900x770x1810mm
  Wind turbine unit : 1200x550x1690mm
  Panels unit 1 : 2220x500x2080mm
  Panels unit 2 : 2300x500x2040mm

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

Documentation

- User's manual
- Technical documentation of the components
- Lab exercises
- Wiring diagram
- Certificate of conformity CE