THREE-PHASE WIND TURBINE UNITS - 400W

Bluetooth®

Requires download in Play Store or Apple Store the free application "Victron Energy".
Display on tablet or Smartphone:
- *Voltage – Current of the panel / Power (W)*
- *Voltage – Current of the battery / Charge current*
- *On-Off state charge*

Smartphone not supplied

Reference EOL-1

Each reference includes:
1 wind turbine + 1 specific electrical cabinet + 1 link cable

Ref	Communicating version	Features
EOL1	**YES (Bluetooth®)**	Operation with partial and total resale + at isolated site
EOL2	**No**	Partial or total resale operation only
EOL3	**YES (Bluetooth®)**	Operation at isolated site only

EDUCATIONAL OBJECTIVES

- **Understanding the different parts of a wind turbine.**
- **Make the measurements of electrical parameters.**
- **Analyzing and interpreting results.**
- **Studying the efficiency and impacts related to the wind force.**
- **Study the chain of wind energy (production, storage, consumption, energetic behavior).**
- **Wiring of a wind turbine installation.**
- **Set up a Bluetooth connection**

TEACHING RESOURCES STUDENT & TEACHER

Proposed practical works

- Studying and reading of the electrical features of the wind turbine.
- Calculate the system's efficiency.
- Realization of the diagram and wiring for the energy injection on the electrical network.
- Realization of a diagram & wiring for the energy use in an isolated site.
- Download and setup of the Bluetooth application

PARTIAL OR TOTAL RESALE OPERATION

In the cabinet, a DC/AC inverter converts the DC current from the turbine into alternating current 220VAC 50Hz and feeds it into the grid in synchronism. This inverter is protected against any polarity reversal and any overload on the DC or AC side. When the wind turbine is stopped, the inverter does not consume any power.

When the turbine is stopped, the inverter consumes no current

INVERTER	VOLTAGE	Max current	Power
INPUT	65~125VDC	8A	
OUTPUT	230VAC-50Hz	2,25A	400W

OPERATION AT ISOLATED SITE

The turbine current charges two 12V sealed batteries cabled in series through a charging controller. This DC voltage is either available on safety terminals at the rear of the cabinet, or transformed into 250VAC 50Hz voltage by a 300VA voltage converter.

Technical characteristics for the isolated site converter

VOLTAGE CONVERTER	Voltage	Max Current	Power
INPUT	20~32 VDC	11A	
OUTPUT	230VAC 50Hz	1.5A	300VA

ELECTRICAL CABINET FOR EOL1

Technical cabinet of standardized solar central unit on wheeled frame.
Dimensions: 810 x 600 x 1890mm

Comprises
- 2 disconnectors
- 1 500mA -30A differential
- 1 30mA differential
- 1 lightning arrester + fuses
- 3 100 Wh resolution meters
- 1 Mushroom head emergency stop
- 1 source inverter
- 1 charging controller 12/24VDC-20A
- 2 batteries 12V-12Ah
- 1 set of photovoltaic connectors
- 1 500W inverter for network synchronisation
- 1 Voltage converter 24VDC/230VAC-200W

ELECTRICAL CABINET FOR EOL2

Technical cabinet of standardized solar central unit on wheeled frame.
Dimensions: 810 x 600 x 1890mm

Comprises
- 2 disconnectors
- 1 500mA -30A differential
- 1 30mA differential
- 1 lightning arrester + fuses
- 1 Mushroom head emergency stop
- 3 100 Wh resolution meters
- 1 set of photovoltaic connectors
- 1 500W inverter for network synchronisation

ELECTRICAL CABINET FOR EOL3

Technical cabinet of standardized solar central unit on wheeled frame.
Dimensions: 810 x 600 x 1890mm

Comprises
- 2 disconnectors
- 1 lightning arrester + fuses
- 1 Mushroom head emergency stop
- 1 charging controller 12/24VDC-20A
- 2 batteries 12V-12Ah
- 1 set of photovoltaic connectors
- 1 Voltage converter 24VDC/230VAC-200W

WIND TURBINE COMMON FOR ALL REF

- Three-phase output 3 x 85V AC - 400W at 440 rpm on safety terminals.
- Direct current output 110V DC - 400W at 440 rpm on safety terminals.
- Selection of these outputs by using an included rectifier or by direct connection.

Features of the wind simulation
- Squirrel-cage three-phase asynchronous motor.
- Speed controller simulating wind turbine speed 0-440 rpm.
- Using the supplied SOMOVE software, the PC operations are:
  - Acceleration of the wind speed.
  - Deceleration of the wind speed.

General features
- Wheeled frame with brakes
- Overall dimensions: 750 x 670 x (h) 1500 mm
- Top cover made with aluminium frame and Lexan sides (translucent and unbreakable).
- Power supply 2P+N+E 230V AC - 50/60 Hz (5m lead with mains plug)
- Supplied with: Practical assignments in the form of measurements/tests; RJ45-USB cable for linking between the speed controller and the PC. **Schneider® SoMove software.**

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