



## WIND POWER PLANTS



### DL WPP

This trainer allows the students to study the functions and operations of a modern wind power plant simulating the effects of the wind force and their effects on the plant.

This system operates through a brushless machine and the simulation software and the double-feed asynchronous machine allows a practical and effective approach to this trainer.

The trainer has a modular structure that will grant teachers and students extreme flexibility during the study of the related topics and the performance of the experiments.

An interactive multimedia software is also available to allow performing the experiments set-up as well as the visualization and management of the collected data through PC.

The control unit of this trainer allows controlling and operating a speed-variable double-feed asynchronous generator. Thanks to this control unit it is possible to simulate and investigate the operating principles of this topic.

This control unit allows approaching and theoretically in depth analyzing the following topics:

- Operation of the double-feed asynchronous generator;
- Integrated power switch for switching the generator on line;
- Reactive and active power, frequency and voltage control;
- Mains synchronization.



This trainer is complete with the relevant software that can control and set the several operations of the system; with this software it is possible to adjust the wind speed and profile and to examine the effects on the operating functions of a real wind power plant. Another important feature of this software is related to the possibility to control, parameterize and visualize the obtained data.

In particular, with this software it is possible to perform the following activities:

- Measurement, calculation and graphic representation of many mechanical and electrical operating parameters.
- Selection of the set-point values for reactive and active power.
- Definition and simulation of wind power and profiles.
- Interactive experiments set-up.
- Values and graphs can be stored.
- Experiments instructions can be viewed directly from the software.
- Possibility to print documents for easy hardcopy printing of experiments instructions with solutions.

With this wind power plant trainer it is possible to perform the following experiments:

- Study of functions and operations of a modern wind power plant.
- Relationships between a pitch control system and the wind.
- Analysis of the mechanical parameters within an induction generator.
- Analysis of the electrical parameters within an induction generator.
- Starting method of a wind system
- DFIG – doubly fed induction generator.

With the optional modules it is possible to perform also:

- Experiments on the Fault Ride Through

Average trainer hours: 10h. (12h with the fault ride through option)



## CONFIGURATIONS

### DL WPP

DL 2108T26	BRUSHLESS CONTROLLER WITH MOTOR	1
DL 2108T26BR	BRAKING RESISTANCE	1
DL 1022P4	SLIP RING THREE-PHASE ASYNCHRONOUS MOTOR	1
DL 1013A	BASE	1
DL 2108TAL-CP	THREE PHASE SUPPLY UNIT	1
DL 2109T29	THREE-PHASE POWER METER	1
DL 2108T29	BACK TO BACK INVERTER	1
DL 2108T02	POWER CIRCUIT BREAKER	3
DL HUBRS485F	MODBUS COMMUNICATION HUB	1
DL WINDSIM	WIND SIMULATOR	1
DL SCADA-WEB	SOFTWARE SCADA	1
DL 1155WPP	KIT OF CONNECTING LEADS	1
DL 2100-3M-AS	FRAME	1
DL PCGRID	ALL-IN-ONE PERSONAL COMPUTER	1
SOCKET-MAINS	THREE-PHASE SOCKETS HOLDER	1
DL 1001-1-AS	WORKBENCH	1
DL 2600TT	THREE-PHASE TRANSFORMER	1

### OPTIONS FOR THE FAULT RIDE THROUGH

DL 7901TT	LINE MODEL	1
DL 2108T18	MULTIFUNCTION THREE-PHASE OVERVOLTAGE/UNDERVOLTAGE RELAY	1
DL 1017R	RESISTIVE LOAD	1
DL 2108T02	POWER CIRCUIT BREAKER	1
DL 2100-3M-AS	FRAME	1