



Introduction

Hybrid Renewable Energy Systems are becoming popular as stand-alone power systems for providing electricity in remote & urban areas due to advances in renewable energy technologies and subsequent rise in prices of petroleum products. A hybrid energy system usually consists of two or more renewable energy sources used together to provide increased system efficiency as well as greater balance in energy supply.

Solar and Wind hybrid power plant is an integrated hybrid energy solution capable of harnessing both the sunlight onsite and wind energy available at low altitudes in urban and rural environment.

It is designed Solar & Wind Hybrid Power Generation Training System to explain fundamentals of power generation and storage of Solar and Wind energy. This system includes controller-based digital measuring instruments for accurate results and protection devices for safety. It also includes an inbuilt Inverter which can be operated with both mains and through batteries. Users can easily understand how to configure Hybrid Solar & Wind system to get the maximum electrical energy for domestic and industrial use.

Features

01. Platform to provide complete understanding of Solar and wind Power Generation and its applications
02. Specially designed patch cords for extra safety.
03. Built-in Off-Grid Inverter
04. Equipped with adequate Protections wherever requires
05. Highly accurate microcontroller-based measuring instruments.
06. Equipped with multifunction meter to analyze output parameters.
07. Designed considering all safety measures.
08. System is flexible to operate on mains as well as inverter mode.

Scope of learning

01. Measurement and Analysis of Different parameters of Solar PV Module open circuit and short circuit, parameter measurement with series PV modules , I-V characteristic of PV module.
02. Study of Wind Power and Wind Energy power generation.
03. Study of wind turbine power and wind speed curves

Note: Specifications are subject to change.

Technical Specifications

Power Supplies:

Electrical control panel Operated on Mains power 230V, 50Hz +10%

Digital Meters:

To measure solar current voltage:

DC Voltmeter: 0-50V, DC Ammeter: 0-20A

To measure battery current voltage:

DC Voltmeter: 0-50V, DC Ammeter: 0-20A

Multi Function Meter (Voltage-10-230V, Current-100mA-5A, Watt-10-1200W, Energy meter, Display Resolution- 0.001kWh, Frequency-50Hz)

Control panel with inverter:

- Capacity: 500VA
- Input Voltage: 190~260V AC
- Output Voltage on Mains mode: same as input
- Output Voltage on UPS mode: 210~245V
- Output Frequency on UPS mode: 50Hz \pm 0.1Hz
- Output waveform on Mains mode: same as input
- Output waveform on UPS mode: Modified Sine wave
- Battery Charging Current: 12A
- Efficiency at full load : >80% UPS Overload/UPS Short circuit: Yes

Battery

- Solar Battery Capacity : 12V/41Ah Qty: 2 Nos.

Power and Charge Controller Unit (Solar):

- Solar PV Module : 24-50V
- Current : 20A
- Battery voltage : 24V
- Technology : PWM based

Power and Charge Controller Unit (Wind):

- Solar PV Module : 24-50V
- Current : 20A
- Battery voltage : 24V

Solar Power Stand (150Wx2) with Stand

- Vmp: 35V
- Imp : 7.14A

Wind Turbine

- Wattage: 200W
- Output: 24V DC
- Blades: 3Nos.

Wind blower

- Wattage 1hp
- Axial fan blower with 3 phase induction motor controlled by 1hp ac VFD drive

Accessories Included

- Battery Bank 2Nos.
- Wind Turbine
- Fan Blower
- Solar Panel- 2Nos.
- Patch Cords
- Halogen Lamp- 6Nos.
- User Manual

Note: Specifications are subject to change.