



# COMBINED WIND and SOLAR GENERATOR DEMONSTRATOR RE580



Year 1  
study

## Features

- Demonstrates the Practical Application of a Solar Power and Wind Powered Generation System
- Allows Investigation Of System Performance Inside The Laboratory Irrespective Of Outside Conditions.
- Investigation of Solar Panel Characteristics and Operation Limitations
- Investigation of Control of a Wind Generator
- Safe for Student Operation.

## Description

A small (12V Nominal) solar panel with nominal 10W output is connected to a battery charge control system. The charge controller is also connected to a small (500mm diameter) wind turbine. The charge controller can be connected to the supplied deep cycle lead acid battery. The solar panel is supplied with a 400W solar simulator that allows the panel to be irradiated and generate power within the laboratory. This allows students to investigate the relative magnitude of incoming solar radiation, relative to power generated. To allow investigation of the wind generator inside the laboratory a small but powerful axial fan is supplied that will allow the generator to be run up to a realistic speed. The 500mm diameter wind turbine can generate up to 25W at 19 knots (approximately 10 m/s). A handheld digital voltmeter is supplied as standard. To investigate the detailed performance of both wind and solar components and to investigate the use of DC power for practical applications. Both the solar panel and wind generator connect to a digital combined charge controller that allows the output power from both the solar panel and the wind generator to be investigated. Optional instrumentation and accessories (which can alternatively be locally sourced) are available.

#### Related Laws/Applications

- Environmental Engineering
- Energy Conservation
- Mechanical Engineering
- Architecture
- Building Services
- Electronics
- Electrical and Electronic Engineering
- Automotive Engineering
- Plant & Process Engineering.

#### Learning capabilities

- Investigation of the components of a combined wind and solar power generation system
- Investigation of the effects of shading on a practical solar installation.
- Investigation of the wind generator output voltage and power with wind variation.
- Investigation of the panel output voltage and power with solar irradiation and an investigation of panel efficiency.
- Investigation of the effect of wind direction on generator performance.
- Examination of a battery charge management system.
- Attachment of Optional DC Loads

#### Technical Specification

- Solar panel: nominal 12V, 10W output
- Wind turbine: Ø500mm, 25W @ 19knots (approx. 10m/s)
- 400W solar simulator
- Ambient Noise Level of Room at 1.5m from equipment: 30DB (equipment switched off)
- Ambient Noise Level of Room at 1.5m from equipment = 78-79DB (equipment switched on)
- Integral charge control system provides overload protection and battery protection
- Low voltage operation
- Electronic cut-outs and fuses fitted

#### Recommended Ancillaries

- REA1 - Deep Cycle Lead Acid GEL Battery
- REA2 - Tachometer
- REA3 - Solarimeter
- REA4 - Water Pump
- REA5 - Single Phase Inverter
- REA6 - Anemometer
- REA7 - Clamp Ammeter

#### What's in the Box?

- 1 x RE580 (Solar collector, charge regulator, wind turbine, test lamp, fan blower, test plate, gel battery)
- 1 x Transformer (115V only)
- 1 x Spare bulb
- 2 x Spare fuse
- 1 x Angle finder
- 1 x Compass
- 2 x Lead set
- 1 x Power cable
- Instruction manual
- Packing list
- Test sheet

#### Weights & Dimensions

- Weight: 42 kg
- Weight: 46 kg (115V version)
- Length: 527mm
- Width: 750mm
- Height: 700mm

#### Essential Services

- 600W 220-240 Volts, Single Phase 50 Hz (with earth / ground).
- Line current up to 3.0A at 230v.
- 600W 110-120 Volts, Single Phase 60 Hz (with earth / ground).
- Line current up to 6.0A at 110V.

#### Ordering information

To order this product, please call PA Hilton quoting the following codes:  
RE580/230 - Combined Wind and Solar Generator Demonstrator  
RE580/115 - Combined Wind and Solar Generator Demonstrator

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COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 5 YEARS