GES-200

Wind Energy Trainer

The GES-200 Wind Energy Trainer is an easy and self-contained trainer designed for learning the basics and characteristics of wind energy.

The current-voltage characteristic curves and charging/discharging curves are obtained through the use of different wind speeds, load units and wind generators.

▶Features

- Self-contained wind energy trainer
- Modular design, easy setup and storage
- Selectable types of blades, adjustable number and tilt angle of blades
- Horizontal and vertical axis wind generator available
- DAQ is advantageous to acquire and save the experimental data (optional)

▶Specifications

Wind Energy Baseplate (GES-28001)

»Wind Generator(Blower)

1. Input voltage : 88 ~ 264VAC
2. Frequency : 47 ~ 63Hz
3. Wind speed controller knob : Scale 0 ~ 11


GES-28001

Vertical Axis Wind Turbine (GES-28002)

1. Drag type wind turbine : 3 blades, 4 blades
2. Nominal voltage : 6V
3. Maximum power : 60mW


GES-28002

Horizontal Axis Wind Turbine (GES-28003)

1. Types of blades : Dutch type, sail wing type, tapered wing type
2. Number of blades : 2 blades, 3 blades, and 4 blades
3. Tilt angle of blades : Adjustable
4. No gearing mechanism, low friction
5. Nominal voltage : 6V
6. Maximum power : 3W
7. Maximum efficiency : 65%


GES-28003

Anemometer (GES-28004)


GES-28004

Wind Energy Module (GES-23001)

1. Digital Multimeter x2

(1) DC voltage : 400mV, 4V, 40V auto range
Input resistance ≥ 10MΩ
(2) AC voltage : 400mV, 4V, 40V auto range
Input resistance ≥ 10MΩ
(3) DC current : 400μA, 400mA, 10A, push button selector switch
10A Range : 10A/250V fuse protected
mA/μA Ranges : 0.5A/250V fuse protected
(4) AC current : 400μA, 400mA, 10A, push button selector switch
10A Range : 10A/250V fuse protected
mA/μA Ranges : 0.5A/250V fuse protected

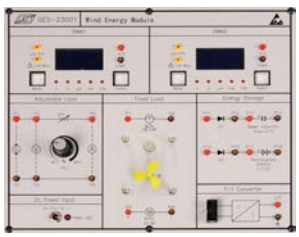
(5) Resistance : 400Ω, 4KΩ, 40KΩ, 4MΩ, 40MΩ, auto range
(6) Diode test : 0~1.5V
(7) Continuity : Buzzer for the measured resistance <30Ω
(8) Display : 3 ¾ digit LCD, maximum indication 3999

2. Energy Storage
(1) NiMH rechargeable battery 1.2V/80mAh,
(2) Super capacitor 10F/2.7V

3. Load
(1) DC motor : 0.5V~6V, 10mA
(2) Light bulb : 1.5V
(3) Potentiometer : 100Ω

4. F/V Converter
(1) Output transfer function 1V = 1000RPM
(2) Maximum effective input speed : 4500RPM

Power Supply
1. Input voltage : 110/220 VAC
2. Output voltage : 15VDC



GES-23001

List of Experiments
1. Measuring wind speed in the surroundings with anemometer
2. Relationship between wind speed and wind speed controller of the blower
3. Effect of blade type on the output power of horizontal axis wind turbine
4. Relationship between the number of blades and the output power of horizontal axis wind turbine
5. Effect of blade angle on the output power of horizontal axis wind turbine
6. I-V curve of the horizontal axis wind turbine at constant rotational speed
7. Relationship between placement and I-V curve of horizontal axis wind turbine
8. Effect of wind speed on the output power of horizontal axis wind turbine
9. Output power of 3-blade and 4-blade vertical axis wind turbines
10. I-V curve of the vertical axis wind turbine at constant wind speed
11. Charging a capacitor with the horizontal axis wind turbine
12. Discharging the capacitor through different loads
13. Constructing a wind power island system

Accessories (GES-29001)
1. Flat cable : 10-pin, 100cm x 1
2. Test leads : 1set
3. Experiment manual
4. Instructor's manual
5. Key
6. Angle calibrator (GES-28005)

GES-28005

Optional
DAQ with Sofware (GES-23003)
1. Channel 1 : V measure, max. input voltage ±5V
2. Channel 2 : A measure, max. input current 1A
3. Channel 3 : RPM measure, max. 4500 rpm
4. DAQ type :
   GES-23003 for Windows 8/Windows 7/Vista/XP
5. PC Requirements
   (1) INTEL CPU P4 or better
   (2) USB port equipped
   (3) 1GB of hard disk space
   (4) CD-ROM drive
   (5) Operating system : Windows 8/Windows 7/Vista/XP

GES-23003

Protection Cover (GES-29002)