

## GES-300

### H<sub>2</sub>/O<sub>2</sub> Fuel Cell Trainer



GES-300 oxy-hydrogen fuel cell trainer makes trainees understand how to produce the fuel via electrolysis and use the produced fuel to generate electricity. The modularized design of the experiment can be implemented easily. In addition, the users can design their own training courses according to their demands.

GES-300 is designed as a toolbox. All the required equipment for making experiments is included, and easy for setting and storage.

#### ► Features

- GES-300 is a basic trainer of the Proton Exchange Membrane Fuel Cell (PEMFC).
- Open system configuration with modularized-design elements.
- Understand the combination of water by electrolysis.
- The voltage and current can be measured.
- A complete fuel cell database can be constructed for study, research, and development.
- The brightness of the simulated sunlight is adjustable.

#### ► Specifications

##### ► H<sub>2</sub>/O<sub>2</sub> Fuel Cell Trainer (GES-31001)

###### 1. Electrolyser

- (1) Size : 54(L)x54(W)x15(H)mm±5%
- (2) Input voltage : DC 1.8~3V
- (3) Input current : 0.7A at 2V
- (4) H<sub>2</sub> production rate : 7ml/min

###### 2. Water storage capacity x 2 : 80ml

###### 3. H<sub>2</sub> storage capacity : 50ml

###### 4. O<sub>2</sub> storage capacity : 50ml

###### 5. H<sub>2</sub>/O<sub>2</sub> Fuel Cell

- (1) Size : 54(L)x54(W)x15(H)mm±5%
- (2) Output voltage : 0.6V
- (3) Output current : 2.4A
- (4) Output power : 1W

###### 6. Keptimer

###### 7. Digital Multimeter x2

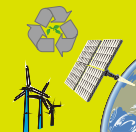
- (1) DC Voltage : 400mV, 4V, 40V, auto range  
Input resistance ≥ 10MΩ
- (2) AC Voltage : 400mV, 4V, 40V, auto range  
Input resistance ≥ 10MΩ
- (3) DC Current : 400μA, 400mA, 10A, pushbutton select switch  
10A Range : 10A/250V fuse protected  
mA/μA Ranges : 0.5A/250V fuse protected
- (4) AC Current : 400μA, 400mA, 10A, pushbutton select switch  
10A Range : 10A/250V fuse protected  
mA/μA Range : 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, max. indication 3999

###### 8. Load

- (1) DC motor : 0.5~6V, 10mA
- (2) Light bulb : 1.1V, 300mA
- (3) Potentiometer : 100Ω, 10-turn



GES-31001



## ► Solar Module (GES-33001)

### 1. Solar Cell

- (1) 6 pcs of monocrystalline silicon solar cell 26\*156mm
- (2) Each unit solar cells
  - a. Open circuit voltage (Voc) : 0.63V
  - b. Short circuit current (Isc) : 1.45A
  - c. Maximum load voltage (Vmp): 0.52V
  - d. Maximum load current (Imp) : 1.35A
  - e. Maximum power (Pmp) : 0.7W
  - f. Efficiency (Eff) : 15%

### 2. Dimmer

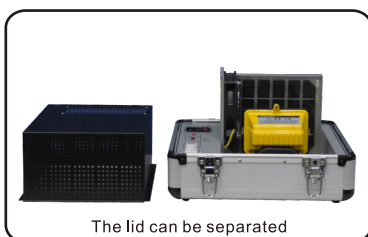
Adjust the brightness of halogen lamp

### 3. Light Source

Halogen lamp 250W

## ► Power Supply

1. Input voltage 110/220VAC
2. Output voltage 9VDC for DMM use only



## ► Accessories (GES-39001)

1. AC Power cord
2. Test lead : 1set
3. Silicone tube : 1set
4. Experiment manual : 1 pce
5. Syringe : 1 pce
6. Scissor : 1 pce
7. Measuring glass : 1 pce

## ► Optional

1. Channel 1 and 2 : max. input voltage  $\pm 5V$
2. Channel 3 and 4 : max. input current 1A
3. 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 7/Vista/XP/2000 (GES-13003)



## ► List of Experiments

1. Safety Information
2. GES-300 H<sub>2</sub>/O<sub>2</sub> Fuel Cell Trainer
3. Hardware Installation
4. Energy Conversion of Solar Cell
5. I-V Curve of Solar Cell
6. H<sub>2</sub>-to-O<sub>2</sub> Ratio in Water Electrolysis
7. Production Rate of Gas Volume in Water Electrolysis
8. Efficiencies of Electrolyser
9. I-V Curve of Electrolyser
10. H<sub>2</sub>/O<sub>2</sub> Fuel Cell
11. I-V Curve of H<sub>2</sub>/O<sub>2</sub> Fuel Cell

## ► Consumables

1. Proton exchange membrane fuel cell
2. Electrolyser
3. Silicone tube

## ► System Requirements

Deionized water resistance :  $\geq 13M\Omega$

