

Reliable Service
Competitive Price

**燃料电池测试及系统零组件
解决方案**

The ideal product you can trust!

Fuel Cell Test Total Solution

Build Your Own Fuel Cell Test System More a Easier Way!

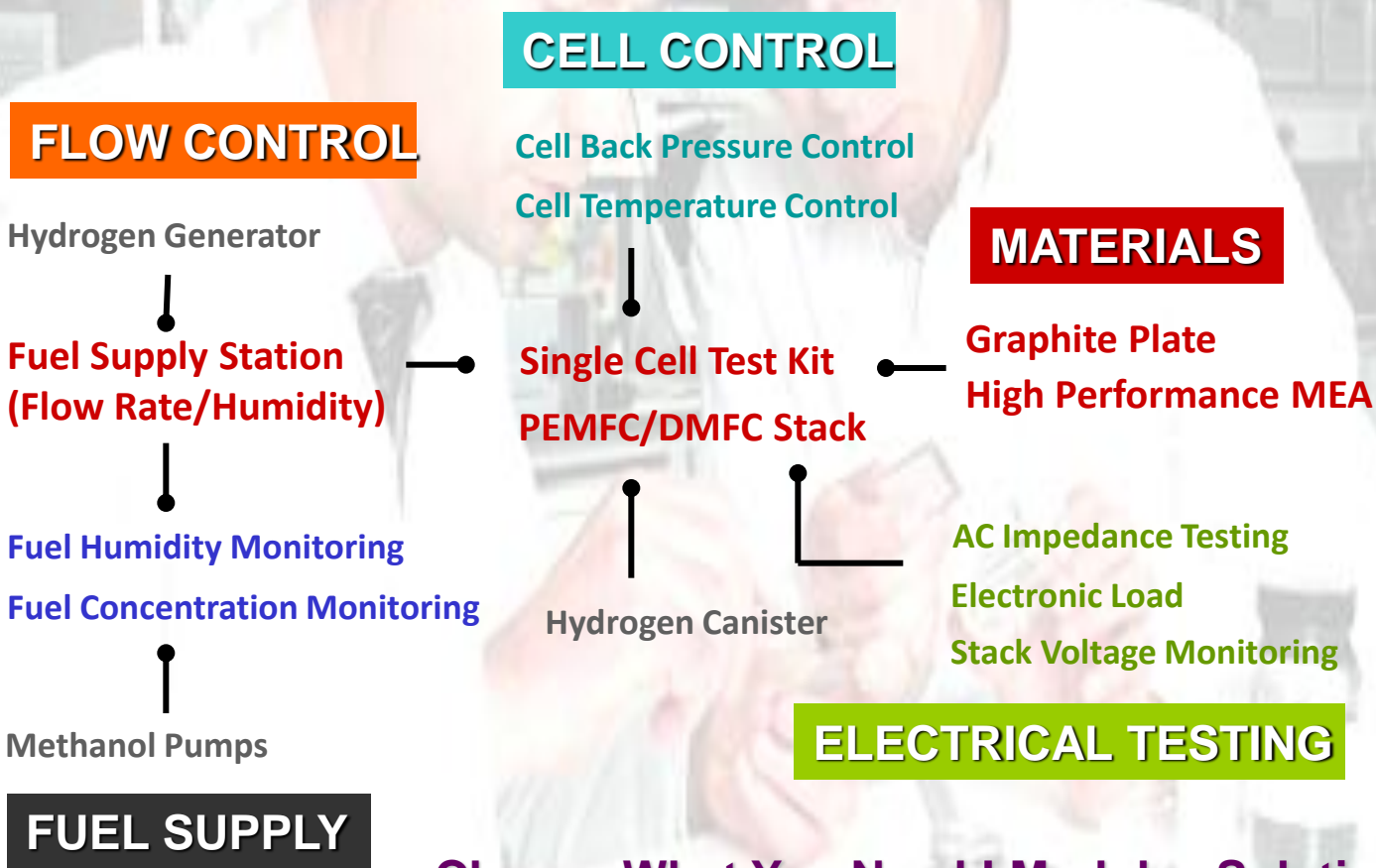
Introduction

Fuel cell can be considered as an eco-friendly electricity generator, optimization of electricity generating in fuel cell is dominated by reactant supply and stack condition. What is taken into account in fuel cell test includes: fuel control (flow rate, humidity, temperature, and pressure control), fuel cell stack design (cell temperature control, flow field design, material selection), and fundamental I-V polarization characterizing (load test, AC impedance analysis).

Hephas Energy provides individual mature module that allows users to select what you need base on research/education specific requirement, you can purchase a flow rate control and humidification module if you already have a e-load; or you can just get a back pressure module for cell pressure control test. And of course, if you need a turnkey solution, we can also provide a whole system that let you start your test immediately.

We also provide proprietary MEA and graphite plate material in accordance to your requirement in terms of active area, layers, flow field design, plate machining service, etc. Hephas Energy strives to match you needs.

What You Need in Fuel Cell Testing



Choose What You Need ! Modules Solution!

燃料电池测试设备

Match *your* Needs!

Advanced Fuel Cell Test System

产品说明

- 适用于大面积燃料电池单电池研发
- 人性化PC软件操作
- 强大的测试编排及分析工具
- SOFC, DMFC, 及重组型燃料电池适用
- 完整的安全保护机制
- 高温单电池测试研究适用
- 可加装湿度变更硬件
- 可手动调整干湿气体进口
- 内含自动补水装置

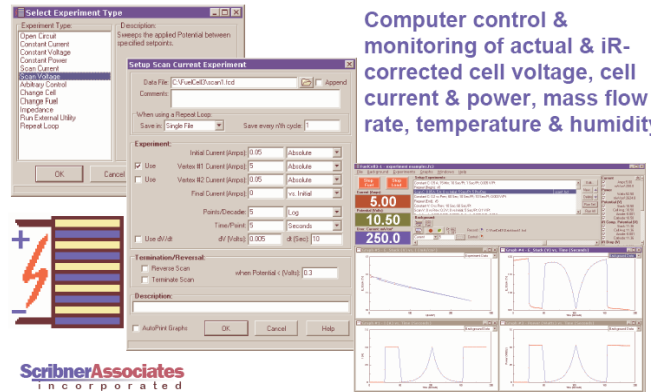
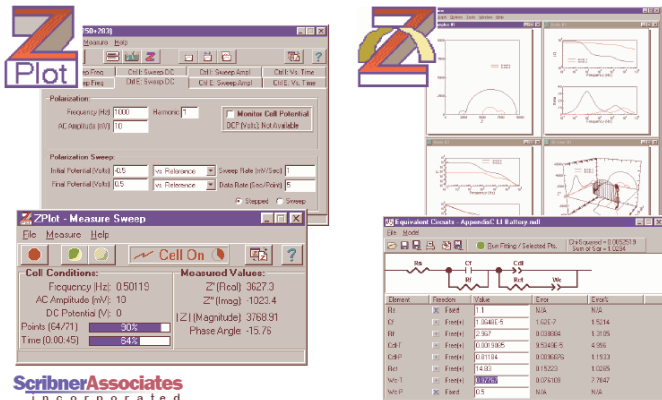
HTS-SOFC50



HTS-125/500

FuelCell[®] offers a comprehensive friendly interface for fuel cell test operation & monitoring, along with FCView[®], you could easily access and compare test data exactly your way.

Computer control & monitoring of actual & iR-corrected cell voltage, cell current & power, mass flow rate, temperature & humidity



Impedance Measurement

With a current-interrupt measurement, you could monitoring the resistance variation of your fuel cell in real time. Furthermore, with a built-in FRA (option), you could obtain a rich set of data about your fuel cell.

Electrochemistry Research

For half cell test requirement, HTS provides two points of reference electrode voltage sense inputs. Combining with FuelCell[®], you could monitor individual voltage variation in real time.

HephaStation

Fuel Cell Test Station for System Performance Evaluation and Activation

Product Features

- Quick Assurance
- Fuel Cell Stack Activation
- Durability Test
- Automatic Test Execution
- Wide E-load Compatibility
- Verified Humidity
- Reproducibility
- Cost effective
- Complete Safety Protection



1kW~3kW Type



100W~600W Type

Product Introduction

HephaStation is a economical fuel cell test station suitable for stack performance evaluation, large area single cell test evaluation, fuel cell continuous test and activation test. With a comprehensive protection and alarm mechanism, HephaStation ensures your safety under all kinds of conditions. With a production oriented design, we hope to provide you a proper test solution yet under an affordable price.

Humidity Verification

Every humidifier in HephaStation unit is verified with an proprietary humidity verification system to assure humidity reliability, stability and proper respond on humidity variation.

Software

HephaSoft® offers a comprehensive friendly interface for fuel cell test operation & monitoring. Available for single channel up to 25 units. (multi-channel control is option function)

Electronic Load

With multi-current range, user has a wider flexibility to test fuel cell from small cell to large active area cell; 0V support for single cell test.

Hardware

HephaStation equipped with an emergency safety shutdown, software will automatically monitor inlet gas pressure, temperature, current, voltage, etc. just to assure your safety and prevent from cell damage. Each channel can be configured independently for experiment procedure and protect alarm setting.

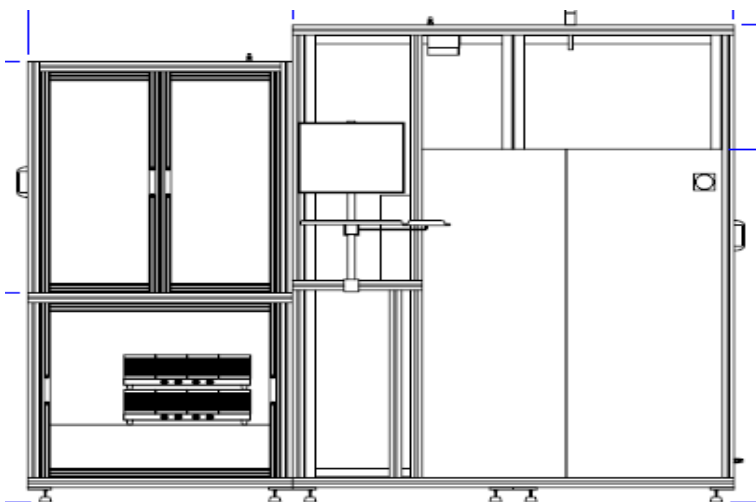
Model Name	Flow range (Anode/Cathode)	Fuel Type	Flow Rate Control Accuracy
P150	2/5 SLPM	H2/Air	±1% of F.S. setting
P300	3/10 SLPM		
P600	10/25 SLPM		
P1200	60/100 SLPM		
D100	80sccm/1 SLPM	Methanol /Air	±1% of F.S. setting

HephaStation

Fuel Cell Test Station for System Performance Evaluation and Activation

Product Features

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- Fuel Cell Stack Activation
- Durability Test
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- Wide E-load Compatibility
- Verified Humidity
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- Cost effective
- Complete Safety Protection



10KW~60KW Type

Product Introduction

	P10KW	P20KW	P30KW	P60KW
Test object				
Stationary / Vehicle stack	○	○	○	○
Electronic Load				
Maximum Power	10KW	20KW	30KW	60KW
Maximum Current	320A	640A	960A	1920A
Minimum Current resolution	5.34mA	10.67mA	16mA	32mA
Voltage range	5V~600V	5V~600V	5V~600V	5V~600V
Voltage resolution	10mV	10mV	10mV	10mV
Multi-point voltage monitoring (option)	○	○	○	○
Reactant Gas Control & Humidifiers				
Anode type	H ₂	H ₂	H ₂	H ₂
Anode flow range (SLPM)	2.4-120	4.8~240	7.2-360	14.4-720
Cathode type	Air/O ₂	Air/O ₂	Air/O ₂	Air/O ₂
Cathode flow range (SLPM)	12-600	24-1200	36-1800	72-3600
Variable humidity option (option)	○	○	○	○
Humidifying Type	Bubbler/Spray	Bubbler/Spray	Bubbler/Spray	Bubbler/Spray
Automatic Water Fill	○	○	○	○

HephasMiniTM

TM

简易型燃料电池流量供应模块，适用于燃料电池活化及耐久分析！

Economical Fuel Cell Test Module

产品说明

- 适用于燃料电池教研使用
- 燃料电池多频道活化测试
- 燃料电池长期耐久性测试
- 高稳定性及操作便利性
- 可搭配产氢机及空气帮浦做为燃料电池教学使用



产品规格

Gas Flow Control

- Flow meter control
 - Anode : up to 2 SLPM
 - Cathode: up to 5 SLPM
- Operation differential pressure : under 300kPa
- Operation temperature range : RT to 80 °C
- Accuracy : +/- 2%FS

Temperature Control

- 3-Points Temperature control : Test Cell , Anode Humidifier, Cathode Humidifier
- Temperature Resolution : ± 1 °C
- Thermal Couple : Type K for cell

Gas Humidity Control

- Bottle-type Humidifier
- Heater : 300 W (Anode/Cathode)
- Temperature Range : room temperature to 85°C @5slpm
- Humidity : >RH 80% @ 5slpm
- Humid/Dry gas switch function

Hardware Specifications and Safety

- Dimension : 490mmX245mmX380mm (+28cm with heating Tubes)
- Weight : 50 lbs.
- Power : 120V 50/60 Hz ~ 1KW
- Manual emergency stop

测试附件



- Electronic Load
- 60V/30A



- Fuel Humidity Monitoring Module (Laser Type)



- Single Cell Test Kit (Active area can custom design)



- Back Pressure Control Module (0~2bar)



- AC High Frequency Impedance (HFR) Test Module (1kHz)



- Hydrogen Generator 100/300/600ml/min



- Cell PID Temperature Control Module



- MeOH Concentration Monitoring Module (For DMFC Research)

Hephas Energy also provides standard fuel cell test station (100W~3kW), please contact us for more information!

High Performance PEMFC & DMFC Single Cell Test Kit

产品说明

- 内含高性能PEMFC/DMFC材料
- 适用于燃料电池教学及基础科研使用
- 安装简易
- 标准活性面积产品为35*35mm, 50*50mm
- 可客制化设计流场板流道
- 氟素接头(1/4 O.D.)

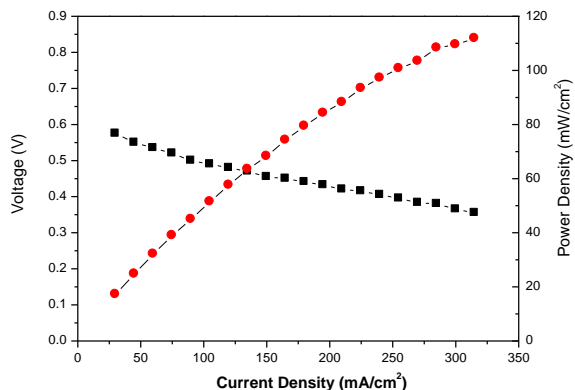


附赠高性能燃料电池 PEMFC/DMFC材料!!

单电池测试 I-V 性能

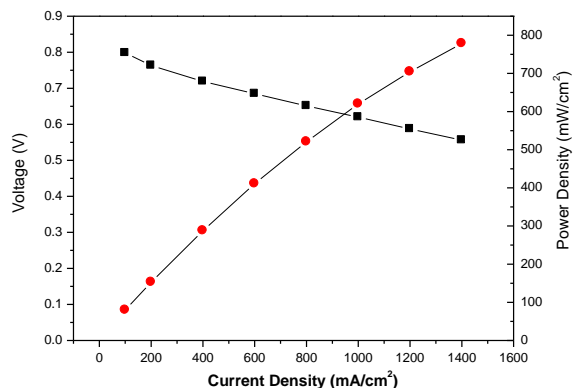
DMFC MEA

Test Condition: MEA3(N-115)+GDL, MeOH(1M) 4X, Air 3X, 70°C



PEMFC MEA

Test Condition: MEA3(NRE211), H2 1.25X, Air 1.67X, 100%RH, 65°C



测试附件



- Electronic Load
- 60V/30A



- Fuel Humidity Monitoring Module (Laser Type)



- Fuel Supply Module (MFC Fuel Controlled, Humidity Bottle, and 3-points Temperature Controller)



- Back Pressure Control Module (0-2bar)



- AC High Frequency Impedance (HFR) Test Module (1kHz)



- Heat Jacket (For High Temperature Testing and Thermal Insulation)



- Cell PID Temperature Control Module



- MeOH Concentration Monitoring Module (For DMFC Research)

Hephas Energy also provides standard fuel cell test station (100W~3kW), please contact us for more information!

测试模块产品

Product List and Specifications



High Performance Single Cell Test Kit

- Active area can custom design
- Standard 35*35 / 50*50 mm
- With standard high performance MEA



Single Cell Heat Jacket

- High quality thermal insulator
- Thermal resistance



PEMFC/DMFC Stack and System

- Self-humidified stack design (SH-series)
- 30W, 100W, 200W, 500W, 1kW system (SH-series)
- 1.2kW water-cooled stack (WC-series)
- 40/65W DMFC Stack available



Gas Humidity Monitoring

- Laser type humidity measurement, high response time.



Fuel Concentration Monitoring

- MeOH concentration (0~10%, variable range)
- MeOH temperature (5~70 °C, variable range)
- Software included



Back Pressure Control

- 0~2bar
- Manual operation



Liquid Fuel Pump

- Flow rate range : 0.3~300mL/min
- Liquid pressure : 10 bar
- Flow rate resolution : $\pm 1\%$



Complete Fuel Cell Test System

- Complete fuel cell testing system
- Software control, test procedure programmable
- 125W 5/25/50A ; 500W 125A e-load design
- 1K~0.1Hz AC impedance function embedded



Fuel Supplying Module with Cell Heating Control

- Fuel Supply Module (MFC Fuel Controlled , Humidity Bottle, and 3-points Temperature Controller)
- 150W



Economical DC Electronic Load

- 60V / 30A
- Resolution 1mA / 10mA upon grade



AC Impedance Meter

- 1kHz AC impedance analysis
- Range auto switch



Stack Cell Voltage Monitoring

- 72-Channel Voltage Monitoring
- -1.25V~1.25V Range
- Resolution 3mV
- Scan rate 72ch/sec



Cell / Fuel Temperature Control

- PID temperature monitor and control
- RT to 400 °C temperature range
- Over temperature alarm
- K-type thermal sensor
- RS232 data record



Hydrogen Generator

- Gas Flow Rate 100/300/600ml/min
- Delivery Pressure 100kPa
- H2 Leakage detection
- Operation Temperature 5~60 °C

燃料电池材料

Match *your* Needs!

Graphite Bi-Polar Plate, 高性能石墨双极板

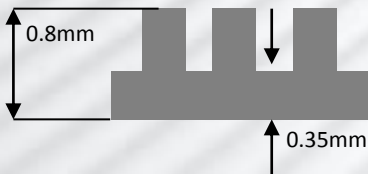
产品说明

- 适合于燃料电池领域应用
- 高横向及纵向导电度
- 高机械强度，适用于电堆组装
- 适用于基础流场板科研开发及组装研究
- 高耐化学特性
- 可客制化提供流场板加工及设计咨询服务

产品规格

Product Type		HCPlate-G	HCPlate-C1	HCPlate-S
Physical Properties				
Density	g/cm ³	1.96	1.85	1.88
Flexural Strength	MPa	45	43	78
Compressive Yield Strength	MPa	99	59	130
Shore Hardness HS-19A		55	39	50
Electrical Resistivity (X-Y)	mΩcm	0.9	20	25
Electrical Resistivity (Z)	mΩcm	<0.5	40	50
Maximum Service Temp.	°C	170	180	180

G: Graphite Plate C: Molding Composite Plate S: Special Composite Plate



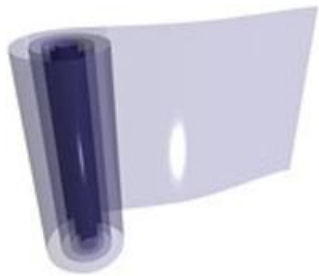
Note:
*1 Best molding/machining dimension :
thickness=0.8mm 、flow side
height=0.45mm 、flow field depth =
0.35mm

Single Cell Research
Stack Research
Flow Pattern Research
Stack Assembling Research

Custom Design Flow Pattern!

MEA 原材料供应目录

本公司供应下列燃料电池MEA零组件产品，欢迎来电洽询！



質子傳導膜

Proton Exchange Membrane, PEM

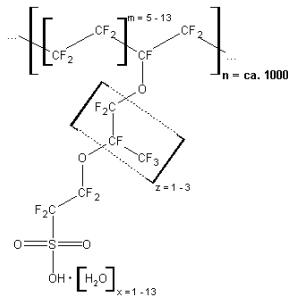
- 氟素系列質子傳導膜 Fluoro-based PEM, (Nafion)
- 碳氫系列質子傳導膜 Hydrocarbon-based PEM
- 高溫專用質子傳導膜
- 厚度尺寸可選擇



活性碳載體

Active Carbon / Carbon Nanotubes

- Cabot 高比表面積活性碳載體 (XC-72、XC72R)
- 碳奈米管供應



離子體溶液

Ionmer Solution

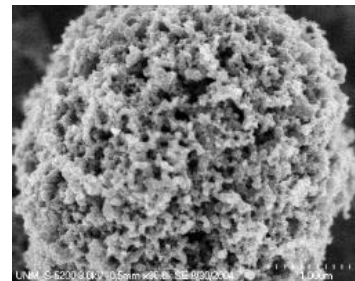
- 氟素系列離子體溶液 (Nafion Solution)
- 碳氫系列離子體溶液 (Hydrocarbon-based Ionmer Solution)
- EW值、固含量濃度可選擇



氣體擴散層

Gas Diffusion Layer, GDL

- 碳布/碳紙 材料氣體擴散層供應
- 可進行疏水處理
- 可進行微孔層處理 (Micro-porous Layer)



電極觸媒

Electrode Catalyst

- 各式白金觸媒供應 (Pt, PtRu 合金)
- 不同負載量可選擇 (20~60wt%, and Pt/PtRu Black)
- E-tek、Johnson Matthey、Tanaka 高性能白金觸媒



氣體擴散電極

Gas Diffusion Electrode, GDE

- 客製化碳布/碳紙 氣體擴散電極供應
- 最小訂購量限制，歡迎來電詢問

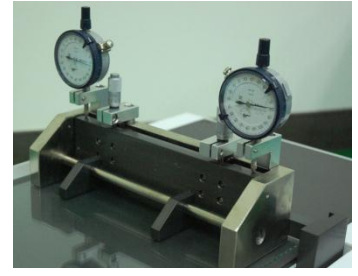
燃料电池MEA 制作设备

Match *your* Needs!

Fuel Cell MEA and Stack Production System

Product Features

- Lab research, Pilot or Mass Production Equipment
- PEM casting, MPL coating, Electrode layer production
- CCM process available
- Slot nozzle and spray coating
- Reliable performance and high throughput
- Complete safety function design
- Custom production line design service



Product Introduction

Doctor Blade Coating

- Lab research
- Formulation test
- PEM, GDE, MPL coating
- Sucking and Heating (Option)



MEA Hot-Presser

- Research/Pilot/Mass Production
- MEA Hot Press
- High throughput
- Safety Function



Slot Nozzle Coating

- Pilot/Mass Production
- Explosion Proof
- MPL, GDE, CCM Available



Electrode Spray Coating

- Lab catalyst Research
- CCM/GDE Research



Electrode Spray Coating

- Pilot/Mass Production
- Explosion Proof
- High throughput

燃料电池发电系统



Match *your* Needs!

EFOY Pro Series 直接甲醇燃料电池系统

EFOY Pro Series Direct Methanol Fuel Cell System

EFOY产品为使用甲醇燃料电池技术(DMFC)之燃料电池电力产品，是目前全球最为畅销之直接甲醇燃料电池系统。其产品于欧洲已经有超过10000台以上之实绩，广泛的利用于多种应用领域中，并通过各项国际安规认证。甲醇燃料的高能量密度，更是目前长时间电力操作的最佳选择！



产品特点

- 耐用免维护
- 重量轻，结构紧密
- 噪声小，污染排放小
- 对12V 和24V 电池自动调节充电
- 适合用混成系统发电—太阳能发电系统的理想组合

甲醇燃料的最大优势

问题：如果您的电力产品每小时消耗20W能量，您需要在野外用上三个月？
(90天*5Hr*20W=9,000 Whr)



是選用鉛酸電池？

鉛酸電池(24V 20Ahr 20顆=9,600Whr)

240 kg

16 kg

M10 燃料罐 (11,100Whr) 搭配 Pro 600 燃料電池系統

還是選用EFOY Pro 燃料電池系統？



● EFOY Pro 产品的使用概念：



● 产品规格：

EFOY	Pro 600	Pro 1200	Pro 1600
充电容量	600 Wh/day	1200 Wh/day	1560 Wh/day
额定输出	25 W	50 W	65 W
额定电压	12 V / 24 V	12 V / 24 V	12 V / 24 V
额定电流 @ 12 V / 24 V	2.1 A / 1.05 A	4.2 A / 2.1 A	5.4 A / 2.7 A
重量	17.2 磅 (7.8kg)	18.1磅 (8.2kg)	18.5磅 (8.4kg)
噪声		23 dB(A) 7米距离内 39 dB(A) 1米距离内	
工作温度		-20 to +45 °C (-4 °F to +133 °F)	
额定燃料消耗量*		0.9 l/kWh	
尺寸 (长 x 宽 x 高)		433 x 188 x 278 mm (17 x 8 x 11 in)	

*实际的燃料消耗量会因实际操作的条件略有改变。

● 甲醇燃料罐规格：



燃料罐	M5	M10	M28*
容量	5 升	10 升 (2.64 加仑)	28 升 (7.4 加仑)
重量	4.3 kg (9.5磅)	8.4 kg (18.5磅)	22 kg (48.5 磅)
额定能量值	5.5 kWh	11.1 kWh	31.1 kWh

● 产品应用：



安防/監視器



太陽能電池混成



獨立型警示燈/告示系統



移動載具/電動車