



# SUSTAINABLE TECHNOLOGY

## GREEN JOBS OF THE FUTURE

 **ANAB**  
ACCREDITED  
MANAGEMENT SYSTEMS  
CERTIFICATION BODY  
ISO 9001:2015

*American made since 1954*

# Hampden Engineering Corporation

The World Leader in Teaching Equipment



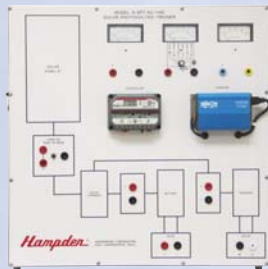
Back View

The **Model H-SPT-AC-1A**  
**Solar Photovoltaic Trainer**

offers the user  
a practical alternative to  
the difficulties  
of supplying  
electric power  
to remote locations.



Front View



Front View

The **Model H-SPT-AC-1-HS**  
**Table Top Solar Photovoltaic Trainer**  
is a control system trainer which lets the student technician  
examine the electrical layout and  
operational features normally associated with a photovoltaic  
power source.



Back View

The **Model H-PVIT-1**  
**Photovoltaic Installers**  
**Trainer**

has been designed with the  
latest Industrial/Commercial  
components available.

The trainer will provide  
the necessary  
training in completing a  
fully functioning,  
grid-tied solar electric system.

This system  
will have the capability  
to be  
fully monitored  
and  
controlled.







The **Model H-SST-1A  
Solar System Trainer**

is an actual  
solar hot water heating system.

The trainer is mounted on  
a mobile frame  
and the  
collector panel  
is adjustable  
for easy  
positioning in  
direct  
sunlight.



The **Model H-SHSP-1  
Solar Heat and Solar  
Photovoltaic Trainer**

is a fully mobile solar heat solar photovoltaic  
control system trainer which lets the  
student technician examine the hot water  
and electrical layouts and operational features  
normally associated with a solar heating system  
and photovoltaic power source.

The trainer demonstrates the characteristics  
of the solar array, water heating, water circulation,  
storage battery, AC and DC distribution, and AC  
and DC loading. The complete water heating  
and charging sequence can be observed.

The H-SHSP-1 Solar System Trainer combines  
solar photovoltaic and solar hot water. The trainer  
can work as a self contained unit using energy  
from the sun to produce electricity and hot water.







### The **Model H-WPG-1B Wind Powered Generator**

has been designed to provide the student with the basic understanding of how wind generators function as an alternate source of energy.



Cutaway view of wind turbine generator

### **H-WPG-1B-CA Wind Powered Generator Cutaway**

provides the student with the ability to understand the internal workings of an actual 400 watt wind generator.



### The **MODEL H-WTS37-DP Distribution Panel**

allows the user the ability to connect to the Wind Generator's power source safely through circuit breakers. It also includes meters to monitor the output voltage and current.



### The **MODEL H-WTS37-CA WIND TURBINE CUTAWAY**



The **MODEL H-WTS37 WIND TURBINE WITH TOWER ADAPTER** is a powerful way to make use of the wind for energy.

- **Rated Capacity** 5 kW peak
- **Weight** 170 lbs / 77 kg
- **Rotor Diameter** 12 feet / 3.72 meters
- **Swept Area** 115.7 ft<sup>2</sup> / 10.87 m<sup>2</sup>
- **Type** Downwind rotor w/ stall regulation control
- **Direction of Rotation** Clockwise looking upwind
- **Blades** 3 Fiberglass reinforced composite
- **Rated Speed** 50 – 230 rpm
- **Shutdown Speed** 370 rpm
- **Tip Speed** 66 – 213 f/s / 9.7 – 63 m/s
- **Alternator** Slotless permanent magnet brushless
- **Yaw Control** Passive
- **Grid Feeding** Interactive 120/240 VAC, 50-60 Hz and 120/208 VAC, 60 Hz, 3 Phase
- **Braking System** Electronic stall regulation w/ redundant relay switch control
- **Cut-in Wind Speed** 8 mph / 3.5 m/s
- **Rated Wind Speed** 20 mph / 9 m/s
- **User Control** Wireless 2-way interface remote system
- **Survival Wind Speed** 140 mph / 63 m/s
- **Total Harmonic Distortion** 2.7% at 2400W, meets UL 1741 and IEEE 1547.1 requirements
- **Frequency Accuracy** ± 0.02 Hz
- **Voltage Accuracy** ± 2.0 V (line to neutral)
- **Surge Rating** IEEE 1547 Surge rating B

**NOTE:** Pole, wiring and installation to be provided by school / owner

The Hampden **Model H-WTS37-CA** Wind Turbine Cutaway demonstrates the internal operation of a wind generator. The Wind Turbine is mounted on a mobile base with two locking castors. For safety reasons the turbine blades have been cut down. The turbine is fully motorized, and is designed to rotate at approximately 3 rpm. The motor is connected to the blade via a slip clutch system that provides an added level of safety. The cutaway areas on the turbine allow full visual access to the internal workings of a wind turbine, such as the alternator, gears, inverter and isolator system. The Hampden **Model H-WTS37-CA** comes with complete detailed decal components. Includes control panel with RPM meter.

**Standard Products...Designed to Meet Your Growing Needs!**





The **Model H-HPT-3**  
**Heat Pump**  
**Trainer**

is designed  
for use with  
a wide variety  
of  
fossil  
fuel  
furnaces,  
electric furnaces,  
air handlers,  
and  
evaporator  
coil  
combinations.

The **Model H-GHT-4A**  
**Gas Fired Warm Air**  
**Heating Trainer**

provides hands-on training  
by allowing students to  
conduct tests  
and  
adjustments  
on a modern forced air  
gas modulating  
furnace.

The **Model H-GTL-1 Geothermal Trainer**  
provides hands-on training by allowing students to conduct tests  
and adjustments on a modern Geothermal Heat Pump.



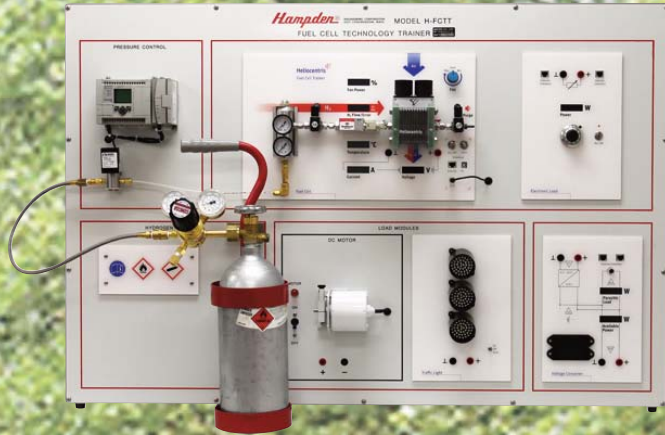




# FUEL CELL – ETHANOL – BIO-DIESEL

## The **Model H-BIO-100 Bio Diesel Demonstrator**

is ideal for the small producer using the same protocol and with the same quality construction as the larger units. Bio Diesel units are chosen for their rugged design, ease of use, no wash process protocol and price/capacity ratio. The H-BIO-100 is capable of producing up to 26.5 gallons per batch.



## The **Model H-FCTT-1 Fuel Cell Technology Trainer**

allows the student to create a grid independent power supply that uses only hydrogen as its fuel.

## The **Model H-6150-TT Table Top Liquid-To-Liquid Extraction Demonstrator**

option has been developed to permit student study of the fundamentals of a small scale liquid-to-liquid extraction stem. In addition to demonstrating the hydrodynamics of liquid-to-liquid extraction systems and interface control techniques, this unit can also be used to determine the mass transfer rates, heat transfer coefficients, extraction efficiency, and operating conditions.



## The **Model H-ETS-1A Ethanol Production Process System**

is designed to facilitate the instruction of students on the process required to produce ethanol for experimental purposes.

Ethanol is a very promising fuel alternative to oil since sources are widely available and ethanol is clean-burning.





The **Model H-6515 Anaerobic Digester** is a bench top trainer designed to demonstrate the fundamentals of the anaerobic treatment processes. Anaerobic treatment processes involve bacteria which function only in the absence of air.



The **Model H-6518 Aerobic Digester**

is a bench top trainer designed as a comprehensive study facility of biological water treatment processes.



The **Model H-6520 Infiltration Demonstrator**

investigates the infiltration rates of different soil types and soil surface treatments. (Shown with accessories)



The **Model H-RPT-1 Residential Piping Trainer**

demonstrates the process of a low flow pressure assisted toilet system.



The **Model H-PST-1 Plumbing System Trainer**

demonstrates the process of using gray water in toilet flushing systems.



Hampden is committed to providing industry-leading technology.

For the latest from Hampden, visit our home page at <http://www.hampden.com> or e-mail us at [sales@hampden.com](mailto:sales@hampden.com)



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ENGINEERING CORPORATION