

BIO-MASS / BIO-FUEL TRAINING SYSTEM



Hampden
ENGINEERING CORPORATION



Compact Mixer

Level Switch

Wire Immersion Heater

Boiler

Pump Stop & Start Pushbuttons (3)

Temperature Controller-Cooker

Temperature Controller-Distillation

Condensate Sight Glass

Cyclone

Venturi

Fill Port

Cooker

Mill Controller

Stainless Steel Mill

Thermocouple (1 of 8)

Experiments

➤ Effect of temperature on ethanol purity

➤ Use of different raw materials to produce ethanol

➤ Effect of type of yeast added on fermentation time

➤ Effect of fermentation time on ethanol yield

Magnetic Drive Pump

Solenoid Valve

Air Compressor

Circulating Water Tank Heating / Cooling

Heater 1000 Watts

Magnetic Drive Pump

4 Position Thermocouple Switch

Solenoid Valve Switch

Boiler Circuit Breaker

Cooker Circuit Breaker

Main Circuit Breaker

Valveless Metering Pump

Cooling Water Reservoir

Bottoms Drum

Bottoms Drum Level Gauge

Condensate Drum

Condensate Drum Level Gauge

Digital Temperature Meter

Cooling Water Flow Control Valve


The Hampden **Model H-ETS-1A** Ethanol Production Process System is designed to facilitate the instruction of students on the processes 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 student will be able to observe and control the process of producing ethanol from corn, sugar, sorghum, fruits or several other sources.

The Hampden **Model H-ETS-1A-CDL-L** Ethanol Training System with Computer Data Logging option is used to measure process temperatures through fermentation, distillation, and condensation. This feature adds six thermocouples to monitor the system. One interface package consisting of National Instruments input modules is provided for interfacing into a computer through a USB port. Templates for LabVIEW® control software are included.

Specify **H-ETS-1A-CDL-L** when ordering

The Hampden **Model H-BIO-100** Bio Diesel Demonstrator is ideal for educational purposes, using the same protocol and with the same quality construction as the large scale units. The rugged design, capacity and ease of use make this unit ideal for teaching and experimentation.

The H-BIO-100 is capable of producing up to 26.5 gallons per batch with High Temperature Pressurized Process (HTP) which consistently delivers 98% or better conversion ratios. Proper use of the unit and the HTP process delivers ASTM and EN compliant Biodiesel, without the need to wash.



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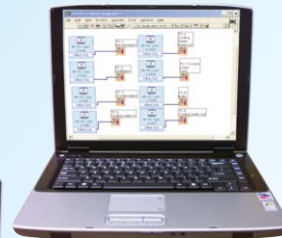
Optional Equipment

- ♦ Liquid-to-Liquid Extraction Demonstrator (H-6150-TT)
- ♦ Bio Diesel Demonstrator (H-BIO-100)
- ♦ Measurement Equipment
- ♦ Computer Data Logging (measuring temperature)
Specify H-ETS-1A-CDL-L when ordering

The Hampden **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 system. 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.



LabVIEW®
Block Diagram
screen shot
used with the
H-ETS-1A-CDL-L



LabVIEW®
Front Panel
screen shot
used with the
H-ETS-1A-CDL-L



Trailer comes complete with heating/air conditioning package and electrical power included in the system. Incorporated into the electrical system are (3) roof mounted solar panels. These panels can be used to keep the trailer battery fully charged and to operate the supplied DC dome lights. Other options are generator system to run heating /air conditioning and electrical power, recharge capability through direct plug of power source. Trailer includes a custom graphics and logos wrapping package applied to the exterior of trailer. The trailer also includes one curb side awning door that raises up to allow for open classroom environment as well as two curb side access doors and one large transportation door/ramp in back for removing and moving in equipment. The trailer is equipped with a water supply package and drain package that allows easy and convenient use of the training equipment.



Hampden is committed to providing industry-leading technology.

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