

# BIO-MASS / BIO-FUEL TRAINING SYSTEM

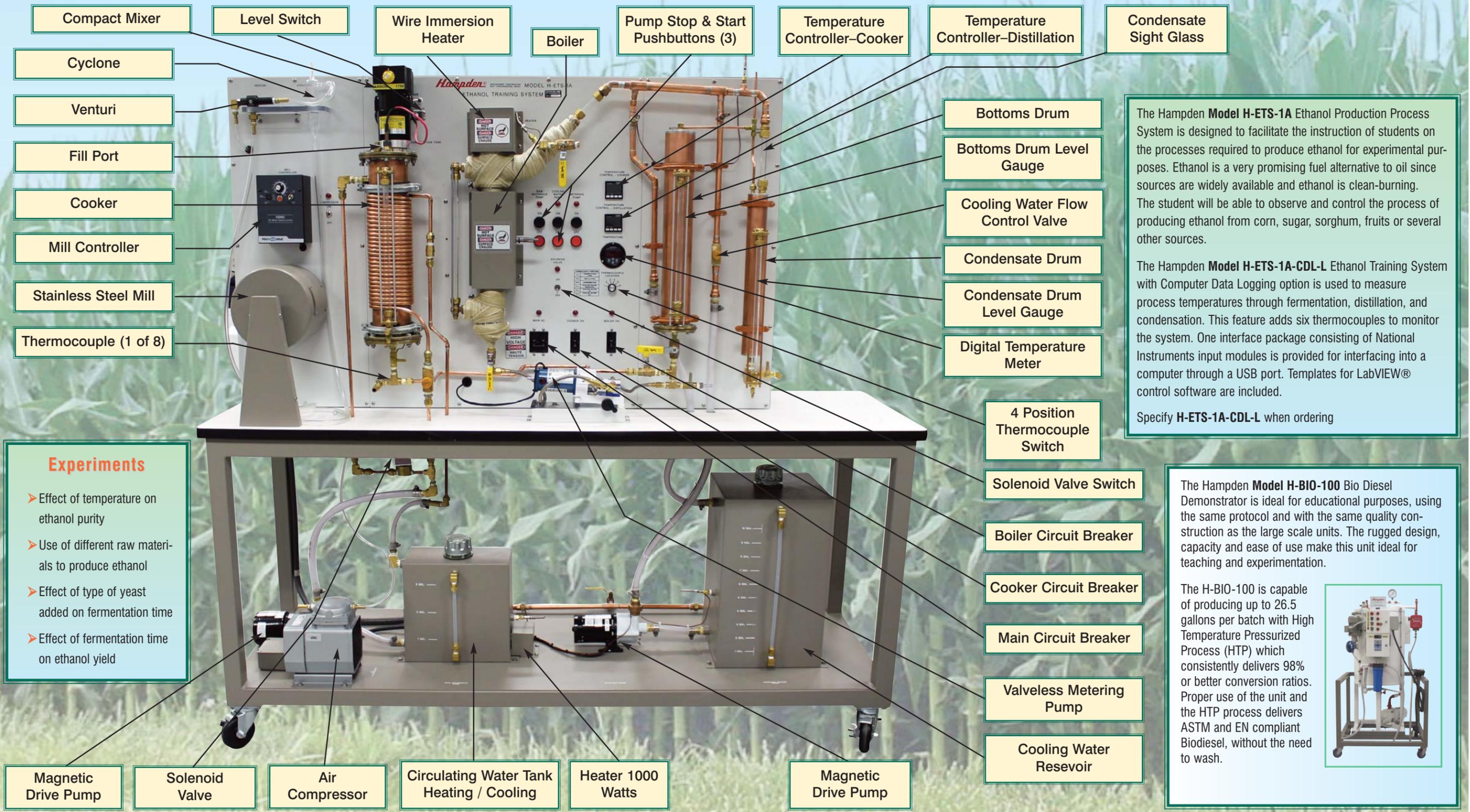


**Hampden**<sup>®</sup>  
ENGINEERING CORPORATION



LET HAMPDEN TAKE YOU INTO THE FUTURE

ETHANOL BIO-PROCESS TRAINING SYSTEM



- 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

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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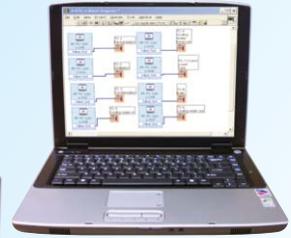
### Optional Equipment

- ◆ 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

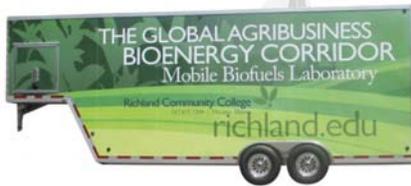
The Hampden **Model H-6150-TT** Table Top Liquid-To-Liquid Extraction Demonstrator option has been developed to permit student study of the fundamentals of a small scale liquid-to-liquid extraction system. In addition to demonstrating the hydrodynamics of liquid-to-liquid extraction systems and interface 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.



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