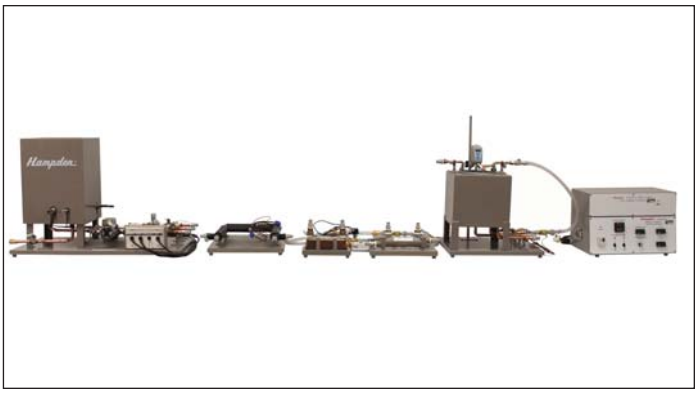
BIOTECHNOLOGY SYSTEMS



Hampden® ENGINEERING CORPORATION

ISO 9001:2015

MADE IN U.S.A.

***Biotechnology**, the development of products by using a biological process, represents an important and rapidly expanding area of science. Many problems associated with water, air, and soil contaminants can be fixed with biotechnology. Modern biotechnology is currently being used in soils for growing better crops, in sewage treatment plants for eliminating odors and meeting regulatory requirements, and in toxic waste clean-up, as well as many other areas. Biotechnology represents a tremendous opportunity for many businesses to change the way they do business, whether they are in manufacturing, pharmaceuticals, or agriculture. Many products modified by the newer techniques of biotechnology are currently in the supermarket, drug and retail stores. Additional products are being developed which offer advantages to farmers, the environment and human health.*

Investigate the Most Important Piece of Equipment in a Chemical Plant

H-6252
Modular Chemical Reactor System

Hampden's **Model H-6252** Modular Chemical Reactor System investigates the chemical reactor, the most commonly used and important piece of equipment in a chemical plant. The system is designed for table top mounting, all modules consist of bases with non-mar feet and incorporate disconnect hose connections or electrical interface connections where required. Chemical reactors are used to manufacture a wide variety of products including polyvinyl chloride, epoxy resin, and pharmaceuticals to name a few. This apparatus permits the student to move from classroom theory to hands-on applications with practical training. The student will control the process and measure those variables which control the reactor.

Thermocouples are located in both the reactor vessel and heating or cooling fluid stream for accurate temperature control. Reagents are introduced to the process using two electronic chemical metering pumps complete with manual or external 4-20mA control. Both feed tanks are non-corrosive.

The Hampden **Model H-6252** Modular Chemical Reactor System consists of the following modules:

2 - **MODEL H-6252-A** Reagent Service Modules
1 - **MODEL H-6252-B** Hot Water Service Module
1 - **MODEL H-6252-C** Batch Reactor Module
1 - **MODEL H-6252-D** Tubular Reactor Module
1 - **MODEL H-6252-E** Continuous Stirred Tank Reactor Module
1 - **MODEL H-6252-F** Control Module
1 - **MODEL H-6252-G** Data Logging I/O Module (Optional)
1 - **MODEL H-6252-H** Hose Set
2 - **MODEL H-6252-I** Flow Transmitter Modules (Optional)
1 - **MODEL H-6252-J** Product Tank Module

MODEL H-6252-A
Reagent Service Module (2)

MODEL H-6252-B
Hot Water Service Module

MODEL H-6252-C
Batch Reactor Module

MODEL H-6252-D
Tubular Reactor Module

MODEL H-6252-E
Continuous Stirred Tank
Reactor Module

MODEL H-6252-I
Flow Transmitter Modules
(Optional, Qty 2)

MODEL H-6252-J
Product Tank Module

MODEL H-6252-F
Control Module

MODEL H-6252-G
Data Logging I/O Module (Optional)

Monitor Hot and Cold Fluid Temperatures and Flow Rates

H-6852 Modular Heat Exchanger System
Shown with Optional Modules: H-6852-D, E, F, and J

H-6852
Modular Heat Exchanger System

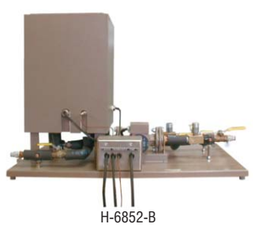
Hampden's **Model H-6852** Modular Heat Exchanger System is used to investigate the fundamental principles of heat transfer devices. The apparatus permits the student to move from classroom theory to hands-on applications with practical training. It allows the student to measure the variables that affect the overall heat transfer coefficient. The hot and cold fluid temperatures as well as flow rates are monitored at strategic locations. The unit can be configured to operate four different types of heat exchanger modules using quick connect couplers, eliminating the use of tools.

The Hampden **Model H-6852** Modular Heat Exchanger System consists of the following modules:

1 - **MODEL H-6852-A** Control Module
1 - **MODEL H-6852-B** Service Module
1 - **MODEL H-6852-G** Thermocouple Module Set (4)
1 - **MODEL H-6852-H** Thermocouple Probe
1 - **MODEL H-6852-I** Flow Transducer Module set (2)
1 - **MODEL H-6852-K** Hose Set (various lengths)

Also available are the following *optional* modules:

1 - **MODEL H-6852-C** Concentric Tube Heat Exchanger Module
1 - **MODEL H-6852-D** Shell-and-Tube Heat Exchanger Module
1 - **MODEL H-6852-E** Plate Heat Exchanger Module
1 - **MODEL H-6852-F** Jacketed Tank with Stirrer
1 - **MODEL H-6852-J** Data Logging I/O Module with Software



H-6852-B
Service Module

H-6852-A
Control Module

H-6852-J (Optional)
Data Logging I/O Module with Software

Conduct Comprehensive Fluid & Hydrostatics Experiments

H-6535
Hydrostatics Bench

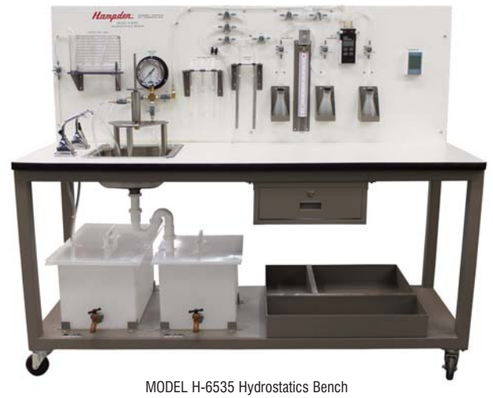
Hampden's **Model H-6535** Hydrostatics Bench consists of an assortment of apparatus needed for numerous experiments into the properties of fluids and hydrostatics, including all of the plumbing, pumps and valve control to direct the fluids in the system. Also included is a built in safety feature that directs fluid (especially mercury) into flasks in the case of over-pressurizing the manometers.

The unit consists of a mobile bench with the following components:

- Viscosimeters (3)
- Hand water pumps (2)
- Pressure gauge, Bourdon Tube
- Weight set
- Air pump
- Dead weight tester
- Fittings
- Valves (14)
- Constant Level Tubes
- Sink
- Storage tank (2)
- Precision balance
- Stop clock
- Manometers (2)
- Lot of glassware
- Tubing
- Barometer

Typical experiments that can be performed with the **Model H-6535** Hydrostatics Bench include:

- Verification of Archimedes Law
- Operation of a Barometer
- Operation of a Bourdon pressure gauge
- Manometry - Principles and Application
- Density and Specific Gravity
- Demonstration of fluid upthrust (Pascal's Law)



MODEL H-6535 Hydrostatics Bench
Dimensions: 56"H x 72"W x 24"D

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

INSTRUMENTATION & PROCESS CONTROL

Designed & Built by the Leading Manufacturer of Industrial Training Equipment

MODEL H-ICS-8189-4
Instrumentation and Control Trainer
62"H x 75"W x 30"D

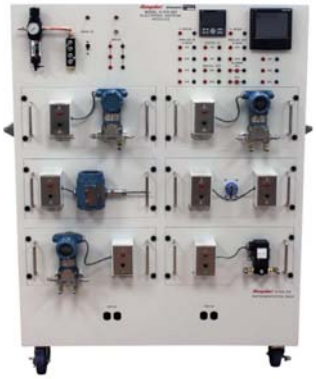
The **Hampden Model H-ICS-8189-4** trainer provides experience in setting up, tuning, operating, and troubleshooting actual instrument and control systems of the type used in the power and process industries. The trainer provides instruction in the measuring and transducing of such physical variables as pressure, temperature, flow and level by simulating a different process loop. Students and trainees learn instrumentation and control techniques of standard commercial manufacturers, such as Foxboro, and Rosemount. Various types of closed-loop control are covered, including: on/off, proportional, proportional plus integral, and proportional plus integral plus derivative, as well as a variety of final control devices, including electric, pneumatic and electronic.

MODEL H-6485-10
Instrumentation and Calibration Console
52"H x 60"W x 34"D

The **Hampden Model H-6485-10** Instrumentation and Calibration Console consists of a **H-6485-10** instrumentation module and a work center (bench). The module consists of an enclosure of 14-gauge furniture stock steel finished in dark brown textured enamel. The panel is 11-gauge furniture stock steel finished in instrument white enamel with black silk-screened nomenclature and symbols. It comes complete with the following accessories: Test Cords, PC-4 (2 required)), Air Insert Plugs, #393-P (6 required), Air Tube, 20 ft. Coil, Manual, Operations & Service Manual.

MODEL H-ICS-8189-4pH
Instrumentation, Controls, and pH Control Trainer
62"H x 75"W x 30"D

The **Hampden Model H-ICS-8189-4pH** provides experience in setting up, tuning, operating, and troubleshooting instrument and control systems. Experience in the measuring and transducing of physical variables; pressure, flow, level and pH is provided by simulating a different process loop. The trainer demonstrates instrumentation and control techniques of standard commercial manufacturers, such as Yokogawa, and Rosemount. Various types of closed-loop control are covered: on/off, proportional, proportional plus integral, and proportional plus integral plus derivative, as well as a variety of final control devices, including electric, pneumatic and electronic.



MODEL H-ICS-320
Electronic Instrumentation Modules

The **Hampden Model H-ICS-320** Electronic Instrumentation Modules provide students with experience in the use, calibration and test of electronic instruments. The modules are panel mounted units that are compatible with the **Model H-ICS-310** Instrumentation Rack. Mounted on these panels are the instrument, a pair of handles, any pneumatic or electrical jacks and legend plates.

Hampden is committed to providing industry-leading technology.

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