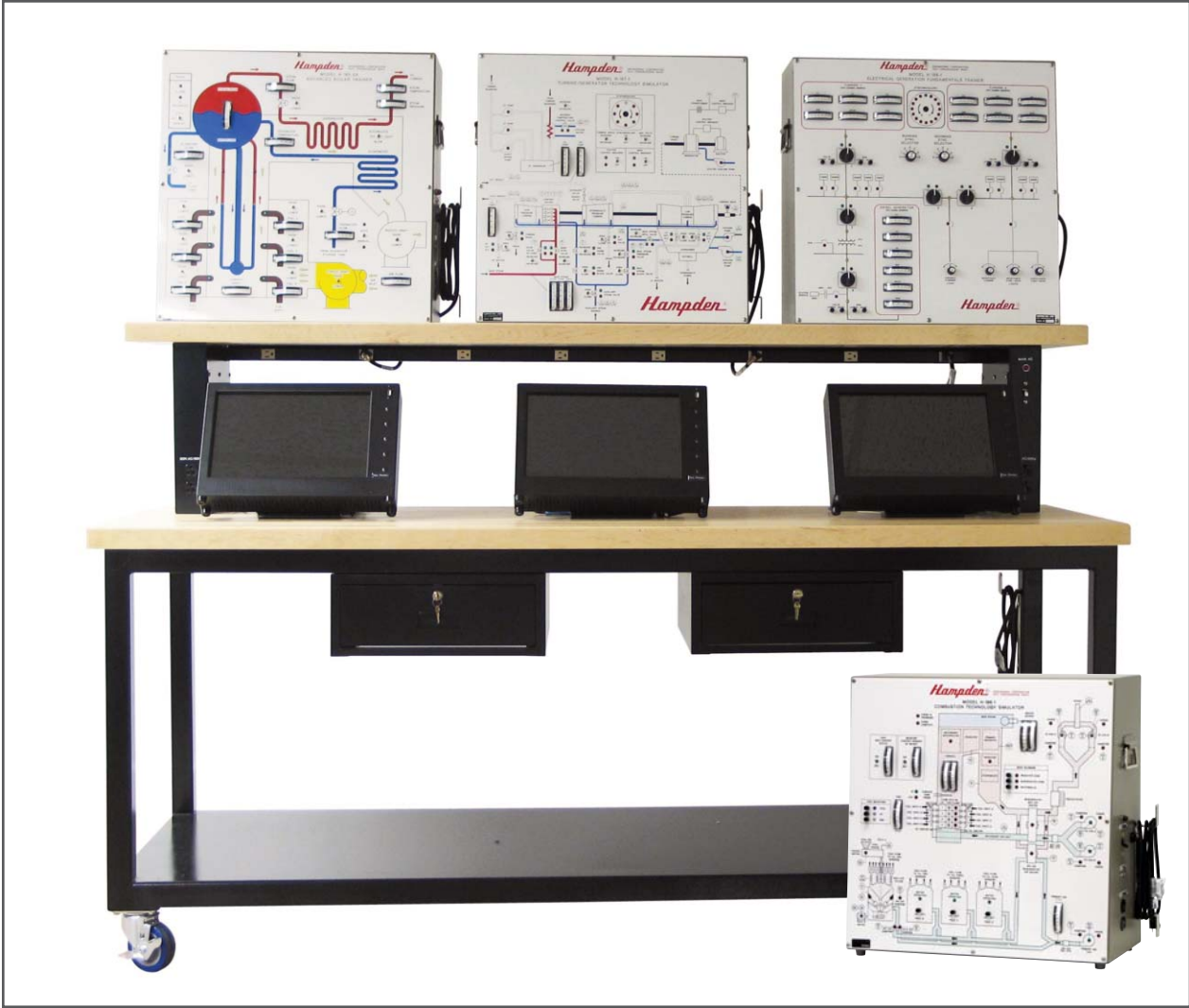


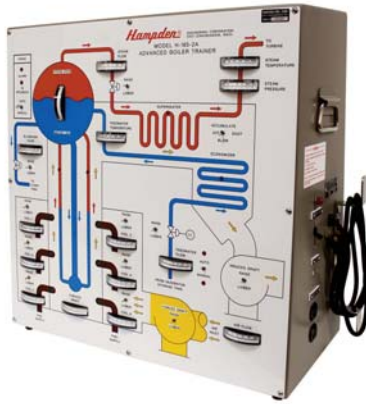
POWER PLANT SYSTEMS DIGITAL SIMULATORS



Hampden[®]
ENGINEERING CORPORATION



Hampden H-185-2A Advanced Boiler Trainer



MODEL H-185-2A Advanced Boiler Trainer

Purpose

The Hampden **MODEL H-185-2A** Hampden Advanced Boiler Trainer serves to demonstrate principles of operation and troubleshooting techniques of a current model boiler system. The module's front panel displays a complete pictorial view of the system.

All functions operate as on the actual equipment and present the student with realistic problem solving opportunities.

Description

The boiler system simulation is based on a typical fossil-fired power plant including operational systems, digital controls, analog control loops, alarms and trips.

Steam, feedwater, flow, pressure, temperature, subsystems, and control positions are continuously displayed on screen to student and instructor.

Operational "hands-on" activities performed by students also include; real time, dynamic experience with all phases of oil, gas and pulverized coal firing.

The **MODEL H-185-2A** Advanced Boiler Trainer is a fully computer-controlled unit designed to interface with a supplied Laptop Computer and covers all aspects of plant operation including:

- System Description
- Theory
- Subsystems Operation
- Controls
- Component Identification
- Integrated Operations

Simulator Malfunctions

The following insertable malfunctions may be accessed via the computer program:

- Forced Draft
- Boiler PSI High
- Induced Draft
- Low Oxygen
- Drum Level High
- Pollution
- Drum Level Low
- Boiler Temp High
- Feedwater

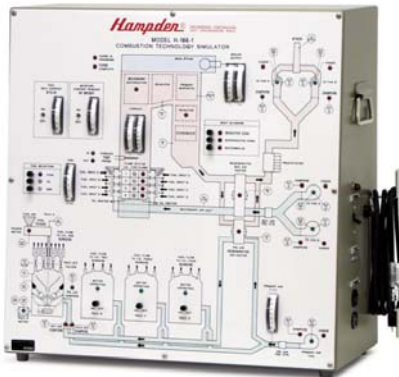
Features

The **MODEL H-185-2A** Advanced Boiler Trainer can be set to simulate the following conditions:

- Cold Boiler
- Drum Level Established
- No Load
- 5% Load
- 25% Load
- 50% Load
- 75% Load
- 100% Load

Students are able to interact with different graphic displays, view system parameters, in addition to operating digital and analog controls. Instructors may insert simulated mechanical or electrical "faults" into the system to test students' troubleshooting capabilities.

Hampden H-186-1 Combustion Technology Simulator



MODEL H-186-1 Combustion Technology Simulator

Purpose

The Hampden **MODEL H-186-1** Combustion Technology Simulator serves to demonstrate principles of operation and troubleshooting techniques of a current power plant combustion system. The module's front panel displays a complete pictorial view of the system. All functions operate as on the actual equipment and present the student with realistic problem solving opportunities.

The combustion technology simulation is based on a typical modern power plant balance draft combustion system with simulation to include air and fuel systems, analog control loops, digital controls, alarms and trips.

Description

The **MODEL H-186-1** Combustion Technology Simulator is a fully computer-controlled unit designed to interface with a supplied Laptop Computer.

Combustion system, secondary air, primary air, oil flow, coal pulverizer, flows, pressures, temperatures, loads and control positions are continuously displayed on screen to student and instructor.

Operational "hands-on" activities performed include; real time, dynamic experience with all phases of oil, gas, and pulverized coal firing.

The courseware covers all aspects of operation including:

- System Description
- Theory
- Component Identification
- Subsystems Operation
- Controls
- Integrated Operations

Simulator Malfunctions

Instructors may insert simulated system "faults" into the system, such as:

- Heater Level High
- Oil Gun Off/Trip
- Gas Gun Off/Trip
- ID Fan Trip
- FD Fan Trip
- Master Fuel Trip
- Furnace PSI Trip
- Main Gas Header Valve Trip
- Primary Air Velocity Low
- Pulverizer Motor Trip

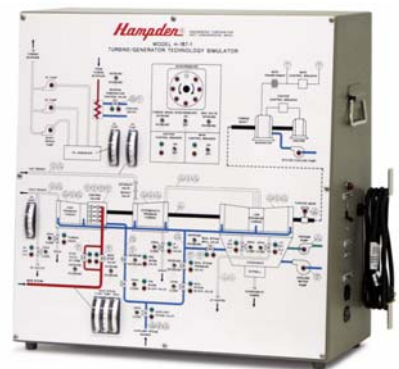
Features

The **MODEL H-186-1** Combustion Technology Simulator can be set to simulate the following start-up conditions:

- Cold System
- 10% Load
- 25% Load
- 50% Load
- 100% Load
- Boiler Warm Up Complete
- Furnace Purge Complete
- Secondary Air Flow Established
- 75% Load
- 100% Load Low BTU Fuel

Students can interact with different graphic displays, view system parameters, in addition to operating digital and analog controls.

Hampden H-187-1 Turbine/Generator Technology Simulator



MODEL H-187-1 Turbine/Generator Technology Simulator

Purpose

The Hampden **MODEL H-187-1** Turbine/Generator Technology Simulator demonstrates principles of operation & troubleshooting skills of a steam turbine/generator system. All functions operate as on actual equipment and present the student with realistic problem solving opportunities.

The steam turbine/generator simulation is based on a typical modern steam turbine/generator system including turbine operation, analog control loops, digital controls, alarms and trips.

Description

The **MODEL H-187-1** Turbine/Generator Technology Simulator is a fully computer-controlled unit designed to interface with a supplied Laptop Computer.

Turbine, generator, turbine valves, bearing oil, flows, pressures, temperatures, speed, loads, voltages and control positions are continuously displayed to students and instructor.

The included courseware covers all aspects of operation.

Simulator Malfunctions

Instructors may insert simulated mechanical or electrical "faults" into the system, such as:

- Turbine Trip
- Low Vacuum Trip
- Turbine Exhaust Hood Temp High
- Lube Oil Tank Low
- Generator Field Temp High
- Bearing Trip High
- Bearing Vibration High

Features

The **MODEL H-187-1** Turbine/Generator Technology Simulator can be set to simulate the following conditions:

- Turbine Stopped and Sold
- On Turning Gear
- Turbine Pre-warming Complete
- 300 RPM Heat Soak Complete
- 1000 RPM Heat Soak Complete
- 3000 RPM Heat Soak Complete

- Ready to Synchronize
- 5% Load in Full Arc Mode
- 30% Load in Partial Arc Mode
- 100% Load

All Hampden units are available for operation on any voltage or frequency

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

Hampden H-188-1 Electrical Generation Fundamentals Trainer

Purpose

The Hampden **Model H-188-1** Electrical Generation Fundamentals Trainer is designed to demonstrate the principles of electrical power generation. The trainer provides an interactive control room experience, that, coupled with the Hampden Power Plant series of trainers, depicts the relationships that an operator must master in order to confidently operate modern generating equipment. Practice in paralleling machines of various sizes is easily accomplished without using actual equipment or more expensive full-scale simulators.

Description

The Hampden **Model H-188-1** Electrical Generation Fundamentals Trainer is a fully computer-controlled unit designed to interface with a supplied Laptop Computer.

A Windows based computer provides operator control and interaction. A synchroscope display and a phase angle display represent the phase difference between running and incoming sources. A graphic representation of how load is shared by two machines of different sizes is shown using a generator characteristics curve. The relationship between real load and reactive load is displayed using meters and by a pictorial diagram of the power triangle.

A variety of inductive, resistive, and capacitive loads can be turned on and off, reinforcing the effects of reactive load and how power factor can change. The trainer easily supports instructor demonstration, student practical exercises, and self-study programs.

The courseware covers all aspects of operation including:

- Energize a dead bus.
- Perform iso-synchronous operations.

- Correctly perform paralleling operations.
- Demonstrate the operation of generators in parallel and load sharing.
- Observe generator response to inductive, resistive, and capacitive loads.
- Calculate power factor.
- Observe diesel generator auto-start and loading.

Features

- Analog meters depicting amps, megawatts, megavars, kilovolts, frequency and speed.
- Realistic, three-position breaker control switches.
- Breaker controls are interlocked with the sync-selector switch and phase angle display.



Hampden **MODEL H-188-1**
Electrical Generation Fundamentals Trainer



Connected Mode

Connected mode is a feature which combines Hampden's Power Trainers together to create a completely unique training experience. Connected mode can combine the Hampden H-186-1 Combustion Technology Simulator, H-185-2A Advanced Boiler Trainer, H-187-1 Turbine/Generator Technology Simulator, and the H-188-1 Electrical Generation Fundamentals Trainer into a complete power generation simulator.



Hampden is committed to providing industry-leading technology.

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