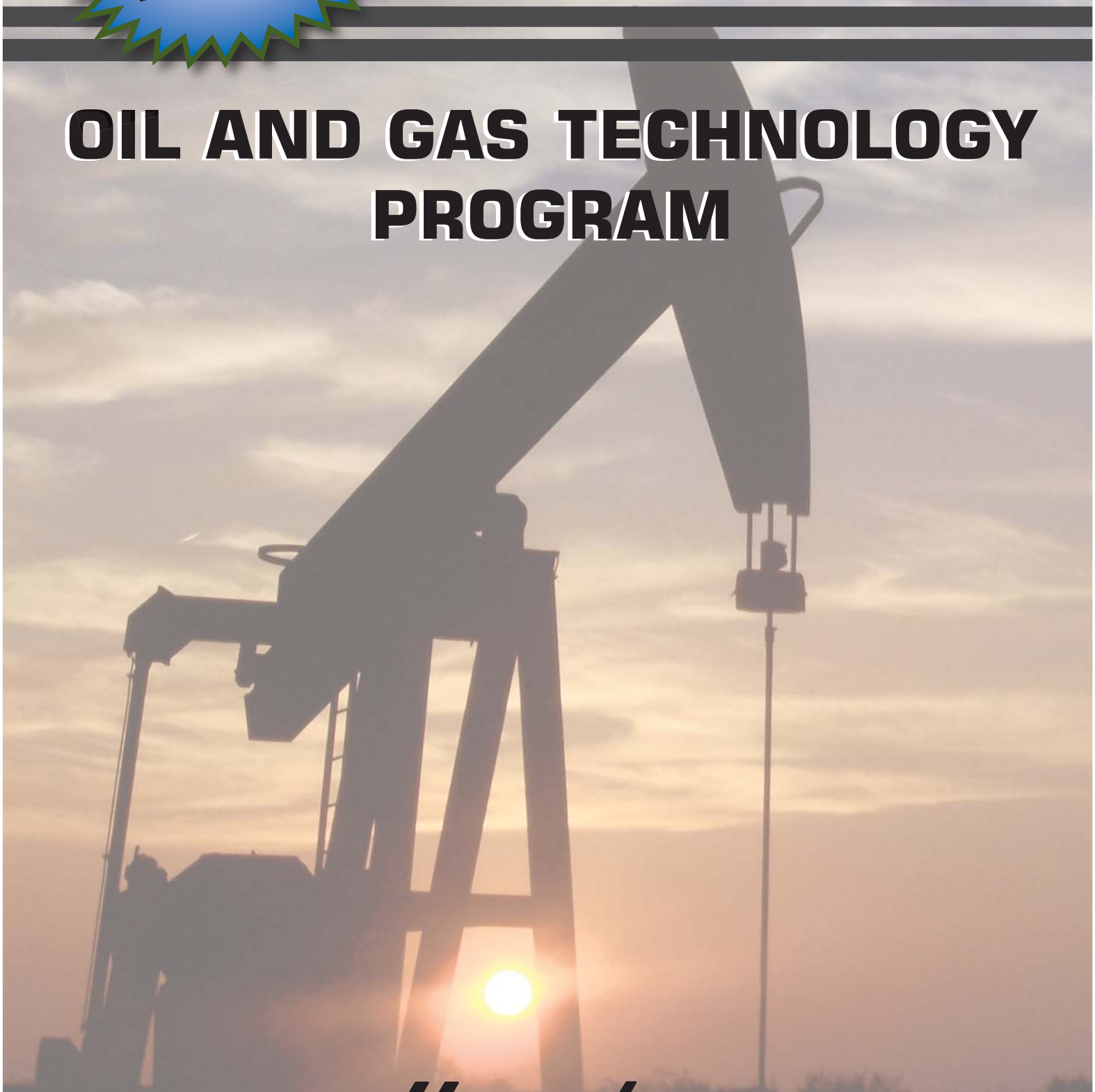
NEW PROGRAM!

OIL AND GAS TECHNOLOGY PROGRAM

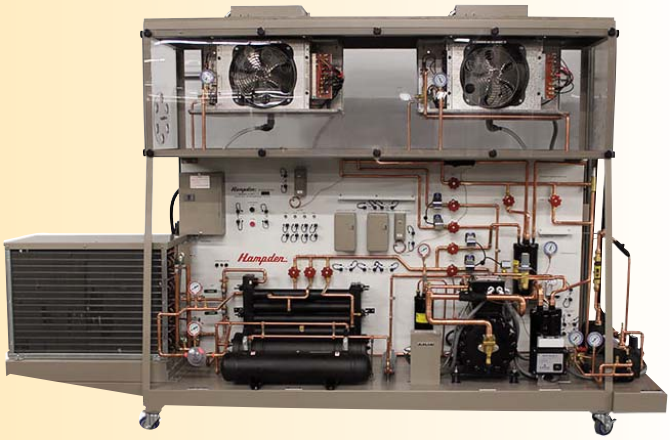


ISO 9001:2015

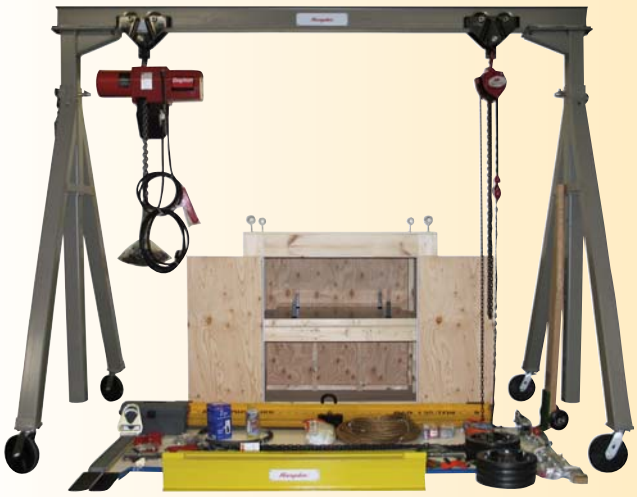
Hampden®
ENGINEERING CORPORATION

MADE IN U.S.A.

Mechanical Maintenance

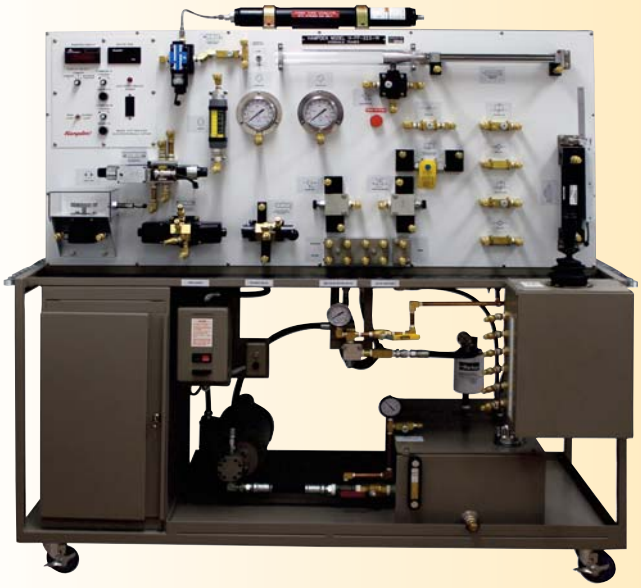


MODEL H-IRT-1
Industrial Refrigeration Trainer



MODEL H-RIG-1C
Rigging Systems Trainer

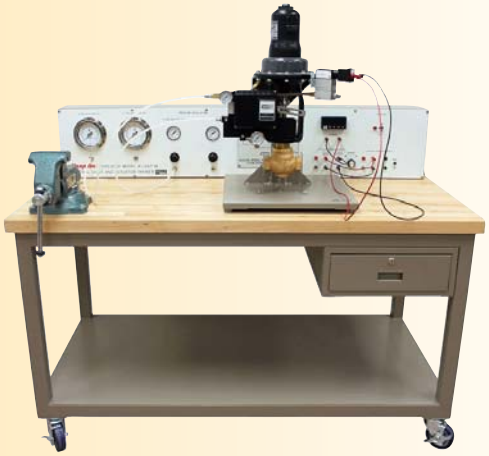
MODEL H-IMTS-1
Industrial Maintenance Training System



MODEL H-FP-223-14
Hydraulic Trainer

Standard Products…Designed to Meet Your Growing Needs!

Valves and Pumps



MODEL H-CVAT-1A
Control Valve and Actuator Trainer

MODEL H-MVOT-2A-FT
Motorized Valve Operator Trainer

MODEL H-6671
Two-Stage Air Compressor Trainer

MODEL H-6645
Series/Parallel Pump Trainer

MODEL H-6643
Centrifugal Compressor Trainer

Cutaway Valves

H-1500-BVC-B
Ball Valve Cutaway with Base

H-1500-PVC-B
Plug Valve Cutaway with Base

H-1500-GVC-B
Globe Valve Cutaway with Base

H-1500-RVC-B
Safety Relief Valve Cutaway with Base

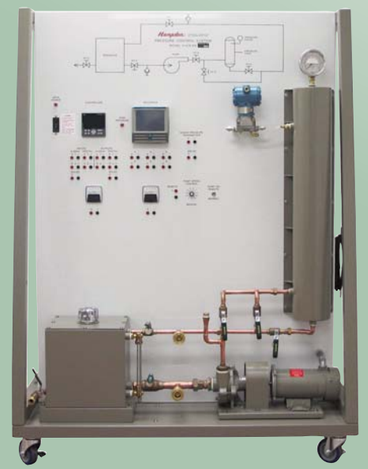
H-1500-UVC-B
Butterfly/Diaphragm Valve Cutaway with Base

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

Calibration and Operations Trainer System

MODEL H-ICS-FX
Hampden Instrumentation and Controls Flow System Trainer

MODEL H-ICS-LX
Hampden Instrumentation and Controls Level System Trainer



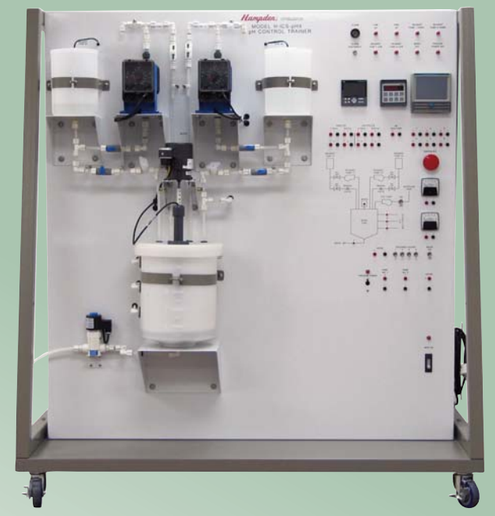
MODEL H-ICS-PX
Hampden Instrumentation and Controls Pressure System Trainer

MODEL H-ICS-TX
Hampden Instrumentation and Controls Temperature System Trainer

Hampden Engineering Corporation
OIL AND GAS TECHNOLOGY

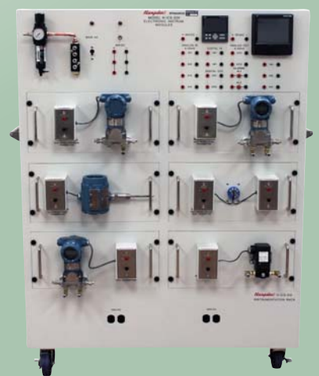
Calibration and Operations Trainer System

MODEL H-ICS-APT
Hampden Analytic Process Control Trainer



MODEL H-ICS-pHX
Hampden pH Control System Trainer

MODEL H-ICS-HET
Hampden Heat Exchanger Process Loop Trainer



MODEL H-ICS-320
Hampden Electronic Instrumentation Trainer

Standard Products…Designed to Meet Your Growing Needs!

Instrumentation

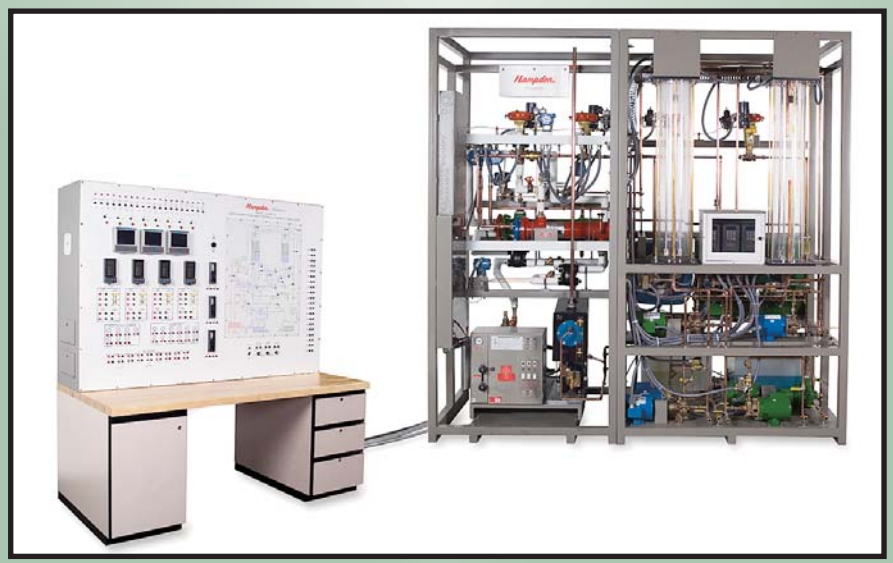
MODEL H-6485
Hampden Instrument and Calibration Bench

The Hampden **Model H-6485** Instrumentation and Calibration Console enables the demonstration of the principles of calibration and measurement of process instrumentation. After calibrating an instrument, it can be installed on a trainer and utilized in a real application. The instrumentation and control console shall have a working surface of at least 72 inch (1.8m) long and includes storage for all devices that are not panel mounted. A standard 2 inch pipe fitting is supplied for mounting transmitters to be tested. A rack for supporting panel mounted equipment.

The Hampden **Model H-IPPT-3** is comprised of two sections. The Control Section contains all control equipment, remote control interface and a complete tri-colored graphic representation of the pilot plant.

The Process Plant incorporates transparent level towers that make it possible for the students to actually see the process in action. The two liquids used in the Process Plant have different specific gravities, different colors, and are immiscible. These liquids are non-corrosive to brass and copper alloys, non-toxic, and nonflammable.

The Process Plant is factory assembled and is supplied with a pair of transparent towers, two storage tanks, circulating pumps, four heat exchangers, a low-pressure steam generating boiler and all necessary hand valves together with its copper and applicable transparent piping. It comes completely equipped with the instrumentation necessary to allow instruction in operation, measurement, control, and control system tuning adjustment of the process and control system variables.



MODEL H-IPPT-3
Hampden Industrial Process Plant Trainer

SAMPLE CURRICULUM

Gas Production Operator (1 Year Certificate)

Courses

1. Gas Flow Measurements
2. Petroleum Gas Compression
3. Injection Water Treatment
4. Gas Dehydration
5. Natural Gas Liquids recovery
6. Produced Water Treatment
7. Oil Pumping and Metering
8. Oil and Gas Separation
9. Oil Treatment (Dehydration)
10. Process Flow and P&ID's (Process Engineering Drawings)
11. Process Flow and P&ID's (Process Engineering Drawings)
12. Principles of Drilling Calculations

Section I

Fractions, areas, volume and capacity, units of capacity, capacity of a hole, pump calculations, bottoms up or bit to surface time, time for complete circulation, annular velocity, spotting pills to free deferentially stuck pipe, cementing calculations, single stage cementing, two stage cementing, liner cementing, balance cement plugs

Section II

Formation pressure, hydrostatic pressure, pressure gradients, additive pressures, "U" tube concept, the well closed in with a kick, behavior of gas under pressure, maximum allowable annular surface pressure, pressure calculations, density of influx, deviated hole, true vertical depth, reduced rate calculating pressure, surface to bit and bit to shoe and bit to surface pump strokes, reduction in circulating pressure while pumping kill mud, graphical analysis of pressure reduction, reduction in hydrostatic pressure due to failure to fill the hole, summary of kick killing methods

Section III

Formation testing, packer calculations, stuck pipe stretch calculations, derrick loading, buoyancy, work done by the drilling line, introduction to hydraulics, hydraulics horse power, drilling collars, bit weight and neutral point

Petroleum Production Operator Certificate

Courses

1. Principles of Oil-Well Production Technology
2. Principles of Oil-Well Drilling Technology
3. Principles of Hydrocarbon and Rig Safety
4. Petroleum Gas Compression
5. Injection Water Treatment
6. Produced Water Treatment
7. Oil Pumping and Metering
8. Oil and Gas Separation
9. Oil Treatment (Dehydration)
10. Process Flow and P&ID's (Process Engineering Drawings)
11. Principles of Drilling Calculations

Section I

Fractions, areas, volume and capacity, units of capacity, capacity of a hole, pump calculations, bottoms up or bit to surface time, time for complete circulation, annular velocity, spotting pills to free deferentially stuck pipe, cementing calculations, single stage cementing, two stage cementing, liner cementing, balance cement plugs

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Formation pressure, hydrostatic pressure, pressure gradients, additive pressures, "U" tube concept, the well closed in with a kick, behavior of gas under pressure, maximum allowable annular surface pressure, pressure calculations, density of influx, deviated hole, true vertical depth, reduced rate calculating pressure, surface to bit and bit to shoe and bit to surface pump strokes, reduction in circulating pressure while pumping kill mud, graphical analysis of pressure reduction, reduction in hydrostatic pressure due to failure to fill the hole, summary of kick killing methods

Section III

Formation testing, packer calculations, stuck pipe stretch calculations, derrick loading, buoyancy, work done by the drilling line, introduction to hydraulics, hydraulics horse power, drilling collars, bit weight and neutral point

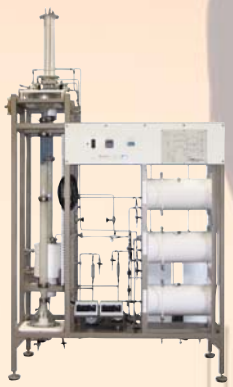
Hampden Engineering Corporation

OIL AND GAS TECHNOLOGY

Separation and Purification Technology

The Hampden **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 student will be able to observe and control the process of producing ethanol from corn, sugar, sorghum, fruits or several other sources. When using this unit along with the Model **H-6150-TT** Liquid-to-Liquid Extraction Demonstrator option, it is possible to produce ethanol with high purity.

The Hampden **Model H-6252** Modular Chemical Reactor System is used to investigate the chemical reactor which is the most commonly used, important piece of equipment in a chemical plant. Chemical reactors are used to manufacture a wide variety of products including: polyvinyl chloride, epoxy resin, and pharmaceuticals. 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.



The Hampden **Model H-6150** Liquid-To-Liquid Extraction Demonstrator has been developed to permit student study of the fundamentals of a liquid-to-liquid extraction system. In addition to demonstrating the hydrodynamics of liquid-toliquid 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 at different liquid flow rates. The extraction process can be operated in a continuous or semi-continuous mode.

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 **Model H-6173** Fractional Distillation Column makes educational and industrial experimentation possible in a virtually limitless range—from simple steady-state binary separations to highly sophisticated process dynamics research including column hydraulics and packing materials. Even bench-scale pilot production runs are feasible with appropriate modifications.

The Hampden **Model H-6160** Solid-To-Liquid Extraction Demonstrator permits student study of the fundamentals of a solid/liquid extraction system. The student is able to determine the operating characteristics of solvent extraction from a packed bed. The equipment is constructed out of stainless steel and glass for material compatibility.

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

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