

AC/DC MOTOR DRIVES

Power Electronics



Hampden
ENGINEERING CORPORATION



Solid State Controllers

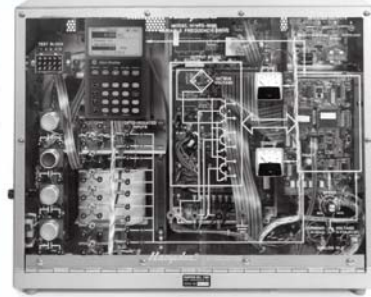
H-ACVD-100 AC Vector Drive Trainer System



The **Model H-ACVD-100** AC Vector Drive Trainer System provides students with hands-on experience with advanced motor controls. It is available in two configurations; as a stand-alone trainer and as an adjunct trainer to the Hampden Series 100 Rotating Machine System. Either system is designed for bench top mounting or may be used with the optional **Model HMT-4** Mobile Table.

This system has many applications such as handling very high torque at low or even no speed which is desirable in a pick and place stacker crane or elevator. It also has precise speed regulation for use in applications where precise timing is required between interconnecting drives. Other applications include accurate positioning utilizing motion control cards for servo performance, braking, regeneration, high performance dynamometer, and precise metering pumps.

H-ACVD-PF70 Adjustable Frequency Drive



The **Model H-ACVD-PF70** Adjustable Frequency 3Ø AC Drive controls the speed of induction or synchronous motors rated to 1/2 horsepower.* The unit is fully compatible with Hampden's Series 100 Fractional Motors and Machine program.

The unit consists of a PowerFlex 70 AC Drive which is designed to world-wide standards and ratings. The PowerFlex 70 can be programmed for Volts-per-Hertz or Sensorless Vector control via its full numeric LCD Human Interface Module (HIM). The drive's control wiring is brought out to Hampden HR-1S socket receptacles which are mounted on a clear Lexan® front panel, allowing the user to wire multiple forms of motor control circuits.

*Other Horsepowers Available

H-VFD-100C Variable Frequency Drive Trainer



The **Model H-VFD-100C** Fractional Horsepower 3Ø Variable Frequency Drive controls the speed of induction or synchronous motors rated to 1/3 HP. The unit consists of a fully operational VFD and all the push buttons and switches that will allow the user to program and run the VFD. The VFD is protected by a Main AC circuit breaker. The output is 0-230 V, 3Ø, 0-500 Hz. The unit can be programmed and reprogrammed to teach students how a VFD works and what kind of parameters to set for various motor applications.

H-RVS-2A Reduced Voltage Starter



The **Model H-RVS-2A** 3Ø AC Reduced Voltage solid-state Starter provides students with experience in connecting, testing, and operating a commercially-available solid state reduced voltage starter for three-phase induction motors.

The **Model H-RVS-2A** provides "soft-start" (stepless acceleration) of three-phase induction motors rated from 1/4 to 3 horsepower. The rectifier and inverter circuits, trigger controls, a three-pole magnetic contactor and isolation transformer are housed in a steel case with a Lexan® front panel. Panel-mounted equipment includes the main circuit breaker, torque adjustment, acceleration adjustment potentiometers, start-stop pushbuttons, a convenience duplex receptacle, Hampden HR-1S socket receptacles, and 15 test points.

Power Electronics Systems

H-R-SCR-2 Power Electronics System



The **Model H-R-SCR-2** Power Electronics System provides students the opportunity to investigate diode rectifier circuits and AC & DC controlled power circuits utilizing silicon controlled rectifiers (thyristors) with resistance, capacitance, and unijunction transistor (UJT) triggering.

The system consists of the following modules:

H-R-SCR-2 SCR Thyristor Training System:

- **H-R-SCR-2A** Thyristor Module with voltage and current protection circuits (6 thyristors) (Voltage and Current Isolated)
- **H-R-SCR-2B** Diode Module with Voltage Protection circuit
- **H-R-SCR-2C** Loads and Discrete Triggers Module
- **H-R-SCR-2D** Trivoltage Power Supply Module
- **H-R-SCR-2E** Thyristor Trigger Control Module
- **H-R-SCR-2F** A/D Converter Module

H-R-SCR-3 Power Electronics System

The **Model H-R-SCR-3** Power Electronics System has been designed to be used together with the **H-R-SCR-2** Power Electronics System, acquiring the AC power and processed DC voltages needed for the experiments from the Trivoltage Power Supply Module H-R-SCR-2D, as well as expanding the capabilities of the H-R-SCR-2.

This system consists of the following modules:

- **H-R-SCR-3A** Smoothing Inductor Module
- **H-R-SCR-3B** IGBT Power Transistor Module
- **H-R-SCR-3C** MOSFET Power Transistor Module
- **H-R-SCR-3D** IGBT/MOSFET Driver Modul
- **H-R-SCR-3E** Signal Converter Module
- **H-R-SCR-3F** Function Generator
- **H-R-SCR-3G** P.I.D. Amplifier Control Module



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

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H-R-SCR-1A Thyristor & Power Electronics Trainers



The **Model H-R-SCR-1A** provides students with the opportunity to investigate diode rectifier circuits and AC and DC controlled power circuits and unijunction transistor (UJT) triggering.

The unit contains all the diode rectifiers, SCR's, UJT triggers, control potentiometers, and resistive and reactive loads needed for a thorough understanding of uncontrolled, half-controlled, and full controlled half-wave and full wave rectifying circuits, both single-phase and three-phase. Components terminate at Hampden HR-1S socket receptacles mounted on the clear Lexan® front panel. The appropriate symbols and circuits are silkscreened on the panel. Diodes and SCR's are rated for 35A maximum. Three-phase AC, 50/60 Hz, is brought into the trainer through a six-foot rubber-covered power cord. Furnished complete with interconnecting cords.

H-SCR-104 4-Quadrant DC Speed Controller



The **Model H-SCR-104** Four-Quadrant DC Speed Controller is a full-wave regenerative drive capable of operating DC, PM or Shunt motors (such as Hampden Series 100 Fractional Horsepower Motors) in a bidirectional mode. Its 4-quadrant operation provides forward and reverse torque in both speed directions. This allows the control to maintain constant speed with overhauling loads and provide rapid instant reversing and controlled braking. Because of its excellent controllability and response time the **Model H-SCR-104** can replace servos in many applications. The control is factory set for armature feedback, which provides up to 1% load regulation over a motor base speed of 50:1. However, tachometer feedback is also available if superior regulation is required. The **Model H-SCR-104** offers both speed control and torque control.

Fifteen test points available on the front of the trainer permit analysis of circuit operation while fault switches, located at the rear of the controller, provide troubleshooting experience.



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