

HAMPDEN ROBOTICS SYSTEM TRAINER

Hampden H-MRS-1 Mobile Robotics Systems Trainer

Purpose

The Hampden **MODEL H-MRS-1** provides instruction and hands-on experience in the control of power and motion by means of AC and DC servo motors, DC stepper motors, hydraulics devices, pneumatics devices, and electronic circuits, all of which are used in industrial robots and other automation equipment. Students, therefore, receive training that prepares them for a wide variety of industrial occupations.

Services Required

The **MODEL H-MRS-1** Multi-Robotics System trainer includes external hydraulic and pneumatic power supplies and operates from a standard single-phase AC receptacle. The fluid supplies may be omitted if other supplies are available. The requirements are: 0.5 gpm at 160 psi, hydraulic and 0.38 cfm at 100 psi, pneumatic. Quick disconnect couplings and hoses are provided for air and oil connections.

The robot base contains, along with the torso motor and fluid controls, a microcomputer controller board with a 24-key keypad. The controller permits up to 30 separate sequences of up to 32 positions each. Optional battery-backed RAM is available for permanent memory of sequences. The control panel includes 7-segment LED displays, mode LEDs, 14 test points, and an RS-232 interface for remote control from an external computer such as the Hampden **MODEL MCB-1A** microcomputer trainer or similar unit.

Options Available

MODEL H-MRS-MB Mobile Bench

The optional mobile bench provides a mounting surface, at a convenient height, for the **MODEL H-MRS-1** robot. In addition, it provides mounting space for the fluid supplies. The bench includes a power cord, 1 ϕ AC outlet with switch and recessed hydraulic and pneumatic quick connectors.



MODEL H-MRS-1
Dimensions:
Base: 18"W x 24"D
Arm (fully extended): 40"
Height (arm horizontal): 22"
Shipping Weight: 260 lbs

Description

The Hampden **MODEL H-MRS-1** Mobile Robotics Trainer consists of a 6-axis robot arm having a set of grippers as the end-of-arm device. If desired, specialized tools may be substituted for the gripper. Each of the six types of movements has its own unique drive and sensor.

Waist Swivel. The cylindrical support (torso) swivels through 225°, driven by a chain and sprocket coupled to an AC synchronous motor in the base. A 10-turn potentiometer provides an encoded 0-5 volt DC position signal to the controller.

Shoulder Elevation. The robot arm moves through a vertical arc of 51°, raised and lowered by a hydraulic cylinder whose controls are in the base. The angle of elevation is transduced by a linear variable differential transformer (LVDT).

Arm Extension. The arm extends up to five inches by means of a hydraulic cylinder whose controls are in the base. The position feedback signal comes from a linear potentiometer.

Elbow Attitude. The elbow bends through an angle of 125° (35° above the arm axis; 90° below), driven by a worm gear configuration coupled to a DC servomotor. The attitude of the forearm relative to the upper arm is transduced by a rotary potentiometer.

Wrist Rotation. The wrist joint has a full 360° rotation in both directions, driven by a gear configuration coupled to a DC stepper motor. An optical sensor establishes "home" position.

Gripper Action. The gripper, which opens to a span of three inches, is actuated by a pneumatic cylinder. The pressure exerted by the gripper as it closes is determined by a servo-driven air regulator in the base.

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

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