

## EXP 4-EHB Industrial Electro-Hydraulics



### Industrial Electro-Hydraulics with Proportional and Joy Stick Control

The EXP4-EHB Electro-Hydraulic Training System is designed to demonstrate electrical control of hydraulic systems in a user-friendly industrially relevant application-oriented setting. Electrical sequence and logic control is done using switches, sensors, joystick (mimic mobile hydraulic operations), and control valves.

System components are mounted in a configuration to replicate **OPEN LOOP** proportional speed and position control of electro-hydraulic manufacturing systems using a hydraulic motor and linear actuator.

Industrial grade electronic, electro-hydraulic and hydraulic components are used throughout the EXP4-EHB. The EXP4-EHB can operate standalone or complement TII's Industrial Hydraulics or Advanced PLC training systems. Included with the EXP4-EHB system is the EXP4-B work station top section, EXP-MB mobile cabinet bottom section, and EXP11-P-1 hydraulic power unit.

The curriculum begins with a fundamental review of basic hydraulics principles followed by electrical graphic communication symbols.

Additional topics focus on typical electro-hydraulic applications found in industry.

An industrial grade component panel with built-in 24-volt DC power supply, instrumentation, and components is mounted on a slanted stainless steel surface for easy access when conducting experiments.

The component panel is attached to an "A-shaped" metal cabinet. A lockable storage area behind the panel provides space for manuals and additional components. Removable components on the panel, specialty components, and sensors from TII that expand the capabilities of the system can be mounted on the T-slot surface in front and on the panel.

The EXP4-B is mounted on a mobile training bench that has cabinet space for the hydraulic power supply and allows the system to be wheeled between classrooms. The portability and rugged design of the training system allow it to meet demanding training schedules.

## SPECIFICATIONS

The EXP4-B is a complete education / training system that covers electro-hydraulic open loop proportional control technology in its three areas of instruction: Physical Properties and Fundamentals, Applications, and Electro-Hydraulic Control. The training system is constructed of a welded steel "A-shaped" frame with a formed sheet steel shell. The system is modular in design so that it can be used as a stand-alone table, on a countertop, or integrated into a bench configuration with other TII trainers.

Components are either panel mounted, attached to a subplate for easy T-slot adjustable mounting, or loose. The EXP4-B is compatible with TII's EXP4-P1 or P5 hydraulic power supply systems. The front trainer panel consists of three sections.

1. The **Instrument Section** includes two pressure gauges (0 - 1500 PSI) for system and in-line pressure readings and two four-port manifolds (pressure and return).

2. The **Component Section** is constructed of 16 gauge stainless steel and angled for ease of use when reading gauges and building circuits. All components are identified in large silkscreen lettering. Components mounted to the stainless steel panel are:

- Proportional Flow Control
- Proportional Pressure Control
- Double Acting Directional Solenoid Valve
- Hydraulic Motor with Gear
- Sequence Cartridge Valve
- Counterbalance Cartridge Valve
- Programmable Pressure Switch
- Multi-Function Accumulator
- Double Acting Cylinder with two sensors

3. The **Control Panel Section** is a central location for electrical interfacing of devices using standard banana jacks. Control Panel interfacing:

- Auxiliary 24VDC Power
- Emergency Stop Button for system shutdown
- Hydraulic Motor Sensor
- Counter/Tech multi-function controller with readout display, reset, input and output
- Two normally open green pushbuttons
- One normally closed red pushbutton
- Directional Solenoid Valve coil (A,B) interface
- Cylinder Extend and Retract Sensors
- Proportional Control Signal
- 0-10VDC Potentiometer with Display
- Joystick with Up/Down Directional Control and Panel Meter

### **Additional Components and Accessories :**

- Hydraulic Hose Kit
- Electrical Patchcord Kit
- Flow Meter (Handheld)
- Wrench for Cartridge Valves
- Student and Instructor Manual

**Storage Compartment** is located behind the component panel and accessed through a hinged door with lock. This area is designed for storing hoses and extra components. All components, hoses, instruments and fittings are industrial grade design. All fittings are ball-check quick connect/disconnect.

**Options** to expand capabilities of the system include a wide range of specialty components which can be purchased for mounting on the system's T-slot experiment surface. The EXP4-B can be purchased with a mobile cabinet (EXP-MB). The EXP4-B is placed on top of the EXP-MB. The hydraulic power supply (EXP4-P-1) is placed inside. The model number for this three part combined system (EXP4-B, EXP4-P-1, EXP-MB) is EXP4-EHB.

## CURRICULUM

The EXP4 curriculum was designed for industrial relevancy and reviewed by industry experts. The comprehensive courseware includes a student activities manual and instructor's guide (40 classroom hours). Instruction includes background study of the topic, observational and hands-on experiments, application exercises, and mathematical calculations.

### **Major Topics:**

- Introduction to the Explorer 4
- Actuators
- Electrical Control and Logic
- Analog I/O and Proportional Control
- Pressure Control, Sequence, Counterbalance, and Accumulator Circuitry

EXP4-B                      Dimensions: 33" W x 30" D x 30" H  
Shipping Weight: 300 lbs

EXP4-EHB                    Dimensions: 33" W x 30" D x 66" H  
Shipping Weight: 600 lbs

*For more information, customer service, or technical assistance please call 800-451-2169*

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