DEGEM SYSTEMS

Industrial Automation

HYD-3500

Hydraulics & Electro-hydraulics Training Systems

About the product

Hydraulics is the hybrid technology, which combines oil hydraulics, electro-hydraulics, programmable logic controllers (PLCs) and/or computers in complex hydraulic power systems.

HYD-3500 is a compact, hands-on, training system designed to provide a clear, comprehensive and efficient teaching facility for this hybrid technology. Of brand new design, the training system covers the latest developments in the field, especially as related to the widespread use of advanced electronic control circuits, PLCs and computers in hydraulic power systems.

The expandable and highly flexible HYD-3500, in step with all the latest hydraulic developments, has the modular capability to be tailored to a broad population profile including voc-techs (vocational schools), civil and military technical schools, polytechnics, colleges for further education, inter-disciplinary faculties and specially, industrial training centers.

The system features a very high degree of modularity and flexibility. The system can function in a basic stand-alone workstation configuration with or without PC support, or as a Computer Managed Laboratory (DCML). Addition of a PC (not included) and computer assisted courseware, provides the key to an interactive environment and simulation capability to enhance the learning process.

The HYD-3500 system's basic unit comprises a compact desktop universal master board (HYD-3501), four sets of industrial hydraulics (HYD-3510, 3520, 3530, 3540) component boards and comprehensive theory and practice manuals.

HYD-3501 - Hydraulics Master Board

The size of the master board is: 575 x 490 x 455 mm (W x H x D). The master board incorporates a supply and measurement unit and 4 rack units into which the components boards can be quickly fastened or removed. It includes:

- External power adaptor
- 12V power supply
- 2 pressure gauges
- 3 hydraulic taps
- Power switch
- Hydraulic supply outlets
- Check valve
- Adjustable relief valve
- Oil measurement container
- 12 VDC outlet to measure hydraulic motor speed

Modules

HYD-3510 Basic Hydraulics

- Familiarization with the hydraulic power unit and main platform
- Installation and maintenance of the power unit and main platform
- Relation between flow rate and pressure
- Adjustable pressure relief valve to limit pressure
- Controlling flow direction on 3/2 and 4/2-way valves
- Two-way compensated flow control valve
- One-way compensated flow control valve
- Non-return (check) valve
- Pilot check valve operation
- Double acting cylinder in two-way movement application

HYD-3520 Advanced Hydraulics

- Operation of a differential cylinder
- Two speed cylinder system
- Pilot pressure adjustable relief valve
- Two speed piston stroke
- Hydraulic motor and control circuit
- Hydraulic accumulator
- Testing and adjusting a pressure control valve
- Testing a 4/3-way tandom valve
- Testing a double acting cylinder
- Operating a double acting cylinder with a hydraulic motor
- Designing a simple hydraulic system

HYD-3530 Basic Electro-hydraulics

- Familiarization with the hydraulic power unit and main platform
- Installation and maintenance of the power unit and main platform
- Series connections
- Series and parallel control
- The relay as an electrical contact multiplier
- The relay as an electrical switch
- The relay as an electrical contact inverter
- The relay as a memory device with self-holding and break priority
- Activate a double-acting cylinder with a push button
- Self-holding relay as a memory device
- Control a double-acting cylinder with a limit switch
- Automatic actuator circuit
- Step-by-step control of a hydraulic clamp
- Pressure switch
- Stop movement of a double-acting cylinder using a push button
- One-by-one feed system

HYD-3540 Advanced Electro-hydraulics Experiments

- On-delay timer and control circuit
- Off-delay timer
- On-delay and off delay control circuit
- Optical sensor
- Capacitive sensor
- Inductive sensor
- Assembly sequence
- Semi-automatic drill system
- Electronic counter
- Control circuit with electronic counter
- Electro-hydraulic control circuit
- Electro-hydraulic control circuit with a counter

PN-3451 Programmable Logic Controller (PLC) Experiments

- Introduction to the PLC ladder diagram
- Series and series-parallel control circuits
- Use of internal PLC coil, self-hold an break priority
- Relay memory, programming a sequence
- On delay and off delay timers and control circuits
- Three piston cascade counter circuits
- Design and programming exercises for applications:
  - Cutting machine, manipulator, concrete block machine
  - Bottle closing machine, packing cans in boxes
  - “Two hands” safety control

PN-3452 USB I/O Unit and manual fault insertion

- Acts as the computer interface for most of the experiments for basic and advanced electro-pneumatic courses including fault insertion
- Supports programming in PLC ladder diagrams (PLSES), logo icons (SES logo), Basic, Pascal, C and C51

HYD-3581 Hydraulic Power Unit

This unit is normally placed underneath the laboratory bench and connected to the universal hydraulic master board via 2 flexible hydraulic hoses.

HYD-3591 Electrical Patch Cords for HYD-3500

This kit contains all the electrical patch cords for HYD-3430 and HYD-3440 electro-hydraulic training systems.

HYD-3592 Accessories Set

The hydraulic master board uses a set of accessories for hydraulic connections containing hoses with quick disconnect plugs and T junctions.

These items are needed for normal operation of the HYD-3500 laboratory.

PN-3454 Mechanical / optical tachometer

The tachometer is required to measure the speed of the hydraulic motor rotational speed in the HYD-3522 module.