

Electrics for hydraulic engineers / proportional control

A four day course designed for mechanical and electrical technicians and fitters involved in the installation, commissioning, maintenance and fault finding of hydraulic systems with proportional valves and their associated controls. Also for hydraulic, mechanical and/or maintenance engineers working with electro hydraulic systems which incorporate on-off solenoid valves, pressure switches and their associated electrical controls.



Candidates should have attended the Level 1 Hydraulics course and have a good understanding of modern hydraulic systems. Some knowledge of basic electrical circuits would be advantageous.

Electrics for hydraulic engineers

Programme objectives (knowledge based)

On completion of this course candidates will:

- Understand how hydraulic and electrical systems work together
- Know the function and construction of common electrical and electro hydraulic devices and know their symbols
- Understand the construction of asynchronous AC induction motors
- Understand the differences between AC and DC systems
- Learn how to read and interpret an electrical diagram
- Understand the cabling requirements for power and signal lines

Programme objectives (skills based)

During the practical section of the course candidates will apply the following skills:

- Read and interpret a circuit diagram
- Locate and identify switches, relays and solenoids
- Build and operate electro hydraulic relay logic circuits
- Carry out system monitoring and effective fault diagnosis and troubleshooting for electro hydraulic relay logic systems
- Know how to use a multi-meter and other simple diagnostic tools

Proportional control

Course content

- Introduction to basic electrical theory, solenoid control, (current and voltage drivers), magnetism, pulse width modulation, dead band compensation and dither
- Principles of operation of proportional valves (design, sizing and selection)
- Commissioning, setting up, testing and fault finding
- Position, velocity, acceleration and force control
- Open loop and closed loop control
- Operation of Servo valves
- Introduction to PVG32 valves as applicable

Aims of the course

- To increase knowledge of proportional hydraulic components: function, operation, application and control
- To give practical training: setting up procedures, tuning and testing of proportional hydraulic systems