Outline

Electronic control of hydraulic systems has become commonplace. Understanding proportional technology is essential for system designers and service technicians.

This course demonstrates working examples of various valves and control cards through practical exercises.

Program

Day 1
Welcome, introductions and overview

Introduction to proportional hydraulics – ST-09-0
What is a proportional system?
What is electro-hydraulic control?
Open loop control and closed loop control

Introduction to electronics – EL45-T04-0
What is electrical energy?
Electrical circuits.
Terms and units of measurement.
Using Ohm’s Law.
Measuring electrical energy.

Hands-on exercise (Task 1)
Using multi-meters
Switches and solenoids
Simple electrical circuits

Solenoid technology – EL45-T05-0
Coils
Relays
Solenoid construction
Switch solenoids vs. Proportional solenoids.

Hands-on exercises (Tasks 2 to 6)
Relay circuit
Latching relay circuit
Set up a hydraulic circuit, and control it with switch solenoids.
Set up a hydraulic circuit and control it with latching relays.
Timer functions.
Day 2

**Industrial logic – EL45-T07-0**
Introduction to Programmable Logic Controllers (PLC’s)
Industrial ladder logic
Function block diagrams
Introducing the Siemens LOGO! PLC
LOGO! Basic functions and special functions.

**Hands-on exercises (Tasks 7 to 11)**
PLC programming and circuits using Siemens LOGO!
Using analogue and digital sensors as PLC inputs.

Day 3

**Proportional Amplifiers – EL45-T06-0**
Types of amplifiers, and their construction
Functions of amplifiers
Analogue and digital signals
Input / command signals and methods
Enable command
Spool overlap compensation
Gain
Ramps
Pulse width modulation (PWM)
Reading amplifier schematics

**Proportional valves – CH99-T08-0**
Proportional valves and their construction
Servo valves and their construction

**Hands-on exercises (Tasks 12 to 15)**
Constructing, programming and setting up a system with cylinder position monitoring.

**Prerequisites**

Understanding Hydraulics 1 or equivalent.

Before this course can be undertaken, the participant would need to have gained a basic understanding of hydraulic principles and components.

This course can only be provided for those fluent in English. Participants must be able to read and write, and be able to follow instructions.

**Clothing and equipment**

Pens, paper, tools and training resources are provided.

Clothing should be neat casual, or cotton drill work clothing is fine, but they must be clean.

Dirty work boots are not to be worn, fully covered footwear such as runners are acceptable. Open toed footwear must not be worn.
Lunches

Morning tea, lunch and afternoon tea are provided. If you have any special dietary needs, please contact HYDAC beforehand to arrange alternatives.

Dates and times

Times: 8:30AM to 5:00PM on the following days in 2016:

- March 21\textsuperscript{st} to 23\textsuperscript{rd}
- June 22\textsuperscript{nd} to 24\textsuperscript{th}
- September 19\textsuperscript{th} to 21\textsuperscript{st}

Course fee

Course fee is AUD $720 per participant, plus GST
Minimum class size is 10 people.
Flights, accommodation and taxi charges are not included in the course fee.

Text book

We also have a 173 page text book available, entitled “Basics of electronics and measurement technology”, it is a supporting text for this course. It can only be purchased by those who attend this course, or our Understanding Sensors And Measurement Devices course.

Part No:  3802481
Nett price: $140 plus GST

Price for the course and the text book is $860 Nett, plus GST.

Contact

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