



Training Course :

Advanced Variable Speed Drives

Training Course For One Week In

**UAE, Dubai, Royal Continental
Hotel Deira**



Which Be Held As Under Details :

Abar Solutions Petroleum Consultancy Invite Your Employee To Participate With Us In Special Training Course As Under Details :

Course Name		Advanced Variable Speed Drives				
Code	Period	Language	Start	End	Location	Fees KD
EL 27	5 Days	Bilingual	15/10/2017	19/10/2017	UAE, Dubai, Royal Continental Hotel Deira	1195
		(Arabic &	19/11/2017	23/11/2017		
		English)	17/12/2017	21/12/2017		
The Fees Includes: Lecturer, Training Material, Training Room With One Coffee Break Daily, Certificate Of Attendance In Last Day Training Course						

Course Description

- The advanced various drive features such as operating modes, braking types, automatic restart and many others will be discussed in detail. You will learn the four basic requirements for a VSD to function properly with emphasis on typical controller faults, their causes and how they can be repaired. The concluding section of the course gives you the fundamental tools in troubleshooting VSDs confidently and effectively.

Course Objectives

- **At the end of this workshop participants will be able to:**
 - Demonstrate a sound understanding of how AC Variable Speed Drives (VSD's) work
 - Install VSDs properly
 - Select the right VSD for a given application
 - Troubleshoot VSDs competently
 - Competently explain how flux-vector control works for drive applications

- Understand squirrel cage induction motors
- Identify the protection and control system requirements for VSD's
- Interface VSD's with PLCs
- Understand the causes of motor burnout
- Deal effectively with VSD harmonics and EMC/EMI problems

Course Content & Outlines

– **CONTROL SYSTEM FOR AC VARIABLE SPEED DRIVES**

- The Overall Control System
- Power Supply to the Control System
- DC Bus Charging System
- VSD Control Loops (Open-Loop, Closed-Loop)
- Vector control and its applications
- Current Feedback in AC Variable Speed Drives
- Speed Feedback from the Motor

– **INTRODUCTION TO VARIABLE SPEED DRIVES**

- The Need for Variable Speed Drives
- Fundamental Principles of Speed Control
- Efficiency, Torque, Inertia, Horsepower/Power Factor
- Torque-Speed Curves
- How the motor produces Torque
- Types of Variable Speed Drives

– **THE SELECTION OF AC CONVERTERS FOR VARIABLE SPEED DRIVE APPLICATIONS**

- The Basic Selection Procedure
- Load ability of Converter Fed induction Motors

- Operation in the Constant Power Region
- The Nature of the Machine Load
- Starting and Stopping VSDs (Motor Braking)
- How to Calculate Acceleration Torques and Times
- How to select the correct Motor and Converter for Pump and Fan Loads
- How to select the correct Motor and Converter for Constant Torque Loads, such as conveyors
- Summary of the Selection Procedure
- **INSTALLATION AND FAULT FINDING TECHNIQUES**
 - General Installation and Environmental Requirements
 - Power Supply Connections and Earthing
 - Where to install the Contactors in the Power Circuit
 - Installing AC Converters into Metal Enclosures
- **PHASE AC INDUCTION MOTORS**
 - Basic Construction and Physical Configuration
 - Principles of Operation and Performance
 - Equivalent Circuit and Fundamental Equations
 - Starting, Acceleration, Running and Stopping
 - Power, Torque and Thermal Rating
- **POWER ELECTRONIC CONVERTERS**
 - Definitions and Basic Principles
 - Power Diodes and Thyristors
 - Principles of Communication
 - Power Electronic Rectifiers

- Power Electronic Inverters
- Gate Commutated Converters
- Gate Controlled Devices - GTO, FCT, GTR, FET, IGBT

– **ELECTROMAGNETIC COMPATIBILITY (EMC)**

- Sources of Electromagnetic Interference
- Harmonics on the Power Supply side of AC Converters
- The Effect of Harmonic Distortion on other connected Equipment
- Methods of reducing the effect of Supply side Harmonics
- Electric Motor Protection
- Thermal Overload Protection – Current Sensing
- Thermal Overload Protection – Direct Temperature Sensing

⇒ **PROTECTION OF MOTORS AND CONVERTERS**

- AC Frequency Converter Protection
- Fault Diagnostics
- Electric Motor Protection
- Thermal Overload Protection – Current Sensors
- Thermal Overload Protection – Direct Temperature

⇒ **SPECIAL TOPICS**

- PWM Rectifier for AC Converters
- Soft Switching
- The Matrix Converter

With Best Regards From Abar Solutions Petroleum Consultancy