Variable Frequency Drives Training

Description

Course Description
The objective of this VFD training course is to build confidence in the student by providing him/her with useful information and practical hands-on exercises
that demonstrate the relevance of the course material.
Course Objective
This course is designed to enable participants to:

- Properly Matching A Drive to A Machine
- Choosing the Correct Motor
- Choosing the Best Type of Variable Frequency Drive (VFD)
- Identify & Correct Drive System Problems
- Identify & Test Major Drive Components
- Perform Start-Up of an AC Drive
- Program & Adjust the Drive for Desired Operation

Course Outline
INTRODUCTION

- Evolution of VFD Control
- Modern Types of Variable Frequency Drives (VFD)

MECHANICAL THEORY

- Horsepower Defined
- Torque Defined
- Example Horsepower and Torque Calculations
- Common Types of Mechanical Loads
- Characteristics of Variable Torque and Constant Torque Loads

BASIC VFD ELECTRICITY THEORY

- Electrical/Hydraulic Circuit Analogy
- Resistance, Voltage, and Current Defined

INTRODUCTION TO AC MOTORS

- Examination of Motor Nameplates and NEMA Designations
- Locked Rotor Current and Full Load Current
- Anatomy of a Motor
- Magnetic Poles and Frequency as Related to Motor Speed
- Torque Characteristics Motors Operated “Across-the-Line”
- Torque Characteristics of Motors Operated on VFDs
- Effects VFDs on Motor Operation and Life Expectancy

PWM AC VFDs

- Common Types of PWM Drives
- Examination of the Main Power Circuit
- Electronic Component Identification
- The PWM Wave Form
- Voltage and Frequency Relationships and Effects on Motor Performance
- Control of Drive System Torque and Horsepower Output
- Torque Output Comparisons of AC Drives VS. Conventional Means of Speed Control
- Standing Wave (Reflective Wave) Phenomena on Motor Cables
- Disassembly of an AC Drive
- Component Identification
- Various Designs of Drives
- Reassemble, Test, Start-Up of AC Drive With Proper Techniques
- Hands-On Programming and Operation of an AC Drive and Motor
- Adjust Minimum and Maximum Speed
- Reset Drive to Factory Defaults
- Adjusting Torque Output
- General Drive Programming
- Methods of Speed and Torque Control

VFD Applications

- Methods of Proper Drive Selection
- Multi-Motor Drive Systems With Example Problem
- Using VFDs to Eliminate Geared Speed Reducers
- Effects of AC Drives on Geared Speed Reducers
- Replacing Mechanical Speed Changers With VFDs

CONCLUSION AND SUMMARY