SYLLABUS

2000 Series of Performance Vector Drives Training Course

UNICO

SYLLABUS

2000 Series of Performance Vector Drives Training Course

Objectives

1. To isolate and troubleshoot to the level of modular components
2. To understand serial communication options and uses
3. To understand software and hardware fault diagnostics
4. To locate important test points for direction to problem areas
5. To understand vector control terminology
6. To understand the options and applications of the drive

Content

AC Vector Control

1. Typical servo drive diagram
2. Advantages and disadvantages of DC drives
3. Speed/torque curve of DC motors
4. Advantages and disadvantages of variable-frequency AC drives
5. Speed/torque curve of an AC induction motor with a variable-frequency AC drive
6. UNICO flux vector control
7. Speed/torque curve of an AC vector drive
8. Comparison of AC vector and DC servo drive systems
9. AC vector control versus DC control
10. Flux vector coordinate transformation
11. Block diagram of AC flux vector control
12. AC vector drive features
13. AC vector drive power conversion
14. Insulated gate bipolar transistors (IGBTs)
15. Digital current regulator
16. Digital signal processor (DSP)
17. Power factor comparison
18. Energy storage and sharing with PWM drives

Content *(continued)*

2000 Series of Performance Vector Drives

With Expandable Control Module

1. Physical layout of inverter and charging unit
2. Electrical installation and wiring
3. External options, shunt resistors, bus discharge circuits, etc.
4. Internal or on-board options, parallel I/O, incremental encoder with repeater interface, serial absolute encoder interface, resolver interface
5. Expandable Control Module tray layout, connections, test points, and LEDs
6. Synchronous Serial and Smart Serial Command modules
7. Analog inputs and outputs
8. Start-up procedures including Phase, Tune, and Align routines
9. System ID and Drive Test functions
10. Keypad and display functions including basic key functions, menu navigation, Main Menu, Fault and Help displays
11. Troubleshooting techniques and charts

With Standard Control Module

1. Physical differences between Expandable and Standard controllers
2. Electrical installation and wiring
3. Built-in parallel I/O selections
4. Incremental encoder with repeater interface, serial absolute encoder interface, resolver interface
5. Standard Control Module tray layout, connections, test points, and LEDs
6. Analog inputs and outputs
7. Troubleshooting techniques and charts

Servo Theory

1. Three types of system orders including position, velocity, and torque
2. Functional diagrams of system integration illustrating drive routine, vector control, UPID, and other control blocks

Communication

1. Remote diagnostics
2. Wiring configurations for RS-232, RS-422, and RS-485 communication
3. Synchronous communication options

UNICO–Worldwide

Corporate Headquarters
UNICO, Inc.
3725 Nicholson Road
P. O. Box 0505
Franksville, Wisconsin
53126-0505
USA
voice: 262.886.5678
fax: 262.504.7396
www.unicous.com

United States
Novi, Michigan
248.380.7610
New Lenox, Illinois
815.485.5775
Sandy, Utah
801.501.7586

Canada
Mississauga, Ontario
905.602.4677

South America
El Tigre, Venezuela
58.283.241.4024

Europe
Milton Keynes, England
44.1908.260000
Wilnsdorf, Germany
49.2739.303.0

Asia
Osaka, Japan
81.66.945.0077
Beijing, China
86.10.6218.6365

8404 8/05