

ABB Basic VFD Course Syllabus

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Day 1 Morning Session:

- Chapter 1—Introduction:
 - Meet the Instructor
 - Student Introductions
 - Course Guidelines
 - Student's Expectations
 - Evacuation Plan

- Preview of the Final Test

- Electrical Safety:
 - General Electrical Safety
 - Lock-out Procedures
 - ACS880 Installation/Safety

- Review of AC Asynchronous Squirrel-Cage Induction Motors

- Review of Generic PWM AC Drives

- ACS880 Type Designation (Code) Breakdown:
 - Discussion of Example Type Designation
 - Finding the ACS880 Frame Size
 - $\leq 40^{\circ}$ C Cooling Air Required

- ACS880 Sizing Details (Chart from The Technical Data Section of the ACS880 Hardware Manual)

- Survey of Options Available for the ABB ACS880

- Electrostatic Discharge (ESD) Concerns:
 - Typical Static Voltage Levels
 - Types of ESD Failures
 - ESD Wrist Straps

- Simple Motor Tests:
 - Motor Testing with a Digital Multimeter (DMM)
 - Motor/Motor Cable Insulation Testing

- Initial Power Terminal Blocks to VFD Frame Absence-of-Voltage Testing

- Torque — Specification for Connections (High Resistance and Damaging High Temperature due to Loose Connections)

- ACS880 Controls, Access, & Memory Unit
 - Controls Terminal Blocks
 - Control Panel Keypad (ABB ACS-AP-I Assistant Control Panel) Operation:
 - User Controls
 - Back of Control Panel
 - Memory Unit
 - Initial Display
 - User Control Details
 - Control Panel Navigation
 - Control Panel Key Shortcuts
 - Tricolor Status LED
 - Menu – Parameter Submenus
- Hands-on Survey of ACS880 Control Panel Keypad
- Common Procedures:
 - Important Initial Parameter Changes (e.g., for US Installations)
 - Setting up I/O Extension Modules
 - ID Run
 - Local (Control Panel Keypad) Control
 - Saving a “User Set” of Parameters
 - Backup/Restore Feature

Day 1 Afternoon Session:

- Chapter 2—Hardware and Firmware:
 - General Information:
 - ACS880 Manual Names and Order Numbers
 - Power/Motor Cable Types
 - Installation Best Practices:
 - Routing Cables
 - Selecting Control Cables
 - EMI/EMC and Grounding/Shielding
 - Equipment Grounding
 - More on Motor/Motor Cable Insulation Testing
 - ACS880 Power-Wiring Diagram
 - Safety Instructions from the ACS880 Hardware Manual
 - ACS880 Motor Overcurrent Protection:
 - Overload
 - Short Circuit
 - Ground Fault
 - Fusing in the Supply Cable:
 - Chart From Technical Data Section of ACS880 Hardware Manual
 - Motor Ground-Fault Protection Parameter
 - Grounding (additional requirements)

- Maintenance Procedures:
 - Lifespan of Specific Components
 - R1, R2, and R3 Frames Main Fan Replacement
 - R1, R2, and R3 Frames Auxiliary Fan Replacement
 - R4 and R5 Frames Main Fan Replacement
 - R4 and R5 Frames Auxiliary Fan Replacement
 - R6, R7, R8, and R9 Frames Main Fan Replacement
 - R6, R7, R8, and R9 Frames Auxiliary Fan Replacement
- Hands-on Survey of Event Log
- Warnings and Faults:
 - Example Warnings and Discussion of Common Warnings
 - Example Faults and Discussion of Common Faults
- ACS880 Connections:
 - Overview of Power and Control Connections
 - External Control Wiring Terminal Blocks (Review)
 - Noise Suppressors for Inductive Loads
 - Preview of Hand/Auto Macro Controls

Day 2 Morning Session:

- Hands-on Troubleshooting LAB
- Hardware and Firmware Chapter Continued:
 - Parameters:
 - Overview — Groups 01 Through 99
 - Parameter Roadmap — Key Parameters in Example Application Groups
 - Analog-Signal Scaling
 - Application Macros
 - Hand/Auto Macro
 - Hand/Auto Macro Default Connections

Day 2 Afternoon Session:

- Exercise: Initial ACS880 Factory Macro Controls Modified for Three-wire Control
- Practical Hands-on Exercises Using the ACS880 Firmware Manual:
 - Perform a “Normal” ID Run
 - Change Accel/Decel Rates
 - Verify Constant Speed Setup and Change this Speed
 - Create an External Interlock
 - Turn on a Relay Output at ≥ 30 Hz.
 - Set up a Second Set of Accel/Decel Rates
- MCC Bucket Example Hand/Auto Application Parameters
- Final Test
- Award Certificates