



IE269: Motor Drives for Industrial Applications

Training Description:

This training course gives you a broad perspective of DC motors, AC motors (single and three-phase), and Variable Speed Drives (for AC Induction Motors and DC Motors). Industrial applications of Variable Speed Drives for constant torque, constant horsepower, and variable torque/variable horsepower are included. Also covered are Motor Starter Circuits and Reduced Voltage Starting techniques. Stepper Motors and Servo Motors are discussed along with their advantages and applications.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Provide an understanding of the fundamentals, and basic techniques to select, size, setup and test the most representative and modern motor-drive systems
- ✓ Define motor torque and horsepower
- ✓ Calculate volts per hertz ratio as related to Variable Frequency Drives
- ✓ Specify, select, and implement motors for variable torque and horsepower
- ✓ Recognize how variable frequency AC drives operate
- ✓ Determine the need for variable speed drives in industrial processes
- ✓ Interpret motor performance curves
- ✓ Differentiate between slip and synchronous speed induction motors
- ✓ Apply procedures to reverse direction of a three-phase motor
- ✓ Identify the advantages of brushless DC motors
- ✓ Discuss stepper and servo motor systems for industrial applications
- ✓ Explain the differences in various motion control feedback devices

Training Designed for:

This course is intended for Plant and facilities managers, engineers, technicians, supervisors who need to be familiar with the fundamentals associated with motor-drive system, Plant and facilities operations personnel, Managers, engineers, consultants, technicians and supervisors responsible for plants and facilities containing motor-drive systems.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

This training course is available upon request in English or Arabic, virtual online live or face to face public/inhouse. Content, location and duration can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

FIVE DAYS:

- ❖ DC Motors Theory and Construction: Series | Shunt | Compound
- ❖ DC Motor Torque and Horsepower Control: Field Control | Armature Control

- ❖ **Single-Phase AC Motor Theory and Construction:** Squirrel Cage | Induction Rotor | Split Phase and Capacitive Start
- ❖ **Three-Phase AC Motor Theory and Construction:** Squirrel Cage | Induction Rotor | Wye Field Winding | Delta Field Winding | Self Starting
- ❖ **Motor Specifications:** NEMA Designs and Types | Torque vs. Speed Curves
- ❖ **Motor Control Circuits:** 2-Wire Control | 3-Wire Control | Magnetic Motor Starters | Soft Start
- ❖ **Motor Applications:** Constant Torque vs. Variable Horsepower | Constant Horsepower vs. Variable Torque | Variable Torque vs. Variable Horsepower
- ❖ **Solid State DC Drives:** Constant Torque Control | Constant Horsepower Control
- ❖ **AC Drive Characteristics:** Volts per Hertz | Variable Voltage Input (VVI) | Pulse Width Modulated (PWM) | Flux Vector Drives (FVD) | Typical Control Applications
- ❖ **Servo Systems:** Brushless DC Motors | Position Loop Systems | Positioners (Encoders)
- ❖ **Stepper Motor Systems:** Theory of Operation | Advantages/Disadvantages | Application Selection
- ❖ Course Conclusion
- ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

Aisha Relativo - Training & Career Development Manager

aisha@cmc-me.com / training@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615