SCANDINAVIAN ACADEMY
For Training and Development

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Course: Practical Motor Protection, Testing, Control & Maintenance

Code	City	Hotel	Start	End	Price	Language - Hours
MA-636	Frankfurt (Germany)	Hotel Meeting	2026-09-14	2026-09-25	9450 €	En - 50

Course Introduction:

Electric motors are critical components in industrial and commercial applications, driving machinery and essential processes. Ensuring their reliability through proper protection, testing, control, and maintenance is essential to avoid costly downtime and equipment failure. This comprehensive training course provides participants with a deep understanding of motor protection principles, control strategies, testing techniques, and effective maintenance practices.

Through theoretical instruction, hands-on practical exercises, and real-world case studies, participants will learn best practices in diagnosing motor faults, applying protection schemes, optimizing motor performance, and implementing preventive maintenance programs.

Course Objectives:

By the end of this course, participants will be able to:

- Understand motor operating principles and failure modes.
- Implement effective motor protection strategies.
- Conduct motor testing using various diagnostic techniques.
- Apply advanced motor control methods for efficient operation.
- Troubleshoot common motor problems and failures.
- Develop and execute preventive and predictive maintenance plans.

- Ensure compliance with relevant electrical and safety standards.

Target Audience:

- Electrical Engineers and Technicians
- Maintenance and Operations Personnel
- Industrial Electricians
- HSE Officers and Safety Professionals
- Plant Engineers and Facility Managers
- Anyone responsible for motor reliability and maintenance

Training Methodology:

- Interactive lectures with case studies
- Hands-on practical exercises and demonstrations
- Group discussions and troubleshooting workshops
- Site visit (if applicable) or virtual simulation exercises
- Competency-based assessment for certification

Course Outline

Day 1: Introduction to Electric Motors

- Types and classifications of electric motors
- Principles of motor operation and efficiency
- Common failure modes and their causes
- Motor nameplate data interpretation

Day 2: Motor Protection Fundamentals

- Protection schemes for LV and MV motors
- Overload, short circuit, and earth fault protection
- Thermal protection and temperature monitoring

- Motor protection relay settings and coordination

Day 3: Motor Testing Techniques

- Insulation resistance testing
- Winding resistance and impedance testing
- Surge comparison testing
- Vibration analysis and dynamic motor testing

Day 4: Motor Control Methods

- Direct-on-line (DOL) starters
- Star-delta and autotransformer starting methods
- Variable frequency drives (VFDs) and soft starters
- Motor braking techniques and regenerative control

Day 5: Safety Considerations in Motor Maintenance

- Lockout/Tagout (LOTO) and isolation procedures
- Arc flash hazard analysis and PPE requirements
- Safe handling of rotating machinery
- Emergency response planning for motor failures

Day 6: Preventive and Predictive Maintenance

- Routine inspection and lubrication practices
- Infrared thermography and condition monitoring
- Root cause analysis of motor failures
- Developing a structured maintenance program

Day 7: Troubleshooting and Fault Diagnosis

- Identifying symptoms of motor failure
- Interpreting test results for accurate fault diagnosis
- Case studies in motor troubleshooting
- Hands-on workshop: Diagnosing real-world motor faults

Day 8: Advanced Motor Protection and Coordination

- Selective coordination of motor protection devices
- Relay coordination and discrimination analysis
- Case study: Designing an effective motor protection system

Day 9: Compliance with Standards and Regulations

- Overview of IEEE, NEMA, IEC, and NFPA standards
- Regulatory requirements for motor safety and maintenance
- Documentation and compliance reporting
- Best practices for regulatory audit preparation

Day 10: Final Assessment

- Review of key concepts and best practices
- Developing a structured motor maintenance and protection strategy
- Mock troubleshooting exercise and practical competency assessment

The Scandinavian Academy for Training and Development adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant will receive comprehensive training materials, including theoretical content, practical exercises, and supporting resources, provided in both printed and digital formats. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training and Development.

Program Timings:

- 9:00 AM to 2:00 PM in Arab cities.
- 10:00 AM to 3:00 PM in European and Asian cities.

The program includes:

- A daily Coffee Break provided during the sessions to ensure participants comfort.