



Brochure

ABB Customer Training Program for Motors and Generators Sharing knowledge and creating value

With expertise, and a comprehensive portfolio of products and life-cycle services, we help value-minded industrial customers improve their energy efficiency and productivity.



Training courses from ABB

Using high quality equipment from a reliable manufacturer is the first step towards getting great performance from your plant. To ensure that your motors, generators and other assets keep running at the optimum level and deliver high availability, you also need to provide proper service and maintenance.

Personnel who look after equipment should have the right training to enable them to maximize the value you get from your assets. Our training courses are designed to give your people the specialized competence they need.

Course topics fall into the broad areas of product knowledge, operation and maintenance. Our courses will ensure your employees have the necessary skills to use the equipment safely, determine the correct maintenance strategy, handle first-line troubleshooting, interpret alerts, and undertake appropriate action to avoid downtime and maintain availability. They will also be in a stronger position to interact with our expert technical support.

At the end of each course we issue an ABB certificate to every participant, enabling you to easily follow your employees' progress.

Both standard and customized courses are available, according to your requirements.

Key benefits of personnel training

- Quicker response, faster decision making and better risk management at critical times due to increased knowledge of motor and generator technology, operations and maintenance
- Reduced downtime, higher asset availability and fewer maintenance issues through better management of assets by competent personnel
- Courses cover topics that are relevant to you and your industry
- Increased job satisfaction and confidence for plant personnel
- Access to ABB's wealth of knowledge
- Course participants receive an ABB certificate

Standard courses



Our standard courses for motors and generators are listed below. These courses can be combined, based on your needs. They include topics ranging from basic theory of motors and generators to advanced diagnostics and troubleshooting.

Course code	Course title (basic)	Duration
K700	Rotating electrical machines theory, operation and maintenance	3 days
K701	Rotating electrical machines theory, operation and maintenance for chemical, oil and gas industry	4 days
K702	Rotating electrical machines theory, operation and maintenance for marine industry	4 days
K703	Rotating electrical machines theory, operation and maintenance for minerals and mining industry	4 days
K704	Diagnosis and condition monitoring of rotating electrical machines	1 day
K280	Seminar for motors and generators in hazardous areas	1 day

Course description

K700

Rotating electrical machines theory, operation and maintenance

This course aims to help reduce the total cost of ownership of motors and generators. It provides structured guidance towards reduced operational costs and increased availability. Subject areas include motor and generator construction, standards and specifications, operation, maintenance, energy efficiency, diagnostics, etc.

The course agenda is as follows:

Day 1 - Dimensioning and selection criteria

- Course introduction
- What is total cost of ownership?
- Basic theory of motors and generators
- Mechanical and electrical design and components
- International standards
- Motor and generator performance and starting considerations
- Motors in VSD applications (basic aspects)

Day 2 - Operational considerations

- Safety
- Installation and commissioning
- Energy efficiency
- TEAM stresses and the concept of equivalent operating hours
- Typical issues and their causes

Day 3 - Availability

- Availability, maintainability, reliability
- Maintenance strategies: reactive, preventive and predictive
- Diagnosis and condition monitoring
- Online and offline tests
- Final test
- Summary

Participant profile

- Participants typically have beginner or intermediate level experience with motors and generators and their operation
- Participants could be engineers, technicians, service personnel, electrical and mechanical maintenance personnel, etc.

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 3 days
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Course description

K701

Rotating electrical machines theory, operation and maintenance for chemical, oil and gas industry

This course is a combination of two courses: **K700 Rotating electrical machines theory, operation and maintenance** and **K280 Seminar for motors and generators in hazardous areas**.

In addition to course K700, this course provides detailed training on important factors relating to the operation of motors and generators in hazardous areas. Topics include directives, service and maintenance requirements, etc.

The course agenda is the same as for K700, with an additional day for K280 covering the following topics:

Additional to K700 agenda

- General Introduction
- Hazardous areas and area classification
- Standards in hazardous areas and key regulations
- Main concepts of Ex protection classes
 - Flameproof enclosure
 - Pressurized enclosure
 - Increased safety protection
 - Non-sparking protection
 - Dust ignition proof enclosure
- Service requirements for Ex equipment
 - Selection and erection – IEC 60079-14
 - Inspection – IEC 60079-17
 - Repair and overhaul – IEC 60079-19
 - Replacement
- ABB approach
 - Service network and authorization process for motors and generators
 - Motors and generators for hazardous areas
- Conclusions and summary

Participant profile

- This course is mainly targeted at service and maintenance engineers, as well as service managers who want to improve their knowledge of Ex issues and of the relevant aspects of maintenance, overhaul and repair for Ex products

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 4 days
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Course description

K702

Rotating electrical machines theory, operation and maintenance for marine industry

In addition to course **K700 Rotating electrical machines theory, operation and maintenance**, this course provides detailed training on important factors relating to the operation of motors and generators in the marine industry. Subject areas include motor and generator construction, standards and specifications, operation, maintenance, energy efficiency, diagnostics, typical marine industry applications and issues, etc.

The course agenda is the same as for K700, with an additional day covering the following topics:

Additional to K700 agenda

- Introduction
- Marine specific applications
- Typical issues and their causes in marine industry
- Special requirements for marine classification societies
- Service and maintenance requirements for marine industry
- Summary

Participant profile

- Participants typically have beginner or intermediate level experience with motors and generators and their operation
- Participants could be engineers, technicians, service personnel, electrical and mechanical maintenance personnel, etc.

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 4 days
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Course description

K703

Rotating electrical machines theory, operation and maintenance for minerals and mining industry

In addition to course **K700 Rotating electrical machines theory, operation and maintenance**, this course provides detailed training on important factors relating to the operation of motors and generators in the minerals and mining industry. Subject areas include motor and generator construction, standards and specifications, operation, maintenance, energy efficiency, diagnostics, typical minerals and mining industry applications and issues, etc.

The course agenda is the same as for K700, with an additional day covering the following topics:

Additional to K700 agenda

- Introduction
- Mining specific applications
- Typical issues and their causes in mining industry
- Protection types for mining industry
- Service and maintenance requirements for mining industry
- Summary

Participant profile

- Participants typically have beginner or intermediate level experience with motors and generators and their operation
- Participants could be engineers, technicians, service personnel, electrical and mechanical maintenance personnel, etc.

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 4 days
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Course description

K704

Diagnosis and condition monitoring of rotating electrical machines

Course participants will learn about maintenance practices related to diagnosis and fault prediction. Subject areas include vibration and temperature monitoring, bearings, stator and rotor diagnostics and electrical measurements.

The following topics are covered:

Day 1

- Introduction
- Diagnosis and condition monitoring
- Online and offline tests
- Bearing diagnostics and monitoring
- Stator diagnostics and monitoring
- Rotor diagnostics and monitoring
- Vibration monitoring
- Temperature monitoring
- Current and voltage signal monitoring
- Summary

Participant profile

- Participants need intermediate level knowledge of motors and generators and their operation
- Participants could be engineers, technicians, service personnel, electrical and mechanical maintenance personnel, testing engineers etc.

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 1 day
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Course description

K280

Seminar for motors and generators in hazardous areas

Participants will learn in detail about important factors relating to the operation of motors and generators in hazardous areas. Subject areas include directives, service and maintenance requirements, etc.

The following topics are covered:

Day 1

- General Introduction
- Hazardous areas and area classification
- Standards in hazardous areas and key regulations
- Main concepts of Ex protection classes
 - Flameproof enclosure
 - Pressurized enclosure
 - Increased safety protection
 - Non-sparking protection
 - Dust ignition proof enclosure
- Service requirements for Ex equipment
 - Selection and erection – IEC 60079-14
 - Inspection – IEC 60079-17
 - Repair and overhaul – IEC 60079-19
 - Replacement
- ABB approach
 - Service network and authorization process for motors and generators
 - Motors and generators for hazardous areas
- Conclusions and summary

Participant profile

- This course is mainly targeted at service and maintenance engineers, as well as service managers who want to improve their knowledge of Ex issues and of the relevant aspects of maintenance, overhaul and repair for Ex products

Practical details

- Teaching method: lecture and practical
- Participants: min. 10 to max. 30
- Duration: 1 day
- Dates and venue: subject to agreement

There is an end-of-course assessment, and course participants receive a certificate.



Customized courses

For any custom requirements, please contact your local sales representative or go to www.abb.com/motors&generators/training

Schedule a course today!

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