



Energizing People > Powering the future



Drive Systems

Seminar No. 101 Fundamentals of variable-speed drives

Course Description:

Participants will learn about the selection process for drive systems and explore the basics of drive system engineering mechanical motion, basic models of DC, induction machines and synchronous electrical machines. Participants will learn about inverters with thyristors for DC and AC motors and IGBT converters for AC machines as well as a practical approach for control systems design. Additionally, they will understand the following drive systems: brushless motor, cyclo converter, and frequency converter for variable speed drives and DC drives.



Learning Outcomes:

Fundamental knowledge of the function of the components of electrical drives



Prerequisites:

Fundamental knowledge of basic electrical engineering & electronics



Participants:

Design, commissioning, operation and development engineers



Duration:

Five days



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Drive Systems

Seminar No. 102 AC drive systems

Course Description:

This course introduces the fundamental principles of drive systems. Participants will learn the basics of squirrel cages, doubly fed asynchronous machines, and synchronous electrical machines. They also will learn the fundamentals of electrical machine operation and control, power electronic components and circuits, variable 3-phase voltage sources (pulse pattern generators), voltage source inverters, variable 3-phase current sources, current source inverters, and control of AC variable speed drives.



Learning Outcomes:

Basic knowledge of AC variable speed drives and their application



Prerequisites:

Fundamental knowledge of general electrical engineering



Participants:

Design, commissioning, operation and development engineers



Duration:

Three days



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Drive Systems

Seminar No. 103 Power electronics

Course Description:

The aim of this course is to introduce participants to converter technology. This is done through a thorough discussion about power electronics components, AC and DC circuit switching in power electronic applications, and single phase and 3-phase converters. Participants also learn about diode rectifiers, thyristor converters, IGBT two- and three-level inverters, IGBT inverters as front end, and motor converters and pulse pattern generators. Additionally, participants will learn about motor and active front-end control as well as EMC, harmonics, and filters.



Learning Outcomes:

Basic knowledge in effectiveness of drive systems and interaction with other system components



Prerequisites:

Fundamental knowledge of basic electrical engineering



Participants:

Design, commissioning, operation and development engineers



Duration:

Five days



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Drive Systems

Seminar No. 104

Oscillation in drive systems

Course Description:

During this course participants will learn about drive trains oscillation analysis (two mass oscillators) and the design of drive trains. They will understand oscillation compensation as also torsion and bending oscillation. The purpose is also to learn about mechanical stimulated periodical noise and oscillations, torque impulse caused by mechanical blocking or electrical short circuit and go through the design of control loops, filter and damping networks for oscillations, oscillation in control loops with back lash, multi mass system and modern control approach for oscillation damping (state space control).



Learning Outcomes:

Basic knowledge about dealing with oscillations



Prerequisites:

Fundamental knowledge of general electrical engineering and control application



Participants:

Design, commissioning, operation and development engineers



Duration:

One day



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