

## Service Training Courses

# Power up with industry experts

*Always Advancing*



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***Power up with industry experts,  
world class leading facilities and  
the vital knowledge to excel.***

## **Always Advancing**

High quality, interactive and theory based training is essential for proven competent and qualified working support and effective cost control. To help meet these demands, the Training Team have curated the perfect suite of courses to introduce, refresh, develop or expand your existing knowledge of **NEWAGE®**, **STAMFORD®** and **AvK®** genuine products.

Whether a dealer technician, service manager or sales personnel, stay up-to-date with the very latest alternator and generating set innovations, developments and implementation. From classroom based, to customer specific courses delivered at our dedicated Global Training Centres or at your location.

For over a century, our experience and knowledge gathered from a large and diverse number of applications of synchronous generator installations help our customers operate with greater efficiency, making it possible for them to compete more successfully throughout the world.

To best support our customers, **NEWAGE®** | **STAMFORD®** | **AvK®** strives to develop and maintain the highest level of service capability possible. Continuous education, available through cutting-edge instruction, helps to make this possible.



# Always Innovating

Whether it's accessing application variables – for individual alternators or complete generating sets, simulating environments, stress analysis, upgrades, or accelerating integration, you can trust our leading industry experts to analyse, validate, train, educate, investigate, solve, facilitate and inspire.

Generating opportunities to transform performance, eradicating risk and enhance product life delivery. Spanning the basics to the inordinately complexed and everything in between.



# Basics of AC Generators

## Course Description

This course is intended for service technicians seeking certification for the Cummins Generator Technologies brand family of AC Generators. Completion of this course satisfies one of the pre-requisites for attending Fundamentals of alternators classroom training. Participants who successfully complete this training will have a basic understanding and knowledge of the construction and operation of alternators.



### Timing & Delivery

4 hours

Online or Classroom



### Pre-requisite Knowledge

None



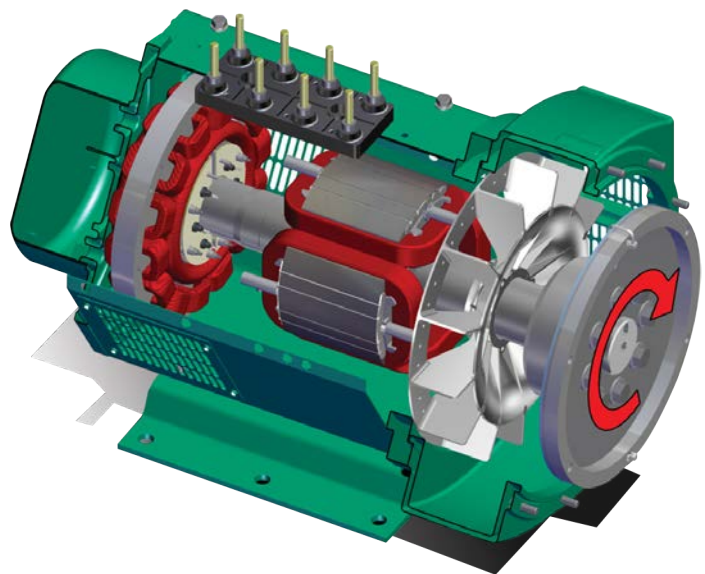
### Products Covered

Basic AC Generator Theory



### Topics

- Background and Overview
- Generator Construction
- Component Features
- Operation and Excitation
- Generator Output



For registration information on this course, please contact our Service Training department at:  
[stamford-avkservicetraining@cummins.com](mailto:stamford-avkservicetraining@cummins.com)



# Fundamentals of AC Generators

## Course Description

The Fundamentals of AC Generators training course is a comprehensive introduction to the inner workings of alternators manufactured by Cummins Generator Technologies. The course material expands on basic AC electricity and magnetism theory to provide a complete understanding of alternator operation. Topics include alternator design and build, theory of operation, excitation processes, troubleshooting, and components testing.



### Timing & Delivery

3 Days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators



### Products Covered

**STAMFORD** and **AvK**; All Frames Basic Theory



### Topics

- Generator Overview
- Generator Build
- Main Alternator – Rotor and Stator
- Excitation Systems
- AVR Systems
- Wiring and Reconnections
- Accessory Components
- Operation
- 5-Step Troubleshooting Approach
- Troubleshooting Exercises
- Bearings



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# Bearings I

## Course Description

**STAMFORD** product ranges from HC6 to P80 and **AvK** ranges from DSG 62-125 and DIG 110-156 are offered with differing bearing types. The Bearings I course covers antifriction bearing theory, regreasing procedures and bearing maintenance. It also covers a basic understanding of fault analysis and service procedures focusing on bearing removal and installation. Ball bearing and roller bearing types are covered, excluding special configurations for DIG 142 machines which are covered in Bearings II.



### Timing & Delivery

3 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of  
AC Generators



### Products Covered

HC6 to P80, S6, S7, S9, DSG62-125  
and DIG 110-156



### Topics

- Identification and Operation
- Regreasable Bearing Maintenance
- Bearing Removal
- Bearing Failures
- Troubleshooting
- Bearing Installation



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# Bearings II

## Course Description

**AvK** model DIG 142 machines are manufactured with a clamped ball and roller bearing design. The Bearings II course covers the justification for a clamped bearing arrangement, maintenance procedures focusing on regreasing procedures, and service procedures focusing on bearing removal and installation. The unique bearing arrangement and specialised tools used for installation make this an advanced course for experienced technicians.



### Timing & Delivery

4 Days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of Alternators  
Bearings I



### Products Covered

**AvK** DIG 142



### Topics

- Identification and Operation
- Regreasable Bearing Maintenance
- Bearing Removal
- Bearing Installation
- Bearing Failures and Troubleshooting



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# Sleeve Bearings

## Course Description

This course provides theory of operation of sleeve bearings along with maintenance, troubleshooting, servicing procedures and techniques to provide the participant adequate knowledge to service sleeve bearings used on machines manufactured by Cummins Generator Technologies. Course instruction includes inspection, cleaning and sealing techniques along with complete disassembly and assembly of a sleeve bearing.



### Timing & Delivery

3 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of  
AC Generators



### Products Covered

DSG and DIG Generators



### Topics

- Theory of Operation
- Troubleshooting
- Lubrication Systems
- Assembly
- Disassembly
- Maintenance
- Construction



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# AVR Adjustments

## Course Description

This course is intended to be a pre-requisite for service technicians seeking qualification on any **STAMFORD**, Basler, or ABB Unitrol Automatic Voltage Regulator courses. AVR Adjustments course will cover the theory of analog AVR's, their adjustments and trim settings, and effects of adjustments. All AVR qualification courses will build upon this course.



### Timing & Delivery

2-4 hours

Online or Classroom



### Pre-requisite Knowledge

Basics of AC Generators

Fundamentals of AC Generators



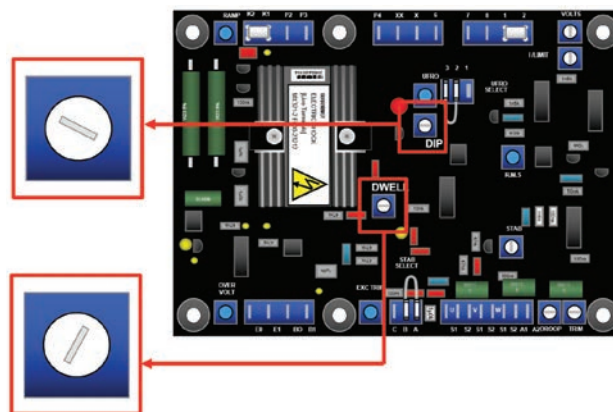
### Products Covered

All principle voltage regulator settings.



### Topics

- Theory of Operation
- Installation and Set-up
- Adjustments
- Troubleshooting
- Overview of Types and Models
- Troubleshooting Exercises



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[stamford-avkservicetraining@cummins.com](mailto:stamford-avkservicetraining@cummins.com)



# STAMFORD® Analogue AVR

## Course Description

This course provides technical and practical understanding of the **STAMFORD** family of analog AVR models. The course material identifies the various connecting terminals and adjustment potentiometers, then provides hands-on experience with connecting and tuning the AVR.



### Timing & Delivery

2 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of AC Generators  
AVR Adjustments



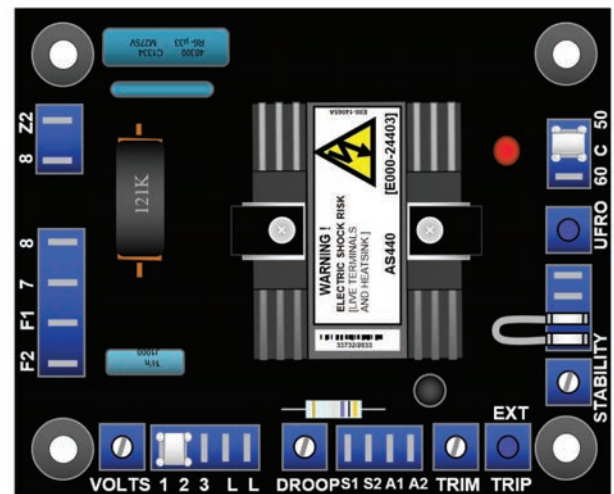
### Products Covered

MX321™, SX460, AS440, AS480, SX421, MX341, MA330, MVR,  
MX322™, AS540



### Topics

- Theory of Operation
- Adjustments
- Overview of Types and Models
- Installation and Set-up
- Troubleshooting
- Troubleshooting Exercises



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# AVR Paralleling

## Course Description

This course trains paralleling theory at the most fundamental level. The course material expands on a prior knowledge of AC electrical and alternator excitation theory. Course topics include synchronisation, the droop circuit, power factor, power sharing, and reactive load sharing. Demonstrations of synchronisation, setting of a droop circuit, and live paralleling using **STAMFORD** AVR's are included.



## Timing & Delivery

2 days

Classroom course at limited global venues.

Course to be placed online in the future.



## Pre-requisite Knowledge

Basics of AC Generators

Fundamentals of AC Generators

AVR Adjustments



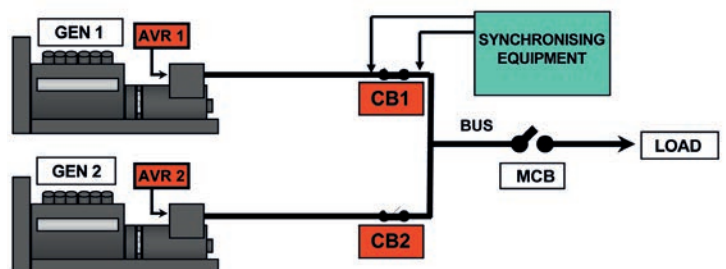
## Products Covered

Paralleling Theory



## Topics

- Parallel Operation
- Synchronization of Alternators
- Load Sharing
- Droop
- Reverse Power
- Parallel Operation with Utility
- Troubleshooting



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# Basler I

## Course Description

This course provides a fundamental understanding of the Basler DECS 100 and 200 digital AVR models as well as covering the **STAMFORD** DM110 digital AVR. The course material provides exposure to the digital interface software for AVR Set-up and monitoring in addition to hands-on practice with connecting and troubleshooting these digital AVR models. (Note: Please view the Basler II content overleaf for newer Basler AVR models).



### Timing & Delivery

3 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of AC Generators  
AVR Adjustments



### Products Covered

DECS 100, 200 and DM110



### Topics

- Theory of Operation
- Adjustments
- Overview of Types and Models
- Installation and Set-up
- Troubleshooting
- Troubleshooting Exercises



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# Basler II

## Course Description

This course provides a fundamental understanding of the New Basler DECS 150 and 250 digital AVR models. The course material provides exposure to the new digital interface software for AVR Set-up and monitoring in addition to hands-on practice with connecting and troubleshooting these digital AVR models. (Note:- Please view the Basler I content for the earlier Basler AVR models).



### Timing & Delivery

3 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of AC Generators  
AVR Adjustments



### Products Covered

DECS 150, 250



### Topics

- Theory of Operation
- Adjustments
- Overview of Types and Models
- Installation and Set-up
- Troubleshooting
- Troubleshooting Exercises



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# ABB Unitrol AVR

## Course Description

This course provides technical understanding of the ABB Unitrol 1010 and 1020 digital AVR models. The course material provides exposure to the digital interface software for AVR Set-up and monitoring in addition to hands-on practice with connecting and troubleshooting these digital AVR models.



### Timing & Delivery

3 days  
Classroom



### Pre-requisite Knowledge

Basics of AC Generatorss  
Fundamentals of AC Generators  
AVR Adjustments



### Products Covered

ABB Unitrol 1010 and 1020



### Topics

- Theory of Operation
- Adjustments
- Overview of Types and Models
- Installation and Set-up
- Troubleshooting
- Troubleshooting Exercises



For registration information on this course, please contact our Service Training department at:  
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# PFC3 Power Factor Controller

## Course Description

This course covers the purpose of using a power factor controller, followed by the layout, function, and interconnection of the **STAMFORD** PFC3 with other support equipment. Topics include operating theory, PFC3 connections, interaction with the AVR, remote control interface, voltage matching, and excitation loss module.



### Timing & Delivery

2-4 hours

Online or Classroom



### Pre-requisite Knowledge

Basics of AC Generators

Fundamentals of AC Generators

AVR Adjustments

Paralleling



### Products Covered

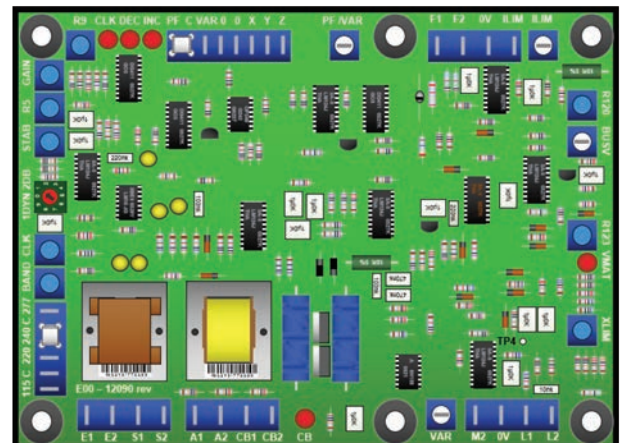
DECS 100, 200, and DM110



### Topics

- Background and Configurations
- Protection Systems

- Basic Systems
- PFC3 Features



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# Excitation Boost System

## Course Description

This course is a familiarisation training course meant to give the participant a clear understanding of how the Excitation Boost System works and how to troubleshoot it. This course is designed for service technicians seeking qualification on the P0/P1 range of **STAMFORD** AC Generators.



### Timing & Delivery

1 hour  
Online or Classroom



### Pre-requisite Knowledge

Basics of AC Generators  
Fundamentals of AC Generators



### Products Covered

**STAMFORD** P0/P1



### Topics

- Background and Theory
- Troubleshooting



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# Grid Code Compliance (Europe)

## Course Description

This course will offer an awareness of Grid Code Compliance and give participants a greater knowledge of how alternators produced specifically for grid applications differ from the standard equipment.



### Timing & Delivery

1-2 hours

Online or Classroom



### Pre-requisite Knowledge

Basics of AC Generators

Fundamentals of  
AC Generators



### Products Covered

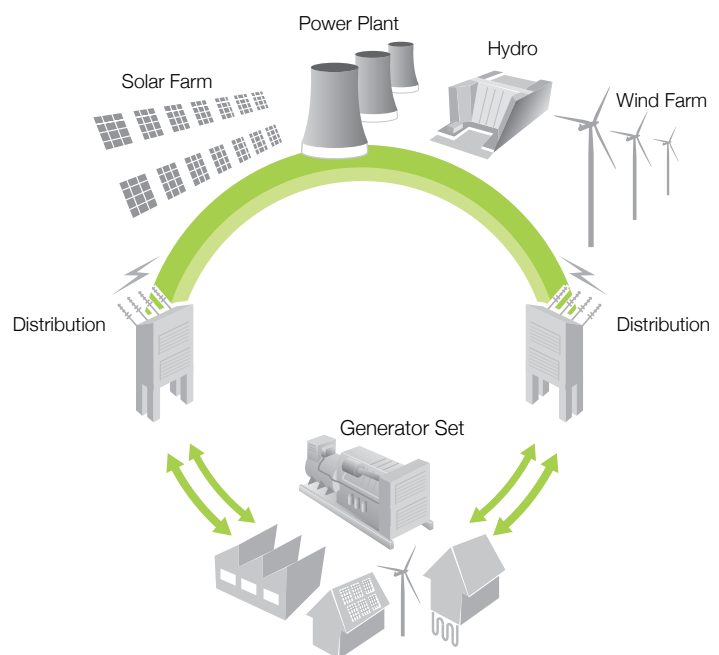
**STAMFORD** and **AvK**

All Frames



### Topics

- Introduction
- Grid Code
- Product Changes



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