

# GENERATOR TRAINING



powerelectronics.com  
0370 850 0858



# GENERATOR TRAINING COURSES

Power Electrics' headquarters in Bristol is Europe's only accredited FG Wilson training centre. Available facilities now include a dedicated test cell and classroom, enabling you to become familiar with the products, develop your understanding of best practice, familiarise yourself with generator technology and improve your ability to deal with compliance issues.

These training facilities have been developed as a result of the company's long term view and commitment to providing assistance throughout the lifecycle your generator requirements.

The training team offers a range of courses that are tailored to develop both theoretical and practical skills, with content designed to meet your requirements. There are three levels of technical training; Foundation, Intermediate and Expert.



Accredited Training Centre



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## FOUNDATION 7

Suitable for new staff, generating set operators, basic technicians, counter staff, management and administrators.

## INTERMEDIATE 11

Suitable for personnel with medium level experience involved with installation, commissioning, service and repair.

## EXPERT 16

Suitable for personnel with a high level of knowledge involved with complex installation, commissioning, service and repair.

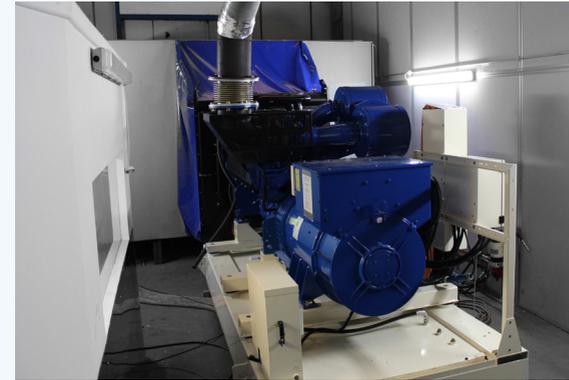
# TRAINING FACILITIES

Power Electrics Headquarters in Bristol incorporates a dedicated training centre.

The 7 acre site also includes a PDI Centre with fully equipped service bays, test bays with loadbanks and generator parts storage, as well as fabrication and painting facilities.

Facilities include multiple classrooms and test cells, enabling you to familiarise yourself with products, develop best practice and deal with compliance issues.

Expert courses are delivered at the FG Wilson training centre in Belfast, Northern Ireland.



## LOCATION

Power Electrics  
St Ivel Way  
Warmley  
Bristol  
BS30 8TY

## CAR (FROM M5/M4)

From the M32 take Junction 1 for the A4174 and head towards Kingswood. Continue for 5.5 miles around the A4174 (ring road) until you reach the roundabout for Warmley and take the High Street for 0.2 miles until turning right onto Tower Road North. Continue along Tower Road North for 0.4 miles until turning left onto St Ivel Way, Power Electrics is located at the end of St Ivel Way.

## RAIL

The closest station to Power Electrics is Temple Meads Train station and is located 7 miles from the South West Headquarters in St Ivel Way. Bristol Parkway station is located 8 miles from Power Electrics.

## FLY

The closest airport is Bristol International, located 14 miles from the Bristol Headquarters.

# BOOKING INFORMATION

**Telephone:** 0370 850 0858

**Email:** training@powerelectrics.com

Please get in touch if you need more information or require a bespoke training course.

## Cancellation Policy

Power Electrics reserve the right to cancel the course due to unforeseen circumstances and do not accept responsibility for any financial loss. Once you have secured your booking the following are the terms and conditions of the cancellation policy:

1. Cancelled booking 8 weeks prior to date of course: 50% of training cost will be charged.
2. Course cancelled 4 weeks prior to date of course: 100% of training cost will be charged.

## Dress Code

Delegates should wear appropriate clothing and will be expected to wear personal protective equipment.

# GENERATING SET FAMILIARISATION AND COMPONENT IDENTIFICATION

## Duration

1 Day

## Cost

£100 per person

Min. 10 delegates

## Course Overview

An introduction to diesel generating sets, this course provides an understanding of basic electrical circuitry and controls and has been designed to provide people new to the Power Generation business with an overview of how generators are designed and how they work.

## Objective

Focusing on familiarisation of the generator range. Delegates will learn to identify and understand the function of the key components of the generating set. This will be structured into specific areas including the Engine, Alternator, Control System, Base Frame and Enclosure.

## Suitability

This course is suitable for new recruits, generating set operators and semi-skilled technicians. It will also be a good starting point for personnel who are required to operate, maintain and make minor adjustments to a generating set, but are not expected to have the breadth of knowledge required to find and fix major faults.

## Topics

### Engine

Description and explanation of a stroke combustion cycle. Fuel systems in use with Perkins engine range.

### Control System

Explanation of basic analogue and digital control system functions.

### Base Frame/Enclosure

Overview and explanation of different designs.

### Alternator

Understanding basic electrical AC and DC power and electrical terminology.

### Cooling Package

Explanation of different cooling package designs and their functions.

## ALTERNATORS AND AVR<sub>s</sub>

### Duration

1 Day

### Cost

£100 per person  
Min. 10 delegates

### Course Overview

This course aims to give participants an understanding of how alternators and AVR<sub>s</sub> work, explain the process behind excitation and provide a discussion of components and terms used when describing alternator and AVR systems. Visual aids including show and tell with alternator and AVR parts are used alongside animation to help reinforce knowledge.

### Objective

To gain a technical base of knowledge allowing a greater understanding of how alternators and AVR<sub>s</sub> are selected or specified for customer application.

### Suitability

Suitable for all staff working with or needing to increase their awareness of alternator and AVR products.

### Topics

#### Introduction to alternator technical data sheets

Explanation of alternator model designations.

#### Alternator physical and operating data

Including: Insulated class, winding pitch and connection, IP Ratings and Telephone Interference Factor (TIF) & Total Harmonic Factor (THF).

#### How alternator and AVR<sub>s</sub> work

Including a discussion of: magnetic fields, 2 and 4 pole alternators, frequency and Stator and Rotor

#### AVR Features

Including: Single and Three Phase sensing, LAM and Synchronisation.

#### Alternator excitation system and AVR models

#### Alternator pricebook options

#### Configuration of voltage option

#### Alternator pricebook options

## INTRODUCTION TO GENERATING SETS AND BASIC OPERATION

### Duration

2 Days

### Cost

£200 per person  
Min. 10 delegates

### Course Overview

A more detailed introduction to Diesel generating sets that provides an understanding basic electrical circuitry and alternator principles. The course is ideal for learners wishing to grow their knowledge enabling them to advance to the Intermediate courses.

### Objective

To focus on familiarisation of the generator range. Delegates will learn to identify and understand the functions of the key components of the generating set. This will be structured into specific areas - the Engine, Alternator, Control System and Cooling Package. The course will also be a good refresher to personnel who have not attended a course for some time.

### Suitability

Generating set operators, semi-skilled technicians or personnel with limited electrical knowledge, who will be required to operate, maintain and make minor adjustments to a generating set. Persons wishing to attend this course will need to have an understanding of diesel engines and a basic understanding of electrics.

### Topics

#### Engine

Identification and explanation of the key components. Description of engine fuel systems and governing.

#### Control System

Explanation of analogue and digital control panel features.

#### Alternator

Explanation of alternator principles and wiring configurations.

#### Cooling Package

Explanation of analogue and digital control panel features. Introduction to AC and DC wiring using basic electrical schematics.

## EVENT TECHNICIAN GENERATOR TRAINING

### Duration

1 Day

### Cost

£150 per person

### Course Overview

This course is designed for anyone in the events industry who is involved with generators on site to give an overview of safe generator operation and the best ways to avoid faults.

### Objective

Delegates will learn to identify and understand the key components of the generating set. The course will be structured into specific areas including; safe operation on site, AMF, Sync pairing of generating sets, panel integration and fault recognition. The course aim is that delegates will leave with a higher knowledge of generators used for temporary power in the event markets and the ability to identify faults quicker and be able to carry out first level repairs.

### Suitability

Anyone involved in the event industry who operates or comes into contact with generators.

### Topics

#### Safe Operation

Generator Health and Safety.

#### Generator Sync Set Up

Communication and Power up.

#### Fault Recognition

Recognising generator faults and knowing what to do when problems occur.

#### AMF

Connecting, Installation and Commissioning.

#### Sync Pair Integration

Connecting, checks and panel integration.

#### TRB Boxes - Basic Fault Diagnosis

What a breaker does and the ways they can trip.

## PRODUCT TECHNICAL TRAINING INTERMEDIATE PANEL

### Duration

5 Days

### Cost

£625 per person

Min. 10 delegates

### Course Overview

An introduction to current and existing FG Wilson generating sets. Ideal for personnel wishing to grow their knowledge.

### Objective

This specially designed course will concentrate on the FG Wilson control systems and their key functions, with a particular focus on installation, commissioning, and fault diagnosis. The programme includes both classroom lecture and practical hands-on exercises.

### Suitability

Skilled Service Engineers with a minimum of six months relevant experience.

### Topics

#### Analogue Control

Explanation of EIM and Magnetic pickup functions. Explanation of 1002T electrical schematics. Control systems IMT applications. Commissioning and adjustment of control systems including EIM and magnetic pickup.

#### Alternators

Excitation types, methods of operation and fault diagnostics. AVR types, functions and adjustments. Output configuration and set-up.

#### PowerWizard Control System

Explanation of EIM functions and magnetic pickup. Explanation of PowerWizard electrical schematics. Control systems operation and functions. Fault resetting. Explanation of status menus including I/O status.

#### ATI/CTI Transfer Panel

Digital controls operation and function. Transfer systems installation and set up.

#### 6000 Series Control System

Modes of operation. Explanation of status menus.

## CUSTOMISED FG WILSON SET TRAINING

<b>Duration</b>	<b>Cost</b>
As Required	POA

### Course Overview

This course is designed to be flexible to suit your requirements and can be adapted to include the full range of intermediate topics applicable to your needs.

### Objective

This course will be based on the topics selected by yourself, providing training focused on installation, commissioning, and fault diagnosis.

### Suitability

This course is suitable for all personnel depending on the topics selected.

### Topics

#### Foundation Courses

Generating Sets Familiarisation and Component Identification (p,7)  
Introduction to Generating Sets and Basic Operation (p,9)

#### Intermediate Courses

Analogue Control Systems (1 Day)	EasyGen 2500
6000 Series Control Systems (1 Day)	Control Systems (1 Day)
PowerWizard Control Systems (1 Day)	EasyGen 3200
ATI/CTI Transfer Panel (Half Day)	Control Systems (1 Day)
Alternators (Half Day)	DCP10 & 20
400 Series Electronic Engines (1 Day)	Control Systems (1 Day)
1100 Series Electronic Engines (1 Day)	
1300 Series Electronic Engines (1 Day)	
2x60 Series Electronic Engines (1 Day)	
Alternators (Half Day)	
L-Series Engine Governing (Half Day)	
ProAct Governing (Half Day)	
Heinzmann Pandoras Governing (Half Day)	
LCS Engine Governing (Half Day)	
Perkins 1500 Electronic Engine (1 Day)	
Merelli Alternators (1 Day)	

## PRODUCT TECHNICAL TRAINING INTERMEDIATE ENGINE

<b>Duration</b>	<b>Cost</b>
4 Days	£500 per person Min. 10 delegates

### Course Overview

An introduction to Electronically Controlled Engines, building confidence in the technology used in controlling modern diesel engine.

### Objective

This specially designed course will focus on generating set installation, commissioning and fault diagnosis. Delegates will learn to identify and understand the function of key components of the engines. The programme includes both classroom lecture and practical hands-on exercises.

### Suitability

Skilled Service Engineers with a minimum of six months relevant experience.

### Topics

#### 2x06 Series Electronic Engines

MEUI fuel system function and operation. Electronic control module management systems. Explanation of electrical wiring diagrams. Control system interface methods of operation. Winflash functions. Electronic service tool operation and functions.

#### 1100 Series Electronic Engines

Fuel system function and operation. Electronic Control Module management system. Control system interface, methods of operation and adjustments. Electronic Service Tool operation and functions.

#### 1300 Series Electronic Engines

HEUI fuel and oil system function and operation. ECM management system. Explanation of electrical wiring diagrams. Control system interface and methods of operation. Electronic Service Tool operation and functions.

**CUSTOMISED GENERATOR SET TRAINING****Duration**

As Required

**Cost**

POA

**Course Overview**

This course is designed to be flexible to suit your requirements and can be adapted to include the full range of intermediate topics applicable to your needs.

**Objective**

This course will be based on the topics selected by the dealer, providing training focused on installation, commissioning, and fault diagnosis.

**Suitability**

This course is suitable for all personnel depending on the topics selected.

**Topics****Foundation Courses**

Generating Sets Familiarisation and Component Identification  
Introduction to Generating Sets and Basic Operation

**Intermediate Courses**

Engines  
Transfer Panel  
Alternators  
Analogue Control Systems  
Digital Control Systems  
Engine Governors

**CUSTOMISED GENERATOR SET TRAINING****Duration**

As Required

**Cost**

POA

**Course Overview**

This course is designed to be flexible to suit your requirements and can be adapted to include the full range of intermediate topics applicable to your needs.

**Objective**

This course will be based on the topics selected by the dealer, providing training focused on installation, commissioning, and fault diagnosis.

**Suitability**

This course is suitable for all personnel depending on the topics selected.

**Topics****Foundation Courses**

Generating Sets Familiarisation and Component Identification  
Introduction to Generating Sets and Basic Operation

**Intermediate Courses**

Engines  
Transfer Panel  
Alternators  
Analogue Control Systems  
Digital Control Systems  
Engine Governors

## 4006/8+12 SERIES TRS GAS ENGINES

### Duration

2 Days

### Cost

POA

### Course Overview

This course is designed to give a thorough technical understanding of the 4000 Series gas engine range. Attendees will gain a comprehensive knowledge of the engine systems, checking and adjusting exhaust gas emissions, preventative maintenance procedures and the necessary fault investigation and rectification techniques and procedures.

### Objective

To provide a good technical understanding of the 4006, 4008 and 4012 series TRS gas engines.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Effective use of information in the operation and maintenance manual.  
 Fault diagnosis and rectification  
 Understanding gas engine control systems  
 External features of the engines  
 Electronic Governor setup and adjustment  
 Adjustment and setting of exhaust emissions  
 Gas train commissioning

## 4000 SERIES DIESEL ENGINES

### Duration

2 Days

### Cost

POA

### Course Overview

This course is particularly suited to workshop personnel wishing to develop their skills in top end set-up.

### Objective

To provide a good technical understanding of the 4000 series diesel engine.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Introduction to the Course  
 External features of the engines  
 Top end stripdown and rebuild  
 Use of special workshop tools  
 Fuel system  
 Engine Governing

## 2x06 SERIES ELECTRONIC ENGINES

### Duration

Two Days

### Cost

POA

### Course Overview

This course will cover generic subjects relating to electronically controlled Perkins engines. The course is a refresh of the Intermediate course with added focus on the ability to diagnose and repair electronic engine faults. Use of diagnostic equipment such as the Electronic Service Tool (EST) is a key element of this course.

### Objective

To return to your workplace confident in your ability to meet the demands of customers in the area of Electronically Controlled Engines and be able to perform systematic fault diagnostics using all equipment necessary to resolve electrical and electronic faults.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Refresh of Intermediate course content  
 Sensor operation and functions  
 Fault finding using EST software  
 Diagnostics / reprogramming using EST  
 Service and maintenance operations  
 Bleeding fuel system procedure  
 Setting valve clearances and injector heights  
 Top end stripdown and rebuild

## 1300 SERIES ELECTRONIC ENGINES

### Duration

Two Days

### Cost

POA

### Course Overview

This course builds on the Intermediate course information with added focus on the ability to diagnose and repair electronic engine faults. Use of diagnostic equipment such as the 1300 Edi service tool, is a key part of this course.

### Objective

To return to your workplace confident in your ability to meet the demands of customers in the area of 1300 series engines. On successful completion of the course, you will also be able to perform systematic fault diagnostics using all equipment necessary to resolve electrical, mechanical and electronic faults.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Refresh of Intermediate course content  
 Sensor operation and functions  
 Service and maintenance  
 Bleeding the fuel / oil system  
 Setting the valve clearances  
 Top end stripdown and rebuild  
 Various practical fault finding exercises

## EASYGEN CONTROL SYSTEMS

### Duration

Two Days

### Cost

POA

### Course Overview

An in-depth understanding of the EasYgen control panel, with the added benefit of hands-on training. Practical experience of synchronising is a key element of this course.

### Objective

To gain confidence and develop diagnostic skills and understanding on installation, commissioning and synchronising EasYgen control systems.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

- Modes of operation
- Explanation of status menus
- Resetting of alarms and shutdowns
- Set-up and programming
- Remote communications
- Full understanding of synchronisation
- Complete installation and commissioning process

## 6000 SERIES CONTROL SYSTEMS

### Duration

Two Days

### Cost

POA

### Course Overview

An in-depth understanding of the 6000 Series control system, with the added benefit of hands on training. Practical experience of synchronising is a key element of this course.

### Objective

To gain confidence and develop diagnostic skills and understanding on installation, commissioning and synchronising 6000 series control systems.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

- Refresh of Intermediate course content
- Set-up and programming
- Remote communications
- Full understanding of synchronisation
- Complete calibration and commissioning process - 6200 Series.

## POWERWIZARD CONTROL SYSTEMS

### Duration

Two Days

### Cost

POA

### Course Overview

An in-depth understanding of the PowerWizard control panel, with the added benefit of practical training. Hands on experience of parameter programming and system troubleshooting is a key element of this course.

### Objective

To further develop the attendees' diagnostic skills and expand on their ability to install, commission and set-up PowerWizard control systems.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Refresh of Intermediate course content  
 Control system operation and function  
 Explanation of electrical schematics  
 Reprogramming using EST  
 Wiring and programming of spare inputs and outputs  
 Remote communications  
 Various practical fault finding exercises

## ANALOGUE CONTROL SYSTEMS

### Duration

Two Days

### Cost

POA

### Course Overview

An in-depth understanding of the 1001, 1002T, 2001, 4001 and 4001E analogue control panels, with the added benefit of hands-on training. Practical experience of setup and troubleshooting is a key element of this course.

### Objective

To further develop the attendees diagnostic and troubleshooting skills and expand on their ability to adjust and set-up analogue control systems.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Refresh of Intermediate course content  
 Overview of 4001 and 4001E electrical schematics  
 Practical training on retrofit options  
 Various hands on diagnostic exercises

## ALTERNATORS

### Duration

Two Days

### Cost

POA

### Course Overview

An in-depth understanding of the PowerWizard control panel, with the added benefit of practical training. Hands on experience of parameter programming and system troubleshooting are key elements of this course.

### Objective

To further develop the attendees' installation and commissioning skills while expanding their ability to troubleshoot alternators and AVRs.

### Suitability

Skilled Service / Field Engineers with a minimum of one year of relevant experience.

### Topics

Refresh of Intermediate course content  
 Technical characteristics  
 Electrical diagrams  
 PMG retrofit  
 AVR and 3 Phase sensing module installation  
 Various practical fault finding exercises

## TRAINING FEEDBACK

“The course met my requirements fully - took the veil of mystery surrounding generators away”

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“The pace and delivery of the course were superb. Many thanks to all. The course was very informative and have given me a very good overall view of the subject.”

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“I would certainly recommend. Thank you for your help, the staff are friendly, very knowledgeable and experienced.”

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“Very impressed by Neil’s knowledge and commitment to the customer. Had a good weeks training course and I certainly feel more confident of the principles of power generation.”

# ABOUT POWER ELECTRICS

A proud family company with a dedication to innovation, excellence and customer service, Power Electrics has grown from a small yard in 1963, to operating out of five locations across the country, including a London sales office and the UK's largest purpose built generator depot, with a fleet of over 1000 generators and 15 HGVs.

Award winning, trusted by customers and accredited by FG Wilson, the Power Electrics team of over 200 employees continues to grow and develop new ways to help you focus on your own objectives, whether you require temporary power, a permanent standby solution, technical support or specific generator parts.



Innovations such as a 24/7 emergency call out service, an in-house generator testing centre and purpose built training facilities will improve your experience from enquiry to specification and purchase to delivery.

Operating an in-house transport fleet provides you with a flexible, cost-effective and reliable delivery service. Tracked using the latest in sophisticated satellite technology, Power Electrics' fleet of crane equipped lorries are designed to accommodate whatever equipment you require.





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