GE VERNOVA

TRAINING CATALOGUE 2024

Power Conversion
Villebon-sur-Yvette, France

GE VERNOVA

TRAINING CATALOGUE

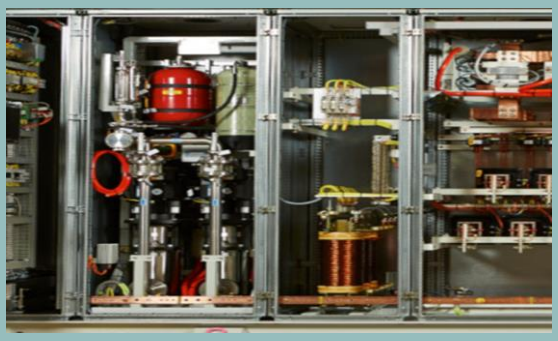
Our training sessions are designed to constantly answer your operation needs by engaging the trainees and developing the human potential of your employees. This training investment is improving and enhancing your team's skill using the latest digital technologies

In that way, the performance of your teams can be strengthened in the various fields of engineering, operation and maintenance, on equipment for which the use must be optimized.

We propose in our certified training centers the general or specific training courses which are detailed in the present catalogue. On request, these training courses can be achieved on your site.

Our experts for training, recognized for their skills within Power Conversion, can make you benefit from their know-how, ceaselessly improved by their experiences on the ground.

They give you a theoretical and practical training in the different fields of our activity, on our workstations in the secure environment of our center, or even on your own equipment made available for.



CONTACT US

*For persons with disabilities, lease contact us to allow us to study your situation.

formation.villebon@ge.com

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Our training programs are certified by Qualiopi

The Qualiopi certification aims at attesting the quality of the processes put in place by companies about their training offering as well as the development of skills.

It also allows other companies and individuals to have readability and easy access to training offerings.

Requirement

- Information
- Identification of need/objective(s) /benefit(s)
- Adaptation and support
- Suitability
- Qualification and development of knowledge and skills
- Monitoring
- Improvement axis

The Qualiopi certification is issued by the French government via accrediting companies.

The process followed by the companies to get certified guarantees the quality of the training in a sustainable way through regular audits.

Evaluation visit (optional) → Preparation of initial audit → Initial audit → Audit summary → Certification → Monitoring & renewal

Qualiopi processus certifié

RÉPUBLIQUE FRANÇAISE

GE VERNOVA

Variable Speed Drives Essentials

Application: AC/DC motors

Training Code	EN VAR IN
Max number of trainees	8
Price	Contact us

Purpose

- Familiarize yourself with basic knowledge concerning motors
- Familiarize yourself with variable frequency drive (VSD)
- Understand the basic principle applied to motor control.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/and systems
- Experience or knowledge in Variable Speed Drives or Control Systems.

Duration: 2 days (14 hours)

Practical Exercises:10 %

- Showing a motor piloted by a variable speed drive.

Training Equipment

- Use of drive mock-ups
- Use of dedicated tools.

Assessment

- Quiz
- Practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material
- Certificate of attendance.

Content

THEORETICAL BASIC REMINDERS

- Elementary notions
- Current, voltage, magnetism

POWER SUPPLIES

- Continuous current, alternating current
- Three phase voltage supply , DC bus
- Graetz bridge

MOTORS

- Direct current motor
- Induction & Synchronous motor
- Introduction to vector control

POWER ELECTRONIC DEVICES

- Diode, Thyristor, IGBT

VARIABLE SPEED DRIVES

- Different types of variable speed drives
- The range of GE Power Conversion variable speed drives
- Introduction to multi-level inverters

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MV7 VSD with PECe system

Application: MV Induction/Synchronous motor

Training Code	EN MV7 B1
Max number of trainees	6
Price	Contact us

Duration: 5 days (35 hours)

Purpose

- Familiarize yourself with power and control system architectures
- Understand, know the MV7000 principles applied to the AC motor control & know the PECe control system using P80i tool
- Operate, maintain and troubleshoot the system.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/ and systems
- Experience or knowledge in VSD & Control Systems.

Practical Exercises: 80 %

- Use of an MV7000 PECe application through the P80i tool & MV7000 piloting an AC motor
- Maintenance & Troubleshooting
- Replacement of parts.

Training Equipment

- Use of MV7 mock-ups & dedicated tools
- Converter cooling unit.

Training Equipment

- Quiz & practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material
- Certificate of attendance.

Content

ELECTROTECHNICAL THEORETICAL (transformer/drive/rotating machines)

MV7000 OPERATING PRINCIPLE

- Configuration, main components and options
- DFE/AFE (Diode/Active Front End)
- DC Bus
- IGBTs and RC snubbers
- The P.W.M. strategy of the MV7000
- Analogy between drawing and equipment

MV7000 PECe DRIVE CONTROL & PROCESS AUTOMATION

- MV7000 PECe system & Main CPU (RXi/B&R/ VME)
- Power Interface Board PIBe
- EtherCAT network & P80i & PERTU

MV7000 APPLICATION

- Application structure
- Control sequences

MAINTENANCE PROCEDURES

- Replacement of Remote IO modules, network switches
- Application reloading (P80i software)
- Focus on CCU parts

TROUBLESHOOTING WITH MV7 MOCK-UP

- Configuration and use of commands
- Alarms & Faults
- Use of P80i tool (dynamic mode) & PERTU tool (recording & THL modes)

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SD7 VSD with PECe system

Application: MV Induction/Synchronous motor

Training Code	EN SD7 B1
Max number of trainees	6
Price	Contact us

Duration: 5 days (35 hours)

Practical Exercises: 80 %

Purpose

- Familiarize yourself with power and control system architectures
- Understand, know the SD7000 principles applied to the AC motor control & know the PECe control system using P80i tool
- Operate, maintain and troubleshoot the system.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/ and systems
- Experience or knowledge in VSD & Control Systems.

- Use of an SD7000 PECe application through the P80i tool & SD7000 piloting an AC motor
- Maintenance & Troubleshooting
- Replacement of parts.

Training Equipment

- Use of SD7 mock-ups & dedicated tools
- Converter cooling unit.

Training Equipment

- Quiz & practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material
- Certificate of attendance.

Content

ELECTROTECHNICAL THEORETICAL (transformer/drive/rotating machines)

SD7000 OPERATING PRINCIPLE

- Converter structure & DC Bus
- Pulsed or synchronous running modes
- Analogy between drawing & equipment

MV7000 PECe DRIVE CONTROL & PROCESS AUTOMATION

- MV7000 PECe system & Main CPU (RXi/B&R/ VME)
- Power Interface Board PIBe
- EtherCAT network & P80i & PERTU

SD7000 APPLICATION

- Application structure & Control sequences

MAINTENANCE PROCEDURES

- Replacement of Remote IO modules, network switches
- Application reloading (P80i software)
- Focus on CCU parts

TROUBLESHOOTING WITH SD7000 TRAINING MOCK-UP

- Configuration and use of commands
- Alarms & Faults
- Use of P80i tool (dynamic mode) & PERTU tool (recording & THL modes)

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LV7 VSD

Training Code	EN LV7
Max number of trainees	6
Price	Contact us

Application: LV Induction/DC motor

Purpose

- Understand the LV7000 principles applied to the AC/DC motor control
- Be able to commission and start the drive
- Identify and analyze the trouble and fix.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/and systems.
- Experience or knowledge in Variable Speed Drives or Electrotechnical Systems.

Duration: 5 days (35 hours)

Practical Exercises: 60 %

- Commissioning and use of the LV7000 variable speed drive
- LV7 piloting and AC/Ac motor through fieldbus.

Training Equipment

- Use of MV7 mock-ups & dedicated tools.

Assessment

- Quiz & Practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material
- Certificate of attendance.

Content

THEORETICAL REMINDERS

- Asynchronous/DC motor reminders
- IGBT/Thyristor bridges
- AC/DC motor control principles

GENERAL PRESENTATION OF THE LV7

- Range of power
- Configuration, main components and options

REMOTE CONTROL USING A FIELDBUS

- CAN, PROFIBUS, EtherCAT, Ethernet

COMMISSIONING OF THE LV7000

- Detailed schematic diagram
- Method of commissioning
- Software loading using NCLOAD
- Parameterization using the keypad/HMI
- Parametrization using NCDRIVE/ CTSoft
- Open/closed loop control mode
- Advanced software functions
- Faults and alarms
- Troubleshooting

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MM7 Converter

Training Code	EN MM7 B1
Max number of trainees	6
Price	Contact us

Application: STATCOM

Purpose

- Understand the principle of the reactive energy compensation
- Know the power components of the MM7 converter
- Know the PECe control system using MM7
- Operate, maintain and troubleshoot the system.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/ and systems
- Experience or knowledge in VSD & Control Systems.

Duration: 5 days (35 hours)

Practical Exercises: 80 %

- Use of the documentation through the P80i tool, maintenance computer and supervision
- Troubleshooting in a MM7 tower & Control and automation cabinet.

Training Equipment

- Use of MV7 tower, dedicated tools & dedicated tools
- Converter cooling unit.

Assessment

- Quiz & Practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material & Certificate of attendance.

Content

Days 1, 2 & 3 : Theory and use of the documentation

- Theoretical reminders on power electronics
- General presentation of the MM7 product & network architecture
- Presentation of the control & automation principles
- Use of the MM7 software application & maintenance computer (drawings/procedures)

Day 4 : Practical exercices into an control & automation cabinet

- Pratical exercices on the components & Equipment maintenance
- Fault simulation & troubleshooting
- Replacement of defective parts & configuration
- Human Machine Interface use
- Diagnostic tools (perturbography ...)

Jour 5 : Practical exercises on power component tower

- Practical exercises on the components
- Equipment maintenance
- Power component's fault & diagnostic
- Power components replacement
- Firing chains troubleshooting steps

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PECe DC drive

Training Code	EN PECe DC Hv
Max number of trainees	6
Price	Contact us

Application: DC motors

Purpose

- Understand the variable speed principles applied to the DC motor control
- Know the PECe control system for DC application using P80i tool
- Know the hardware and communication architecture of the PECe DC
- Know and use the PECe dialog tools.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/ and systems
- Experience or knowledge in VSD & Control Systems.

Duration: 5 days (35 hours)

Practical Exercises: 50 %

- Use of a PECe DC application through P80i tool
- PECe DC piloting a DC motor.

Training Equipment

- Use of PECe DC mock-up
- Use of dedicated tools.

Training Equipment

- Use of PECe DC mock-up
- Quiz & Practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material
- Certificate of attendance.

Content

THEORETICAL REMINDERS

- DC motor reminders & Thyristor bridges
- DC motor control principles

PRESENTATION OF THE PECe DC CONTROL

- PECe system & Main CPU
- Power interface PIBe
- EtherCAT network
- PECe DC application P80i libraries

PECe DC MOCK-UP FOR TRAINING

- Configuration and use of commands
- Use of P80i tool (dynamic mode)

PECe DC APPLICATION

- Application structure
- Main sequences & torque regulation
- Test modes & Faults and alarms
- Perturbography

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Controls & Automation

Training Code	EN 80 HPCi B1
Max number of trainees	6
Price	Contact us

Application: HPCi – P80i

Purpose

- Know the PECe control system using P80i tool
- Learn to program your process with the P80i
- Learn to use PERTU.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products or/ and systems
- Experience or knowledge in VSD & Control Systems.
- Basic Computer knowledge

Duration: 5 days (35 hours)

Practical Exercises: 70 %

- Programming exercises
- Graphic tools and use of schematics
- Functional checking.

Practical Equipment

- HPCi-VME controller, APC620 controller and RXi controller
- Development PCs
- Beckhoff & Wago network.

Practical Equipment

- Quiz & practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material & Certificate of attendance.

Content

HPCi PRESENTATION

- VME rack, CPU cards, I/O cards on VME
- APC controller, RXi controller
- Networks
    - Canbus & Profibus
    - Reflective memory

P80i PC DEVELOPMENT

- Main control command SHELL
- Software surrounding

INSTALLING AND COMMISSIONNING THE P80i/HPCi

- The Controller Database
- Simulator & Perturbography

P80i EDITOR

- The project & Local Database
- Development of an application
    - Build & Load
    - Dynamic mode
    - I/O overriding
    - OLE object and control

INSTALLING AND COMMISSIONNING THE I/O BECKHOFF

- The RIO Tool software
- The library ECAT.cli
- Configuration and visualization

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Remote training using 360° views

Application: MV7/ SD7/ MM7

Training Code	EN REMOTE V
Max number of trainees	8
Price	Contact us

Purpose

- Understand power & control architecture
- Understand the drive (power components & control/drive sequences)
- Understand & practice maintenance operations
- Identify all components used on the converter & automation using HD webcam and 360° views.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products, systems, VSD & Control Systems.
- Basic Computer knowledge
- Basic VSD training is recommended

Duration: 2.5 days (17.5 hours)

Practical Exercises: 40 %

- Use of specific documentation & access to 360° views.

Practical Equipment

- Access to 360° views* of the electrical system remotely
- Webcams with all the participants & training officer
- Whiteboards , Polls, Interactive quizz and Q& A through Slido .

Practical Equipment

- Quiz & practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material & Certificate of attendance.

Content

ELECTROTECHNICAL THEORETICAL (transformer/drive/rotating machines)

VARIABLE FREQUENCY DRIVE OPERATING PRINCIPLE

CONTROL NETWORK ARCHITECTURE (communication principles, hardware/software description)

DRIVE CONTROL & PROCESS AUTOMATION PRINCIPLES:

- Software – System functions & application
- Hardware – Configuration

REMOTE DESCRIPTION OF THE AUTOMATION PROCEDURES:

- Replacement of remote panels & replacement of network switches
- Application reloading (P80i software)

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Remote training using virtual labs

Application: PECe architectures

Training Code	EN REMOTE V
Max number of trainees	8
Price	Contact us

Purpose

- Understand the maintenance laptop software, documentation and HMI functionalities/alarms
- Connect to main CPU using maintenance laptop
- Practice maintenance operations for control and process systems
- Practice on HMI with available tools.

Target audience

- Operator personnel / Management personnel / Maintenance personnel / Engineering personnel.

Prerequisite

- Experience or knowledge in Power Conversion products, systems, VSD & Control Systems.
- Basic Computer knowledge
- Basic VSD training is recommended

Duration: 2 days (14 hours)

Practical Exercises: 100 %

- Virtual lab and use of simulation.

Practical Equipment

- Access to Virtual lab remotely from standard web browser
- Webcams with all the participants & training officer
- Whiteboards , Polls, Interactive quizz and Q& A through Slido .

Practical Equipment

- Quiz & practical exercises.

Trainee's Documentation

- Specific customer documentation
- Customized training material & Certificate of attendance.

Content

ACCESS TO VIRTUAL LABS WITH WEB BROWSER

- Remote connection to customized CPU/HMI & dedicated laptop

REMOTE MAINTENANCE LAPTOP PRACTICE:

- Practice on all main application software
- Reload software to remote CPU
- Explanation of software & alarms topologies
- Diagnosis files opening and analysis

REMOTE HMI PRACTICE:

- Navigation on all the mimics
- Alarms & faults for troubleshooting
- Trends generation

360° VIEWS ON THE CONTROL EQUIPMENT

- Connection between propulsion laptop and components (CPU/cards)
- Connection of HMI to process network architecture.

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Quotation Enquiry for training 2024

Company		Stamp
Billing address		
Applicant's name		
Position		
Phone		
Email		
Booking for	…… persons	Signature
Training course		
Preferred date	From .../.../... to .../.../...	Date
Unit price	……€ HT	

Specific expectations for this training?		
List of trainees		
Name/First name	Qualification	Name of manager
What are your specific needs (PWD People With Disabilities)?		

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Particular conditions of sale 2024

Quotation inquiry for a training

We propose you to use the document included into our catalog. This document can be sent to us by post or fax after being filled and signed by 1 decision-maker (Department or Training Manager). We will send you a commercial proposal, including available dates for the training required.

Training registration/convocation

After receiving your order (including the names of the trainees), we will send you:

- An acknowledgement of registration to the training course, including the list of additional information's needed to register each trainee
- A convocation in the name of the trainee,
- An access map to our Training Center.

Services

Our services include training by our instructor, the use of the Training Center equipment by the trainees and the provision of training documents to each trainee. On request, we can book hotel rooms for each trainee (in Power Conversion's qualified hotels)

Training price

The price of the training is given specifically for the training(s) required, and the number of trainees specified. The price will not be reduced in case one or more trainees do not attend the training.

- Trainees' traveling, meal and accommodation expenses are not included in the price of the courses.
- Price of lunch: included if it is taken in our staff restaurant.
- For training at site, the trainer expenses will be invoiced at real cost + 15%
- Our prices are quoted in Euros, net and free of taxes.

Payment conditions

By Swift Transfer minimum 2 weeks before the training starts following receipt of invoice, or by irrevocable Documentary Credit payable at sight against presentation of a training certificate issued by GE Power Conversion after the end of the training.

Deferred training

Power Conversion reserves the right to cancel or postpone the training course if the number of participants is insufficient and will inform you accordingly at the earliest..

Cancellation/Withdrawal from training

- We take the greatest care to the composition of the groups. Any request to postpone or cancel will have financial consequences. Consequently, we offer you the possibility of replacing the prevented trainee by another person having the same profile, before the start of the training.
- In case of too late cancellation (less than 15 days before the course starts), we reserve the right to charge cancellation fees, which may reach 100% of the training price.

Training hours and duration

As a general rule our training courses start at 9.00 AM and end at around 5.00 PM. The schedule of the last training day is defined together with the group in order to enable the trainees, who must take a train or a plane, to be on time. A standard training day lasts 7 hours (35 hours in 5 days).

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Particular conditions of sale 2024

Lunch

For all training courses held in our premises, the trainees are allowed to access the staff restaurant.

Royalties and copyrights

It is forbidden to copy the documents or software made available by GE Power Conversion for training purposes. Training material shall not be used, circulated or disclosed, either partially or fully, to any third parties. In case of violation, we will be entitled to receive damages.

In the interest of our customers, no dealer or training center is authorized to refer to Power Conversion's official courses, which may cause an ambiguity on the name, content, quality and proposed curriculum.

Safety regulations

During the entire training period in GE Power Conversion's premises, the trainees shall comply with the company's rules and safety regulations, which they will be informed of at the beginning of the training courses.

Prerequisites

For the courses given in English, the trainees shall have a good command of the spoken and written English language.

The specific prerequisites for each course are indicated in the relevant data sheet of the training list. They are a precondition to reach the training objectives.

Certificate of training

Power Conversion's customized certificate of training will be given to each trainee at the end of course.

Continuing education:

All our courses can be held within the framework of continuing education.

Our training center is agreed by the French State Training Organization (number 11910769191).

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