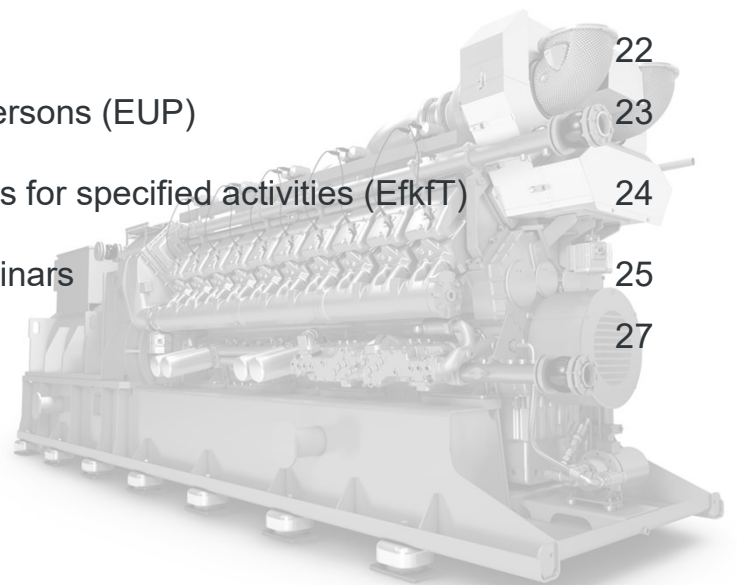


Training Center Service

Training program for operators 2022

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Service Training at Caterpillar Energy Solutions GmbH - A Valuable Investment

Training offers for the operator

The right know-how is the most important basic prerequisite for qualified operation and offers the possibility of locating simple system malfunctions and fixing them yourself.

Central and decentralized trainings

The courses are held at the Training Centers in Mannheim, Singapore, Atlanta (USA) or Wuxi (China), but can also be organized on-site on request.



Worldwide Training Center Locations

There are currently 5 Training Center locations available around the world. The newest location is Wuxi in China, which opened in 2019. Further locations will follow and will be communicated within the training program.

All locations can offer different trainings in different languages depending on the location and the population. On the following pages you will find further information on the individual locations. Please do not hesitate to contact the appropriate contact person if you have any questions about training courses.



Welcome to the Caterpillar Energy Solutions GmbH Training Center Mannheim

Caterpillar Energy Solutions
GmbH

Training Center

Carl-Benz-Strasse 1
68167 Mannheim, Germany

Phone: +49 621 384 9955

Mail: training@mwm.net



**Head of Training
Center**

Tobias Marnet

Welcome to Caterpillar Energy Solutions GmbH Training Center Mannheim - our team for your success



**Administration
Training Center**
Petra Kupka



**Administration
Training Center**
Nadeschda Wiedergold



**Administration
Training Center**
Sandra Stockert



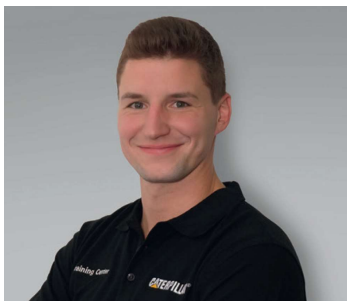
**Trainer Gas Engine
Technology**
Abdul Soueidan



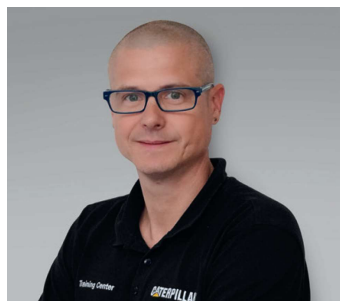
**Trainer Gas Engines &
Electrical Engineering**
Werner Schlenker



**Trainer
Electrical Engineering**
Ralf Krauß



**Trainer Gas Engine
Technology**
Alexander Klotz



**Trainer
Electrical Engineering**
Fabian Habel



**Trainer Gas Engines &
Electrical Engineering**
Daniel Arenz



Welcome to Caterpillar Energy Solutions GmbH Training Center Singapore

**Caterpillar Energy Solutions Asia Pacific
Service & Training Department**
5 Tukang Innovation Grove
Singapore 618304
Tel.: +65 6868 7233
Mail: training_ap@cat.com

Welcome to Caterpillar Energy Solutions GmbH Training Center Singapore - our team for your success



**Administration
Training Center**
Claire Tan



Trainer
David McCracken



Trainer
Md Nur Islam



Welcome to Caterpillar Energy Solutions GmbH Training Center Miami (USA)

Miami Lakes Learning Center

15550 NW 59th Avenue

Miami Lakes, FL 33014

Tel.: +1 770 279 6720

Mail: CES_USA@cat.com

Willkommen im Caterpillar Energy Solutions GmbH Training Center Miami – unser Team für Ihren Erfolg



Administration
Training Center /
Trainer
Karlton Sutherland



Trainer
Tiffany Vela



Welcome to Caterpillar Energy Solutions GmbH Training Center Vigo (Spain)

Caterpillar Energy Solutions S.A.
Training Center Vigo
Muelle de reparaciones de Bouzas s/n
36.208 Vigo-Pontevedra
Tel.: +34 770 279 6720
Mail: trainingcenter.spain@mwm.net

Welcome to Caterpillar Energy Solutions GmbH Training Center Vigo – our team for your success



**Administration
Training Center**
Iria Arean



Trainer
Emilio Martinez



Trainer
José Lamela



Welcome to Caterpillar Energy Solutions GmbH Training Center Wuxi (China)

MWM Training Center Service

Caterpillar R&D Center (China) Co., Ltd.

Lot B6-D, National High-Tech Development, 214028 Zone Jiangsu

Tel.: 13911129987

Mail: jie.zhao@mwm.net

Courses available at the individual Training Centers

Training Type	Mannheim	Singapore	Atlanta (USA)	Vigo (Spain)
Series TCG 2016 Operator Level	•	•	•	•
Series TCG 2020 Operator Level	•	•	•	•
Series TCG 2032 Operator Level	•	•	•	•
Series TCG 3016 Operator Level	•		•	
Series TCG 3020 Operator Level	•			
Annual instruction for electrotechnically instructed persons (EUP)	•			
Annual instruction for EfkFT and electricians	•			
TEM Level 100 (customer Dongle)	•	•	•	•
TPEM Level 100 (customer Token)	•	•	•	

For trainings in China, please contact the contact person of the Chinese Training Center directly.

The way to a qualified and competent operator

Trainings on all systems

The contents of the training courses serve to convey the structure and function of the engines. The ability to operate the motors and systems ensures additional safety for subsequent practical use. Problem cases can be specifically dealt with by means of independent system testing and error handling using measurement technology.

Trainings for operators

TEM Level 100 (customer Dongle)			TPEM Level 100 (customer Token)	
gas engines model series TCG 2016 Operator Level	gas engines model series TCG 2020 Operator Level	Gas engines Series TCG 2032 / 2032 B Operator Level	gas engines model series TCG 3016 Operator Level	gas engines model series TCG 3020 Operator Level

Annual instruction in electrical engineering

Annual instruction for electrotechnically instructed persons (EUP)	Annual training for electricians and electricians for specified activities (EFKfT)
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Forms of training

Classroom training

Classroom training takes place at the respective Training Center. Please note that the number of participants in each Training Center is individually adjusted due to Covid-19 based on the size of the training rooms.

Live-Webinars

Live webinars are specially adapted trainings that can be held by trainers instead of face-to-face training. They take place via video conference and convey the same content as the face-to-face training.

Type of trainings	Classroom training	Live-Webinars
Series TCG 2016 Operator Level	•	•
Series TCG 2020 Operator Level	•	•
Series TCG 2032 Operator Level	•	•
Series TCG 3016 Operator Level	•	•
Series TCG 3020 Operator Level	•	•
TEM Level 100 Customer Token	•	•
TPEM Level 100 Customer Token	•	•
Annual instruction for electrically instructed persons (EUP)	•	•
Annual training for electricians and electricians for specified activities (EfkfT)	•	•

Series TCG 2016 Operator Level

General Information

reference	The seminars deal exclusively with the engine and include the maintenance levels E 10 to E 40.
prerequisites	Thorough knowledge of gas engine technology is an advantage
target audience	Customers and operators
duration	5 days
number of participants	max. 12

Course Contents

In this seminar we will briefly discuss the performance spectrum of MWM engines. You will receive an overview of the service documentation and learn more about the structure and function of the TCG 2016 as well as the modules and systems. You will also receive all necessary information about the operation of the engine with regard to lubricants and coolants. You will learn all the necessary details, such as maintenance, inspection and repair of the maintenance levels E10 to E40 and will be able to assemble/disassemble the parts involved in those maintenance levels. You will be able to assess the coolant and lubricating oil as well.

As the main component of the TEM engine control you will get to know all the essential details of the user interface as well as details on engine control (auxiliary unit test mode, ignition system, histories, operating log, anti-knock control, etc.).

A tour of our production plant rounds off the training week.

Series TCG 2020 Operator Level

General Information

reference	The seminars deal exclusively with the engine and include the maintenance levels E 10 to E 40.
prerequisites	Thorough knowledge of gas engine technology is an advantage
target audience	Customers and operators
duration	5 days
number of participants	max. 12

Course Contents

In this seminar we will briefly discuss the performance spectrum of MWM engines. You will receive an overview of the service documentation and learn more about the structure and function of the TCG 2020 as well as the modules and systems. You will also receive all necessary information about the operation of the engine with regard to lubricants and coolants. You will learn all the necessary details, such as maintenance, inspection and repair of the maintenance levels E10 to E40 and will be able to assemble/disassemble the parts involved in those maintenance levels. You will be able to assess the coolant and lubricating oil as well.

As the main component of the TEM engine control you will get to know all the essential details of the user interface as well as details on engine control (auxiliary unit test mode, ignition system, histories, operating log, anti-knock control, etc.).

A tour of our production plant rounds off the training week.

Series TCG 2032 Operator Level

General Information

reference	The seminars deal exclusively with the engine and include the maintenance levels E 10 to E 40.
prerequisites	Thorough knowledge of gas engine technology is an advantage
target audience	Customers and operators
duration	5 days
number of participants	max. 12

Course Contents

In this seminar we will briefly discuss the performance spectrum of MWM engines. You will receive an overview of the service documentation and learn more about the structure and function of the TCG 2032 as well as the modules and systems. You will also receive all necessary information about the operation of the engine with regard to lubricants and coolants. You will learn all the necessary details, such as maintenance, inspection and repair of the maintenance levels E10 to E40 and will be able to assemble/disassemble the parts involved in those maintenance levels. You will be able to assess the coolant and lubricating oil as well.

As the main component of the TEM engine control you will get to know all the essential details of the user interface as well as details on engine control (auxiliary unit test mode, ignition system, histories, operating log, anti-knock control, etc.).

A tour of our production plant rounds off the training week.

Series TCG 3016 Operator Level

General Information

reference	The seminars deal exclusively with the engine and include the maintenance levels E 10 to E 40.
prerequisites	Thorough knowledge of gas engine technology is an advantage
target audience	Customers and operators
duration	5 days
number of participants	max. 12

Course Contents

In this seminar we will briefly discuss the performance spectrum of MWM engines. You will receive an overview of the service documentation and learn more about the structure and function of the TCG 3016 as well as the modules and systems. You will also receive all necessary information about the operation of the engine with regard to lubricants and coolants. You will learn all the necessary details, such as maintenance, inspection and repair of the maintenance levels E10 to E40 and will be able to assemble/disassemble the parts involved in those maintenance levels. You will be able to assess the coolant and lubricating oil as well.

As the main component of the TPEM engine control, you will learn all the essential details of the user interface, as well as details on engine control (auxiliary unit test mode, ignition system, histories, operating log, anti-knock control, etc.).

A tour of our production plant rounds off the training week.

Series TCG 3020 Operator Level

General Information

reference	The seminars deal exclusively with the engine and include the maintenance levels E 10 to E 40.
prerequisites	Thorough knowledge of gas engine technology is an advantage
target audience	Customers and operators
duration	5 days
number of participants	max. 12

Course Contents

In this seminar we will briefly discuss the performance spectrum of MWM engines. You will receive an overview of the service documentation and learn more about the structure and function of the TCG 3020 as well as the modules and systems. You will also receive all necessary information about the operation of the engine with regard to lubricants and coolants. You will learn all the necessary details, such as maintenance, inspection and repair of the maintenance levels E10 to E40 and will be able to assemble/disassemble the parts involved in those maintenance levels. You will be able to assess the coolant and lubricating oil as well.

As the main component of the TPEM engine control, you will learn all the essential details of the user interface, as well as details on engine control (auxiliary unit test mode, ignition system, histories, operating log, anti-knock control, etc.).

A tour of our production plant rounds off the training week.

TEM L100 (customer Dongle)

General Information

reference	The seminar deals with the TEM motor control system.
prerequisites	Successful participation in one of the operator level trainings for one of the existing TCG 20XX / TCG 30XX series
target audience	Customers and operators
duration	4 days
number of participants	max. 12

Course Contents

In this training you will receive detailed knowledge about:

- Operating the Genset with the TEM System
- The structure of the TEM control cabinet and the other hardware components of the TEM System
- The Authorization Concept of the TEM System
- TEM motor control with detailed information on the motor parameters according to the authorization level
- Using the Test Mode
- Storing histories and diagrams for troubleshooting purposes
- Practical exercises based on practical case studies for troubleshooting
- Background information on PID settings
- Use the documentation and descriptions according to the permission level.
- NEW: NOx or combustion chamber temperature setting with level 100 (from TEM version 2.50.22)

The successfully passed final test entitles you to use a TEM Level 100 Dongle (the Dongle is not included in the price of the training).

TPEM L100 (customer Token)

General Information

reference	The seminar deals with the TPEM motor control system.
prerequisites	Successful participation in one of the operator level trainings for one of the existing TCG 20XX / TCG 30XX series
target audience	Customers and operators
duration	4 days
number of participants	max. 12

Course Contents

In this training you will receive detailed knowledge about:

- Operating the Genset with the TPEM System
- The structure of the TPEM control cabinet and the other hardware components of the TPEM System
- The Authorization Concept of the TPEM System
- TPEM motor control with detailed information on the motor parameters according to the authorization level
- Using the Test Mode
- Storing histories and diagrams for troubleshooting purposes
- Practical exercises based on practical case studies for troubleshooting
- Background information on PID settings
- Use the documentation and descriptions according to the permission level.
- NOx or combustion chamber temperature setting with level 100 (from TPEM version 1.5)

The successfully passed final test entitles you to use a TPEM Level 100 Token (the Token is not included in the price of the training).

Annual instruction for Electrically instructed persons (EUP)

General Information

reference	The annual training is aimed at EUP as an annual refresher training.
prerequisites	Appointment to the EUP
target audience	Customers and operators
duration	1 day
number of participants	max.12

Course Contents

In this training you will receive detailed knowledge about:

- The fundamentals of electrical engineering and electrical current (protective measures and accident prevention are a major focus here)
- The dangers and effects of electric current on the human body
- Protective measures against direct and indirect contact, examination of protective measures
- Accident prevention when working on electrical systems
- Definition of permissible activities of the EUP (Electrically instructed person)
- Your personal protective equipment
- accident causes
- Behaviour in an emergency

Note:

This training is only necessary for German technicians with the appropriate preliminary training to comply with legal regulations in Germany. The participation of foreign participants is not necessary. This training can also be carried out in other educational institutions.

Annual training for electricians and electricians for defined activities

General Information

reference	The annual instruction is aimed at electricians and at EFKfT as annual repetition training.
prerequisites	Designation to the EFKfT or EFK
target audience	Customers and operators
duration	1 day
number of participants	max.12

Course Contents

In this training you will receive detailed knowledge about:

- The fulfilment of the requirements for recurring instruction according to § 12 ArbSchG and DGUV regulation 1 and maintenance of the certificate of competence
- Refreshing existing electrical engineering expertise
- Recognizing hazards and risks, correctly assessing hazards to minimize electrical accidents
- The dangers of electric current and effects on the human body
- The application of the 5 safety rules in practice (working in a de-energised state)
- Installation and modification of low-voltage systems up to 1000 V AC according to VDE 0100
- The requirements for persons working in the electrical sector according to DIN VDE 1000-10 and DGUV regulations
- Testing electrical systems and equipment in accordance with BetrSichV
- Operation and handling of electrical systems (according to DIN EN 50110-01)
- Tasks and duties of the electrician
- Behaviour in an emergency
- Personal protective equipment
- The causes of the accident

Note:

This training is only necessary for German technicians with the appropriate preliminary training to comply with legal regulations in Germany. The participation of foreign participants is not necessary. This training can also be carried out in other educational institutions.

Conditions for orders and participation in seminars

General information

With the publication of this seminar program all previously published programs lose their validity. The conditions and seminar fees for the respective seminars as shown in this publication or on the online platform apply to ordering and implementation. We reserve the right to change prices. All prices are quoted without value added tax.

- The seminar fees include one copy of the participant documents, the provision of work coats and writing utensils, a selection of cold and hot drinks during the seminar breaks and, if the participation is successful, a certificate of participation or a certificate.
- Participation in the seminars is generally only possible after prior and confirmed registration and only in the selected seminar(s). Persons arriving on their own initiative, without confirmed registration, cannot be considered.
- If a seminar registration confirmed by the Training Center is not taken up, the estimated cancellation fees apply (except for the presentation of a medical certificate in case of unforeseen illness). The sending of a substitute participant is possible without additional fees.
- For special seminars, the cancellation fees shown are also applicable. For special seminars with an external location, any transport costs for seminar equipment that may already have been incurred, as well as any costs for flight and hotel cancellations, will be invoiced additionally.
- For participants from foreign service partners, the

customer must ensure that the participant(s) have a valid and sufficient health and accident insurance policy for their stay in Germany, which the customer must provide with appropriate proof on request. Any costs incurred by Caterpillar Energy Solutions GmbH as a result of missing or insufficient insurance shall be reimbursed by the customer.

Registration

- Binding registration is only possible via our online portal for the Training Center Mannheim. All other Training Centers can still be contacted by e-mail.
- By participating in the seminars, the customer declares his binding acceptance of the conditions set out in this brochure.
- Registration can only be made via the responsible service partner of Caterpillar Energy Solutions GmbH.

Conditions for orders and participation in seminars

Cancellation/change of name / course

cancellation

- Name changes and exchanges of participants are possible until the beginning of the seminar.
- In case of a complete cancellation, cancellation fees are due according to the underlying conditions from the course description of the online portal. (Exception in case of illness with presentation of a medical certificate).
- In the case of on-site seminars, the costs for flight/train and/or hotel cancellations will be charged additionally in the event of cancellation.
- The Training Center reserves the right to cancel seminar dates for important reasons, e.g. insufficient number of participants (depending on the course, as shown in the course description on the online platform), illness of the seminar leader, etc. The customer will be informed of this in advance within a reasonable period of time and about a possible new date.

Course languages/interpreter

All seminars are available in German and English. Seminars in Russian, French and Italian are offered with our qualified interpreters. Seminars in other languages can be held if a trained interpreter with technical language skills is hired by the company. Seminars with interpreter are special seminars and at least 4 participants must be registered.

Disclaimer

The respective event is carefully prepared and carried out according to the current state of the art. We assume no liability for advice given or the utilization of acquired knowledge.

Dongle / Token Extension

A dongle/token license can be renewed for a maximum of 2 years after the expiration of its validity. For this purpose an online training must be provided by Caterpillar Energy Solutions GmbH. For this purpose, the costs are due which, according to the current price list, would have been incurred for the complete licensing period from the expiry of the dongle/token. Renewal/resurrection of the license after exceeding the 2 years is not possible and requires again the attendance of all necessary trainings, which are necessary to acquire the license. For this the course fees as well as the initial setup fee are due.

Privacy

With the registration the currently valid data protection regulations are accepted.

You can find them under:

<https://caterpillar-energy-solutions.com/home/privacy/>

Please make bookings for Training Center Mannheim directly on the online platform. Please send inquiries and registrations for other Training Centers to the contact address of the respective Training Center.

Fees

For training courses held in the Training Center	EUR	USD
Per seminar day and participant The seminar fees listed for the events held in the Training Centers include hot and cold drinks and the provision of working clothes.	825	980

For external trainings	EUR	USD
Per trainer/application/seminar day Plus travel expenses	4.750	5.660
Per travel day of the trainer	3.200	3.810
Other arrival and departure costs, flight/rail ticket, taxi, visa fees, etc.	According to expenditure	
Accommodation and meals	1) + 2)	
Shipping costs for engines, special tools, customs duties, etc.	According to expenditure	

- 1) Daily flat rates according to the rates of the respectively valid travel guidelines of Caterpillar Energy Solutions GmbH
- 2) If necessary plus additional costs for overnight stay and/or board

Cancellation fees for trainings
If a course is cancelled 14 days (or less) before a training, 80% of the course price will be charged.
Plus any costs incurred for flight and hotel cancellations, as well as any costs already incurred for shipping seminar accessories.

All aforementioned prices do not include value added tax.

Fees

TEM EVO - Total Electronic Management	EUR	USD
Monthly usage fee USB Dongle (Contract period 12 months; monthly fees are billed at the beginning of the full contract period. A shortening of the contract term is not possible).	29	34
Handling fee loss Dongle / not return shipment after contract end (12* monthly usage fee)	348	410
Additional Programming Dongle per Change/Extension/Genset from the 4th genset or dongle/token	180	210
Hardware Key set TEM1 / TEM Compact / TEM EVO	170	200

All aforementioned prices do not include value added tax.

Fees

TEM JView software packages (latest version)	PC-User EUR	PC-Serv EUR	PC-User USD	PC Serv USD
Software without softmodem with license Dongle	4.475	6.850	5.330	8.160
Software with softmodem with license Dongle	4.630	7.010	5.510	8.350
Loss of license Dongle (red) for JView software	new purchase	new purchase	new purchase	new purchase

Updates / Extensions for TEM JView Software Packages	PC-User/ PC-Serv EUR	PC-User/ PC-Serv USD
Update from 2.XX.XX to 3.XX.XX	735	875
Extension Softmodem	405	480
Update from 1.XX.XX to 3.XX.XX	2.345	2.790

Upgrade license Dongle (PC-User PC-Serv) for TEM JView	EUR	USD
Starting with version 3.XX.XX	3.560	4.240
Version 2.XX.XX and higher	2.050	2.440
As of version 1.XX.XX	4.205	5.010

All aforementioned prices do not include value added tax.

Fees

TPEM - Total Plant Electronic Management	EUR	USD
TPEM Remote Client	Free of charge	Free of charge
USB-Token Level 50	999	1.190
Monthly usage fee for Token Level 100 Includes TPEM Token Level 100 incl. license, access to authorized TPEM systems, TPEM Remote Client for dial-up to TPEM systems, server license fees; (contract period 12 months; monthly fees are billed at the beginning of the full contract period. A shortening of the contract term is not possible).	29	34
Handling fee loss token / not return shipment after contract end (12* monthly usage fee)	348	410

All aforementioned prices do not include value added tax.