

## COMPANY BROCHURE

2018 - 2020 *II*

Electrical Engineering Seminars

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# FBZ-E® AND ITS TRAINING CENTRE

Since 2008, FBZ-E® has been active in the field of electrical engineering seminars. The training centre combines accumulated knowledge with increased demands for a modern professional training. Connecting rooms to open areas with near division-free sections where theoretical and practical sessions take place, the new training centre not only presents a unique experience for participants, but they also find a truly innovative learning environment. Being able to move freely between theory, laboratory tutorials and practice-oriented surroundings, allows for best communication of seminar topics on a high level.

Latest state-of-the art technology is provided, constantly keeping up with any innovation.

With 426 seminars and 1696 participants in the year 2017, the FBZ-E® provided next to partial qualifications EUP (electro-technically instructed person) and EFFT (electro-technically skilled person for defined tasks) also seminars for measuring and test engineering, explosion protection, switching qualification/switching authorisation and the special training AuS (Arbeiten unter Spannung - working on live systems) according to work procedure AF2 insulation.

Specific requirements are met by site inspections, preparing individual seminar documentation and a precisely designed seminar process. For sustaining qualifications and for required post-training as well as post-testing, all seminars are included in our sustainability system of regular reminders about upcoming dates and refresher-courses



FBZ-E® FACHBEREICHSZENTRUM ENERGIETECHNIK  
GMBH



AUTHORISED SIGNATORY HEIKE BUSCHARDT  
AND MANAGING DIRECTOR JOSEF POTT



# TRANSFERRING KNOWLEDGE IN THE THEORY SEGMENT

Generously designed, the upper level provides for a pleasant learning atmosphere. Presentations and interactions are devised on a normative basis to meet operational requirements. The media equipment is state-of-the-art and oriented on the regularly updated portfolio of the test engineering respective to the manufacturers Gossen Metrawatt, Fluke und Testo. The equipment used is made by Lemp, Klauke, Knipex, Wiha, Wera and Gedore.





# SERVICE



Alongside the lecturer, a service team will do its best to make sure you have a pleasant stay.

During international seminars our interpreters, who themselves have attended the relevant technical seminars at the FBZ-E®, will ensure you understand electro-engineering terms in the technical context.



# TRANSFERRING KNOWLEDGE IN THE PRACTISE SEGMENT

Practical training consists of several zones of theoretically- and practically oriented schooling segments.





# OPERATIONAL ORIENTATION



The success of a seminar hugely depends on its relevance for operational technology.

During seminar preparations structures, models, and net reproductions are set-up in the practice area on the lower floor. These are included in the seminar documentation to allow for an integral transfer of knowledge.

In compliance with operational requirements, the material used for practical training segments is made by Hager, Doepke, Eaton, Mennekes, Merten and others.



# EUP

The first qualification step in the electrical scope of application is the „electro-technically instructed person“

This qualification, intended for persons without any training in electrical engineering, becomes necessary when the following circumstances prevail in their workplace:

- Electrical facilities such as wind power plants, substations and transformer stations have to be accessed.
- Personnel sometimes has to open electric switching cabinets/control boxes, for example, in order to switch on protection devices again or they have to set parameters.
- Personnel is to assist on tasks to support the electrical engineering department.

## Process of an EUP Qualification

- Determining operational requirements
- FBZ-E® proposal and seminar concept
- Clarification on how to gain access to various support programs
- Seminar for the qualification in EUP
- Test and certification for EUP
- Operating order/appointment whilst adhering to organisational requirements for vEFK (responsible qualified electrician)
- Registration into the sustainability for annual post-trainings with an average of 4 to 8 schooling hours

The qualification in EUP takes - depending on the operational requirements - between one day and one week.

Prerequisite to organisational structures, among others, is the Industrial Safety Regulation and for the trained person, amongst others the TRBS 1203. The employer needs to adhere to these requirements.

# EFFT

The advanced training to become a „electro-technically trained person for defined tasks“ may be designed as an upgrade level to EUP or independently structures.

This training authorises personnel with electro-technical tasks to perform such work in addition to their main field of expertise, for example:

- Kitchen electricians are allowed to install electric cooking ranges.
- Installation mechanic specialized in SHK are allowed to electrically install heating systems
- Health care supply stores may test care beds according to VDE 0751.

## Process of an EFFT- advanced training

- Determining operational requirements adhering to initial qualifications
- FBZ-E® proposal and seminar concept
- Clarification on how to gain access to various support programs
- Seminar for the advanced training in EFFT
- Test and certification for EFFT
- Operating order/appointment whilst adhering to organisation requirements for vEFK
- Registration into the sustainability for annual post-trainings with an average of 8 to 16 schooling hours
- Optional advanced trainings to extend activities in the electrical scope of application

The qualification in EFFT takes - depending on the operational requirements - between two and three weeks.

Prerequisite to organisational structure, among others, is the Industrial Safety Regulation and, for the trained person, amongst others the TRBS 1203. The employer needs to adhere to these requirements.

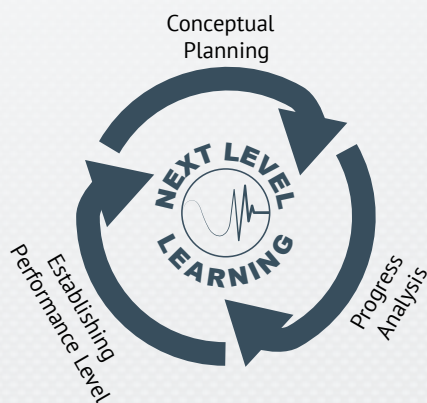


External apprenticeship exam in electrical engineering craft, electronics engineer in the field of energy and building technology.

Obtaining the apprenticeship diploma in electrical engineering craft, electronics engineer in the field of energy and building technology is a future-oriented vocational training with career advancement opportunity.

Preparation for the apprenticeship exam is used for partially qualified specialists, personnel with long-term employment times within the electrical field as well as for those that finish their vocational training early without a diploma. On the basis of time spent in the field of electrical applications, individual processes with preparation time between 6 and 24 months are taken into consideration. Hereby, we consider phases of presence in full-time or work-based learning environments as well as training time spent at the work place and autodidactic learning.

As an educational training facility we clarify the admission requirements and take care of application forms needed for the apprentices' register and the registration for participation in the exams. Analogue to the preparation for trade craft, we provide the test preparation for the proficiency examination "electrical engineer in operating technology" and "electrical engineer industrial engineering".



The field of work of electrical specialists may require special skills depending on the respective operational focus. Knowledge and skills of vocational training as well as master craftsman training will then have to be extended.

We train electrical engineers with special knowledge in the following fields:

#### Measurement and Test Engineering

- Explosive atmosphere
- Switchgear combinations
- Photovoltaic systems
- Wind power systems

#### Work on Live Systems

- Mounting metres
- Exchanging components
- Cable sets
- Battery systems

#### Switching Qualification and Switching Authority

- Low voltage main distribution systems
- High-voltage system with 20/36 kV
- Limited switching authority for power plant operators

#### Explosive Atmosphere

- Trained personnel
- Qualified person
- Qualified person with special knowledge
- Preparation for "trained personnel with official approval"

#### Country specific Safety Instructions

- NEN 3140: 2011 Bedrijfsvoering van elektrische installaties
- UTE C 18-510: 2010 Recueil d'instructions générales d'ordre électrique
- SFS 6002: 2005 Sähkötyöturvallisuus/Safety at electrical work
- NEK EN 50110-1: 2015(EN50110-2-100: 2014) applies
- ÖVE / ÖNORM EN50110-1 + EN50110-2-100: 2014 (integrated paper)

# SEMINAR OVERVIEW

## Power Engineering

INS	Entry to electrical engineering 3 Days
INS	Electrical installations project AB 4D
INS	Power generators for building feed
INS	Protection against overcurrent
INS	Fire protection
STE	Entry to switching cabinet assembly 4D
STE	Switching cabinet project 8D
SHK	Electrical safety + electrical basics
SIBE	Safety lighting systems
SIBE	Operational lighting systems
EMA	Electrical machines
JSU	Annual safety briefing
JSU	Annual safety briefing NL
JSU	1kV Technicians
JSU	1kV 20kV Technicians
BFO	Specialist management seminars 1D
BFO	Specialist management seminars 2D
BFO	Qualified responsible electrician 2D
BFO	Standardisation work SP
BFO	Qualified responsible electrician NH 2017
BFO	Standards' requirements for electric mobility
AuS	Work on live systems AF2 Insolation 2D
AuS	Work on live systems 4,5D
AuS	Post-training and post- testing AF2
SBB	Limited switching qualification and switching authority 20kV 1D
SBB	Switching qualification 20/36kV 1,5D
SBB	Switching qualification 20/36kV 2D
SBB	Post-training and post-testing 20/36kV
SBB	Prof. navigation industry 36kV 2D-Theory
MRL	Machinery guidelines
BP	Ladders and steps
BP	Post-training ladders and steps 4Lessons
ÜSS	Surge protection components STE
CE	Conformity declaration SP
PVB	IHK Part 1 Exam EBT 1Week
PVB	IHK Part 2 Final exam EBT 1W
PVB	IHK Part 2 Final exam GEK 13D
PVB	IHK Part 2 Final exam GEK 5D
PVB	HWK Part 1 Exam EEB 1W
PVB	HWK Part 2 Final exam EEB 1W
SPS	Operational requirements 3D

## Explosion Protection

EX	Safety seminar 1D
EX	Information seminar 2D
EX	Company seminar 4,5D
EX	Company seminar advanced training 2,5D
EX	Company seminar advanced training MP 1D
EX	BP – Post-training + adv. training MP 2D
EX	Motor repairs 3D
EX	Qualified person – post-training 1D
EX	Instructed person – post-training 0,5D

## Apprenticeship Exam

US	External apprenticeship exam
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## Measurement- and Testing Technology

MP	Testing in the electrical sphere 3D
MP	Testing of electrical devices 2D
MP	Testing of electrical devices 2D - EN
MP	Testing of electrical devices 3D - EN
MP	Testing of electrical devices K 1D
MP	Testing using your company's testing device 1D
MP	Testing of medical devices 2D
MP	Testing of car charging stations 1D
MP	Testing of PRCDs 1D
MP	Testing on transformer stations 2D
MP	Testing of electrical installations 2D
MP	Testing of electrical installations 2D - EN
MP	Testing of electrical installations K1 1D
MP	Testing of electrical installations K2 1D
MP	On-site testing wind power plants AB 1D
MP	Testing installations and lifting platforms 2D
MP	Testing installations and lifting platforms 3D
MP	Thermography in electrical systems 1D
MP	Post-training thermography in 6L
MP	The use of leakage current clamps 1D
MP	Testing equipment of machinery 2D
MP	Testing electrical machines 1D
MP	Switch gear combination 2D
MP	Production accompanying test procedure 2D
MP	Testing installations and cranes 2D
MP	Testing photovoltaic systems 1D
MP	Testing of large photovoltaic systems DC 1D
MP	Testing techn. f. power generators plus 4D



# SEMINAR OVERVIEW

MP	Equipment, installations + power generators 3D
MP	Installations and switchgear combinations 4D
MP	Testing technology for electric cables 2D - M
MP	Testing technology for electric cables 1D - G
MP	Measuring technology using oscilloscopes 1D
MP	Electromagnetic compatibility STE 1D
MP	Post-training 1D
MP	Post-training seminar in English 1D
MP	Post-training seminar in English 2D
MP	Sustaining the tester's qualification 1D

## Electro-Technically Instructed Person

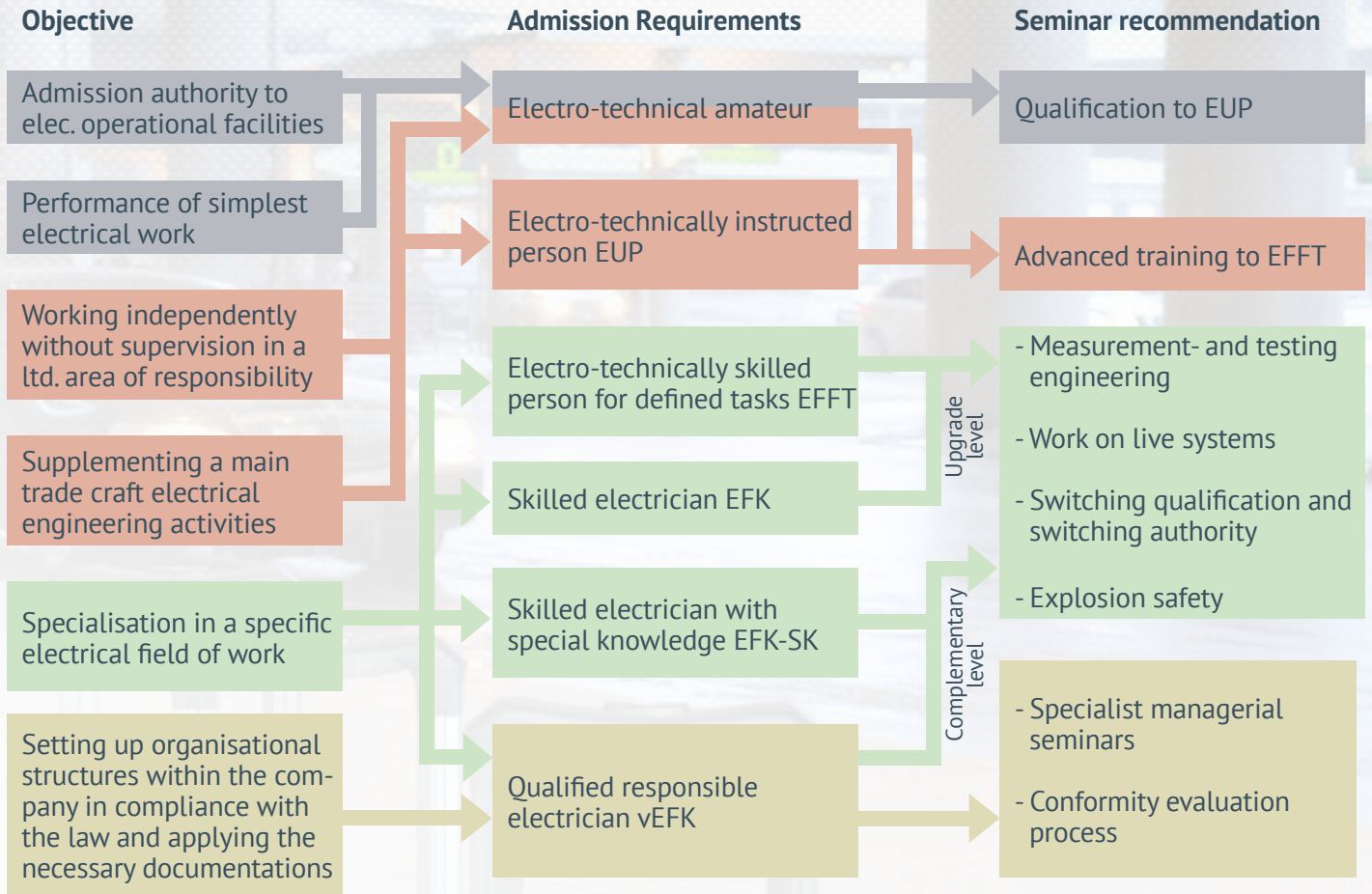
EUP	Electro-Technically Instructed Person INFO
EUP	SU Low voltage
EUP	SU High voltage
EUP	SU Low- and high voltage
EUP	Extinguishing fires in photovoltaics
EUP	Machine operator
EUP	Odourising systems
EUP	Event engineering
EUP	Schools
EUP	Janitors
EUP	Wind power plants 4D
EUP	Wind power plants - offshore 2D
EUP	Professional navigation/shipping industry 4D
EUP	Post-trainings 4L

## Electro-Technically Skilled Person for Defined Tasks

EFFT	EFK for defined tasks INFO
EFFT	EFK for defined tasks INFO AB
EFFT	Wind power plants 1W
EFFT	Wind power plants AB 1W
EFFT	Wind power pl. - construction site equip. 2W
EFFT	Wind power plants – construction site 2W - EN
EFFT	WEA – Construction site requirements 2W
EFFT	WEA – Company-specific requirements 2W
EFFT	Installations- and heating engineers
EFFT	Plant mechanics SHK
EFFT	Blocking cashier
EFFT	Electrical gate systems
EFFT	Automation for building technology
EFFT	Precision mechanic and metalworker
EFFT	Janitor
EFFT	Janitor AB 1W

EFFT	Youth hostels
EFFT	Sewage treatment plants 2W
EFFT	Sewage treatment plants 3W
EFFT	Small sewage treatment plants
EFFT	Kitchen fitting
EFFT	Painter and varnisher
EFFT	Machine operator
EFFT	Maintenance of production machinery
EFFT	Garbage compactors + compaction syst. 12D
EFFT	Fuel station engineering
EFFT	Mobile torches
EFFT	Bricklayer and concrete worker
EFFT	Glazier trade
EFFT	Cable layers
EFFT	Measuring point detections
EFFT	Photovoltaics
EFFT	Installation- and control engineering
EFFT	Control engineering
EFFT	Electronic engineering for SPS
EFFT	Production in automatic lines
EFFT	Crane engineering
EFFT	Switching cabinet assembly
EFFT	Odourising systems
EFFT	Chimney sweepers
EFFT	Carpenter trade
EFFT	Gastronomy facilities
EFFT	Roller shutter- and shade engineering
EFFT	Windows, doors and gates
EFFT	Event engineering
EFFT	Electric vehicles and charging technology
EFFT	Traff./transp. areas, removal damaged pylons + poles
EFFT	Water works
EFFT	Poles for gathering meteorological data
EFFT	Sound measuring systems
EFFT	Sound measuring systems - seminar in English
EFFT	Electr. eng. for spec. test. techn. - basics
EFFT	Installation testing acc. to VDE 0100-600 MP
EFFT	Equipment testing acc. to VDE 0701-0702 MP
EFFT	Testing of medical devices MP
EFFT	Testing systems according to VDE 0104 MP
EFFT	Installations and power generator testing MP
EFFT	Post-trainings 1D
EFFT	Post-trainings 2D

# SEMINAR FINDER



## The seminar basis

Seminars based on standards ensure a high level of conformity. According to various subject areas and operational requirements, additional sets of rules are taken into account. Operational specification and practical implementation allows for a targeted application.





# FURTHER ACTIVITIES OF THE FBZ-E®

## FACHBEREICHSZENTRUM ENERGIE TECHNIK GMBH

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### **OPS-M®**

The web based learning environment OPS-M® „Online- Presence-Seminar-Management“ provides seminars and safety training without having to be present or being partially present in our training centre.

### **BEW**

Assessment processes are an integral component within the activities of FBZ-E®. With processes in multiple stages for optimisation, load management and interference field evaluation in electrical systems, reports are the working basis for the implementation in electrical companies.

### **GMC**

Our distribution partnership with Gossen Metrawatt provides the test devices necessary for selection, delivery and calibration as a supplement service to the test seminars. The rental of test devices and thermographic cameras round off the broad spectrum.

### **Standards**

By analysing the operational focus and the existing work processes, the applicable standards and technical codes are identified, including technical elaborations for the operational implementation of the requirements in form of operating and work instructions.

### **RFF-B®**

The RFF-B® „Regional-Specialist-Advancement Education“ is a support program to promote specialists. The RFF-B® develops concepts for individually raising the professional potential within companies so that new hires with modest qualifications are possible at the basis.

### **MP-P**

Due to manifold test requirements at product manufacturing and application in the electrical field, test procedures and protocols for the production accompanying test process are developed on a standard basis.

### **Foreign languages**

Next to German, all seminars and learning material can also be offered, in English, French, Spanish and other foreign languages upon request. Seminars abroad are conducted with an interpreter present.

### **Lecturers**

Lecturers from different technical fields allow for extending central topics of electrical engineering to special areas. Therefore combinations of various topics can be included when structuring a seminar.

# MEASURING- AND TEST ENGINEERING

## MP-NSK-EA-A-G

Measuring- and test engineering is a one of the central topics at the FBZ-E®. In addition to other seminar services we offer advice on testing devices, also selling and servicing them. For testing devices used less frequently, you can take advantage of our rental service.



GOSSEN  
METRAWATT



SECUSTARS IN CHARGE MODE  
FOR THE NEXT SEMINAR



SECUTEST  
GENERATION 3  
  
FLUKE AND  
TESTO



MACHINE TESTER



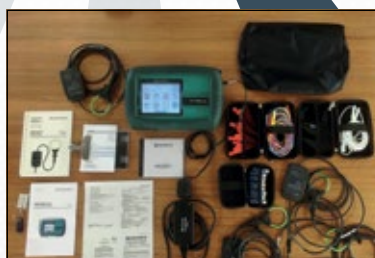
METRAHIT PRO



SECUTEST GENERATION 4 AND  
PROFITEST XTRA



CURRENT CLAMPS AND  
TESTING EQUIPMENT



NETWORK ANALYSIS DEVICE



FLUKE 1664 AND  
METRA MACHINE

MP



# MEASURING- AND TEST ENGINEERING SEMINAR EXAMPLE



# WORKS ON LIVE SYSTEMS

## AuS AM3PLUS AF2

For our special training course “works on live systems“, the FBZ-E® is able to provide the necessary power supplies. Together with our clients, we analysed requirements, procured tools and material, prepared training set-ups and backed our seminar concept with trial runs.

These 3-5 day AuS seminars not cover modern materials, but also materials such as old cables partially still used in some local supply systems, e.g. cables such as NKBA.





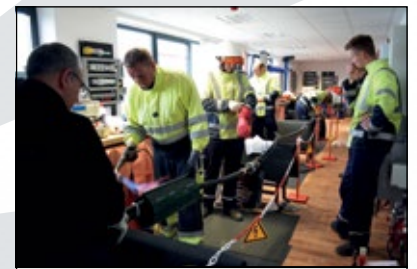
# WORKS ON LIVE SYSTEMS SEMINAR EXAMPLE



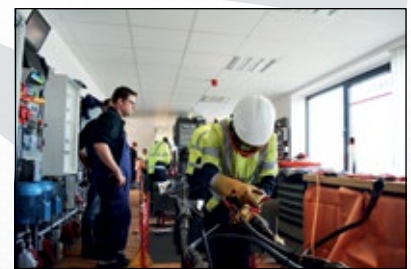
PHOTOTECHNICAL DOCUMENTATION



AUS TEAMS FOR CHANGING  
METRE



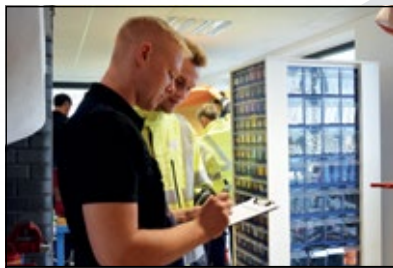
AUS TEAMS FOR BRANCH TEE



AUS TEAMS FOR CONNECTION  
SLEEVES



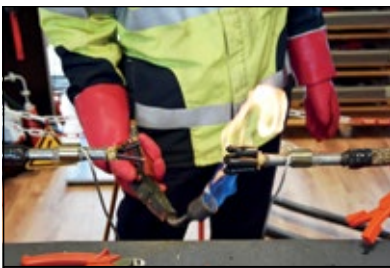
NAYCWY BRANCH TEE



DOCUMENTATION



AUS TEAMS FOR CONNECTING  
DOMESTIC JUNCTION BOXES



NBKA END CAP

AuS AM3plus AF2



# IMPRESSIONS



DOCUMENTATION



INSTALLATION



CONTROL ENGINEERING



THERMOGRAPHY



AUTOMATION



WORK ON LIVE SYSTEMS



POWER GENERATOR



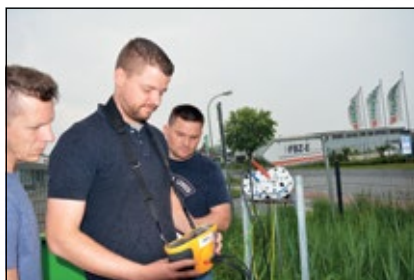
HIGH VOLTAGE



TESTING EQUIPMENT



CONSTRUCTION SITE REQUIREMENTS



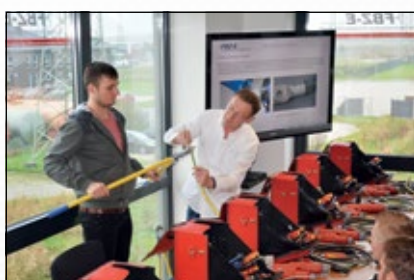
EARTH MEASUREMENT



TEST ENGINEERING



MOTOR ENGINEERING



PRESS TOOLS



SECUSTAR



# THE VEHICLE FLEET



To provide an even more comfortable environment, there are now FBZ-E®-vehicles and drivers to take our seminar participants to lunch.





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