

*#howtrainingworks*



# TECHNICAL ACADEMY.





*This is who we are*  
**GROB-WERKE.**







*Technology at its best*

# STEP WITH US INTO A GREEN FUTURE.

At GROB, we strive for continuous progress and improvement. Not only do we strive to develop outstanding solutions and products for our customers, but we also seek to make a contribution to our environment and future generations. This is firmly anchored in our corporate philosophy and lived every day.

We therefore utilize photovoltaics and geothermal energy in our locations and support a wide variety of social projects. We also value SUSTAINABILITY in our internal departments. Our products are based on the highest energy efficiency and regenerative drive systems. We integrate our supplier network in reducing CO2 footprint.



OUR PRODUCT RANGE.

#machiningtechnology #universalmachiningcenters  
#assemblyplants #electromobility #automation  
#additivemanufacturing #digitalization  
#usedmachines #service

*Concentrated competence worldwide*

# INTELLIGENT TECHNOLOGY IS HUMAN.

For generations, we at GROB have lived and experienced this principle by making our customer's requirements the focus of our work. The result is sophisticated technology creating more efficient production processes worldwide and delivering highest quality.



## RESEARCH & DEVELOPMENT

With a high degree of creativity and technical intuition, as well as the best engineering expertise, our developers have worked hard to earn the reputation of being a technology leader.



## ASSEMBLY

From pre-assembly to machine assembly to process commissioning – our employees demonstrate their expertise with optimally coordinated workflows.



## ENGINEERING

With method development and structured problem solving, our employees in Engineering develop innovative concepts representing milestones for precision, dynamics, and reliability.



## COMMISSIONING

With simulation techniques and virtual commissioning, we achieve the highest adherence to delivery dates and product quality.



## PRODUCTION

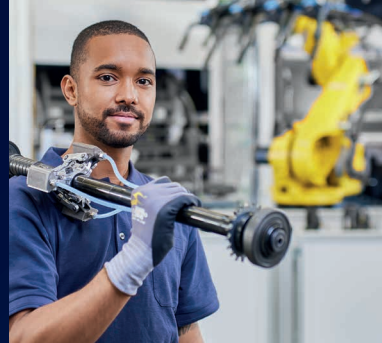
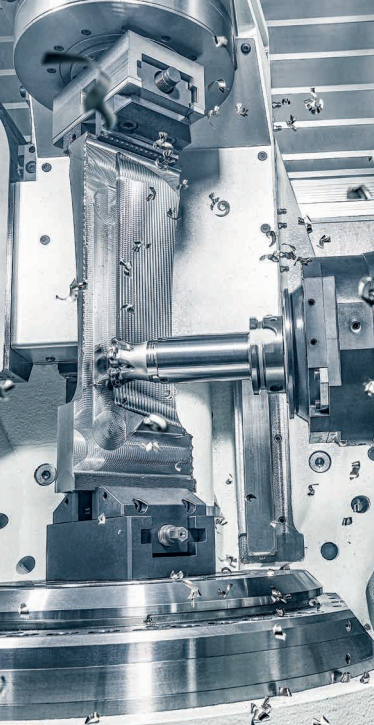
The high degree of vertical integration along the entire value creation chain, numerous machining technologies and our employees' distinctive specialist knowledge create the best conditions for state-of-the-art production.



## TECHNICAL APPLICATION CENTERS

Our production plants in Germany, Brazil, the USA, China, Italy and India have technical application centers for the machining and electromobility sectors, where our customers can experience GROB technologies up close.







*We demonstrate how to make optimum use of machines*

# GROB TECHNICAL ACADEMY.

UNIVERSAL MACHINING CENTERS.

MACHINING TECHNOLOGY.

ASSEMBLY & E-MOBILITY.

GENERAL CONDITIONS.

E-LEARNING@GROB.

SPECIAL EQUIPMENT BOX.





UNIVERSAL MACHINING CENTERS

MACHINING TECHNOLOGY

ASSEMBLY & E-MOBILITY



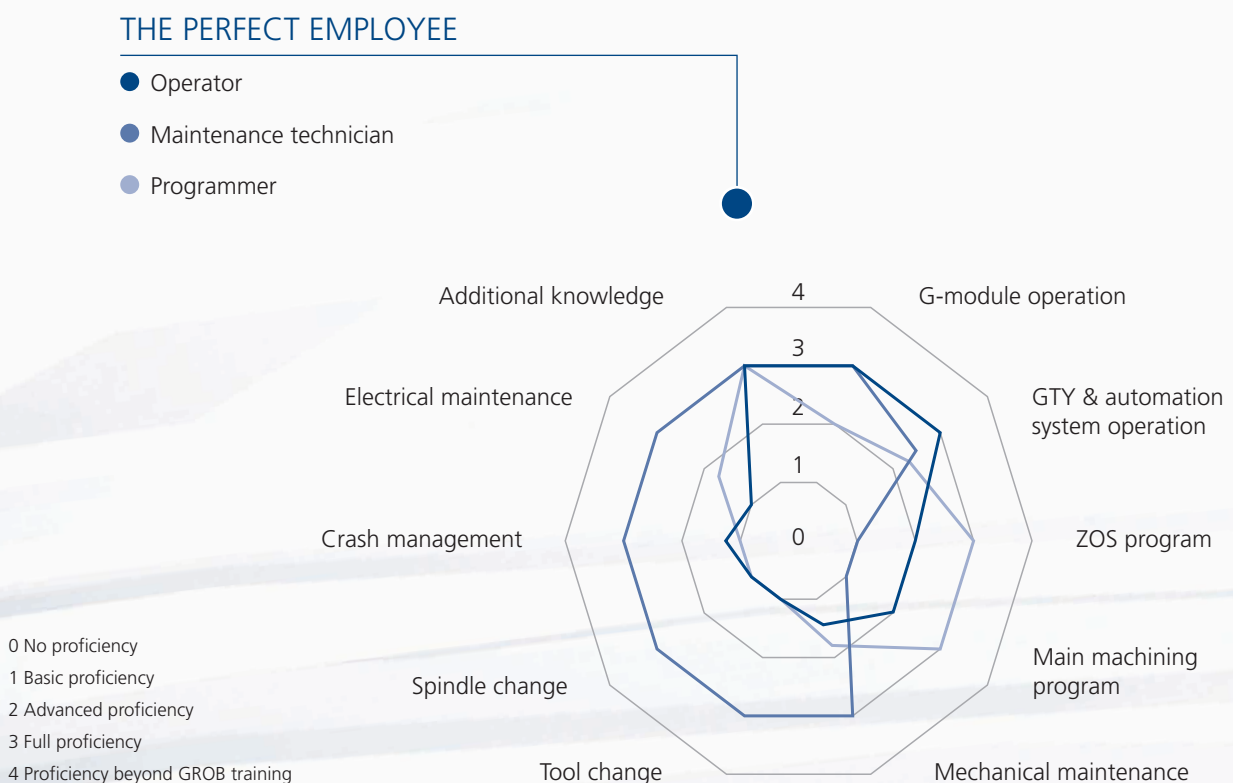
# TRAINING CONCEPT.

As products become more and more complex and the competition gets tougher, the importance of the GROB Technical Academy as a key component of the GROB global range of services is constantly increasing. An experienced team of qualified trainers is meeting this challenge at GROB.

## The GROB service range

Aside from individual customer consultation and support, the GROB service range above all includes a wide range of instruction and training modules.

Due to GROB's individual machines and systems, we provide most of our customized training courses based on a standard program. We provide instruction and training courses for all GROB product ranges, not only for universal machining centers and system solutions, but also for e-mobility. Depending on availability, individual training modules can be configured to suit particular needs. Learning progress tests can be integrated as required. All participants who successfully attend the GROB Technical Academy will receive a certificate.





*Gain new insights*

# GROB TRAINING MODULES.

Whether operator, programmer, installation technician, or maintenance technician: we provide various training modules for optimum use of your GROB system in your production. All training programs on offer are available for the SIEMENS 840D sl, SIEMENS TIA, BECKHOFF TwinCAT3, HEIDENHAIN iTNC 530, TNC 640, and FANUC 30i-B machine control systems.



## WOULD YOU LIKE TO KNOW MORE?

Our training team is always available for you!

### GROB TECHNICAL ACADEMY

Phone: +49 8261 996-7488

E-mail: [training@grob.de](mailto:training@grob.de)

### GROB-SERVICE / SALES

Phone: +49 8261 996-6000

E-mail: [sales.service@grob.de](mailto:sales.service@grob.de)











*Whether you are a novice or an experienced machine operator*

# UNIVERSAL MACHINING CENTERS.

You will learn about GROB machining centers in various modules. Whether you are a novice or an experienced machine operator – we will show you how the machines work to optimal effect.

- ✚ We convey important know-how in handling your machine in a practical manner
- ✚ The safety of man and machine is guaranteed by learned knowledge
- ✚ Increase your team's problem-solving skills



GROB TECHNICAL ACADEMY – PORTFOLIO.  
#universalmachiningcenters  
#machiningtechnology  
#assembly\_and\_electromobility #e-learning  
#specialequipmentbox #service

*Training modules*

# UNIVERSAL MACHINING CENTERS.

Choose the right training course now! All training programs on offer are available for the SIEMENS 840D sl, SIEMENS TIA, BECKHOFF TwinCAT3, HEIDENHAIN iTNC 530, TNC 640, and FANUC 30i-B machine control systems.

## OPERATION

<b>Requirements</b>	Basic knowledge of the control system used
<b>Duration</b>	3 days (4 days for mill-turn machines)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety</li> <li>• Operation incl. pallet change</li> <li>• Program introduction</li> <li>• Tool management</li> <li>• Loading and unloading tools</li> <li>• Touch probe calibration</li> <li>• Introduction to swiveling in manual mode</li> <li>• Touch probe in manual mode</li> <li>• Standard machine calibration</li> <li>• Daily inspection and maintenance of universal machining centers</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Autonomous and safe machine operation in manual and automatic mode</li> <li>• Correct handling of tools and associated data</li> <li>• Correct handling of the touch probe</li> <li>• Recognizing the need for machine maintenance</li> </ul>

## NC PROGRAMMING – BASIC COURSE

<b>Requirements</b>	Knowledge of milling according to technical drawings, CNC basics
<b>Duration</b>	4.5 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to the corresponding control system functionality</li> <li>• Axis designations and coordinate systems</li> <li>• File management and tables</li> <li>• Tool management</li> <li>• Standard and contour cycles</li> <li>• Reference and zero points</li> <li>• Web functions</li> <li>• Basics of NC programming of the specific control system manufacturer</li> <li>• Programming techniques such as partial program repetition and subroutine technology</li> </ul>
<b>Learning objective</b>	Creating and testing 3-axis NC programs according to part drawings



## NC PROGRAMMING – SWIVELING

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	2 days
<b>Contents</b>	<ul style="list-style-type: none"><li>• Swiveling the machining plane with the control system's own swivel cycles</li><li>• Producing boreholes and surfaces on swiveled-in planes</li><li>• Resetting the swivel plane</li><li>• GROB manufacturer cycles</li></ul>
<b>Learning objective</b>	Machine programming in five axes

## NC PROGRAMMING – ADVANCED COURSE

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	2 days
<b>Contents</b>	<ul style="list-style-type: none"><li>• Using calculation parameters</li><li>• Reading and writing system variables</li><li>• Creating log files</li><li>• Definition and usage of user variables</li></ul>
<b>Learning objective</b>	<ul style="list-style-type: none"><li>• Flexible program design</li><li>• Basics of high-level language programming</li></ul>

## NC PROGRAMMING – GROB-SPECIFIC PROGRAMMING

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"><li>• Using GROB manufacturing cycles</li><li>• Adapting the homing program</li><li>• Checking the tool data</li><li>• Automatic program initialization after program abort</li></ul>
<b>Learning objective</b>	Reliable program design



*Training modules***UNIVERSAL MACHINING CENTERS.****NC PROGRAMMING – GROB MACHINE CALIBRATION**

<b>Requirements</b>	Comprehensive experience with GROB machining centers and knowledge from the basic course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Context of machine calibration</li> <li>• Calibration manipulation via variables</li> <li>• Defining individual measuring positions</li> <li>• Checking the calibration via measuring programs and the log file</li> <li>• Automation options</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Understanding the necessity for calibration and individual adjustment</li> <li>• Detailed insight into the calibration process and its variables</li> <li>• Safe use of control programs and logs</li> </ul>

**GROB CLAMPING SYSTEM**

<b>Requirements</b>	Knowledge from the advanced course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Naming and filing clamping programs</li> <li>• Basic structure of setting, clamping and unclamping programs</li> <li>• Program assignment</li> <li>• Relevant functions and signals</li> </ul>
<b>Learning objective</b>	Creating an automatic clamping and unclamping operation

**NC PROGRAMMING – INTERPOLATION TURNING**

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Tool management, defining tool data</li> <li>• Interpolation turning cycles</li> <li>• Plane switchover</li> <li>• Programming a part with turning contour</li> </ul>
<b>Learning objective</b>	Creating and editing turning contours



## NC PROGRAMMING – IN-PROCESS TOOL MEASUREMENT

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Calibration</li> <li>• Tool measurement</li> <li>• Wear measurement</li> <li>• Tool breakage detection</li> <li>• Single cutting edge control</li> </ul>
<b>Learning objective</b>	Integrating the tool measurement system into the process

## NC PROGRAMMING – GROB FILE INPUT / OUTPUT (FIO)

<b>Requirements</b>	Knowledge from the advanced course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Creating, reading and copying files</li> <li>• Creating time stamps</li> <li>• Output of measured values in log file format, for example</li> <li>• Creating tolerance and progress bars</li> <li>• Creating message boxes and selection softkeys</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• In-process communication with the machine</li> <li>• Extracting machine information</li> </ul>



*Training modules***UNIVERSAL MACHINING CENTERS.****MILL-TURN TECHNOLOGY**

<b>Requirements</b>	Knowledge from the basic course and machine operation
<b>Duration</b>	3 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Basics of turning mode</li> <li>• Balancing parts</li> <li>• Advanced tool management</li> <li>• In-process measurement of turning tools</li> <li>• Toggling between milling and turning mode</li> <li>• Using turning cycles</li> <li>• Practical exercises on the machine</li> </ul>
<b>Learning objective</b>	Operating and programming mill-turn machines

**TOUCH PROBE PROGRAMMING**

<b>Requirements</b>	Knowledge from the advanced course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Naming and filing clamping programs</li> <li>• Basic structure of setting, clamping and unclamping programs</li> <li>• Program assignment</li> <li>• Relevant functions and signals</li> </ul>
<b>Learning objective</b>	Creating an automatic clamping and unclamping operation





## GROB PALLET STORAGE SYSTEMS

<b>Requirements</b>	Basic knowledge of the machining unit used
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety</li> <li>• Design and function of GROB pallet storage systems</li> <li>• Pallet storage system control software basics</li> <li>• Generation of work plans</li> <li>• Production planning</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Autonomous and safe PSS operation</li> <li>• Proper equipping and production planning</li> </ul>

## COURSE FOR SWITCHING FROM HEIDENHAIN iTNC530 TO TNC640

<b>Requirements</b>	Knowledge of the iTNC530 control system
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• New cycles (face milling cycle 233 and more)</li> <li>• New, fast and high-performance cutting simulation</li> <li>• Working with the preset table</li> <li>• New probing functions</li> <li>• New TNC functions</li> <li>• DXF converter</li> <li>• iTNC530 ↔ TNC640 control system comparison</li> </ul>
<b>Learning objective</b>	Learning and applying special features and functions of the TNC640



*Training modules***UNIVERSAL MACHINING CENTERS.****ELECTRICAL MAINTENANCE – STANDARD**

<b>Requirements</b>	Training on electrical or electronic systems <ul style="list-style-type: none"> <li>• Basic knowledge of drive and control systems technology as well as of the control system used</li> </ul>
<b>Duration</b>	3 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety training</li> <li>• Function description of the electrical components</li> <li>• Data backup</li> <li>• Data recovery</li> <li>• Hardware replacement</li> <li>• Hardware settings</li> <li>• Diagnostic options</li> <li>• Error analysis and the correct approach to machine malfunctions</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Minimizing machine downtime through preventive maintenance activities</li> <li>• Repair of electrical components</li> <li>• Localizing and rectifying electrical faults</li> <li>• Creation and use of the data backup as a reference</li> <li>• Proficient use of the documentation</li> </ul>

**ELECTRICAL MAINTENANCE – ADVANCED**

<b>Requirements</b>	Training on electrical or electronic systems <ul style="list-style-type: none"> <li>• Basic knowledge of drive and control systems technology as well as of the control system used</li> </ul>
<b>Duration</b>	2 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety training</li> <li>• Basic knowledge of editing GROB diagnostic diagrams</li> <li>• Evaluating alarms and messages</li> <li>• General PLC and HMI program overview</li> <li>• Customer-specific functions</li> <li>• Diagnostic options</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Minimizing machine downtimes through preventive maintenance activities</li> <li>• Repair of electrical components</li> <li>• Localizing and rectifying electrical faults</li> <li>• Creation and use of the data backup as a reference</li> <li>• Proficient use of the documentation</li> </ul>

## GROB SPINDLE DIAGNOSTICS – ELECTRICAL SYSTEM

<b>Target group</b>	Specifically for electrical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on electrical systems</li> <li>• Basic knowledge of drive and control systems technology as well as of the control system used</li> </ul>
<b>Duration / venue</b>	1 day – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Structure and function of GROB spindle diagnostics</li> <li>• Basics of the software used (IFM Octavis)</li> <li>• Troubleshooting on the machine</li> <li>• Maintenance, commissioning, and hardware replacement</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Minimizing machine downtimes following malfunctions</li> <li>• Proper use of the software</li> </ul>

## MECHANICAL MAINTENANCE

<b>Target group</b>	Specifically for mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basic knowledge of hydraulic and pneumatic systems</li> <li>• Basic knowledge of the control system used</li> </ul>
<b>Duration / venue</b>	3 days – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure of the machine (assemblies, drives, tool magazine)</li> <li>• Using the machine documentation</li> <li>• Motorized spindle (inspection)</li> <li>• Machine zero points</li> <li>• Service and preventive maintenance measures</li> <li>• Introduction to the special equipment</li> <li>• Fluid technology</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Minimizing machine downtime through preventive maintenance activities</li> <li>• Implementing simple mechanical repair and maintenance activities</li> </ul>

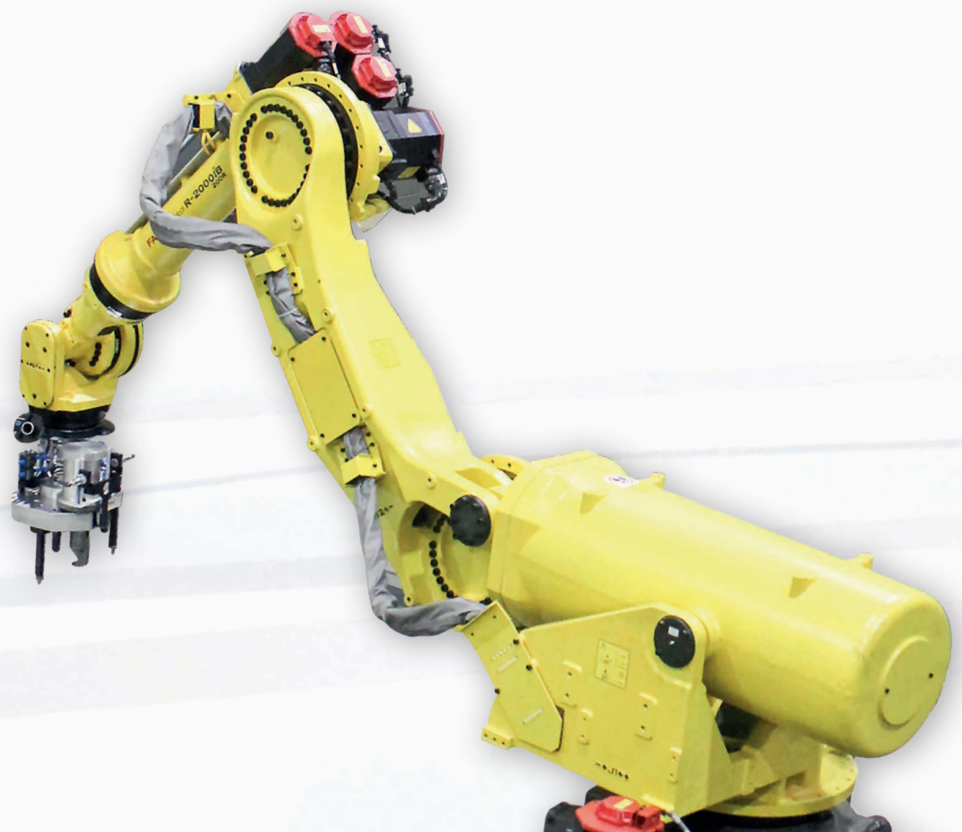


## Training modules

# UNIVERSAL MACHINING CENTERS.

### ROBOT TRAINING – BASIC COURSE

<b>Target group</b>	<ul style="list-style-type: none"><li>• Specifically for operating personnel</li><li>• Also recommended for maintenance personnel depending on their area of activity</li></ul>
<b>Requirements</b>	Knowledge of the function of robots
<b>Duration / venue</b>	2 days – Mindelheim Training Center <ul style="list-style-type: none"><li>• Course composition: Combination of theory (20 %) and practical exercises (80 %)</li></ul>
<b>Contents</b>	<p>Prior arrangement with the robot manufacturer necessary (KUKA, ABB, or FANUC)</p> <ul style="list-style-type: none"><li>• Structure of a robot</li><li>• Safety and operating modes</li><li>• Coordinate systems</li><li>• Base and tool measurement</li><li>• Determining the load data</li><li>• Robot calibration (zero points)</li><li>• Selecting and running programs</li><li>• "Teaching" transfer points and adjusting positions</li><li>• Retracting the robot and creating/uploading backups</li><li>• Backing up and reimporting programs</li></ul>
<b>Learning objective</b>	<ul style="list-style-type: none"><li>• Correct and safe robot operation</li><li>• Minimizing downtimes through proactive machine operation</li><li>• Expert knowledge about robots on GROB systems</li></ul>





## GRC ROBOT TRAINING

<b>Target group</b>	System supervisor
<b>Requirements</b>	Knowledge from the "Robot training – basic course" training course
<b>Duration / venue</b>	1 day – Mindelheim Training Center or on customer premises
<b>Contents</b>	<ul style="list-style-type: none"><li>• Basics of the standard robot cell</li><li>• Basics of teach positions using the GROB workbook</li><li>• Operating a GROB robot cell (GROB4Automation production control software)</li><li>• Retraction of robots</li><li>• Individual content (Vision)</li></ul>
<b>Learning objective</b>	<ul style="list-style-type: none"><li>• Correct and safe GRC operation</li><li>• Minimizing downtimes through proactive machine operation</li><li>• Expert knowledge about robot cells</li></ul>









# *Equipped for the future* **MACHINING TECHNOLOGY.**

GROB's specific machine concepts let you live up to e-mobility and automotive industry requirements.

- ✦ Get the most out of your productivity with trained staff
- ✦ Our customized training courses improve your workflow and speed
- ✦ Avoid application errors due to a high performance level of your staff



GROB TECHNICAL ACADEMY – PORTFOLIO.

#universalmachiningcenters

#machiningtechnology

#assembly\_and\_electromobility #e-learning

#specialequipmentbox #service



*Training modules*

# MACHINING TECHNOLOGY.

GROB G-modules and F-series! In GROB machining technology, machining centers of various sizes are built in a modular fashion. These can be connected via automation solutions. Their field of use lies in series production – in the automotive industry, among others.

## NC PROGRAMMING – SWIVELING

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	2 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Swiveling the machining plane with the control system's own swivel cycles</li> <li>• Producing boreholes and surfaces on swiveled-in planes</li> <li>• Resetting the swivel plane</li> <li>• GROB manufacturer cycles</li> </ul>
<b>Learning objective</b>	Machine programming in five axes

## NC PROGRAMMING – ADVANCED COURSE

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	2 days
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Using calculation parameters</li> <li>• Reading and writing system variables</li> <li>• Creating log files</li> <li>• Definition and usage of user variables</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Flexible program design</li> <li>• Basics of high-level language programming</li> </ul>

## NC PROGRAMMING – GROB-SPECIFIC PROGRAMMING

<b>Requirements</b>	Knowledge from the basic course
<b>Duration</b>	1 day
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Using GROB manufacturing cycles</li> <li>• Adapting the homing program</li> <li>• Checking the tool data</li> <li>• Automatic program initialization after program abort</li> </ul>
<b>Learning objective</b>	Reliable program design

## SIEMENS NC PROGRAMMING – GROB-SPECIFIC PROGRAMMING

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for NC programmers</li> <li>Also recommended for persons who optimize process quality through program modifications</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>NC basic course or equivalent knowledge</li> <li>Knowledge of the function of automated machine tools</li> <li>Knowledge of handling production documents, such as drawings, parts lists, tool layouts</li> </ul>
<b>Duration / venue</b>	2 days – Mindelheim Training Center, customer premises, or online training via MS Teams <ul style="list-style-type: none"> <li>Course composition: Theory (100 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Familiarization with the coordinate systems used by GROB</li> <li>Program management</li> <li>Structure of machining programs</li> <li>Machining sub-routines</li> <li>Quality optimization/offset parameters</li> <li>Tool correction and monitoring</li> <li>Speed, feed and position parameters</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Autonomous modification to machining programs (without touch probe)</li> <li>Performing quality optimizations</li> <li>Understanding the machine, its functions and machining programs</li> <li>Localizing sources of faults</li> <li>Comprehensive knowledge of the GROB-specific NC program</li> </ul>

## OPERATION

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for operating personnel</li> <li>Also recommended for maintenance personnel depending on their tasks</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>Knowledge of the function of automated machine tools</li> <li>Basic course of the control system manufacturer</li> </ul>
<b>Duration / venue</b>	2 days – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"> <li>Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Safety training</li> <li>Introduction to safety technology</li> <li>Structure of the machine</li> <li>Basics of machine operation</li> <li>Operating modes and how they are used</li> <li>Tool management and its use</li> <li>Detecting faults (troubleshooting)</li> <li>Seating check</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Correct and safety-conscious machine operation</li> <li>Minimizing machine downtimes through proactive machine operation</li> <li>Adequate knowledge of GROB system solutions</li> </ul>



*Training modules***MACHINING TECHNOLOGY.****MECHANICAL MAINTENANCE – G-MODULE**

<b>Target group</b>	Specifically for mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of hydraulic, pneumatic, and lubrication systems (lubricants, lubrication diagrams)</li> <li>• Experience in the preventive maintenance of automated machine tools</li> <li>• Experience in diagnosing faults and their causes</li> </ul>
<b>Duration / venue</b>	3 days – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure of the machine (assemblies, guides, drives, measuring systems, tool magazine)</li> <li>• Introduction to the machine documentation</li> <li>• Service and preventive maintenance measures</li> <li>• Introduction to the special equipment</li> <li>• Motorized spindle (inspection)</li> <li>• Machine zero points</li> <li>• Fluid technology</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Analyzing and rectifying mechanical faults</li> <li>• Replacing spare and wear parts</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Localizing sources of faults</li> <li>• Carrying out repair activities</li> </ul>

**GROB SPINDLE DIAGNOSTICS (GSD) – ELECTRICAL SYSTEMS**

<b>Target group</b>	Specifically for electrical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on electrical systems</li> <li>• Basic knowledge of drive and control systems technology as well as of the control system used</li> </ul>
<b>Duration / venue</b>	1 day – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Structure and function of GROB spindle diagnostics</li> <li>• Basics of the software used (IFM Octavis)</li> <li>• Troubleshooting on the machine</li> <li>• Maintenance, commissioning, and hardware replacement</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Minimizing machine downtimes following malfunctions</li> <li>• Proper use of the software</li> </ul>

## TOUCH PROBE

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for NC programmers</li> <li>Also recommended for persons who optimize process quality through program modifications</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>NC basic course or equivalent knowledge</li> <li>Knowledge of the function of automated machine tools</li> <li>Knowledge of the use of production documents, including drawings, parts lists, tool layouts</li> </ul>
<b>Duration / venue</b>	<p>1 day or ½ day in connection with the "SIEMENS NC-programming – GROB-specific programming" training course</p> <ul style="list-style-type: none"> <li>Course composition: Combination of theory (50 %) and practical exercises (50 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Basic knowledge of the different manufacturers of touch probes</li> <li>Calibration of the touch probe</li> <li>Replacement of the battery and probe head</li> <li>Internal function settings</li> <li>Replacement and initial operation of a touch probe</li> <li>Programming in main and subprograms</li> <li>Customer-specific functions</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Autonomous modification of the touch probe programming</li> <li>Quality optimization</li> <li>Understanding touch probe functions and their NC programming</li> <li>Localizing sources of faults</li> <li>Comprehensive knowledge of the GROB-specific use of the touch probe</li> </ul>

## MOTORIZED SPINDLE MECHANICAL SYSTEMS – INSTALLATION AND REMOVAL

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for mechanical maintenance engineers</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>Comprehensive training on mechanical systems</li> <li>Basics of machine operation and geometry</li> <li>Experience with machine tools</li> </ul>
<b>Duration / venue</b>	<p>2 days – Mindelheim Training Center</p> <ul style="list-style-type: none"> <li>Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Introduction to safety technology</li> <li>Service and preventive maintenance measures</li> <li>Introduction to the special equipment</li> <li>Installation and removal of a motorized spindle using the special equipment provided</li> <li>Checking perpendicularity, correcting as necessary</li> <li>Spindle 0° setting</li> <li>Setting the machine zero point (Z-axis)</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Using the technical documentation as a reference</li> <li>Performing preventive maintenance and inspection tasks</li> <li>Correcting reference setting points</li> <li>Localizing and rectifying mechanical faults</li> <li>Replacing spare and wear parts</li> <li>Localizing sources of faults</li> <li>Carrying out repair activities</li> </ul>



*Training modules***MACHINING TECHNOLOGY.****RENISHAW BALLBAR MECHANICAL SYSTEMS**

<b>Target group</b>	Specifically for mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	3 days – Mindelheim Training Center <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Basics of machine operation</li> <li>• Operating modes and how they are used</li> <li>• Structure and function of the RENISHAW applications</li> <li>• Introduction to fault overviews</li> <li>• Evaluation of diagnostic routines and graphics</li> <li>• Restoring perpendicularity</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Carrying out repair activities</li> </ul>

**CRASH MANAGEMENT (MAIN MACHINING AXES)**

<b>Target group</b>	Specifically for mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	5 days – Mindelheim Training Center <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Identification of geometry errors</li> <li>• RENISHAW Ballbar measurement and corresponding machine settings</li> <li>• Restoring machine geometry</li> <li>• Setting of machine zero points</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Localizing sources of faults</li> <li>• Localizing and rectifying mechanical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Carrying out repair activities</li> </ul>

## ASSEMBLY REPLACEMENT

<b>Target group</b>	Specifically for experienced mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	1-5 days – Mindelheim Training Center (prior arrangement required) • Course composition: Combination of theory (10 %) and practical exercises (90 %)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Identification of geometry errors</li> <li>• Replacement of an assembly (prior arrangement required)</li> <li>• Restoring machine geometry</li> <li>• Commissioning of the assembly</li> <li>• Setting of machine zero points</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Carrying out repair activities</li> </ul>

## TOOL CHANGE MECHANICAL SYSTEMS

<b>Target group</b>	Specifically for mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	3 days – Mindelheim Training Center • Course composition: Combination of theory (10 %) and practical exercises (90 %)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Tool magazine (structure)</li> <li>• Configuration and installation using special equipment (positioner)</li> <li>• Checking and setting up the transfer position</li> <li>• Setting the software cams</li> <li>• Checking the tool change operation in automatic mode</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Carrying out repair activities</li> </ul>



## Training modules

## MACHINING TECHNOLOGY.

## MOTORIZED SPINDLE MECHANICAL SYSTEMS – WITH TYPE 22 CROSS-FEED UNIT

<b>Target group</b>	Mechanical maintenance technicians or machine operators (prior arrangement required)
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation, NC programming, and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	1 or 2 days (prior arrangement required) – Mindelheim Training Center or customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure, function, service, and preventive maintenance activities for the motorized spindle with cross-feed (clamping set maintenance)</li> <li>• Introduction to the special equipment and standard parts (sealing elements)</li> <li>• Removal and installation of a motorized spindle with cross-feed using the special equipment provided (prior arrangement required)</li> <li>• Check and adjustment of the motorized spindle position</li> <li>• Spindle 0° setting with special equipment</li> <li>• Configuration of the feed-out tool in tool management</li> <li>• NC programs and the associated contexts</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Presentation of specific knowledge used across all relevant technical departments</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Carrying out repair activities</li> </ul>

## PART CHANGER

<b>Target group</b>	Mechanical maintenance technicians or machine operators (prior arrangement required)
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Operating modes and how they are used</li> <li>• Part changer (structure)</li> <li>• Structure and setup of the axes and grippers</li> <li>• Checking and setting up the transfer position</li> <li>• Setting the GUDs, software cams, and part change program</li> <li>• Automatic mode and operation</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Correct and safety-conscious machine operation</li> <li>• Minimizing machine downtimes through proactive machine operation</li> </ul>



## LINEAR GANTRY

<b>Target group</b>	Mechanical maintenance technicians, electrical maintenance technicians, or machine operators (prior arrangement required)
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical/electrical systems</li> <li>• Basics of machine operation</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Operating modes and how they are used</li> <li>• Linear gantry (structure)</li> <li>• Structure and setup of the axes and grippers</li> <li>• Checking and setting up the transfer position</li> <li>• Setting the GUDs, software cams, and part change program</li> <li>• Automatic mode and operation</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical and electrical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Correct and safety-conscious machine operation</li> <li>• Minimizing machine downtimes through proactive machine operation</li> </ul>



## Training modules

# MACHINING TECHNOLOGY.

### SPECIAL-PURPOSE MACHINES – MAINTENANCE

<b>Target group</b>	Mechanical maintenance technicians or electrical maintenance technicians (prior arrangement required)
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical/electrical systems</li> <li>• Basics of machine operation and geometry</li> <li>• Experience with machine tools</li> </ul>
<b>Duration / venue</b>	1 day – on customer premises (prior arrangement required) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure of the machine (assemblies, guides, drives, measuring systems, tool magazine)</li> <li>• Introduction to the machine documentation</li> <li>• Service and preventive maintenance measures</li> <li>• Introduction to the special equipment</li> <li>• Motorized spindle (inspection)</li> <li>• Machine zero points</li> <li>• Fluid technology</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Analyzing and rectifying mechanical faults</li> <li>• Replacing spare and wear parts</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Localizing sources of faults</li> <li>• Carrying out repair activities</li> </ul>

### SPECIAL-PURPOSE MACHINES – OPERATION

<b>Target group</b>	<ul style="list-style-type: none"> <li>• Specifically for operating personnel</li> <li>• Also recommended for maintenance personnel depending on their tasks</li> </ul>
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Knowledge of the function of automated machine tools</li> <li>• Basic course of the control system manufacturer</li> <li>• Training immediately follows process commissioning</li> </ul>
<b>Duration / venue</b>	1 day – on customer premises (prior arrangement required) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety training</li> <li>• Introduction to safety technology</li> <li>• Structure of the machine</li> <li>• Basics of machine operation</li> <li>• Operating modes and how they are used</li> <li>• Tool management and its use</li> <li>• Detecting faults (troubleshooting)</li> <li>• Seating check</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Correct and safety-conscious machine operation</li> <li>• Minimizing machine downtimes through proactive machine operation</li> <li>• Sufficient knowledge of GROB machining technology</li> </ul>

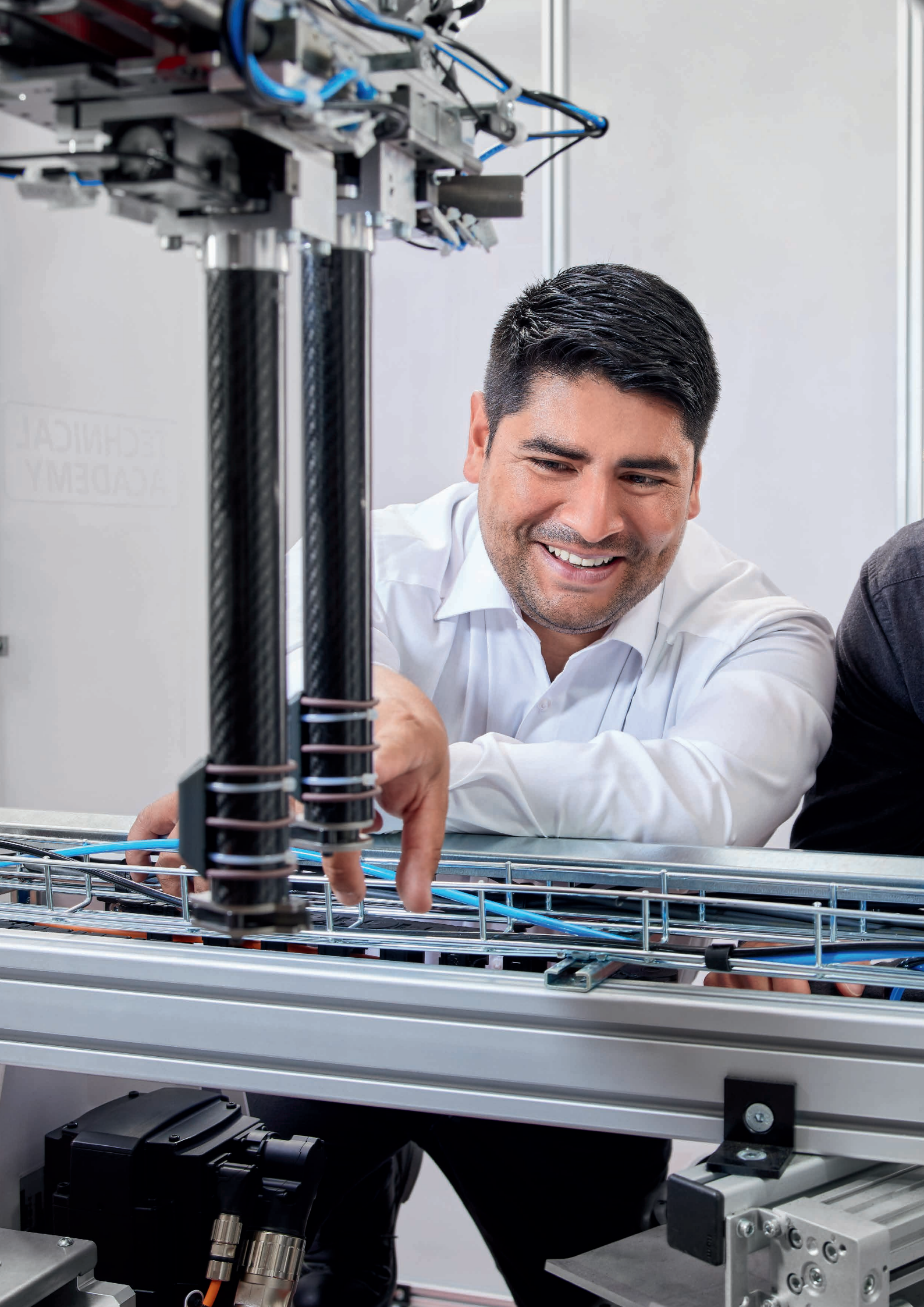
## ROBOT TRAINING – BASIC COURSE

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for operating personnel</li> <li>Also recommended for maintenance personnel depending on their area of activity</li> </ul>
<b>Requirements</b>	Knowledge of the function of robots
<b>Duration / venue</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	Prior arrangement with the robot manufacturer necessary (KUKA, ABB, or FANUC) <ul style="list-style-type: none"> <li>Structure of a robot</li> <li>Safety and operating modes</li> <li>Coordinate systems</li> <li>Base and tool measurement</li> <li>Determining the load data</li> <li>Plotting zero points</li> <li>Selecting and running programs</li> <li>Moving to transfer points and positions</li> <li>Retracting the robot and creating/uploading backups</li> <li>Backing up and reimporting programs</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Correct and safe robot operation</li> <li>Minimizing downtimes through proactive machine operation</li> <li>Expert knowledge about robots in GROB machining technology</li> </ul>

## ROBOT TRAINING – ADVANCED COURSE

<b>Target group</b>	<ul style="list-style-type: none"> <li>Specifically for operating personnel</li> <li>Also recommended for maintenance personnel depending on their area of activity</li> </ul>
<b>Requirements</b>	Knowledge from the "Robot training – basic course" training course
<b>Duration / venue</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	Prior arrangement with the robot manufacturer necessary (KUKA, ABB, or FANUC) <ul style="list-style-type: none"> <li>Structure of a robot and the connected stations</li> <li>Safe operation and system setup</li> <li>Correct use of the operating modes</li> <li>Handling individual work steps</li> <li>Interface between robot and GROB system</li> <li>Retracting the robot in the event of a fault</li> <li>"Re-teaching" positions</li> <li>Adjusting the program structure</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Correct and safe robot operation</li> <li>Minimizing downtimes through proactive machine operation</li> <li>Expert knowledge about robots in GROB machining technology</li> </ul>









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## OPERATION

<b>Target group</b>	Machine operators, mechanical and electrical maintenance technicians
<b>Requirements</b>	Basic knowledge of the assembly line
<b>Duration</b>	0.5 days per station (project-specific adaptation required) <ul style="list-style-type: none"> <li>Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Introduction to safety technology</li> <li>Structure of the machine</li> <li>Basics of machine operation</li> <li>Operating modes and how they are used</li> <li>Detecting faults (troubleshooting)</li> </ul> <p>Additional training course content must be adapted individually for the system.</p>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Correct and safety-conscious machine operation</li> <li>Fast correction and analysis of malfunctions</li> <li>Minimizing machine downtimes</li> </ul>

## SPECIAL-PURPOSE MACHINES – OPERATION

<b>Target group</b>	Mechanical maintenance technicians
<b>Requirements</b>	Training on mechanical systems
<b>Duration</b>	1 day per station (project-specific adaptation required) <ul style="list-style-type: none"> <li>Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>Structure and function</li> <li>Inspection</li> <li>Service and preventive maintenance measures</li> <li>Replacing wear parts</li> </ul> <p>Additional training course content must be adapted individually for the system.</p>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>Localizing and rectifying mechanical faults</li> <li>Replacing spare and wear parts</li> <li>Minimizing machine downtimes</li> <li>Carrying out inspection and preventive maintenance tasks</li> </ul>

## LINEAR GANTRY

<b>Target group</b>	Mechanical maintenance technicians, electrical maintenance technicians, or machine operators (prior arrangement required)
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Comprehensive training on mechanical/electrical systems</li> <li>• Basics of machine operation</li> <li>• Experience with assembly systems</li> </ul>
<b>Duration</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Operating modes and how they are used</li> <li>• Linear gantry (structure)</li> <li>• Structure and setup of the axes and grippers</li> <li>• Checking and setting up the transfer position</li> <li>• Setting the required parameters</li> <li>• Automatic mode and operation</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Using the technical documentation as a reference</li> <li>• Correcting reference setting points</li> <li>• Localizing and rectifying mechanical and electrical faults</li> <li>• Performing preventive maintenance and inspection tasks</li> <li>• Correct and safety-conscious machine operation</li> <li>• Minimizing machine downtimes through proactive machine operation</li> </ul>

## MECHANICAL SYSTEMS

<b>Target group</b>	Mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Training on mechanical systems</li> <li>• Basic knowledge of hydraulic and pneumatic systems</li> <li>• Knowledge of preventive maintenance for assembly lines</li> </ul>
<b>Duration</b>	0.5 days per station (project-specific adaptation required) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (20 %) and practical exercises (80 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure of the machine (assemblies, guides, drives, measuring systems, etc.)</li> <li>• Service and preventive maintenance measures</li> <li>• Replacing wear parts</li> </ul> <p>Additional training course content must be adapted individually for the system.</p>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Localizing and rectifying mechanical faults</li> <li>• Replacing spare and wear parts</li> <li>• Minimization of machine downtimes</li> <li>• Carrying out inspection and preventive maintenance tasks</li> </ul>



*Training modules*

# ASSEMBLY & E-MOBILITY.

## MECHANICAL MAINTENANCE

<b>Target group</b>	Mechanical maintenance technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Training on mechanical systems</li> <li>• Basic knowledge of hydraulic and pneumatic systems</li> <li>• Knowledge of preventive maintenance for assembly lines</li> </ul>
<b>Duration</b>	0.5 days per station (project-specific adaptation required) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (20 %) and practical exercises (80 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to safety technology</li> <li>• Structure of the machine (assemblies, guides, drives, measuring systems, etc.)</li> <li>• Service and preventive maintenance measures</li> <li>• Replacing wear parts</li> </ul> Additional training course content must be adapted individually for the system.
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Localizing and rectifying mechanical faults</li> <li>• Replacing spare and wear parts</li> <li>• Minimization of machine downtimes</li> <li>• Carrying out inspection and preventive maintenance tasks</li> </ul>

## ELECTRICAL MAINTENANCE

<b>Target group</b>	Maintenance technicians, electronics technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Training on electrical or electronic systems</li> <li>• Basic knowledge of drive and control systems technology as well as of the control system used</li> </ul>
<b>Duration</b>	0.5 days per station (project-specific adaptation required) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (50 %) and practical exercises (50 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety training</li> <li>• Function description of the electrical components</li> <li>• Data backup</li> <li>• Data recovery</li> <li>• Hardware replacement</li> <li>• Hardware settings</li> <li>• Diagnostic options</li> <li>• Error analysis and the correct approach to machine malfunctions</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Minimizing machine downtime through preventive maintenance activities</li> <li>• Repair of electrical components</li> <li>• Rectifying and finding electrical faults</li> <li>• Creation and use of the data backup as a reference</li> </ul>



## CAMERA SYSTEMS BASICS (KEYENCE, BAUMER, COGNEX, ETC.)

<b>Target group</b>	BASICS (KEYENCE, BAUMER, COGNEX, etc.) Maintenance technicians, electronics technicians, quality assurance personnel
<b>Requirements</b>	Training on electrical or electronic systems
<b>Duration</b>	1 day (project-specific adaptation required) • Course composition: Combination of theory (60 %) and practical exercises (40 %)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Structure of a camera system</li> <li>• Function description of the electrical components</li> <li>• Hardware replacement</li> <li>• Hardware settings</li> <li>• Diagnostic options</li> <li>• Fault analysis</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Quality improvement through better understanding</li> <li>• Safe replacement of components</li> <li>• Localizing and rectifying faults</li> <li>• Creation and use of data backups</li> </ul>



*Training modules***ASSEMBLY & E-MOBILITY.****SIEMENS TIA – GROB STRUCTURE BASIC COURSE**

<b>Target group</b>	Maintenance technicians, electronics technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Training on electronic systems</li> <li>• Basic knowledge of the control system used</li> </ul>
<b>Duration</b>	3 days (can be adapted project-specifically) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (70 %) and practical exercises (30 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to the hardware</li> <li>• Introduction to the GROB structures</li> <li>• Basics of programming</li> <li>• Data backup</li> <li>• Diagnostic options</li> <li>• Data processing</li> <li>• Interface description</li> <li>• Sequences</li> <li>• Visualization</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Correct and safety-conscious machine operation</li> <li>• Knowledge of the GROB structures</li> <li>• Tracking data communication</li> <li>• Understanding the sub-components' interfaces</li> </ul>

**BECKHOFF – GROB STRUCTURE BASIC COURSE**

<b>Target group</b>	Maintenance technicians, electronics technicians
<b>Requirements</b>	<ul style="list-style-type: none"> <li>• Training on electronic systems</li> <li>• Basic knowledge of the control system used</li> </ul>
<b>Duration</b>	2 days (can be adapted project-specifically) <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (70 %) and practical exercises (30 %)</li> </ul>
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Introduction to the hardware</li> <li>• Introduction to the GROB structures</li> <li>• Basics of programming</li> <li>• Data backup</li> <li>• Diagnostic options</li> <li>• Data processing</li> <li>• Interface description</li> <li>• Sequences</li> <li>• Visualization</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Correct and safety-conscious machine operation</li> <li>• Knowledge of the GROB structures</li> <li>• Tracking data communication</li> <li>• Understanding the sub-components' interfaces</li> </ul>



## LASER BASICS – BASED ON TRUMPF

<b>Target group</b>	Application technicians, operators
<b>Requirements</b>	Technical training
<b>Duration</b>	2 days – Mindelheim Training Center or on customer premises • Course composition: Combination of theory (40 %) and practical exercises (60 %)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety training</li> <li>• Introduction to safety technology</li> <li>• Basics/structure of the various laser systems</li> <li>• Basics of machine operation</li> <li>• Detecting faults (troubleshooting)</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Correct and safety-conscious machine operation</li> <li>• Basic understanding of laser systems</li> </ul>

## ROBOT TRAINING – BASIC COURSE

<b>Target group</b>	Machine operators, maintenance technicians
<b>Requirements</b>	Basic knowledge of automated systems
<b>Duration</b>	2 days • Course composition: Combination of theory (20 %) and practical exercises (80 %)
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Safety during robot operation</li> <li>• Types of movement</li> <li>• Base and tool measurement</li> <li>• Selecting and running programs</li> <li>• "Teaching" points/correcting positions</li> <li>• Retraction of robots</li> <li>• Creating and importing backups</li> <li>• Practical exercises</li> </ul>
<b>Learning objective</b>	Safe operation of a robot



*Training modules***ASSEMBLY & E-MOBILITY.****ROBOT TRAINING – ADVANCED COURSE**

<b>Target group</b>	<ul style="list-style-type: none"> <li>• Specifically for operating personnel</li> <li>• Also recommended for maintenance personnel depending on their area of activity</li> </ul>
<b>Requirements</b>	Knowledge of the "Robot training – basic course" training course
<b>Duration</b>	1 day – on customer premises <ul style="list-style-type: none"> <li>• Course composition: Combination of theory (30 %) and practical exercises (70 %)</li> </ul>
<b>Contents</b>	Prior arrangement with the robot manufacturer necessary (KUKA, ABB, or FANUC) <ul style="list-style-type: none"> <li>• Structure of a robot and the connected stations</li> <li>• Safe operation and system setup</li> <li>• Correct use of the operating modes</li> <li>• Handling individual work steps</li> <li>• Interface between robot and GROB system</li> <li>• Retracting the robot in the event of a fault</li> <li>• "Re-teaching" positions</li> <li>• Adjusting the program structure</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Correct and safe robot operation</li> <li>• Minimizing downtimes through proactive machine operation</li> <li>• Expert knowledge about robots in GROB machining technology</li> </ul>





## KISTLER SPINDLE TRAINING

<b>Target group</b>	Mechanical maintenance technicians, machine operators, quality assurance personnel
<b>Requirements</b>	<ul style="list-style-type: none"><li>• Training on mechanical systems</li><li>• Basics of machine operation</li></ul>
<b>Duration</b>	1 day – Mindelheim Training Center or on customer premises <ul style="list-style-type: none"><li>• Course composition: Combination of theory (10 %) and practical exercises (90 %)</li></ul>
<b>Contents</b>	<ul style="list-style-type: none"><li>• Introduction to safety technology</li><li>• Structure, function, service, and preventive maintenance activities for spindles</li><li>• Spindle removal and installation incl. referencing</li><li>• Basic spindle settings</li><li>• Operation of the maXYmos HMI (control system)</li><li>• Basic structure of the programs</li><li>• Evaluation of press-fitting programs</li><li>• Calibration of press-fitting spindles</li></ul>
<b>Learning objective</b>	<ul style="list-style-type: none"><li>• Understanding the maXYmos control system</li><li>• Performing preventive maintenance and inspection tasks</li><li>• Carrying out repair activities</li><li>• Correct and safety-conscious machine operation</li></ul>





Magazin HBG) > G516-1920-0000-01 (Bürsteinheit)

Schnellsuche

## Bauteil-Details

### Informationen

Material-Nr. GROB: 1663

GROB Benennung: Decke

Menge: 1

ME: ST

ETV: ☒

### Icons

Benennung	Hersteller	Bestell-Nr.	Typ-Bez.
	GROB		
	GROB		
	GROB		
	GROB		
	GROB		

System





*Stabilized production  
with training*

# UNIVERSAL CONCEPTS FOR ALL TECHNOLOGIES.

GROB offers its customers a broad spectrum of state-of-the-art training courses. With all expertise and core processes in-house, we can elaborate on your individual systems.

- ⊕ Strengthening of individual maintenance competence
- ⊕ Understanding & lasting correction of faults
- ⊕ Stabilization of internal workflows
- ⊕ A highly qualified contact person on site



GROB TECHNICAL ACADEMY – PORTFOLIO.

#universalmachiningcenters

#machiningtechnology

#assembly\_and\_electromobility #e-learning

#specialequipmentbox #service

*Training modules*

# UNIVERSAL CONCEPTS FOR ALL TECHNOLOGIES.

## SKILL GAP ANALYSIS (WORKSHOP)

<b>Target group</b>	Machine operators, mechanical and electrical maintenance technicians
<b>Requirements</b>	Power of instruction
<b>Duration</b>	1 – 2 days/depending on complexity
<b>Contents</b>	Joint elaboration of a qualification matrix and associated job profiles for different roles
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Covering all required skills and qualifications to operate the system safely</li> <li>• Develop an understanding of the complexity of the machine</li> <li>• Identify possible qualification deficits of various target groups</li> </ul>

## The skill gap analysis as an introduction to customer-specific training concepts





## ON-THE-JOB TRAINING

<b>Target group</b>	Maintenance technicians, maintenance personnel
<b>Requirements</b>	Corresponding field of activity and authorization
<b>Duration</b>	<b>By agreement</b> Example: during shifts, 8 – 10 h per day, Mon – Fri Recommendation: min. 1 – 3 months, ongoing if needed
<b>Contents</b>	<ul style="list-style-type: none"> <li>• Maintenance qualification</li> <li>• Developing system-specific competence: mechanical &amp; electrical</li> <li>• Developing problem-solving competence</li> <li>• Fault analysis</li> <li>• Stabilization of systems</li> <li>• Preventing machine downtime</li> <li>• Attending and establishing shop floor meetings and documentation, 8D, FMEA, RCA, etc.</li> </ul>
<b>Learning objective</b>	<ul style="list-style-type: none"> <li>• Strengthening of individual maintenance competence</li> <li>• Understanding &amp; lasting correction of faults</li> <li>• Stabilization of production and internal workflows</li> </ul>



*Everything at a glance*

# GENERAL CONDITIONS.

## GENERAL INFORMATION

<b>Registration</b>	<p>Please provide the following information when submitting your training inquiry/application:</p> <ul style="list-style-type: none"> <li>• Relevant training module</li> <li>• Number of participants including first and last names (The maximum number of participants per course is limited to five. No minimum number of participants is required.)</li> <li>• Your complete contact data (company name, address, telephone number and e-mail address, as well as a contact for inquiries). The training application is binding only after our e-mail confirmation!</li> </ul>
<b>Training duration</b>	The training time is indicated to the customer in days, whereas one day lasts from 8 am – 3 pm unless otherwise agreed. The total break time is 45 minutes, usually divided as follows: 15 minutes in the morning, 30 minutes at noon.
<b>Language of the training</b>	German or English – if interpreters are required, these must be provided by the customer. We will of course assist you with your search for a suitable interpreter.
<b>Cancellation</b>	A cancellation of the training is free of charge, provided that the written cancellation notice arrives at GROB 14 days before the start of the course at the latest. Cancellations received after this time will incur a charge of 30 % of the course fees. If a participant fails to attend or leaves the course prematurely, the full fee will be charged.
<b>Agreed performance period</b>	The ordered training course(s) must be completed within three years from the date of order confirmation, otherwise the customer's claim to fulfillment expires and the service is considered to have been rendered.
<b>Course procedure</b>	All courses are held at GROB in professionally-equipped training rooms.
<b>Course materials</b>	Training documentation is provided in German or the language of the Technical Documentation supplied. Please contact us if further languages are required. The course materials are protected by copyright. They must not be copied nor otherwise reproduced, either in whole or in part, without the trainer's prior consent. Use of online content: For training activities and content made available online by GROB (e.g., webinars, online courses, etc.), the customer will receive a temporary, non-transferable right of use depending on the agreement.
<b>Disclaimer</b>	The information provided in the courses and related documents is always given to the best of our knowledge and ability. GROB does not accept any liability for discrepancies or errors. The written information in particular does not constitute any assurance of quality or the equipment versions of the machines sold.
<b>Accommodation during the courses</b>	The participants must arrange their own accommodation. We will of course assist you with your search for overnight accommodation.
<b>Safety</b>	The training participants are obliged to observe and comply with the safety regulations applicable on GROB company premises. Specifically, the participants are obliged to wear safety footwear. Please bring safety footwear with you to the training.
<b>Costs</b>	We will happily inform you of all costs on request. Generally speaking, the costs are calculated per training day and participant.
<b>Meals</b>	Per training day, each participant will receive drinks, snacks and one lunch free-of-charge in the GROB company restaurant.

*Everything at a glance*

# INDIVIDUAL TRAINING PLANS WITH GROB.

If you are not sure which is the best course for you, we would be happy to create an individual training concept. We will work with you to analyze your needs and requirements to develop a tailored course that meets your personal expectations.



## ANALYSIS OF

- ⊕ your needs and requirements

## DESIGN OF

- ⊕ customized training courses

## TRAINING

- ⊕ tailored to your requirements

*Learn when and where you want!*

# E-LEARNING@GROB.



## DIGITAL TRAINING CONCEPTS WITH GROB

Our e-learning portfolio is being continuously expanded to provide workplace-based learning in various fields at the "moment of need". The aim of digital training is to convey complex content to learners as interactively as possible.

**Expand and deepen your knowledge with digital training!**

## Your benefits

- ⊕ Flexibility with learning provided anywhere and anytime
- ⊕ Individual topics
- ⊕ Ideal preparation for on-site training courses
- ⊕ Interactive modules
- ⊕ Adjustable learning speed for more efficient work
- ⊕ Central access to e-learning via the GROB Campus

Multimedia learning is possible with e-learning on a wide variety of electronic devices, such as tablets, PCs and laptops. **And the best part? Learn when and where you want!**





*As versatile as your requirements*

# SPECIAL EQUIPMENT BOX.

The box and its contents can be requested and ordered individually specific to the machine type.

## USB STICK

Documentation of  
all operations



## REFERENCE TOOL HOLDER

Determination of the spindle  
zero degree position



## ASSEMBLY AID FOR THE SEALING RING

Lip seal installation in the clamping set



## HOLDER PLATE

Geometry measurement



## TAPER WIPER

Cleaning of the tool holder  
on the motorized spindle



## ARTICULATED TRIPOD

Geometry measurement



## MIRROR

Auxiliary equipment



## LEVER TYPE DIAL INDICATOR, 0.002 MM

Geometry measurement



\* The special equipment pieces displayed are examples. You can find the entire product range for the box contents in our equipment catalog.









## *Friendly, committed, competent* **GROB SERVICE.**

From 24-hour service and a comprehensive range of spare parts and training courses to professional machine maintenance and analysis: The GROB service spectrum offers you a comprehensive range of products and services and is available to you worldwide thanks to our global production plants and service branches.

- ✚ Worldwide service network
- ✚ Available 24/7/360
- ✚ One hotline for everything
- ✚ We are right where our customers are



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#grobtechnicalacademy



*Worldwide throughout the machine service life*

# GROB – GLOBAL AND INTERNATIONAL.

From Bavaria to the world: Since our founding in 1926 in Munich, we as a global, family-managed company have been on a constant growth trajectory developing and manufacturing systems and machine tools. Our customers include the world's leading automotive manufacturers, their suppliers, and renowned companies from the aerospace, mechanical engineering, and other industries. With our production facilities in Germany, Brazil, the USA, China, Italy and India, as well as 14 worldwide service centers and sales branches, we are represented around the globe, ensuring the highest quality.

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*Our global production sites*



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São Paulo, Brazil

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Baar, Switzerland  
Poznań, Poland  
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Haiphong, Vietnam  
Bangkok, Thailand



**Bluffton, USA**



**Dalian, China**



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**Bangalore, India**



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#usedmachines #service*

