GUNT TECHNOLOGY LIMITED

GUNT-TVET

Technical and Vocational Education and Training with GUNT

Training people, empowering the economy, creating opportunities

TVET for operation & maintenance services

GUNT-TVET

Table of contents

Technical and Vocational Education and Training with GUNT	04
Learning & practice modules	06
GUNT DigiSkills	08
Industrial application projects – learning in an environment similar to industry	10
Pilot plants & training plants	12
Hands-on is our daily business	14

TVET with GUNT
in the area of operation & maintenance services

Technical and vocational education and training (**TVET**) is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods.

Source: UNESCO 2015 "Recommendation concerning technical and vocational education and training"

At **GUNT**, we have made skills development in vocational training our most important task. While theoretical knowledge lays the foundation, we are strong advocates for a hands-on approach.

Operation & maintenance services showing the highest demand of skilled workforce in most of the industrial sectors nearly everywhere:

- industrial operations on the environment
- renewable energies and energy efficiency, including hydrogen
- chemical and pharmaceutical industry
- food and beverage service
- transport and logistic
- health industry

GUNT can offer you nearly everything to cover the various learning areas of the curriculum in the area of operating & maintenance services.

By collaborating with GUNT, TVET institutions can access cutting-edge curricula, training materials, and hands-on learning equipment specifically tailored for your needs.

GUNT-TVET
www.gunt.de

Technical and Vocational Education and Training with GUNT

Learning & practice modules

GUNT offers a wide range of learning and practical modules that meet almost all the requirements of typical maintenance and reliability trainings.

- learning step by step: GUNT offers the perfect device for all training levels
- practice-oriented devices, but carefully planned from a didactic perspective
- ideally suitable for students' group working or project-oriented working methods
- typical maintenance methods and testing procedures are offered as learning content

TM124
Worm gear unit

HM700.20 Cutaway model: piston pump

GUNT DigiSkills

The teaching of digital skills in training students and professionals takes an essential part due to the increasing digitalisation of work processes in the context of Industry 4.0. **GUNT DigiSkills** learning projects aim to support the digitalisation of the vocational education.

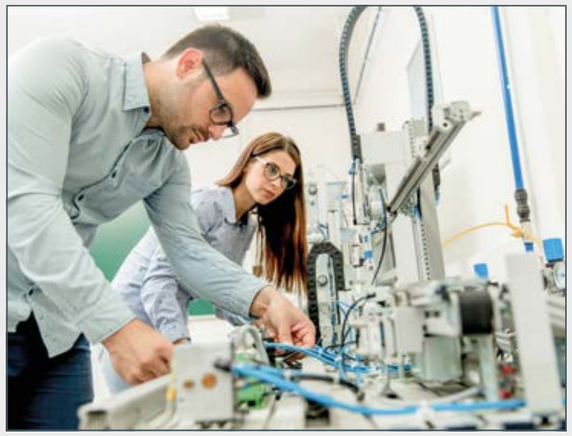
MT101
Assembly exercise: pneumatically driven control valve

- interdisciplinary, practical, process-oriented and fully digitally supported
- carefully and comprehensively planned from a didactic perspective
- practice-oriented devices with industrial components

MT174
Sorting plant

Industrial application projects

Each of GUNT's Industrial application project replicates a real industrial process. Functions, operations and maintenance tasks are run through step by step.



- learning in an environment similar to industry
- industrial processes represented in all its aspects
- latest process technology, cutting-edge industrial components
- carefully prepared for training: clear design, easily accessible
- wide range of typical operations and maintenance tasks

Pilot plants & training plants

The pilot plants & training plants of GUNT are particularly designed to meet the specific training needs of the industry.

- handling real-world industrial equipment components
- detailed familiarisation with plants and processes
- understanding and executing maintenance and servicing procedures aspects of plant and occupational safety

MPTR
Main Process Training Rig

Learning & practice modules

GUNT DigiSkills

Industrial application projects

Pilot plants & training plants

Power transmission: gears, driving belts, bearings, couplings

- get to know gears, driving belts, bearings, couplings...

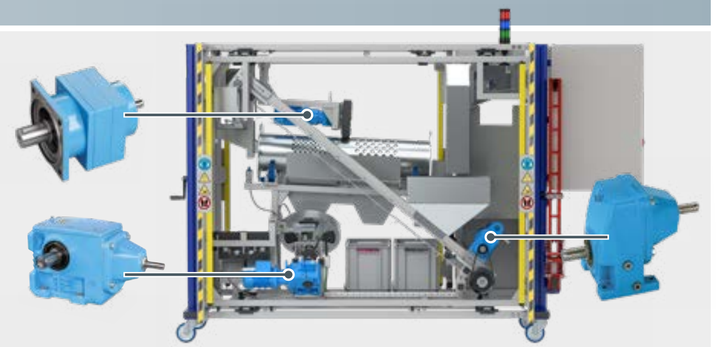
- cutaway models of gears, drive elements, bearings

- assembly projects: gears, bearing
- gear units in an industrial plant

- test stand for gears
- advanced level: machinery diagnosis

Gear units in an industrial plant

This complex learning project is based on the MT174 Sorting plant including real operation processes. The entire process of preventive maintenance is applied to the drive trains of the individual elements.
The process is IT-supported, using a wide variety of digital elements and technologies. Three different gearboxes are included.



Fluid power: pumps, plumbing, valves and fittings

- fundamentals of fluid mechanics
- hydraulics with HM150 hydraulic bench

- cutaway models of pumps, plumbing/piping, valves and fittings

- assembly of pumps, valves and fittings
- plumbing/piping
- pneumatics/compressors

- test stands for valves and fittings

Complex piping and pump system

The HL962 Assembly stand for pumps together with the tank system and connecting pipes results in a complete system with a closed water circuit. The following work steps, for example, can be practiced in detail:

- the removal and installation of pumps for inspection, repair or replacement
- aligning the drive
- commissioning and testing the pump, e.g. for leaks

HVAC: refrigeration, ventilation, air conditioning

- cold production
- modular systems for different refrigeration circuits

- cutaway models of refrigeration components

- assembly & maintenance
- study projects, service exercises

- mechanical faults
- electrical faults

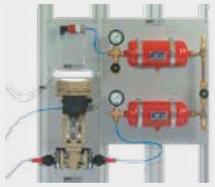
Refrigeration training system

The modular ET910 Training system can be used to construct various refrigerant circuits thanks to a comprehensive selection of refrigeration components. Refrigeration solutions and real world problems are worked out didactically in experiments.

Instrumentation and control: control valves, process control, control systems, field instrumentation

- principles of industrial sensors
- pneumatics and hydraulics

- basic process control
- PLC basics
- calibration



- process measurement
- basic experiments on common controlled variables
- smart instrumentation

- industrial-scale experimental plant, fault finding

Process automation training system

Together with its wide-ranging accessory components, the RT450 base module provides a modular, fully flexible and open-design system for learning the fundamentals of process automation by means of experimentation.
The accessory components are pre-installed on panels.

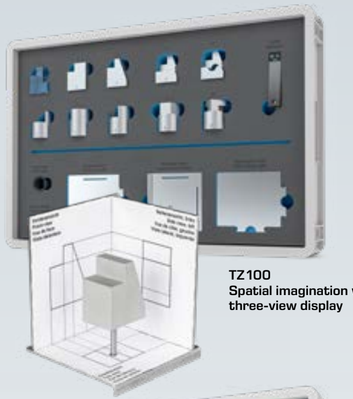
GUNT-TVET
www.gunt.de

Learning & practice modules | **GUNT DigiSkills** | Industrial application projects | Pilot plants & training plants

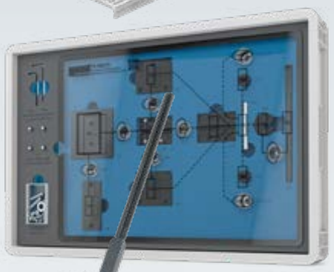
GUNT DigiSkills projects aim to support the digitalisation of the vocational education and thus the transition to a more effective and efficient education and training system, in particular by promoting digital learning and teaching in TVET.

Engineering drawing

- fundamentals of engineering drawing
- geometric models, functional models
- Geometrical Product Specifications (GPS)
- constructive thinking, machine elements, materials



TZ100
Spatial imagination with three-view display



TZ200.01
Assembly exercise: bending press

Dimensional metrology

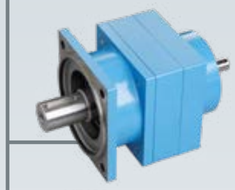
- fundamentals of inspection technology: testing, measuring, gauging
- familiarisation with measuring instruments
- Geometrical Product Specifications (GPS)
- surface marking, fit systems

PT108
Dimensional metrology, output shaft

Preventive maintenance

- design and function of a sorting plant
- predictive maintenance, condition monitoring
- assembly and disassembly, functional testing, commissioning
- machine elements, materials

MT120
Assembly exercise: spur gear



MT122
Assembly exercise: planetary gear

MT123
Assembly exercise: spur and worm gear

MT174
Sorting plant

Energy efficiency in compressed air systems

- design and function of a compressed air system
- assembly and functional testing of compressed air generators
- systematic optimisation of modern compressed air systems
- representation of energy flows

Whether assembly or explanatory films, the videos can be played again and again, a repetition that ensures learning success.

Checking the belt tension

Robotics and automation

- robot programming, process automation
- mechanics, hydraulics, pneumatics, electrics
- control system, PLC
- sensors and actuators
- system integration
- process integration

GUNT-TVET
www.gunt.de

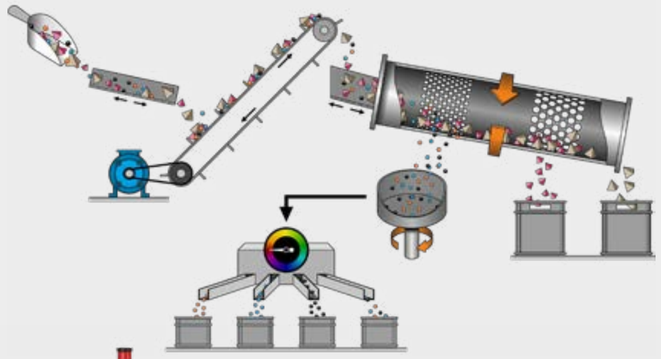
Industrial application projects – learning in an environment similar to industry

Industrial application projects from GUNT are designed for learning in an environment similar to industry. All the devices included are fully functional systems, designed for training and hands-on work. Each device replicates a real industrial process. Functions, operations and maintenance tasks are run through step by step.

- industrial processes represented in all its aspects
- latest process technology, cutting-edge industrial components
- carefully prepared for training: clear design, easily accessible
- wide range of typical operation and maintenance tasks

Work on system level

- analysing a complex industrial system
- recognising sub systems
- understanding functionality and operation
- understanding maintenance demand



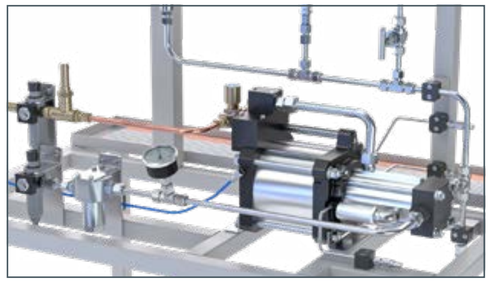
Switching between the levels gives you a perfect TVET learning environment.

Work on component / sub system level

Coming from an industrial application and branching into various technology fields

- gears and drive elements
- instrumentation and control
- valves, pumps, pipes...

Industrial application projects from various technology areas



MT 220 Assembly station: gas booster in hydrogen technology

Compressors are essential for the utilization of hydrogen: they compress the hydrogen after electrolysis and thus enable space-efficient storage, for example.
With MT 220, the pipe assembly of the device is carried out by the trainees themselves. This also includes bending and cutting the pipes to length. A final leak test completes the range of experiments.

CE 585 Water purification process

CE 585 provides a clear demonstration of the most important key standard operations in water treatment: aeration, filtration, adsorption, ion exchange and disinfection.
In addition to unit operation with primarily monitoring tasks, various maintenance tasks can be carried out: e.g. backwashing or replacing filters, regeneration of ion exchangers.

ET 195 Process cooling

In various areas of technology, reliable and precise process cooling is a key factor for maximum product quality. With ET 195 trainees get to know a water cooler in detail and learn about important aspects of maintenance in a practical way. Maintenance tasks include replacing components, filling, emptying and evacuating, as well as pressure testing and fault findung.

CE 750 Pasteurisation process

CE 750 can handle all aspects of pasteurisation. The key element is an industrial plate heat exchanger that is divided into three sections: heating, heat recovery, cooling. The experimental unit is suitable for numerous hours of instruction and hands-on practice. The heat exchanger, for example, can be completely dismantled for maintenance tasks.

MT 174 Sorting plant

The MT 174 sorting plant comprises a separation process that serves as an application example for various maintenance tasks. Bulk material is separated into three size fractions using a drum screen. The fine fraction is next sorted by colour.
Maintenance work is carried out on the drive trains of the individual elements.

GUNT-TVET
www.gunt.de

Pilot plants & training plants

GUNT training systems for industry are absolutely authentic:

- handling real-world industrial equipment components
- detailed familiarisation with plants and processes
- familiarisation with and application of industrial automation technology
- operating plants
- understanding and executing maintenance and servicing procedures
- aspects of plant and occupational safety

Complete course concepts with diverse problems can be constructed and the training plant can be the centre of training for several weeks. For example, the MPTR Main Process Training Rig. The training rig is based entirely on industrial technologies. It presents a complex project task for training of piping and plant fitters as well as for maintenance technicians. Mechanical, electrical and hydraulic topics can be covered with this rig.

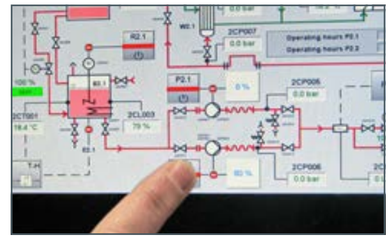
The rig consists of **two units:**

- **Unit 1: flow control and level control**
- **Unit 2: flow control, level control and temperature control**

The operating parameters are monitored with the aid of measuring instruments

Assembly of a pump

With different fittings different operating conditions can be set



Touchscreen operation on the device

Pumps can be removed and tested

Optionally available pump test bench **HM 1000**

MPTR Main process training rig

Training plant for pipeline and pump systems:

- assembly and disassembly of pipe components such as valves, pipes, measurement instruments and pumps
- monitoring the operation
- maintenance of pumps and other parts
- filling and bleeding pumps and suction pipes
- operating pumps in series or parallel
- setting parameters and configurating electronic controllers
- control loops for level, flow rate and temperature
- fault finding at pipe components and instrumentation
- identifying and rectifying malfunctions
- reading and understanding process schematics

GUNT-TVET
www.gunt.de

Hands-on is our daily business

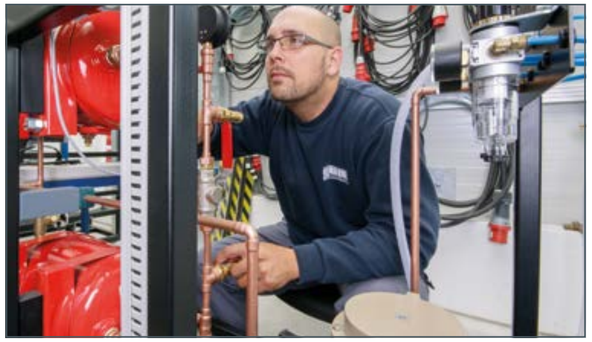
When it comes to TVET education, we know what we're talking about!

As manufacturer of Equipment for Engineering Education, we fabricate and assemble our devices in our production hall with TVET trained and skilled staff.

A total of 70 skilled workers and technicians are responsible for the professional production of the equipment. The manufacturing machines at GUNT are state-of-the-art of best available technology.

We train our junior staff: we offer training places for 3-year vocational training Courses in a, e.g. as a cutting machine operator or industrial mechanic.

We know what TVET is and how to apply it successfully!



GUNT service performances

How can we support your TVET teaching:

- commissioning of technical training systems in your laboratory
- trainings on TVET topics in our GUNT Technical Academy
- planning and consultancy – to support your projects in accordance to your curriculum

Bundesministerium für Bildung und Forschung | iMOVE TRAINING – MADE IN GERMANY | bibb Bundesinstitut für Berufsbildung | GUNT-TVET Skills to succeed | H2SKILLS Green hydrogen expertise

References for TVET projects all over the world

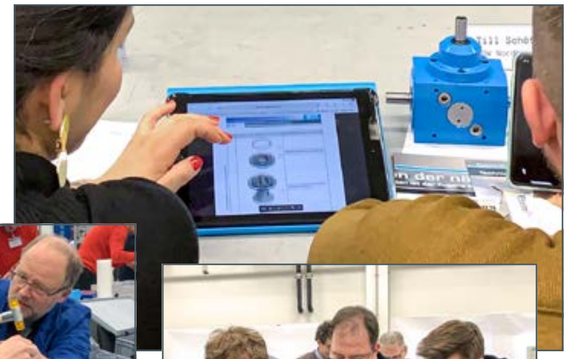
GUNT has supplied TVET educational engineering equipment to many TVET establishments all over the world, among which are the following that we are happy to have built relationships with:

Rhein-Erft Akademie
Cologne, Germany: several DigiSkills projects, e.g. the DigiSkills 3 devices including MT174

New College Durham
Durham, England: DigiSkills 3 devices including MT174

ITQAN Institute
Ras Tanura, Saudi Arabia: IUI, Inspection Unit for Industry

CAPP - Centro de Adiestramiento en Procesos de Producción
El Rancho, Qro., Mexico: MPTR, Main Process Training Rig



G.U.N.T. Gerätebau GmbH
Hanskampring 15 - 17
22885 Barsbüttel
Germany

+49 40 67 08 54 - 0
sales@gunt.de
www.gunt.de

GUNT Technology Limited
Unit 3 · Glenmore Business Park
Colebrook Way
Andover, SP10 3GL

t: +44(0) 1264 33 93 56
e: sales@gunt-technology.co.uk
www.gunt-technology.co.uk

Imprint

Image credits: G.U.N.T. Gerätebau GmbH, manufacturer photos, Shutterstock.
Design & typesetting: Profisatz.Graphics, Bianca Buhmann, Hamburg.

Printed on chlorine-free, environmentally friendly paper.

Visit our website
www.gunt.de