

# eHTG – Basic hydraulic knowledge

Examples of learning contents

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# Drive & Control Academy eHTG – the eLearning training for basic hydraulic knowledge

Basic Physical Principles | Pascal's Law  
- Definition of Pascal's Law

The effect of a force on a stationary liquid is such that the force is spread equally throughout the liquid in all directions.

**Basic physical principles:**  
56 study pages and final test

Graphical Symbols | Functions  
- Simplified Representation

Complete power unit      Schematic representation with cross sections      Circuit diagram with graphical symbols

**Graphical symbols:**  
44 study pages and final test

- Learning contents:**
- ▶ Weight and force, pressure, Pascal's law
  - ▶ Flow and flow law, flow types
  - ▶ Origin and throttling of the flow

- Learning contents:**
- ▶ Tasks, systems, structure
  - ▶ Basic elements, drawing elements
  - ▶ Frequently used symbols, circuit diagrams

Design of a Hydraulic System | Components  
- Flow Control Valve

- 1 Hydraulic pump
- 2 Flow control valve
- 3 Pressure relief valve
- 4 Hydraulic cylinder

**Design of a hydraulic system:**  
41 study pages and final test

Hydraulic Pumps | Directly Operated Vane Pump  
- Displacement Position

In displacement position:  
 $p_{pivot} < p_{p2}$   
 $F_n < F_F$

$p_{p1}$  = System pressure  
 $p_{p2}$  = Control pressure  
 $F_n$  = Horizontal force on the stator ring  
 $F_F$  = Spring tension

**Hydraulic pumps**  
46 study pages and final test

- Learning contents:**
- ▶ Functional groups, mode of operation
  - ▶ Important hydraulic components (valves, pumps, cylinders)
  - ▶ Open/closed hydraulic circuit
  - ▶ Losses, efficiency

- Learning contents:**
- ▶ Task and mode of operation
  - ▶ Distinguishing features, typical pump types
  - ▶ External gear pumps, direct operated vane pump
  - ▶ Pump flow, pump performance, efficiency



# Knowledge – the decisive competitive advantage



Bosch Rexroth is one of the globally leading specialists in drive and control technology and has unique technology know-how with regard to products, solutions and their application.

Via the Drive & Control Academy, the company passes this knowledge on and supports the customized training and further development as well as the qualification of technical experts.

"An investment in knowledge  
always pays the best interest."

*Benjamin Franklin*

## eLearning training

Learning anytime,  
anywhere

### Prerequisites:

- ▶ PC with Internet access and email address for personal log-in on Rexroth study server

### Training times:

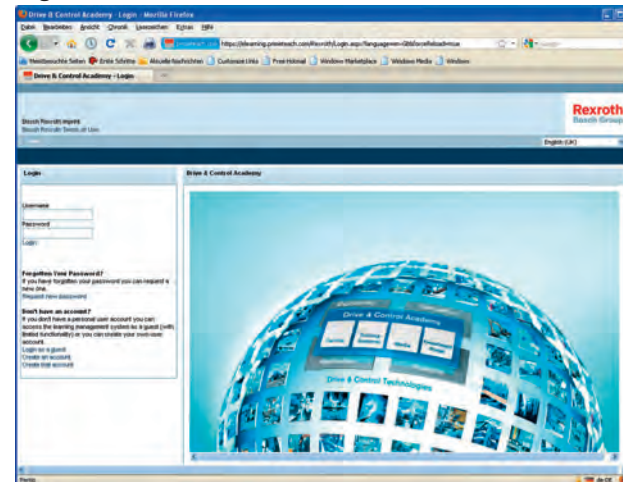
During the license period, the training contents are permanently available.

### Advantages:

- ▶ Free division of time
- ▶ Individual speed of learning
- ▶ Unlimited repeatability

You'll receive your personal log-in 3 to 4 days after receipt of your registration (receipt of order). Your eLearning experience can now begin.

### Log-in window:



After having completed the final test successfully, you will get a personal Rexroth certificate authorizing you to participate in further trainings.

## eHTG - Basic hydraulic knowledge

Learning targets and contents

Today, independent learning at the computer is an integral part of the knowledge transfer. The freedom to choose time and place, unlimited repeatability, individual speed of learning and interactive learning contents make this method an indispensable studying tool.

### Learning targets:

- ▶ Getting to know the basic structure of a hydraulic system
- ▶ Understanding the function and structure of selected hydraulic components
- ▶ Preparing hydraulic diagrams
- ▶ Effectively using technical documentation (DIN ISO 1219, catalog sheets, ...)
- ▶ Learning how to handle hydraulic components and systems in operational everyday life

### Prerequisite:

Technical understanding

### Target group:

People interested in hydraulics, machine operators, maintenance and assembly personnel, people involved in the planning of hydraulic systems, design engineers

From the function and the properties of selected components to the structure of hydraulic diagrams – Many basics that hydraulic engineers need to know are offered in the "eHTG - Basic hydraulic knowledge" online training.

### Contents:

- ▶ Hydraulic systems in general
- ▶ Properties of the hydraulic system
- ▶ Structure and function of a hydraulic system
- ▶ Physical basic principles and their meaning in hydraulics
- ▶ Symbols according to DIN ISO 1219
- ▶ Hydraulic fluids
- ▶ Hydraulic pumps, motors and cylinders
- ▶ Control technology (isolation, directional, pressure and flow control valves)
- ▶ Simple circuit diagrams

### More in-depth trainings (attendance training):

- ▶ HTP-1 – Practical training "Hydraulic on/off valves"
- ▶ HTPPu – Practical training "Hydraulic pumps and motors"
- ▶ EHG – "Electrical engineering for hydraulic engineers"