

# Level 2: Advanced Mechatronics

## Applied Fluid Power—Maintenance & Troubleshooting

**Estimated Duration: 16 hours**

Level 2

This industry recognized certification adds on to the Basic Pneumatics course in Level I. Students will learn how to read and interpret electro-pneumatics circuits and dive deeper into how to maintain, troubleshoot, and repair pneumatic systems. This extends your knowledge of complex pneumatic systems and improves your troubleshooting skills. Practical exercises on training equipment for setup, commissioning, troubleshooting, and fault elimination facilitate the transfer of knowledge to real world industrial applications.

### Industry Recognized Certification Topics

- Setup and commissioning of pneumatic and electro-pneumatic systems
- Analysis of control tasks using GRAFCET in accordance with DIN EN 60848
- Design and function of pneumatic and electro-pneumatic circuits
- Common failures of components
- Characteristics and behaviors of failing components
- Disassembly, inspection, and repair of failed components
- Identifying root causes of component failures
- Troubleshooting of various pneumatic circuits

### Core Competencies

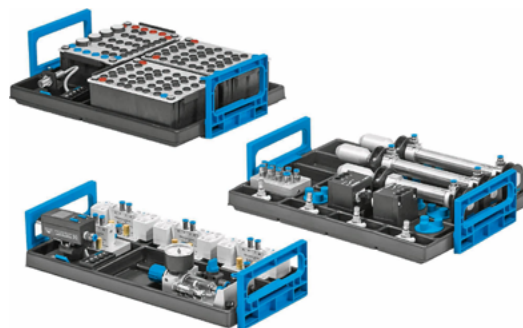
- Set up and commission complex pneumatic systems
- Systematically troubleshoot pneumatic systems
- Know the role of PLC in automation and to integrate the PLC into the control section
- Work with valve terminals
- Interpret latest standards and regulations

### Equipment

#### Electropneumatics System Training Package

This training systems is a direct add-on to the level one Pneumatics Systems. It easily integrates into the bench and includes the following elements:

- Signal input, electrical
- Relay, three-fold
- Mechanical Limit Switches
- Proximity sensor, optical and magnetic
- 2 x 3/2-way solenoid valve with LED, normally closed
- 5/2-way solenoid valve with LED
- 5/2-way double solenoid valve with LED
- Pressure sensor with display
- One-way flow control valve
- Single-acting and Double-acting cylinders
- Faulty component package for real-world troubleshooting



# Level 2: Advanced Mechatronics

## Applied Fluid Power—Vacuum Technology

**Estimated Duration: 8 hours**

Level 2

The use of suction grippers to handle workpieces has become an integral part of handling technology as they offer advantages such as the ease of construction and the gentleness of the grippers. Suction grippers also enable rapid cycle times, and the investment required is comparatively low. Yet, many technicians are not familiar with how it works. This course follows Basic Electropneumatics Training, focusing on the topic of handling technology using a vacuum.

### Course Topics

- Introduction to vacuum technology
- Vacuum generation in handling technology
- Vacuum components in handling technology
- Component selection criteria

### Core Competencies

- Understand and explain the generation and provision of vacuum
- Able to describe the fundamentals of vacuum
- Select and dimensions suction cups
- Interpret the material properties of handling with vacuum
- Interpret the vacuum generator properties
- Design simple vacuum circuits

### Equipment

#### Vacuum Technology Training Package

This learning package directly integrates into the other pneumatics systems and includes a wide range of vacuum elements:

- Air pressure reservoir
- Pressure switch
- Vacuum gauge
- Flow control valve
- Vacuum generator, type H
- Vacuum generator, type L
- Non-return valve
- Non-return valve, delockable
- Six types of suction grippers

