



## Pneumatic Technology Training Syllabus

This 2-day hands-on course is structure to teach fundamental pneumatic concepts, understand system components, operation, and maintenance. Students will learn how to read schematics, understand industry vocabulary, and build pneumatic circuits.

### Module 1 – Introduction to Pneumatic Systems

#### ***Description:***

A foundational understanding of pneumatic systems, including their applications and benefits. Participants will learn about the basic principles of pneumatics and how these systems operate within industrial settings.

#### ***Learning Objectives:***

- Understand the basic principles of pneumatics.
- Identify common applications of pneumatic systems in industry.
- Recognize the benefits and limitations of pneumatic systems.
- Explain the fundamental operation of a pneumatic system.

### Module 2 – Pneumatic Fundamentals

#### ***Description:***

This lesson discusses several concepts such as gas laws, compressibility, force, pressure, work, pneumatic transmission of energy, comparison between pneumatics and hydraulics systems.

#### ***Learning Objectives:***

- Describe the physical laws governing the behavior of confined gases.
- Understand inefficiencies in a pneumatic system.
- Understand heat of compression.
- Demonstrate the relationship between pressure, area, and force.
- Identify factors affecting pressure calculations.
- Understand pressure, vacuum, and flow velocities.

## Module 3 – Pneumatic Symbols and Circuits

### ***Description:***

Introduction to reading pneumatic circuit diagrams and understanding common symbols used in pneumatics, followed by basic circuit design and functionality.

### ***Learning Objectives:***

- Develop the ability to read and understand pneumatic schematic symbols.
- Recognize common symbols and understand their functions.
- Be able to draw common pneumatic schematic symbols.
- Interpret pneumatic schematics to facilitate troubleshoot systems.

## Module 4 – Compressed Air System

### **Description:**

This section focuses on the role of air compressors in pneumatic systems. Participants will review different types of compressors, their working principles, and common issues that can arise.

### **Learning Objectives:**

- Identify different types of air compressors.
- Understand the working principles of each type of compressor.
- Recognize common compressor issues and their causes.
- Determine the cost of air leaks.
- Review air distribution types and installation methods

## Module 5 – Air Treatment and Conditioning

### ***Description:***

Participants will learn about the importance of air treatment and conditioning in maintaining the efficiency and longevity of pneumatic systems. This section covers filters, regulators, and lubricators (FRLs), as well as drying and cooling systems.

### ***Learning Objectives:***

- Understand the importance of air treatment and conditioning.
- Identify the components of an air treatment unit.
- Recognize common air quality issues and their impacts.
- Troubleshoot and maintain air treatment components.

## Module 6 – Pneumatic Valves

### ***Description:***

This section covers the different types of valves used in pneumatic systems, their functions, and common issues. Participants will learn how to diagnose and troubleshoot valve-related problems.

### ***Learning Objectives:***

- Identify various types of pneumatic valves (e.g., directional control valves, solenoid valves flow control valves).
- Understand the function and operation of each type of valve.
- Recognize common valve issues and their symptoms.
- Perform troubleshooting and maintenance on pneumatic valves.

## Module 7 – Pneumatic Actuators

### ***Description:***

Focusing on actuators, this section explores their types, working principles, and common problems. Participants will gain hands-on experience in diagnosing and resolving actuator issues.

### ***Learning Objectives:***

- Identify different types of pneumatic actuators (e.g., cylinders, motors).
- Understand the working principles of each type of actuator.
- Recognize common actuator issues and their symptoms.
- Troubleshoot and maintain pneumatic actuators.

## Module 8 – Vacuum Generators and Cups

### ***Description:***

This section introduces vacuum generators and cups, which are essential for certain pneumatic applications, such as material handling and automation. Participants will learn about different types of vacuum systems, their applications, and troubleshooting techniques.

### ***Learning Objectives:***

- Identify various types of vacuum generators and cups.
- Understand the principles of vacuum generation.
- Recognize common issues with vacuum systems and their symptoms.
- Troubleshoot and maintain vacuum generators and cups.

## Module 9 – Sensors and Instrumentation

### ***Description:***

This section introduces the sensors and instrumentation used in pneumatic systems for monitoring and control. Participants will learn about different sensor types, their applications, and troubleshooting techniques.

### ***Learning Objectives:***

- Identify various types of sensors used in pneumatic systems.
- Understand the role and operation of each type of sensor.
- Recognize common sensor issues and their causes.
- Troubleshoot and maintain pneumatic sensors and instrumentation.

## Module 10 – Connectors and Tubing

### ***Description:***

Participants will learn about the various types of connectors and tubing used in pneumatic systems, including their selection, installation, and maintenance. This section also covers common issues and how to address them.

### ***Learning Objectives:***

- Identify different types of connectors and tubing.
- Understand the criteria for selecting appropriate connectors and tubing.
- Recognize common issues related to connectors and tubing.
- Perform troubleshooting and maintenance on connectors and tubing.