# Introduction To Industrial Pneumatics

Unit Code: NM-03-AU-03307-2024-V1-IASC

Version: 1.0

NSQF Level: 3.0

Instrumentation, Automation, Surveillance & Communication Sector Skill Council
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## Training Parameters

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|---|---|
| **Course** | Introduction to Industrial Pneumatics |
| **Duration** | 30 Hours |
| **Occupation** | Manufacturing |
| **Country** | India |
| **Minimum Educational Qualification & Experience** | 8th<br>Grade Pass + 2 Years NTC/NAC in Relevant field*<br><br>OR<br>10th Grade Pass |
| **Pre-Requisite License or Training** | NA |
| **Minimum Job Entry Age** | 18 Years |
| **Minimum Duration of the Course** | 30 Hours, 0 Minutes |
| **Maximum Duration of the Course** | 30 Hours, 0 Minutes |

# Module Details

## Module 1: Introduction to Fluid Power

**Terminal Outcomes:**

- Gain a comprehensive understanding of fluid power systems, including fundamental principles, industrial applications, fluid properties, and essential safety measures.

| **Duration**: *03:00* | **Duration**: *00:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Introduction to Fluid Power: Basics, Principles and Applications<br>• Importance of Compressed Air Technology in Industries<br>• Compressed Air Fluids: Properties and Selection Criteria | |
| **Classroom Aids** | |
| Whiteboard/blackboard marker/chalk, duster, computer, or Laptop attached to LCD projector | |
| **Tools, Equipment, and Other Requirements** | |
| Laptop, projector, Multimedia Presentation, Pneumatic and Electro-Pneumatic Trainer Kits, Pneumatic cut-sections, etc., Product Animations, Color wall poster, Simulation software, PPE Kit, Safety Signage , First Aid Box, Fire Extinguishers etc. | |

## Module 2: Identification of Industrial Pneumatics Components and Circuits

**Terminal Outcomes:**

- Understand, distinguish, and explain the construction, design features, and functionality of pneumatic components.
- Recognize and describe the graphical symbols for pneumatic, electrical, and electro-pneumatic components.
- Be aware of the latest advancements and current trends in automation products and their applications.
- Acquire practical skills in the operation, maintenance, installation, troubleshooting, and testing of pneumatic valves, filters, cylinders, and circuit design and simulation.

| **Duration**: *04:00* | **Duration**: *07:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Introduction to Pneumatic Systems and their Safety Measures<br>• Describe the functioning and use of various components of an Industrial pneumatic system e.g. –reservoir, strainer, pipelines, Air pressure gauge, pressure gauge, breather filter, all kinds of valves, compressor, dryer, etc<br>• Sequential Flow & Circuit diagram & concept of cascading | • Demonstrate how to interpret circuit diagrams of pneumatic equipment.<br>• Interpret technical specifications and data relating to trouble, cause, and remedy for a product<br>• Demonstrate the standard operating procedure for utilizing tools, measuring instruments, equipment, and necessary spares during work tasks.<br>• Carryout continuity check of all pneumatic & electric connections.<br>• Circuit Design and Simulation |
| **Classroom Aids** | |
| Whiteboard/blackboard marker/chalk, duster, computer, or Laptop attached to LCD projector | |
| **Tools, Equipment, and Other Requirements** | |
| Laptop, projector, Multimedia Presentation, Pneumatic and Electro-Pneumatic Trainer Kits, Pneumatic cut-sections, etc., Product Animations, Color wall poster, Simulation software, PPE Kit, Safety Signage, First Aid Box, Fire Extinguishers, etc. | |

## Module 3: Application and Integration

**Terminal Outcomes:**

- Develop proficiency in the design, operation, optimization, and integration of Industrial Pneumatic circuits, along with exploring industrial applications through case studies and integration with other industrial systems.
- Perform maintenance and troubleshooting on products in alignment with industry practices.
- Gain practical expertise in system optimization through exercises and simulations, and master integration techniques in Industrial Pneumatic through hands-on sessions.

| **Duration**: *04:00* | **Duration**: *06:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Electro Pneumatic Circuit designing using relay ladder diagram<br>• Design and Functioning of Electro Pneumatic products such as Magnetic sensors, Pressure Switches, Relay, etc<br>• Integration of Industrial Pneumatic Systems with other Industrial Systems<br>• Systems Industrial Applications of Industrial Pneumatic Systems: Case Studies | • Practical Exercises on System Optimization<br>• Integration Exercises and Simulations |
| **Classroom Aids** | |
| Whiteboard/blackboard marker/chalk, duster, computer or Laptop attached to LCD projector | |
| **Tools, Equipment, and Other Requirements** | |
| Laptop, projector, Multimedia Presentation, Pneumatic and Electro-Pneumatic Trainer Kits, Pneumatic cut-sections, etc., Product Animations, Color wall poster, Simulation software, PPE Kit, Safety Signage, First Aid Box, Fire Extinguishers, etc. | |

## Module 4: Maintenance and Troubleshooting

**Terminal Outcomes:**

- Develop expertise in preventive maintenance and troubleshooting of Industrial pneumatics systems, addressing common issues and solutions.
- Gain hands-on skills in inspection, maintenance procedures, and troubleshooting exercises for Industrial Pneumatics systems.

| **Duration**: *01:00* | **Duration**: *05:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| ● Preventive Maintenance of Industrial Pneumatics systems<br>● Troubleshooting Pneumatic circuits<br>● Troubleshooting Electro-pneumatic circuits<br>● Troubleshooting Industrial Pneumatics systems: Common Issues, leakage and Solutions | ● Inspection and Maintenance Procedures<br>● Troubleshooting Exercises |
| **Classroom Aids** | |
| Whiteboard/blackboard marker/chalk, duster, computer, or Laptop attached to LCD projector | |
| **Tools, Equipment, and Other Requirements** | |
| Laptop, projector, Multimedia Presentation, Pneumatic and Electro-Pneumatic Trainer Kits, Pneumatic cut-sections, etc., Product Animations, Color wall poster, Simulation software, PPE Kit, Safety Signage, First Aid Box, Fire Extinguishers, etc. | |