

MB200 Principles of Pneumatics



A Comprehensive, Self-Contained System That Introduces Students to Pneumatic Technology and its Applications

TII's instructor-developed curriculum is flexible and features 25 to 30 hours of instruction in pneumatic components, applications and principles. The modular format allows self-teach/self-paced or group instruction. The Physical Properties section combines science and technology as in programs like the Principles of Technology.

Each lesson requires students to conduct an experiment in pneumatic technology using one or more of the 22 industrial-grade pneumatic components, including different types of valves, cylinders and measuring instruments. In the Application Laboratories section of the manual, students use the components to emulate industrial applications.

A complete power supply with compressor, together with a work surface and the components conveniently stored on a panel, provide everything needed to understand this fluid power technology. The compressor is limited to 60 PSI for classroom safety.

The Principles of Pneumatics learning system is one building block in the TII Fundamentals of Technology system. Other modules address the principles of mechanisms, hydraulics, robotics, sensors, programmable controllers, computer interfacing and systems integration. All systems feature:

- Instructor and student versions of the curriculum; the instructor guide includes lesson preparation and presentation suggestions
- Easy-to-read curriculum with three levels of instruction: introduction to components, industrial applications and physical properties
- Student mountable components that maximize comprehension and manual dexterity
- Impact-resistant, lockable and portable case for use in different classrooms or buildings
- Clearly labeled storage panel for component identification and inventory
- Removable panels for mounting the system on a table or in a carrel to meet space requirements

SPECIFICATIONS

The entire learning system is enclosed in a portable and lockable impact-resistant polyethylene storage case. It consists of an experiment station, a component kit, a visual aids chart and a set of courseware that includes a student activity manual and an instructor's reference guide.

Experiment Station

The steel reinforced interior lower panel contains a complete pneumatic power supply and circuit mounting plate. The power supply includes a piston-driven air compressor capable of 60 PSI, equipped with a safety relief valve. The compressor is connected to an air storage tank made of 1/8" welded steel that is monitored by a pressure limit switch to prevent the compressor from running constantly. A regulated (0 to 100 PSI) 2-port distribution manifold with air shut-off valves is also provided. The compressor can be disconnected to allow use of an external air supply. The circuit mounting plate is made of a 1/2" extruded and anodized aluminum T-slot slider bar and includes four component mounting brackets. The entire experiment work station can easily be removed from the case for table-top use.

Component Kit

The kit includes 22 components and instruments to provide a solid understanding of pneumatic technology and how it is applied in the real world. It also includes 20 feet of air hose. Most components are clear for internal observation. They are student mountable for versatility in building circuits and designing applications as well as for promoting dexterity in their use. All devices have industrial grade brass quick-disconnect fittings. The component storage panel is color coded, clearly labeled and silhouetted for component identification and inventory. The components are securely mounted but can be released quickly, and the panel is removable for wall mount or table-top use.

CURRICULUM

The Principles of Pneumatics curriculum was designed and reviewed by a panel of experienced high school and community college teachers. Courseware includes an instructor's reference guide and a student manual with 27 units of activities and instructional support. The 8 to 10 hours of introductory instruction are ideally suited for exploratory Technology Education programs. Each of the three necessary levels of instruction includes background study of the topic, observational and hands-on experiments, application exercises, and mathematical formulas for proving results. Students will also develop skills in problem solving, data management, pneumatic concepts and unit conversion.

A 10 activity modular format is also available.

Introduction to Pneumatic Components

Trainer Familiarization Introduction to Pneumatics Flow Meters Manual Valves Solenoid Valves Air Piloted Valves Flow Control Valves Single and Double Acting Cylinders Lubrication Systems Fluid Contamination and Air Filters Vacuum Generators

Application Laboratories

Paired Cylinders in a Circuit Feedback in Pneumatic Systems Parts Feeder Application Machining Application Introduction to Air Logic Symbols and Schematics

Physical Properties*

Force in Pneumatic Systems
Flow Rate in Pneumatic Systems Work Done with Pneumatic Systems Power in Pneumatics
Fluid Resistance in Air Filters
Fluid Resistance in Pipes
Force Transformers in Pneumatics
Vacuums and Venturies
Glossary
Appendix

** The Physical Properties section of the curriculum has been designed to correlate to the objectives in Principles of Technology by the Center for Occupational Research and Development*

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