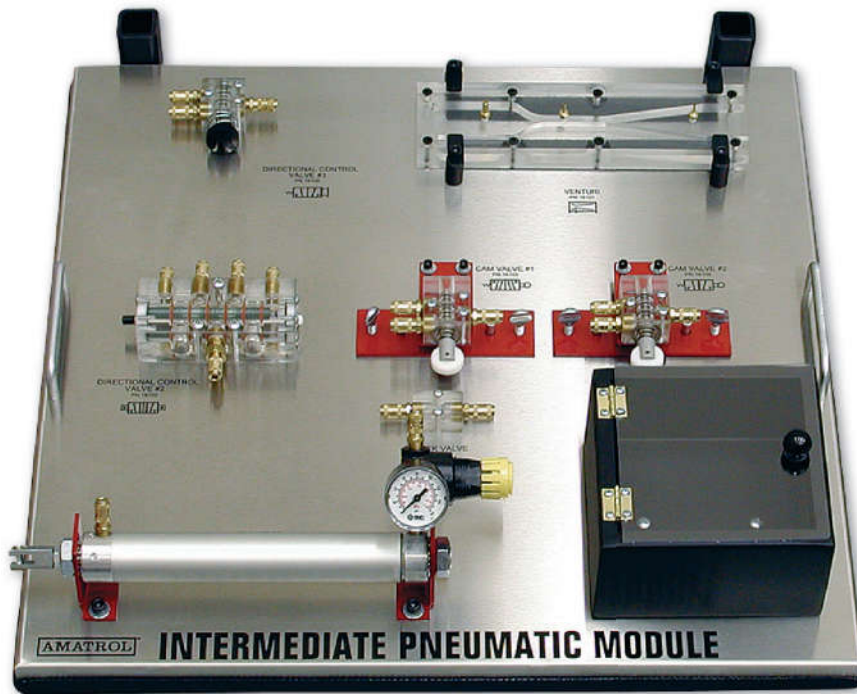


Intermediate Pneumatics Learning System

85-IP

Fp

FLUID
POWER



85-IP



Interactive Multimedia and Student Reference Guide

Learning Topics:

- Pneumatic DCV Applications
- Cam Valves
- Two-Way Valves
- Air Logic
- Externally Piloted Valves
- Pneumatic Maintenance
- Air Filtration
- Water Removal
- Lubrication
- Servicing Pneumatic Components

Amatrol's Intermediate Pneumatics Learning System (85-IP) builds on basic pneumatic skills by introducing more advanced concepts such as air logic, ways to decelerate a pneumatic cylinder, and how to prevent condensation in a pneumatic circuit. Learners will have the opportunity to study these concepts while working with a hands-on training module, which enables practicing skills such as connecting and operating a two-way valve and changing an air filter element; this approach of simultaneously teaching theory and practice reinforces each element and results in a thorough understanding of the topic.

The 85-IP includes directional control valves, check valve, pneumatic cylinder, Venturi block, assorted filter elements, and much more. Amatrol's commitment to using top-flight, industry-standard materials ensures that learners work with components they'll actually see on the job. This attention to quality and detail culminates in a durable, attractive, user-friendly learning system that will last for years.

After completing the 85-IP curriculum, learners can continue to build on these skills by moving on to Amatrol's Advances Pneumatics Learning System (85-AP) and the Pneumatics Troubleshooting Learning System (950-PT1). The 85-AP covers topics such as motor loads, pneumatic cylinder loads, and quick exhaust valves, while the 950-PT1 is the first product to offer a realistic troubleshooting experience for learners because the faults are inserted throughout the system.



Technical Data

Complete technical specifications available upon request.

Intermediate Pneumatic Module

- Pushbutton Valve
- Venturi Block
- DCV Air Pilot-Operated
- Check Valve
- Load Cylinder
- Cam Valve
- Cam-Operated Valve
- Loose Component Storage Box

Loose Components

- Cylinder Seal Kit
- Filter Element, 5 Micron
- Filter Element, 20 Micron
- Filter Element, 70 Micron
- Synthetic Filter Element
- Coalescing Element
- Impingement Device
- Patch Kit
- Service Kit, Air Motor
- Quick-Connect Coupling
- Safety Relief Valve
- Air Bearing
- Lubricator Assembly
- Air Hoses

Interactive Multimedia Curriculum (MB835)

Instructor's Guide (CB835)

Installation Guide (DB835)

Student Reference Guide (HB835)

Additional Requirements:

One of the following: 850-P1, 850-PD1, 850-C1, 850-CD1, or 85-BP

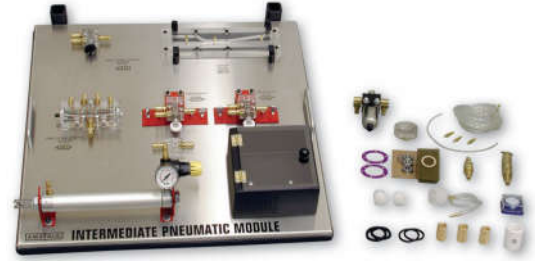
Hand Tool Package (41221)

Utilities:

Supplied by Required System

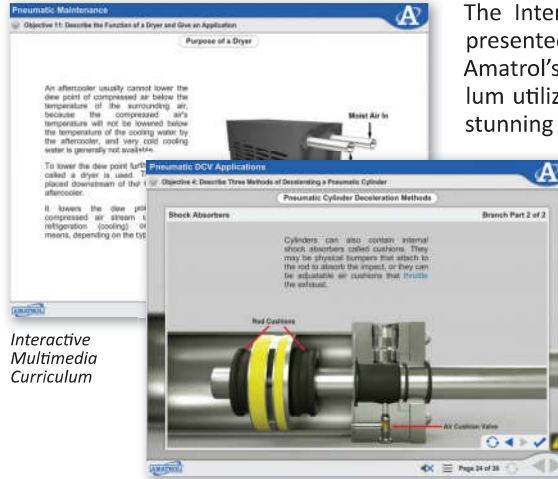
Real World Applications

The 85-IP curriculum will explain how concepts and skills are applied in real-world environments including petroleum refineries and food processing plants. As two examples, the 85-IP will explain how an externally air-piloted pneumatic directional control valve is implemented in a pneumatic punch press and why sliding plate spools are preferable to other spools in a cement plant.



Pneumatic Maintenance

One of the major topics within the 85-IP curriculum is the maintenance of pneumatic components and systems. Because contamination of pneumatic circuits can greatly decrease performance or even breakdown certain components, learners will benefit from the maintenance skills they'll acquire from practicing on the 85-IP module. Specific topics include how to select the correct air filter, how to calibrate pressure gauges, the functions of after coolers and dryers, and the process of aerosol lubrication.



Interactive Multimedia Curriculum

The Intermediate Pneumatics training course is presented in an interactive multimedia format. Amatrol's peerless interactive multimedia curriculum utilizes text with voiceovers, pictures, videos, stunning 3D animations, and interactive quizzes and reviews that engage learners in theoretical knowledge and concepts. This thorough, detailed curriculum begins with the basics and advances to complex concepts. Through partnerships with key industry leaders and leading educators, Amatrol developed the right balance of knowledge to train learners to work in their chosen field.

Expanded Teaching Add-Ons

The next levels for purchase in Amatrol's pneumatics training are the Advanced Pneumatics Learning System (85-AP) and the Pneumatics Troubleshooting Learning System (950-PT1). The 85-AP introduces learners to advanced pneumatic components such as vacuum gauges, manometers, vacuum generator, and orifice plate flowmeter. The 950-PT1 models real world electro-pneumatic machines with 30 faults that can be inserted into the system. The 950-PT1 covers topics such as system tuning, startup/shutdown, and rodless cylinders.

Student Reference Guide

A sample copy of the Intermediate Pneumatics Student Reference Guide is also included with the system for your evaluation. Sourced from the system's multimedia curriculum, the Student Reference Guide takes the entire series' technical content contained in the learning objectives and combines them into one perfect-bound book.



INTERMEDIATE PNEUMATIC LEARNING SYSTEM

This system shall build on basic pneumatic skills by introducing more advanced pneumatic concepts. This learning system requires Amatrol's hand tools package (41221) and a compressed air source. This learning system shall include:

An intermediate pneumatics module that allows for quick setup and easy inventory by providing: pneumatic components pre-mounted on a circuit panel; silk-screened identifications next to each component showing each component's standard symbol, description and part number; and quick connect fittings. To give equipment durability and realistic exposure all components shall be 100 PSI min. rated - industrial grade and the circuit panel shall be of welded stainless steel construction.

Provisions shall also be made to allow the module to be used on a mobile workstation or as a satellite station on any standard work surface. These provisions shall include as a minimum: (2) permanent-mounted lift handles for mobility and mounting surface scuff protection. The components for the module shall include as a minimum:

- Pushbutton Valve Assembly
- Venturi Block Assembly
- DCV Air Pilot-Operated Assembly
- Check Valve Assembly
- Load Cylinder Assembly
- Cam Valve Assembly #1, 3-way
- Cam-Operated Valve #2, 2-way
- Loose Component Storage Box
- Filter Elements: 5 micron, 20 micron, and 70 micron
- Synthetic Filter Element
- Coalescing Element (2)
- Impingement Device
- Patch Kit
- Safety Relief Valve
- Air Bearing
- Lubricator Assembly
- Air Hose – 4-ft., 1/8-in. (2)
- Air Hose – 1-ft., 1/16-in.

Student Curriculum

The student curriculum shall consist of an interactive multimedia course divided into three (3) modules covering thirteen (13) skills in intermediate pneumatics applications. The major topic areas covered shall include: cam valve applications, two-way valves, externally piloted valves, air logic design, air filtration, water removal, lubrication, and how to service pneumatic components.

The student curriculum shall be designed in a skill-based format that focuses on teaching industry-relevant tasks. The objectives shall be accomplished by organizing the learning material into a series of interactive multimedia modules, which are further subdivided into three or more segments per module. All learning material needed shall be contained in the modules including text material, laboratory equipment activities, and multimedia directions. No external text sources shall be required. The specific cognitive skills taught by each text passage shall be identified next to the passage. Each lab activity shall be identified by the industrial task taught. All activities shall be highly detailed with step-by-step instructions to facilitate a self-directed learning environment. A combination of step-by-step enabling activities and creative, problem-solving activities shall be provided. A self-review of five to ten questions shall be provided after each segment. The curriculum must be capable of both self-directed and instructor directed study. All activities must correlate directly to the hardware supplied, with detailed illustrations and diagrams.

Teacher's Assessment/ Portfolio Guides

A teacher's guide shall be provided. It shall contain student data sheets, data sheet solutions, self review answers, quizzes, quiz answers, student skill record sheets, and authentic assessment. A quiz shall be provided for each packet. A question shall be provided in each quiz for each cognitive objective taught. All tasks listed in the packet shall be listed on personalized student record sheets. The Instructor's Package shall include directions for authentic skill assessment.

Amatrol Model No. 85-IP or equal

85-IP
INTERMEDIATE PNEUMATICS LEARNING SYSTEM

LAP 1 PNEUMATIC DCV APPLICATIONS

SEGMENT 1	CAM VALVES
OBJECTIVE 1	Describe the function of a pneumatic cam-operated valve and give an application
OBJECTIVE 2	Describe the operation of a pneumatic cam-operated DCV and give its schematic symbol
SKILL 1	Connect and operate a pneumatic cam-operated 4/2 DCV
SKILL 2	Connect and operate a pneumatic cam-operated 3/2 DCV
SEGMENT 2	CAM VALVE APPLICATIONS
OBJECTIVE 3	Describe the operation of a 2-speed pneumatic circuit using a cam valve
SKILL 3	Design a rapid traverse-slow feed pneumatic circuit
SKILL 4	Design a pneumatic circuit to sequence two cylinders
OBJECTIVE 4	Describe three methods of decelerating a pneumatic cylinder
SKILL 5	Connect and operate a cylinder deceleration circuit using power braking
SEGMENT 3	TWO-WAY VALVES
OBJECTIVE 5	Describe the function of two-way valves
OBJECTIVE 6	Describe the construction and operation of five types of two-way valves
SKILL 6	Connect and operate a two-way DCV

LAP 2 AIR LOGIC

SEGMENT 1	EXTERNALLY PILOTED VALVES
OBJECTIVE 1	Describe the function of an externally air-piloted DCV and give an application
OBJECTIVE 2	Describe the function of a detent and give its schematic symbol
OBJECTIVE 3	Describe four types of pneumatic DCV construction
OBJECTIVE 4	Describe the operation of an externally air-piloted DCV and give its schematic symbol
SKILL 1	Connect and operate an externally air-piloted DCV using the manual override
SKILL 2	Design a pneumatic circuit that uses an externally air-piloted DCV
SEGMENT 2	INTRODUCTION TO AIR LOGIC
OBJECTIVE 5	Define air logic and give two applications
OBJECTIVE 6	List four advantages and four disadvantages of air logic
OBJECTIVE 7	Describe the operation of an air logic cylinder sequence circuit
SKILL 3	Connect and operate a cam-operated sequence circuit
SEGMENT 3	AIR LOGIC DESIGN
OBJECTIVE 8	Describe the function of a shuttle valve and give an application
OBJECTIVE 9	Describe the operation of a shuttle valve and give its schematic symbol
OBJECTIVE 10	Describe the operation of a pneumatic seal-in circuit
SKILL 4	Connect and operate an air logic circuit to control a reciprocating cylinder

LAP 3 PNEUMATIC MAINTENANCE

SEGMENT 1	AIR FILTRATION
OBJECTIVE 1	List four sources of compressed air contamination and explain their effect
OBJECTIVE 2	Describe the operation of three common filter elements
OBJECTIVE 3	Describe the function of a coalescing filter and give an application
OBJECTIVE 4	Describe the operation of a coalescing filter and give its schematic symbol
SKILL 1	Change an air filter element
OBJECTIVE 5	Explain how air filter elements are rated
Activity 1	Measurement of filter element flow rate and pressure drop
OBJECTIVE 6	Describe how to select a filter for an application
SKILL 2	Select an air filter for an application

SEGMENT 2	WATER REMOVAL
OBJECTIVE 7	Define dew point and relative humidity and explain their importance
OBJECTIVE 8	Explain how water condenses in a pneumatic system and its effect
Activity 2	Air filter removal of free water
OBJECTIVE 9	Describe two methods of removing water vapor from a pneumatic system
OBJECTIVE 10	Describe the function of an aftercooler and give an application
OBJECTIVE 11	Describe the function of a dryer and give an application
OBJECTIVE 12	Describe the principle of operation of three types of dryers and give an advantage of each
OBJECTIVE 13	Describe the operation of a refrigeration type air dryer
Activity 3	Effect of cooling below dew point
OBJECTIVE 14	Describe the function of pneumatic system trap
OBJECTIVE 15	Describe the operation of two types of pneumatic traps and give the schematic symbol of each

SEGMENT 3	LUBRICATION
OBJECTIVE 16	Describe the function of air lubrication and list three lubrication methods
OBJECTIVE 17	Describe the function of a lubricator and give its schematic symbol
OBJECTIVE 18	Describe the operation of three types of pneumatic lubricators and give an application of each
OBJECTIVE 19	Describe the types of oils used in lubricators
SKILL 3	Connect, fill and adjust a lubricator

SEGMENT 4	SERVICING PNEUMATIC COMPONENTS
OBJECTIVE 20	Describe how pressure gages are calibrated
OBJECTIVE 21	Describe how acrylic flowmeters are cleaned
OBJECTIVE 22	Describe the importance of eliminating air leaks
OBJECTIVE 23	Describe how to locate air leaks
OBJECTIVE 24	Describe four common pneumatic component failures and their probable causes