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AutoControl

High-Performance Practical Pneumatic Trainer

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High-Performance Practical Pneumatic Trainer for Hands-On Mastery

This **High-Performance Practical Pneumatic Trainer** serves as a comprehensive platform for professional pneumatic circuit design and demonstration, ideal for colleges and vocational schools. It supports the training and assessment of subjects like pneumatic drive systems, PLC control technology, and integrated machine-electric-pneumatic control systems. Equipped with various pneumatic components and a programmable controller module, this trainer meets all the teaching and training needs for pneumatic disciplines.

Key Features of High-Performance Practical Pneumatic Trainer

- **Comprehensive Pneumatic Transmission System Training**: The trainer provides in-depth education on the composition and operation of pneumatic transmission systems.
- **Basic Pneumatic Circuit Experiments**: Students can perform a wide range of fundamental pneumatic circuit experiments, making it easier to grasp core concepts.
- **PLC Electrical Control Experiments**: This includes machine-electric-pneumatic integrated control experiments, enabling students to gain hands-on experience with real-world applications.

SKU: 0401020010

Advantages of High-Performance Practical Pneumatic Trainer

- **T-Slot Design for Easy Operation**: The training panel features a T-slot design, allowing all pneumatic modules to be inserted with rapid joints for quick and easy operation.
- **Industrial-Grade Components**: All pneumatic components and valves are made from industrial-grade materials, ensuring durability and reliability.
- **Independent Pneumatic Modules**: Each module is independent with spring pins, making it simple to assemble various pneumatic circuits on the T-slot panel.
- **Quick Coupling Connections**: The pneumatic circuits use quick couplings for easy connection, while the electrical control circuits use training wires with protective functions. Students can follow instruction manuals or design their own circuits, supporting up to 90 types of experimental designs.
- **Quiet, Oil-Free Air Compressor**: The trainer includes a low-noise (<57dB), oil-free air compressor that produces clean and dry air, ideal for a classroom environment.
- **Safety Features**: The trainer is equipped with 1P + N leakage protection. The output voltage is 220V, and if the earth leakage current exceeds 30mA, the power supply automatically cuts off. The electrical control operates at DC 24V with overvoltage protection to prevent damage in case of malfunction.

This **High-Performance Practical Pneumatic Trainer** is a versatile and comprehensive tool for mastering pneumatic systems, offering a complete range of training possibilities to meet the needs of modern educational institutions.

Electrical Control Modules of High-Performance Practical Pneumatic Trainer

- **PLC Module**: Features Mitsubishi FX1S-20MR with 20 I/O points, including 12 DC inputs and 8 relay outputs.
- **Button Control Module**: Includes 6 self-resetting DPDT green button switches and 6 self-locking DPDT red button switches for versatile control options.
- **Intermediate Relay Module**: Comprises 4 DC24V relays with inputs and outputs that lead to the panel, with LEDs indicating coil energization.
- **Time Relay Module**: Contains 2 DC24V time relays, with terminals for inputs, outputs, and coils leading to the panel.
- **Electronic Control Module**: Features 6 solenoid valve interfaces, 2 pressure relay interfaces, and 4 stroke switch interfaces.
- **Control Module**: Equipped with a 250V AC voltmeter to indicate power supply output voltage and a 30V DC voltmeter for switching power supply output voltage monitoring.

Comprehensive Training Modules for High-Performance Practical Pneumatic Trainer

Basic Pneumatic Circuit Training

1.Pressure Control Circuits:

- **Differential Pressure Circuit:** Learn how to control varying pressure levels within a system.
- **High and Low-Pressure Control Circuit I & II:** Understand the mechanisms for managing different pressure states in pneumatic systems.

2.Directional Control Circuits:

- **Alternative Reversing Circuit (Two-Position Two-Way Single Electric Solenoid Valve):** Master the fundamentals of simple reversing mechanisms.
- **Single-Acting Cylinder Circuit (Two-Position Three-Way Single Electric Solenoid Valve):** Explore control circuits for single-acting cylinders.

- **Reversing Circuit (Two-Position Five-Way Single Electric Solenoid Valve):** Study reversing functions using advanced solenoid valves.
- **Alternative Reversing Circuit (Three-Position Five-Way Single Electric Solenoid Valve):** Delve into complex directional control using multi-position valves.
- **Electric/Pneumatic Control Valve Circuits:** Gain expertise in circuits controlled by electric or pneumatic inputs, including:
- **Two-Position Five-Way Single Electric/Pneumatic Control Valve Circuit**
- **Reversing Circuit I & II (Two-Position Five-Way Double Electric/Pneumatic Valve)**
- **Reversing Circuit (Three-Position Five-Way Double Electric Valve)**
- **Travel/Reversing Valve Circuits:**
- **Reversing Circuits by Travel Valve & Manual Reversing Valve:** Learn to implement manual and automatic travel reversing functions.
- **PLC-Controlled Reversing Circuits:** Incorporate Programmable Logic Controller (PLC) technology for precise control.
- **Proximity Switch & PLC Sequence Action Circuits:** Understand sequence actions in automated systems, including delayed sequences.

3.Speed Control Circuits:

- **Single Pneumatic Acting Cylinder:**
- **Speed Regulation I (One-Way Throttle Valve in Series):** Control speed through a single pathway.
- **Quick Return Circuit (Quick Exhaust Valve):** Enable rapid cylinder return using exhaust valves.
- **Pneumatic Control Speed Regulation:** Implement fine-tuned speed controls for pneumatic cylinders.
- **Double Pneumatic Acting Cylinder:**
- **Exhaust and Speed Regulation (One-Way Throttle Valve):** Master speed control for dual-action cylinders.

- **Parallel and Series Speed Regulation:** Study different methods for synchronizing cylinder speeds.
- **Synchronization and Slow-Travel Snap-Back Circuits:** Explore advanced techniques like slow forward and fast backward motion.
- **Secondary Feed Action Circuits:** Learn to implement secondary action phases in pneumatic operations.
- **Position Control Circuits:**
- **Position Control I & II (Three-Position Five-Way Valve):** Achieve precise positioning with complex valve arrangements.
- **Delay Control Circuits (PLC):** Implement timed controls using PLC technology.

4.PLC Electrical Control Experimentation

PLC Programming & Ladder Logic:

- Gain proficiency in programming PLCs, understanding ladder logic, and creating effective control programs.
- **PLC Software Usage:** Learn to navigate and use PLC programming software efficiently.
- **PLC-Computer Communication:** Explore how to link PLCs with computers for advanced control.
- **Optimization in Pneumatic Systems:** Apply PLCs in pneumatic systems to optimize performance and control.

These **Comprehensive Training Modules** ensure that students gain practical, hands-on experience with a wide array of pneumatic systems, from basic circuits to advanced PLC-controlled setups. The program covers everything from the essentials of pressure and directional control to sophisticated simulation exercises, making it ideal for in-depth pneumatic training and education.

Key Technical Specifications of the High-Performance Practical Pneumatic Trainer

- **Air Displacement:** 65L/min
- **Noise Level:** Less than 57dB (Ultra-Quiet Operation)
- **Motor Power:** 750W
- **Voltage:** 220V
- **Speed:** 2860 RPM
- **Rated Pressure:** 0.75 MPa
- **Tank Capacity:** 38L
- **Dimensions:** 1660mm × 940mm × 1800mm (L × W × H)

These technical specifications highlight the robust and efficient performance of the High-Performance Practical Pneumatic Trainer, making it an ideal choice for advanced pneumatic training and educational applications.