

AIR CONDITIONING / HEAT PUMP TROUBLESHOOTING LEARNING SYSTEM

T7082-A



Monitor shown is not included

Thermal system troubleshooting skills are in high demand today with these systems playing a key role in industrial, commercial and residential applications to provide heating and cooling of spaces and processes. The T7082-A Air Conditioning/Heat Pump Troubleshooting Learning System teaches these valuable troubleshooting skills like no other product with a hands-on learning station that contains a working system that can perform heat pump, air conditioning and refrigeration operation and a wide array of faults that can be inserted. A unique computerized fault insertion system safely inserts faults automatically and tracks student progress.

The model T7082-A uses the principle of vapor compression and offers three different types of expansion methods, enabling students to explore a wide range of thermal application and system designs. The T7082-A is specially designed as a teaching system with its components arranged in a breadboard fashion to make it easy for students to follow the system flow and understand its operation. Extensive instrumentation is also provided so that students can better learn how these systems operate and how to improve performance.

The T7082-A System consists of a mobile workstation, vapor-compression type thermal system, thermal multi-meter, gauge/manifold assembly, computer-based fault insertion system, student learning materials for both theory and lab, and teacher's assessment guide. Students will learn industry-relevant skills including how to: operate, adjust, and troubleshoot thermal systems for a variety of applications.

CURRICULUM IS THE KEY TO LEARNING

Learning Topics:

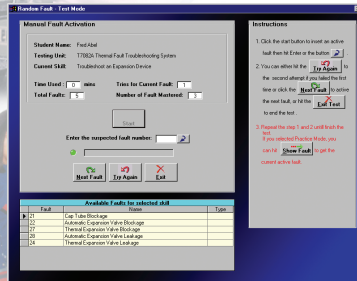
- Troubleshooting
- Temperature Measurement
- Thermal Science Concepts
- Thermodynamic Cycles
- Refrigeration System Operation
- Refrigerant Types
- Heat Pump System Operation
- Thermal Efficiency
- Compressors
- Reversing Valves
- Expansion Valves
- Evaporators/Condensers
- Refrigeration Components
- Phase Diagrams
- Property Tables

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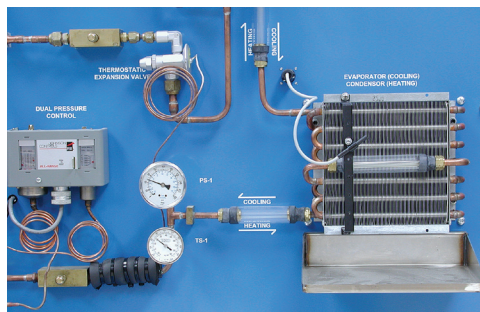
DESIGNED FOR LEARNING

Computer-Based Fault Insertion - The T7082-A System includes Amatrol's unique FaultPro computerized troubleshooting system, which automatically inserts faults and tracks student troubleshooting efforts. This system enables students to learn troubleshooting in a self-directed environment, allowing teachers to support more students. FaultPro features

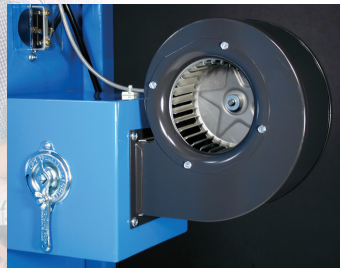


Develop troubleshooting expertise

Instrumentation Features - The T7082-A includes many instrumentation features to observe and monitor system operation. Sight glasses are located at three points on both the evaporator and condenser coils to show how the refrigerant changes phase as it passes through each coil. Pressure and temperature gauges are placed at the inlet and outlet of the condenser and evaporator to determine heating and cooling performance. Other teaching components include moisture indicator, panel-mounted compressor ammeter, and flow meter.



Clear teaching instrumentation



Heavy duty blowers

are used to restrict the flow of refrigerant and change the amount of refrigerant in the system by allowing it to flow into or out of the accumulator.

Modern Temperature Control - The T7082-A uses a modern microprocessor-based temperature control of the air temperature at the coil. It includes a programmable keypad for both heating and cooling modes, electrical reversing valve, RTD-type remote temperature probe, and digital display. The display shows current temperature and set-point.

Variable Conditions - The T7082-A can replicate a variety of performance conditions with features such as heavy-duty industrial blowers, attached to the condenser and evaporator coils, and manual valves placed throughout the refrigeration system. The blowers have dampers that can vary the flow across the coils, showing the effect of varying heat transfer rates. Manual valves are used to restrict the flow of refrigerant and change the



Microprocessor-based temperature control

TECHNICAL DATA

Workstation

- Dimensions 72 in. (183 cm) L x 72 in. (183 cm) H x 30 in. (76 cm) W
- Welded 1.5 in. steel tube construction
- Drip pans for evaporator and condenser
- All components mounted and plumbed on two heavy-duty gauge steel panels which are painted and silk-screened
- Casters, locking type (2)

Compressor

- Electric motor, 1/5 hp, hermetically sealed
- Thermal electrical overload protection
- Pre-charged with polyester oil
- Supports medium and high temp applications

Pressure Control System

- Dual pressure setpoint
- High compressor protection
- Low pressure cycling or safety functions

Refrigerant Type R134a

Refrigeration Circuit

- Check valves (2)
- Manual valves (7)
- Receiver with liquid level gauge
- Filter / dryer
- Suction accumulator
- Moisture indicator
- Reversing valve, solenoid operated
- Evaporator / condenser coils, 7-in x 7-in (2)
- Reversing valve control
- Capillary tube
- Automatic expansion valve
- Thermostatic expansion valve

Instrumentation

- Current Meter, analog, 0-10 Amp, panel mounted
- Temperature gauge, 0-200 F (4)
- Pressure gauge, 0-300 psi (4)
- Flow Meter, rotameter type with needle valve

Temperature Control System

- Microprocessor-control
- Programmable sealed keypad
- Digital display, LCD type with set-point and current temperature
- Lockout switch; RTD remote temperature probe

Blower Control System

- Blowers (2)
- Dampers (2)

Main Power

- Master power switch, manual rocker type
- Circuit breaker, 15-Amp

Fault Troubleshooting Software

- PC digital I/O fault control card, PCI Slot
- Fault module with (12) fault relays-30 A @ 115VAC & (2) fault relays-1A @ 5VDC
- Ribbon cable, 4-foot length
- PC-Based Windows XP software with:
 - On-line student troubleshooting
 - Database student response tracking
 - Custom template design capability
 - Class administration capability
 - Student results reporting

Test Points

- Refrigerant (9)
- Electrical (12)

Thermal/Multimeter

- Hand-held; LCD display
- Clamp-on type
- Current measurement 600A max
- Voltage measurement, 600 AC/DC volts max
- Resistance measurement, 40 Megaohms max
- Capacitance measurement, 100microfarad max
- Temperature measurement range, -20-760 C
- Thermocouple temperature probe attachment-Type K

Gauge/Manifold Assembly

- Pressure gauges (2)
- R-134a compatible
- Control valves (2)
- Color-coded hoses-3 ft length (3)
- Pressure surge protectors
- "Flutterless" dampened gauges

Student Learning Activity Packet Set 11572

Teacher's Assessment Guide 11582

Additional Requirements

- Personal computer with Windows XP operating system, PCI slot power requirements
 - Phase, 110 VAC, 60 Hz, 9 Amps or
 - Phase, 230 VAC, 50 Hz, 6 Amps