

Geothermal Troubleshooting Learning System

950-GEO2

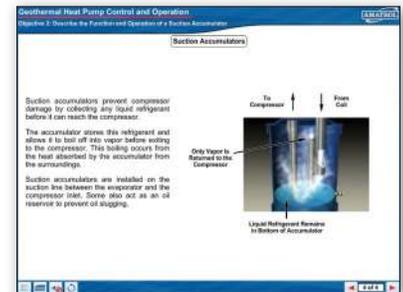


Geothermal Troubleshooting Learning System

Amatrol's Electronic FaultPro Troubleshooting



Interactive Multimedia Curriculum



Learning Topics:

- Component Troubleshooting
- System Troubleshooting
- Geothermal Heat Pump Systems
- Geothermal Source Circuits
- Closed-Loop Source Circuit Operation
- Source Circuit Piping and Components
- Compressors
- Energy Units of Measure
- Condensers
- Heat Transfer
- Phase Change Effects
- Heat Pump Components
- Heat Pump Control
- Heat Pump Operation
- Heat Pump System Performance
- Heat Duty
- Coefficient of Performance

Amatrol's 950-GEO2 Geothermal Troubleshooting Learning System is equipped with FaultPro, Amatrol's premier electronic fault insertion program for teaching troubleshooting skills! Geothermal systems are becoming very popular as an alternative energy source and the need for trained technicians is rapidly increasing. Using FaultPro, learners troubleshoot electrical, mechanical, and fluid-based geothermal system faults to become experts on residential and commercial geothermal systems. In addition to troubleshooting, the interactive multimedia curriculum and hands-on skills will teach startup, operation, shutdown, and maintenance of a geothermal system.

Amatrol's Geothermal Troubleshooting Learning System packs a residential-sized system into a 6-ft. (1.83 M) long mobile system that easily fits through a standard door. Major components include a 2-stage compressor with a 2-ton heat pump, air duct with ECM blower, ground source loop, and industrial grade blower. Additionally, the system includes a custom designed, temperature-controlled ground simulator so the system can run continuously. All of this plus the ability to insert faults electronically, using FaultPro, makes this system unmatched in Geothermal System training!



Technical Data

Complete technical specifications available upon request.

Mobile Workstation

30" W x 72" H x 72" L
Casters (4)

Heat Pump

Water-to-Air
R410A Refrigerant
2-stage Compressor (20,000 BtuH)
Air-Duct System
Flow Meter
Pressure and Temperature Gauges
Condensate Sensor
Pressure Switches
Receiver
Manual Valves
Filter/Dryer
Suction Accumulator
Thermostatic Expansion Valve
Reversing Valve
Moisture Indicator
Load Side Heat Exchanger
Water Coil
Tubing
Air Flow Control

Ground Source Loop

Flow Center
Header Loop Circuit
Expansion Tank
Header Tank
Pressure Gauges
Flow Center Manual Control

Ground Simulator

Geothermal Control Section

Main Power Control
Geothermal Controller
Thermostat
Fault Power Control

Handheld Instrumentation

Fault Insertion Unit

Curriculum (M12305, M12306)

Instructor's Guide (C12306)

Install Guide (D12306)

Student Reference Guide (H12306)

Additional Requirements:

95-GEO3 Geothermal Flush Cart Learning System
11766 ECM Diagnostic Module
Computer: See <http://www.amatrol.com/support/computer-requirements>

Required Utilities:

240 VAC/60 Hz Split Phase
Water Supply

FaultPro – Electronic Fault Insertion for a Realistic Troubleshooting Experience!

Using our world-class troubleshooting program, FaultPro, Amatrol has inserted 28 electronic faults on the 950-GEO2! Covering electrical, mechanical, and fluid-based faults, Amatrol designed the 950-GEO2's troubleshooting to allow learners to practice applicable industry skills and prepare them for real-world geothermal system problems. With the simple click of a mouse button, a multitude of faults can be instantly inserted into the geothermal system including faults such as a heat exchanger blockage, an open thermostat, a stuck spool on a reversing valve, and many more. Amatrol's troubleshooting systems are unmatched in their ability to simulate real-world equipment failures!



Industry Standard System Components and Features

From its 2-stage compressor and 2-ton heat pump to the ground source loop that includes a flow center and a header loop, Amatrol's 950-GEO2 delivers features commonly found in installed geothermal systems but often excluded from training systems. These include a variable speed ECM air blower, water coil heat exchanger, sight-glasses at many points in the system for observing the refrigerant cycle, ample temperature and pressure monitoring, electrical test points, ground simulation, and even the high-density polyethylene pipe specified for use in installed geothermal systems. These components are clearly labeled and mounted for easy observation on a vertical panel, allowing learners to easily observe and evaluate system operation and performance.

Ground Simulator Allows Continuous Training



Simulates Ground Source/Sink

Amatrol's 950-GEO2's ground simulator is a temperature-controlled system that creates a constant temperature which allows the system to operate continuously. A digital, programmable temperature control unit is used to set and maintain the ground simulator at the desired temperature, resulting in both accurate data collection and continuous operation.

Integrated Multimedia Curriculum Provides a Solid Foundation for an IGSHPA Certification!

The 950-GEO2 includes feature-rich interactive multimedia curriculum that begins with an introduction to geothermal energy and applies these concepts to overall system performance evaluation. Learners start with the basics of geothermal heat pump systems, such as compressors, condensers, metering devices, refrigerants, dryers, moisture indicators, thermostats, controllers, and blowers. Learners can then relate this knowledge to geothermal troubleshooting in areas such as system operation and overall system performance. Through Amatrol's partnership with key industry leaders and leading edge educators in the area of geothermal energy to develop the right balance of knowledge and applied skills needed to work with geothermal systems. Amatrol's 950-GEO2 curriculum is a strong starting point toward obtaining International Ground Source Heat Pump Association (IGSHPA) certification.



Geothermal eLearning

Pressurized Operation for Realistic Field Conditions

While the 950-GEO2 can operate in an unpressurized state, technicians often encounter pressurized systems. Amatrol requires the 95-GEO3 Geothermal Flush Cart Learning System to ensure job-ready skills.

Enrich the Training Experience with the Optional Desuperheater Learning System

The 950-GEO2's learning scope can be further expanded by adding the 95-GEO4 Geothermal Desuperheater Learning System. The 95-GEO4 covers the operation, startup, shutdown, troubleshooting, and maintenance of a desuperheater system used for a geothermal heat pump system. The 95-GEO4 includes a water tank, desuperheater unit, student curriculum, and instructor's guide.

