

SOLAR THERMAL CLOSED-LOOP TROUBLESHOOTING LEARNING SYSTEM

950-STCL1



Shown with optional sun simulator

Installing and maintaining solar thermal closed-loop systems require hands-on skills and troubleshooting ability across both drainback and pressurized systems. Likewise, engineers and designers need to understand the technologies used in these systems as well.

Amatrol's 950-STCL1 Solar Thermal Closed-Loop Troubleshooting Learning System allows students to develop the specialized skills and knowledge needed for working with the two common types of thermal closed-loop systems: drainback and pressurized. The 950-STCL1 teaches students connection, operation, programming, and troubleshooting of both drainback and pressurized systems. The curriculum is PC-based multimedia that is highly interactive. It allows students to use the learning style best for them – reading, listening, or visual. The 950-STCL1 supports the NABCEP (North American Board of Certified Energy Practitioners) test for Certified Solar Thermal System Installer.

The 950-STCL1 includes all components needed to develop hands-on, job-ready skills: all solar specific components as well as balance of system items. The learning system contains a mobile workstation, multiple component circuit panels, two solar collectors, fault insertion, PC-based multimedia student curriculum, and instructor's assessment guide. An optional sun simulator is available to facilitate classes indoors when outdoor conditions do not support solar heating.

Learning Topics:

- Collectors
- Balance of System Components
- System Operation & Adjustment
- Drainback Solar Thermal Systems
- System Charging
- System Programming
- Pumps
- Heat Exchanger
- Solar Storage Tanks
- Digital Differential Controllers
- Pressurized Closed-Loop Solar Thermal Systems
- System Troubleshooting

CURRICULUM IS THE KEY TO LEARNING



AMATROL[®]

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DESIGNED FOR LEARNING

Fault Insertion For Both Electrical and Fluid Systems

At the heart of a technician's skill set is the ability to troubleshoot a system. The 950-STCL1 is equipped with a wide array of both electrical and fluid faults that allow instructors to replicate realistic system and component failures. Students will learn to independently solve the many common types of situations they will encounter on the job.

Balance of System Components – Replicates Real World Thermal Systems

Developing installation and troubleshooting skills for solar thermal systems requires all the components commonly found in these systems. Elements such as vacation bypass, check valves, relief valves, flow meters, and tempering valves are essential to create realistic systems and troubleshooting situations. Amatrol also includes a digital differential controller that features many programming capabilities which allow students to learn how to program the more sophisticated thermal systems they are likely to encounter.



Flow Meter

Vacation By-Pass

Tempering Valve

Differential Controller

Two Types of Closed-Loop Thermal Systems

Solar technicians will encounter both drainback and pressurized closed-loop solar thermal systems. Across any given region that experiences freezing conditions, both of these systems are used extensively. Amatrol includes the components needed to configure either system, including both an expansion tank and drainback tank. Students can switch between the two systems with valving.

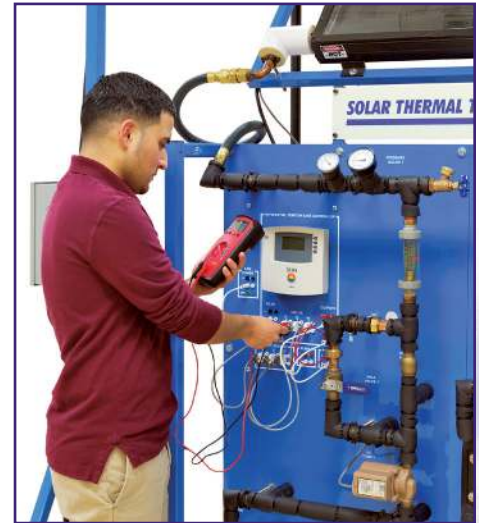


Drainback Tank

Pressurized Tank

Optional Sun Simulator (95-ST51)

Amatrol offers an optional sun simulator, the 95-ST51, for use indoors with the 950-STCL1. The Solar Thermal Closed-Loop Learning System's two thermal collectors work either outside with direct sunlight or inside with the sun simulator.



Student Reacting to Electrical Fault

TECHNICAL DATA

Mobile Workstation

- Dimensions 72" (183 cm) L x 72" (183 cm) H x 34" (86 cm) W
- Swivel casters (4) with 2 locking
- Square tube steel, welded and braced

Component Circuit Panels

- Silk-screened sheet steel
- Pre-mounted and pre-connected fluid components
- Models drainback thermal water systems
- Models pressurized or antifreeze thermal water systems
- Copper and plastic fluid piping, insulated as needed
- AC disconnect switch with breaker
- Ground fault circuit interrupter
- Centrifugal pumps, AC-motor powered
- Heat exchanger, Plate type
- Differential controller
 - Digital
 - Multiple outputs allowing independent pump control
 - Multiple temperature inputs
 - Large LCD graphic display
 - Animated control circuits
 - Specialty control functions
- RTD probes
- Solar storage tanks, insulated with boiler drain valve
- Expansion tank
- Tempering valve
- Boiler Drain valves
- Ball valves
- Relief valves, temperature and pressure
- Check valve
- Schrader valve
- Flow control valve
- Flow meter
- Pressure and temperature gauges
- Charge system
- Emergency stop pushbutton, hard-wired
- Connector lead set
- Multimeter

Solar Collector Unit

- Multiple solar collectors
- Adjustable frame to permit variation of solar angle of incidence
- Can use optional sun simulator for indoor use

Fault Insertion System

- Component and system level faults
- Realistic troubleshooting test points
- Fluid and electrical fault types

Multimedia, PC-Based Student Curriculum, M20102
Instructor's Assessment Guide, C20102
Installation Guide, D20102