

# Temperature Process Control Training System Plus



Model: 602-PAC

Process control systems maintain precise control of liquid and gas variables, such as liquid level, flow rate, pressure, temperature, and pH level. These multifaceted systems are a critical part of major industries like power generation, refineries, petrochemicals, chemical manufacturing, pharmaceuticals, biotechnology, and food processing and bottling.

DAC Worldwide's Temperature Process Control Training System Plus (602-PAC) is a fully-functional, industrial-quality fluid process system that provides hands-on training in the measurement and control of temperature in an industrial fluid process system. The Temperature Process Control Training System allows control loops to be configured employing feedback and feedforward control methods, incorporating thermocouple or RTD inputs.

The 602-PAC includes the following:

- #602-000 Temperature Process Control Training System
- #602-001EH Standard Instrument & Control Package
- #600-006A Standard Calibration Test and Equipment Package
- #600-007 PLC Control Interface Panel
- #600-011A Economy Chiller System

Clear PVC piping provides protection from elevated process heat levels and allows learners to visually monitor

process changes based on control parameters or intentional disturbances inserted using solenoid valves in combination with metered ball valves.

The temperature measurement and control system uses a dynamic shell and tube heat exchanger and two immersion heaters. Both the hot and cold legs can be controlled. Common cold tap water can be used as a cooling water source and is applied through quick-disconnect fittings and valves.

The unit contains a 24 volt DC power supply and two air regulators with gauges. All 24 volt power sources, air sources, and function switches are conveniently located on the front panel face.

The system has the look and feel of actual industrial hardware, allowing a broad range of exercises in temperature and flow measurement and control. Through its standard features and its adaptability to optional, specialized control and measurement equipment, it can replicate many unique industrial control arrangements.

### **Industry-Standard Components Provide Realistic, Hands-On Training**

Technical training is most effective when learners can gain hands-on practice with industry-standard components they'll encounter on the job. The Temperature Process Control Training System features a wide variety of common, industrial-quality components and instruments to provide learners with a realistic training experience that will build skills that translate easily to the workplace.

The Temperature Process Control Training System Plus is a sturdy unit with a tubular steel frame and instrument mounting racks with modular instrument and controller panels. Some of the industrial-quality components learners will find on the trainer include: CPVC piping; air supplies with gauges and connectors; power distribution panel; control valves; quick-disconnect fittings; solenoid valves; thermowells; thermometers; heat exchanger; centrifugal pumps; immersion heaters; thermocouples; RTDs; rotameters; flow meters; clear acrylic tanks; test leads; tubing; and tubing tees and couplers.

### **Courseware & Hands-On Exercises**

The Temperature Process Control Training System's courseware consists of one of several optional textbooks, a course guide, and hands-on exercises. These can be used as part of either an instructor-led course or self-directed study.

Learners will explore a wide variety of fundamental temperature process control topics, including: process instrumentation terms; process control theory; thermocouple and RTD operating characteristics; flow versus differential pressure for an orifice plate; digital controllers; closed loop integral and proportional control in temperature processes; and notch, ultimate, and open loop tuning of temperature processes.

Hands-on exercises include industry-relevant temperature process control skills, such as: temperature measurements using a thermocouple and an RTD in a process; calibration of a flow transmitter and square root extractor; installation and calibration of an electronic flow measurement channel; determining a temperature process' operating characteristics; and cascade control of a temperature process.

### **Expand Training Capabilities with Custom Options**

The Temperature Process Control Training System can be customized with a wide array of options to create a

training system that matches a particular industry's or user's specific needs. In industry, one size rarely fits all and this trainer can be tailor-made to your exact needs.

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## **FEATURES & SPECIFICATIONS**

- One-piece, welded, 1/8" wall, tubular steel frame.
- Four 4" diameter casters, two with locks.
- Integral, 19" x 70" high, instrument mounting rack with silk-screened instrument and controller panels.
- Front panel faces fabricated from marine-grade 1/2" plywood and covered with a high-durability laminate.
- 1/2" diameter and 3/4" diameter CPVC piping components throughout.
- Front panel-mounted operator control panel, including switches and pilot lights for: pump, solenoid valve, immersion heaters, control relay connections for equipment, 24 VDC power supply terminals, and electric "free line" connections. A regulator with gauge controlling a 0-60 psi air supply with associated fittings and a second instrument air gauge with associated fittings is also mounted on this panel.
- Master instrument air supply regulator.
- Circuit breaker with GFI protection.
- Two orifice assemblies with associated flanges and tubing connections.
- Power distribution panel mounted in instrument rack, including on/off power switch, GFI receptacle, fuses for all circuits, and 12 electric "free Line" connections to front panel.
- Quick-disconnect fittings throughout, allowing for convenient attachment of instruments.
- One diaphragm-type, industrial control valve.
- One diaphragm-type, industrial three-way control valve.
- Solenoid valve, allowing for creation of flow disturbances.
- Four thermowell-type thermometers.
- Industrial-quality, multi-pass shell and tube heat exchanger.
- Pipe stanchion, allowing for attachment of differential pressure transmitters and pressure transmitters at varying heights.
- Primary reservoir, 20 gallon capacity, high-temperature polypropylene.
- Centrifugal pump, 1/2 HP.
- Two immersion-type heaters, 1.5 KW each.
- 24 VDC Power supply.
- Process quick-disconnect hose fittings, allowing for connection to other process control trainers.
- Twenty 36" test leads.
- Twenty 60" test leads.

- 150' ¼"-diameter instrument connection tubing of two colors.
- Fifteen quick-disconnect nipples.
- Ten tubing tees.
- Ten tubing couplers.
- Use/Exercise Guide
- Packaging for shipment via motor freight.

## **PRODUCT DIMENSIONS**

- **Product Dimensions**

(L x W x H)

33.5" x 48" x 76" (860 x 1210 x 1930 mm)

425lbs. (193kg)

- **Shipping Dimensions**

750lbs. (340kg)

## **OPTIONS**

- #464-037 - PLC Package, AB Micro850
- #581-007 - Instrumentation and Process Control, 6th Ed (Kirk/Weedon/Kirk)
- #600-010 - AC Variable Speed Drive Upgrade
- #600-111 - Dry Well Temperature Calibrator
- #600-132 - Gauge And Meter Panel
- #616 - Portable Calibration Training System
- #600-031 - Pitot Tube
- #600-032 - Venturi Tube
- #600-036EH - Magnetic Flow Meter - Endress & Hauser
- #600-036R - Magnetic Flow Meter - Rosemount
- #600-040 - Pneumatic Control Valve Positioner
- #600-041 - Electro-Pneumatic Control Valve Positioner
- #600-041F - Fieldvue Control Valve Positioner
- #600-051 - Strip Chart Recorder
- #600-056 - Differential Pressure Transmitter - Honeywell
- #600-059 - 3-Valve Manifold

- #600-060 - Industrial PID Controller, 1/4 DIN
- #600-102 - Sweep/Function Generator
- #600-205 - Digital Multimeter/Process Calibrator
- #602-500 - Use/Exercise Guide, Temperature Process Control (additional)

## **UTILITIES**

- 220V/50-60Hz/1 Ph power

### **Address**

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