PROCESS TRAINER

CE117

A self-contained, benchtop, fully integrated teaching apparatus that mimics industrial process engineering, including a comprehensive range of experiments in flow, level, pressure and temperature, ranging from basic theories through to more advanced principles.

KEY FEATURES

- Self-contained, benchtop apparatus
- Includes four basic process control methods in one compact unit
- Supplied with TecQuipment's CE2000 software for supervisory control of the process with data acquisition
- Mimics common industrial parts and processes with realistic results
- Ideal for classroom demonstrations and student experiments
- Demonstrates flow control, level control, pressure control and temperature control by feedback
- Includes experiments from basic control to advanced control methods, including ratio control, cascade control, interactive control and feedforward control

TECQUIPMENT

PROCESS TRAINER

CE117

DESCRIPTION

TecQuipment's Process Trainer is an educational package that mimics industrial process engineering. The fully integrated, self-contained teaching apparatus gives a comprehensive range of process control experiments, from basic to advanced.

Using water as the working fluid, the equipment allows safe, practical experiments on control of flow, liquid level, temperature and pressure. Students can study each of these separately or in combinations.

The equipment consists of an experiment module, a control module and TecQuipment's CE2000 software.

The experiment module includes all the essential parts to allow students to create process control systems. The main part is the process vessel, with a stirrer, a temperature sensor, level and pressure sensors, a heat exchanger and vent valve. It also includes two loops, linked by the heat exchanger in the process vessel. One loop is the heating loop with pump, heater tank and heater. The other loop is a process and cooling loop with pump, cooler, fan, valves and reservoir.

The control module links to the experiment module to provide access to the connections of each part on the experiment module. It includes a clear mimic diagram with switches and controls to allow manual control of pump speed, cooler-fan speed, heater power and stirrer. It also includes sockets and a built-in computer interface. This allows the user to link each part of the experiment module to a suitable computer (not included) for remote control and data acquisition.

Supplied with the equipment is TecQuipment's Control Software (CE2000, see separate datasheet) for supervisory control of the CE117 and data acquisition. You need a suitable computer to use the CE2000 software.

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

LEARNING OUTCOMES

- Proportional, Integral and Derivative (PID) control
- Control of flow
- Control of level
- Control of pressure
- Control of temperature
- Ratio control
- Cascade control
- Multi-loop control
- Interacting control loops

ESSENTIAL SERVICES

ELECTRICAL SUPPLY (SPECIFY ON ORDER):

Single phase, 220/240 VAC, 50/60 Hz, 11.5 A

or

Single phase, 110/120 VAC, 50/60 Hz, 11.5 A

BENCH SPACE NEEDED:

Approximately 1600 mm x 500 mm of solid, level bench, plus space for a computer (computer not supplied)

COMPUTER

Suitable computer (not included) for the CE2000 software

WATER

10l clean cold water (below 15°C)

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

SOUND LEVELS

Less than 70 dB (A)

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SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specifcation without prior notice.

DIMENSIONS:

- Experiment module: 800 mm x 1000 mm x 450 mm
- Control module: 80 mm x 500 mm x 370 mm
- Packed for export: 0.5 m^3

WEIGHTS:

- Experiment module: 40 kg
- Control module: 7 kg
- Packed for export: 80 kg

CLEAR PROCESS VESSEL WITH:

- Heat exchanger coil
- Stirrer
- Vent valve
- Pressure transmitter
- Level transmitter
- Temperature transmitter
- Drain valve

HEATING LOOP WITH:

- Heater tank with heater
- Low level float switch
- Temperature transmitter
- Circulation pump
- Heat exchanger output/tank return temperature transmitter
- Heater loop flow rate transmitter
- Over-temperature safety device

PROCESS AND COOLING LOOP WITH:

- Cooling radiator and fan
- Reservoir (with low-water level switch)
- Circulation pump
- Temperature transmitter (at inlet to the cooling radiator)
- Temperature transmitter (at outlet of the cooling radiator)
- Flow transmitter
- Proportional valve
- Process loop bypass valve

TECQUIPMENT