

Equipment overview of Process Control Lab

a) Process control training equipment apparatus

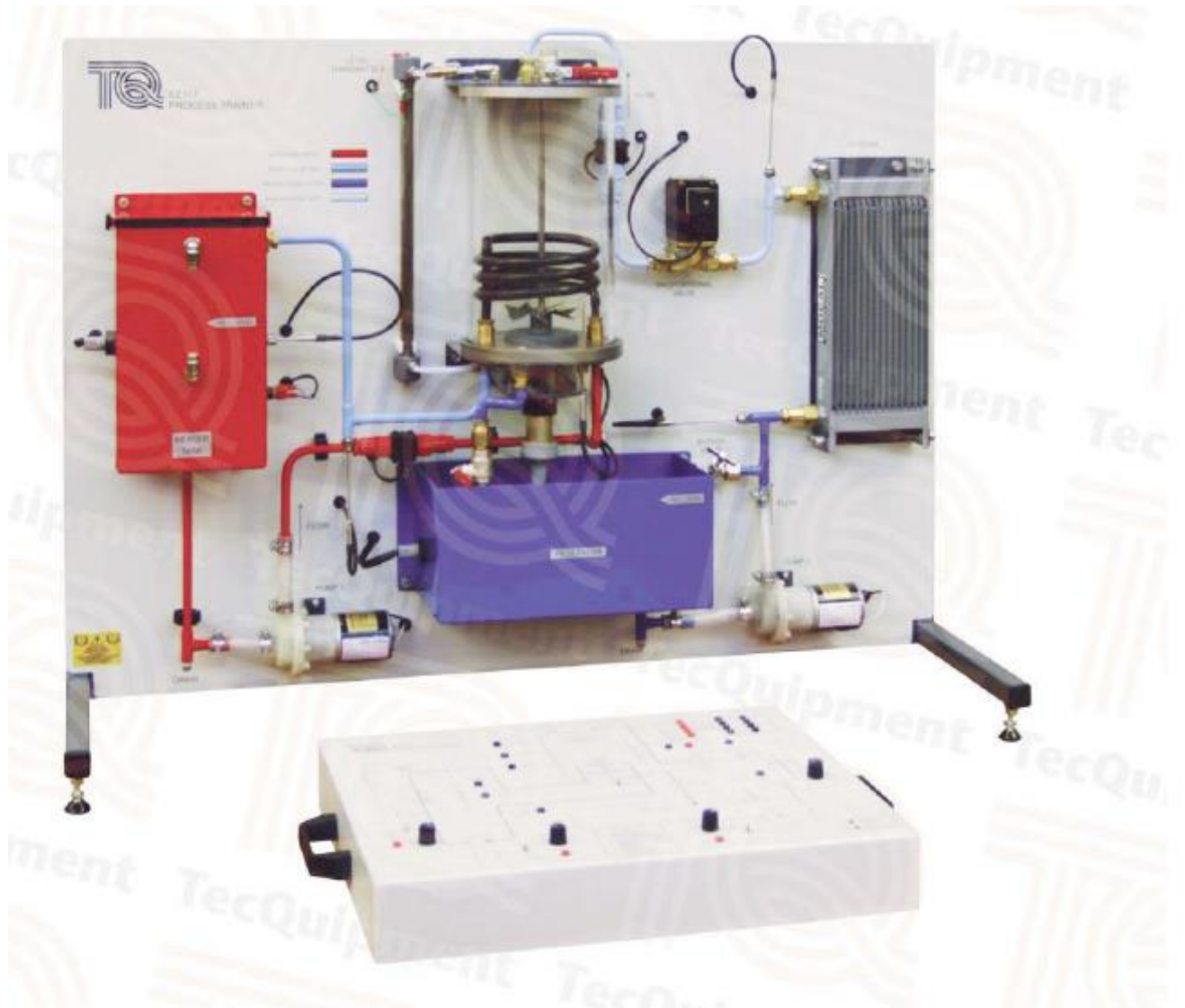


Fig 1: Self-contained, fully integrated bench mounting teaching apparatus

Description

Self-contained, fully integrated bench mounting teaching apparatus that allows process control experiments in flow, level, pressure and temperature

Technical Details:

Self-contained, bench-mounting apparatus

- *Includes four basic process control methods in one compact unit*
- *Supplied with Equipment'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*
- *Shows 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.*

Description

Equipment'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 Equipment'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.

Experiments

- 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 Ancillary

- Suitable computer (not included) for the CE2000 software

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

Specifications

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 m³*

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*