THE LAB EQUIPMENT

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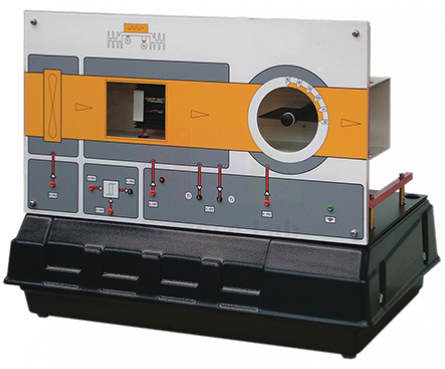
Product Name :

Thermal Control Process Apparatus

Product Code :

SLE/ETC/01



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Description :

The Thermal Control Process Apparatus a common industrial process, including an air-conditioning plant, where a combination of adjustments can control temperature. These can be:

- Varying the heat energy input to the system.
- Varying the speed of a circulating fan.
- Using a variable vane to restrict the flow.
- Two temperature sensors measure the temperature of the block.
- One sensor is in direct thermal contact with the block.
- The apparatus has a variable-speed fan that forces air through a duct.
- In the duct is an electrically-heated process block.
- A balance of the heat gained from electrical heating and heat lost by convection and conduction gives a steady temperature at the block.
- The other sensor mounts on an insulating spacer to introduce thermal inertia and variable-time constants into the control loop. The apparatus has scaled down time constants for shorter laboratory time.
- A servo-driven vane, mounted after the fan and the process block, creates a variable restriction downstream for more advanced experiments.
- The control problem is to keep the process temperature within acceptable limits while it works under various conditions.
- A combination of regulating the electrical energy to the heater, varying the air flow rate and rotating the vane gives the heat control.

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