PCT SERIES

Pressure Control - PCT53

PCT53 is a highly visible and easy to understand pressure control process, which uses pumped water to generate air pressure in a closed tank.

It comprises two clear acrylic vessels, an upper process vessel mounted above an open sump tank. The process vessel is sealed and so the air inside the tank is pressurised as water from the sump tank is pumped into it. Water drains from the process tank back into the lower sump tank via two outlets, one continuous and one incorporating a remotely controlled solenoid valve. Both outlets incorporate interchangeable orifices plus a hand operated variable valve, allowing the flow of water to be varied continuously to suit particular demonstrations.

This flexible arrangement allows a wide range of control scenarios to be set up, including two fundamentally different processes, i.e.

- Pressure control by proportionally varying pump speed (Inflow control)
- Pressure control by time-proportioned opening of a solenoid valve (Outflow control)

When using inflow control, repeatable disturbances can be implemented using the solenoid valve, and varied by using the different orifice sizes.

When using outflow control the pump speed can be stepped to provide a full range of repeatable disturbances. These techniques allow direct comparison of different controller settings.

Demonstration / instructional capabilities

- Pressure controlled by proportionally varying pump speed (Inflow Control)
- Pressure controlled by time-proportionally opening of a solenoid valve (Outflow Control)
- Direct control or Indirect control using an external controller:
  - PID Controller (PCT54)
  - PLC Controller (PCT55)

Related products

PCT40 Multifunction Process Control Teaching System
PCT23-MKII Process Plant Trainer
PCT54 Industrial PID Controller
PCT55 Programmable Logic Controller (PLC)

Ordering specifications

PCT53 Temperature Control Process

A Pressure control process trainer, comprising:

- 2 litre Process tank, mounted above a 3.5 litre sump tank
- 0-0.6 bar pressure range
- Two discharge ports, one with remote controlled solenoid valve and one with manually controlled valve.
- Four interchangeable orifices for use with the discharge valves
- Variable speed submersible centrifugal pump used to pressurise the air by water pressure.
- Capable of both analogue PID control using the pump and time proportioning PID control using the solenoid valve
- USB interface to PC, plus connection terminals for interfacing to external controllers
- Supplied with educational software for PID control as well as data logging.

Requirements

PC | USB

Mains electrical supply:
110 to 240 V, 50 or 60 Hz.
(Note, the units are supplied with: IEC leads to suit European and UK 230V, 50Hz outlets and USA 115V, 60 Hz outlets.)

PC computer with 2 spare USB ports (not supplied by Armfield) or external controller (PCT54 or PCT55)

Tap Water

Scale

Overall dimensions	
Length	0.425m (total)
Width	0.350m
Height	0.550m
Packed and crated shipping specifications	
Volume	0.2m^3
Gross weight	25kg

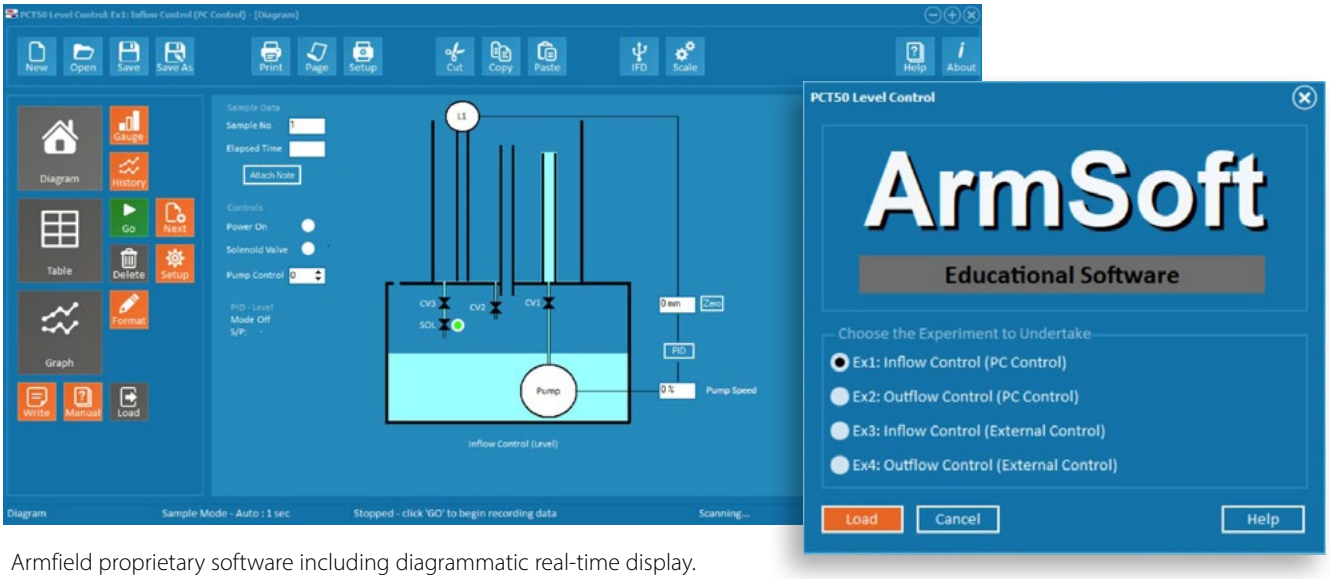
Ordering code

PCT53

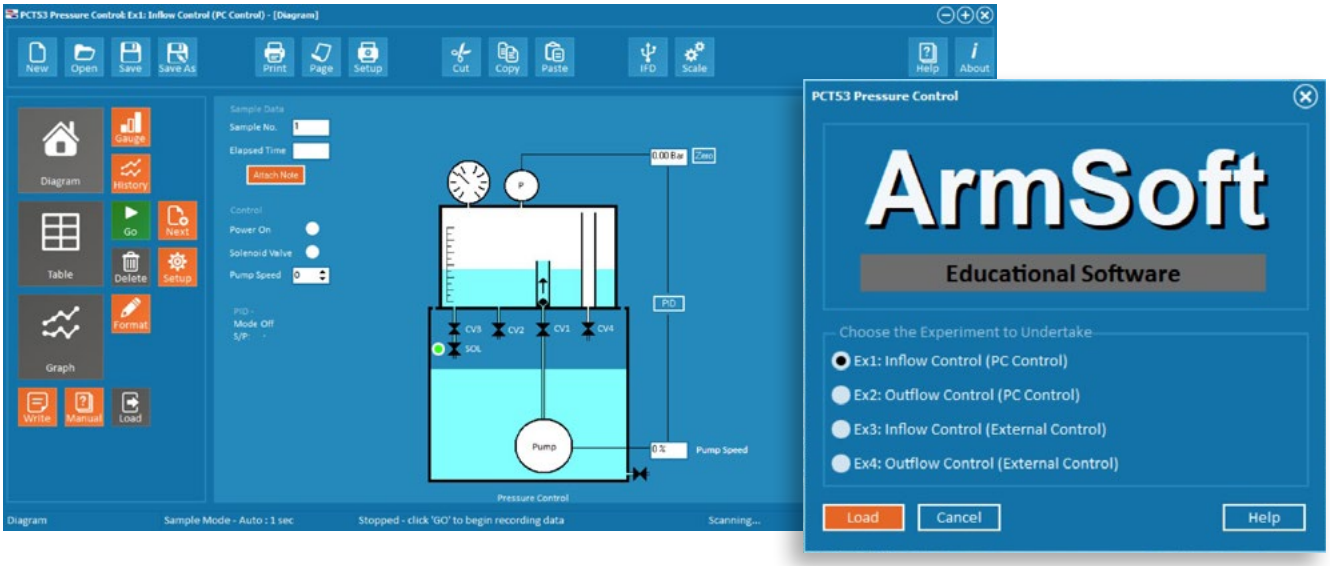
UK office - email: sales@armfield.co.uk tel: +44 (0) 1425 478781 (for ROW)
USA office - email: info@armfield.inc tel: +1 (609) 208-2800 (USA only)

SOFTWARE AND INTERFACING FOR THE ESSENTIALS OF PROCESS CONTROL UNITS

Each process is supplied complete with software that allows it to be controlled using a Windows PC via a USB connection.
The effect of making changes to the system or to the controller configuration can be quickly investigated by applying repeatable disturbances or step changes to the process. Comparison of the responses obtained with different control settings clearly demonstrates the need for correct matching of the controller to the system characteristics.
Another fundamental aspect of process control is an understanding of sensors and how they are calibrated. This is demonstrated by a sensor calibration apparatus designed specifically to demonstrate this subject.



Armfield proprietary software including diagrammatic real-time display.
Pressing the load button allows the operator to select alternative experimental options.

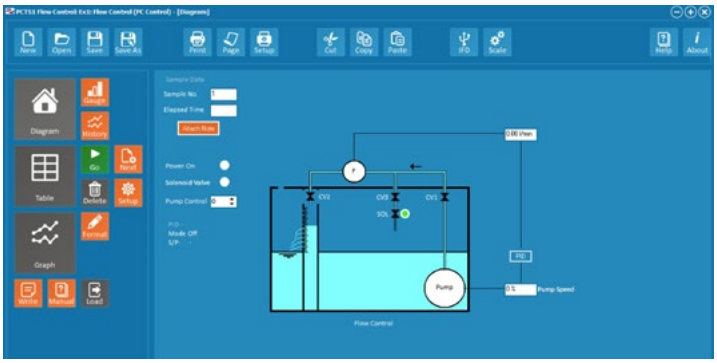


Software

Primarily computer controlled the ArmSOFT software demonstrates a real time diagrammatic display with readings of the relevant sensor outputs and controls the system inputs. The manual on/off time proportional and PID loops can be configured.

The ArmSOFT software enables the operator to control the pump speed and temperature 0 to 100%. Feedback from the sensors is then displayed in real time for the end user with simultaneous data-logging.

The data trend is also displayed graphically in real time and can be exported to another platform such as Excel for further analysis.



Knowledge base

> 28 years' expertise in research & development technology
> 50 years' providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company

CE

Products CE certified

armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com