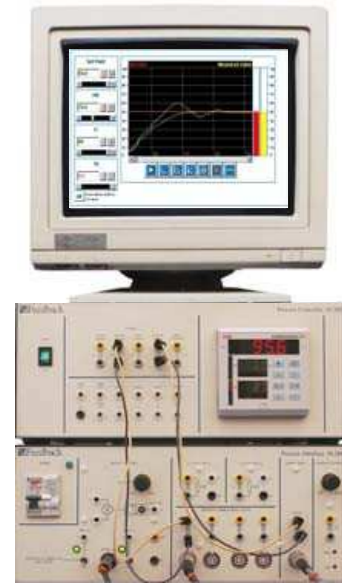
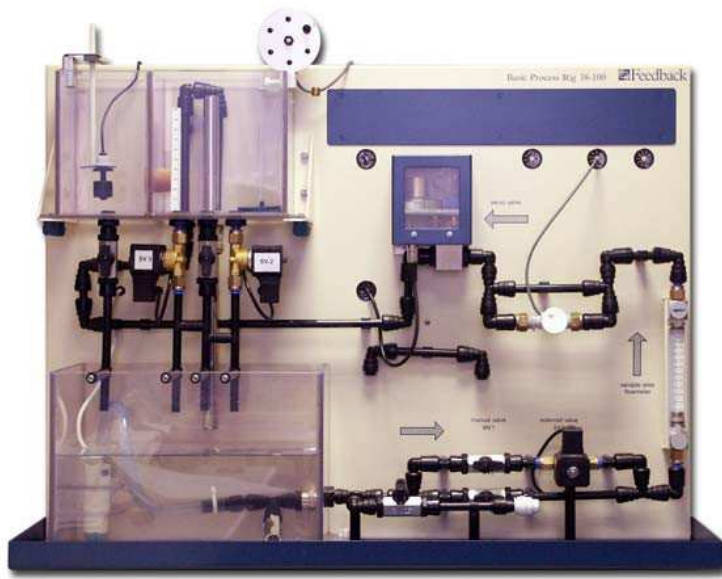


PROCON - Level/Flow Process Control

38-001



Description

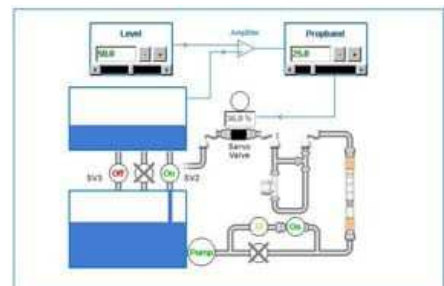
The Level/Flow Process Trainer is a single loop system allowing the study of the principles of process control, using liquid level and flow rates as the measured process variables. The system is a completely self-contained, low pressure flowing water circuit supported on a benchtop-mounted panel, making it suitable for individual student work or for group demonstrations.

It comprises a dual compartment process tank, linked to a sump tank by manual and solenoid operated valves. Water is pumped through the system, via a variable area flow meter and motorised control valve. Level is measured in the process tank. Flow is measured through an optical pulse flowmeter.

The PC Computer and Monitors are not supplied.

Features

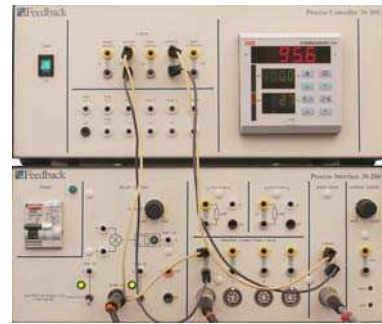
- Contains a selection of level and flow sensors & indicators
- Flow controlled by linear motorised control valve
- On/Off and proportional control
- P, PI and full PID control with autotune facility
- Couples with Temperature Trainer for dual loop control
- Modern push fittings
- Water used as the process fluid
- Comprehensive lab notes and ESPIAL Software



System with Proportional Control

Curriculum Coverage

- Flow & Level familiarisation and calibration
- Interface familiarisation and calibration
- Controller familiarisation and calibration
- Float level transmitter
- Pulse flow transmitter
- On-Off control
- Study of P, PI and PID control of Level and Flow
- Tuning PID controllers
- Advanced process control



*Process Controller (top) with
Process Interface*

Required Equipment - supplied with all Procon Training Systems

Process Interface 38-200

The Process Interface is connected to the system and provides all necessary power outlets for the Process Trainer, sensors and Process Controller. It accepts up to four 4-20 mA transmitter signal inputs and allows signal patching so that different control schemes can be quickly configured. It also provides a 4-20 mA current source, two current to voltage converters and a voltage comparator with adjustable hysteresis which can be used to provide a simple 2-state control loop in addition to the main controller loop. Protection is provided by a residual current circuit breaker.

Process Controller 38-300

The ABB Industrial Process Controller contained within the Process Controller is microprocessor based and is easily configured by the user to provide a range of control functions from 2-state control to 3-term PID control. It also features local or remote set-point, re-transmission of set-point or process variable, 4 logic inputs, 4 relay outputs, ramp/soak (profile sequencing) and an autotune facility which can analyse the requirements of a process and configure the control parameters for optimum performance. Together with the Process Interface, it provides a simple and convenient means of controlling the system.

Assignments

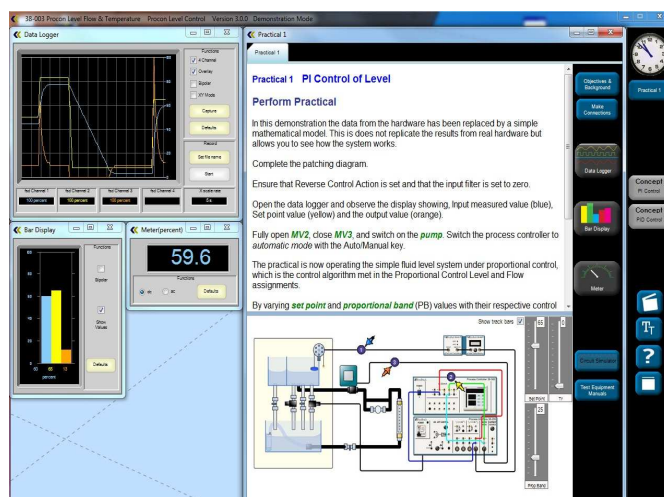
The ESPIAL Software assignments provided with the PROCON Level/Flow Process Control System are:

- **Introduction to PROCON**
- **Flow/Level Rig Familiarisation**
The Centrifugal Pump.
The Manual Valves and the Flow Gauge.
The Servo Valve.
The Solenoid Valves.
- **Flow/Level Rig Calibration**
A Level-Volume Correspondence.
Flow Meter Calibration.
Servo Valve Calibration.
Solenoid Valve Calibration.
- **Interface Familiarisation**
Circuit Breaker & Circuit Loop Connections.
The Servo Valve.
The Current-Voltage Converters.
- **Interface Calibration**
Current Source Calibration.
- **Controller Familiarisation**
Serial Communication.
Navigating the Controller.
Using the Controller.
- **Controller Calibration**
Controller Calibration.
Controller Relays.
Reading the Controller.
- **Float Level Transmitter**
The Float Level Transmitter (FLT).
Calibrating the FLT.
A Level Control Demonstration.

- **Pulse Flow Transmitter**
The Pulse Flow Transmitter (PFT).
Calibrating the PFT.
A Flow Control Demonstration.
- **On/Off Control**
On/Off Pump Control.
On/Off Solenoid Control.
The Float Switch.
Controller On/Off Control.
- **Proportional Control: Level**
Simulation.
Proportional Control of Level.
Proportional Control and Offset.
Proportional Band.
- **Proportional Control: Flow**
Servo Proportional Control.
- **Proportional Control Offset.**
- **PI & PID: Level Control**
PI Control of Level.
Limitations of PI Control.
PID Control of Level.
- **PI &PID: Flow Control**
PI Control of Flow.
PID Control of Flow.
- **Tuning PID Controllers**
Zeigler-Nichols Tuning.
Self-Tuning.
- **Process Controller: Advanced**
Remote Set-Point.
Profile Programming.
Time Proportioned Output.

ESPIAL

The teaching content is provided by the Espial software including the underlying theory, relevant background and all instrumentation. Test instruments are initialised with settings suitable for the required measurements but can be changed. Displays and measurements may be printed or exported for inclusion in laboratory reports



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Feedback reserves the right to change these specifications without notice.

For further information on Feedback equipment please contact ...

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