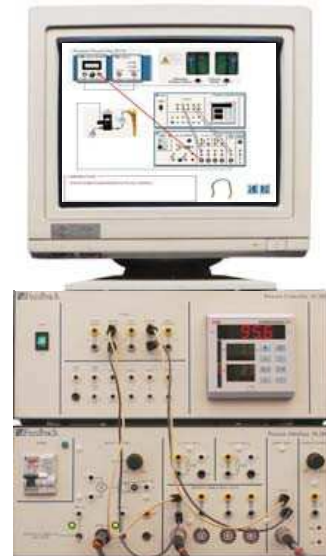
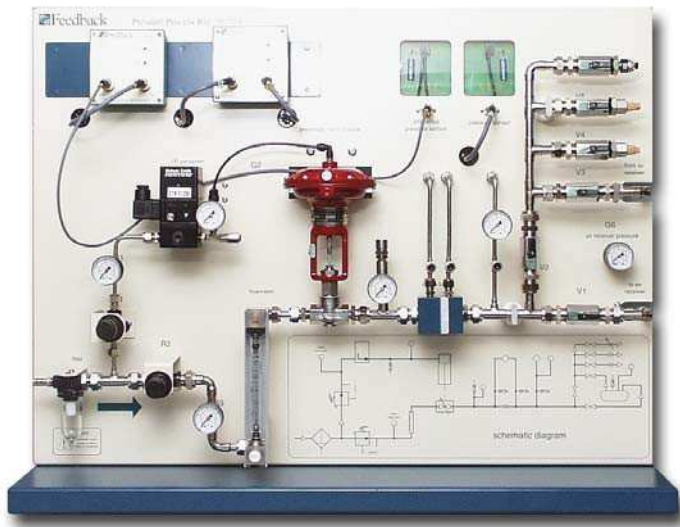


PROCON - Pressure Process Control

38-004



Description

The Pressure Training System is a single loop pneumatic control system. It enables the study of the principles of both pressure regulation of a process and the control of flow in a pressurised system.

The System comprises a low pressure air circuit supported on a panel for use on a benchtop, making it suitable for individual student work or for group demonstration.

The Pressure Trainer requires a compressed air supply at a recommended input pressure of 40psi. An input filter/drier is used to clean the supplied air. Separately regulated branches provide air for the process and for valve control.

The process branch comprises a regulator, a variable area flow meter, a pneumatically operated control valve, an orifice block with changeable orifice plates and both differential and point of measure pressure sensors. The process air flow can be discharged to atmosphere via adjustable diffused outlets.

An air receiver tank can be switched in and out of the circuit. The valve control branch comprises a regulator and an electrically operated current to pressure input converter. This is used to regulate the pneumatic control valve in the process line. The input converter operates from a 4-20 mA signal. Signal conditioning for the sensors is provided by pressure transmitters. The Differential Pressure Transmitter gives a linear differential pressure sensor output. The system is fully equipped with pressure gauges to indicate the pressures around the system.

Please note, the PC Computer & Monitor are not supplied with the system.

Optional Accessory

Air Compressor 38-820-120 or 38-820-230.

Features

- Safe low pressure operation
- Fully gauged for pressure and flow rate
- Differential and Gauge pressure sensors
- Current controlled (4-20mA) pneumatically operated control valve
- Standard industrial components
- Self-sealing outlets for manometer
- Safety valves fitted as standard
- Air used as the process fluid

Curriculum Coverage

- Pressure safety, familiarisation and calibration
- I/P converter and Pneumatic control valve operation
- Controller familiarisation and calibration
- Automatic control systems
- Serial communication
- Pressure sensor, transmitter and I/P converter- Linearity and Hysteresis
- Pneumatic control valve - characteristics at different pressure ranges
- System response and Air receiver
- Principles of Proportioning valve and proportional process control
- Study of P, PI and PID control of Pressure
- Calibration of the differential pressure sensor & transmitter
- Flow control in the Process rig

Assignment

ESPIAL Software, similar to that for the other PROCON Process Control Systems, is provided and the assignments that can be performed are:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Introduction to PROCON | <ul style="list-style-type: none"> • Interface Calibration
Current Source Calibration. |
| <ul style="list-style-type: none"> • Pressure Rig Familiarisation
The Input Converter.
The Pneumatic Control Valve.
The Pressure Sensors and Gauges.
The Air Receiver. | <ul style="list-style-type: none"> • Controller Familiarisation
Serial Communication.
Navigating the Controller.
Using the Controller. |
| <ul style="list-style-type: none"> • Pressure Rig Calibration
Pressure Sensor Calibration.
Differential Pressure Sensor Calibration.
Input Converter Calibration.
Pneumatic Control Valve Calibration. | <ul style="list-style-type: none"> • Controller Calibration
Controller Calibration.
Controller Relays.
Reading the Controller. |
| <ul style="list-style-type: none"> • Interface Familiarisation
Circuit Breaker & Circuit Loop Connections.
The Input Converter.
The Current-Voltage Converters. | <ul style="list-style-type: none"> • Pressure Transmitter
The Pressure Transmitter (PT).
Calibrating the PT.
A Pressure Control Demonstration. |

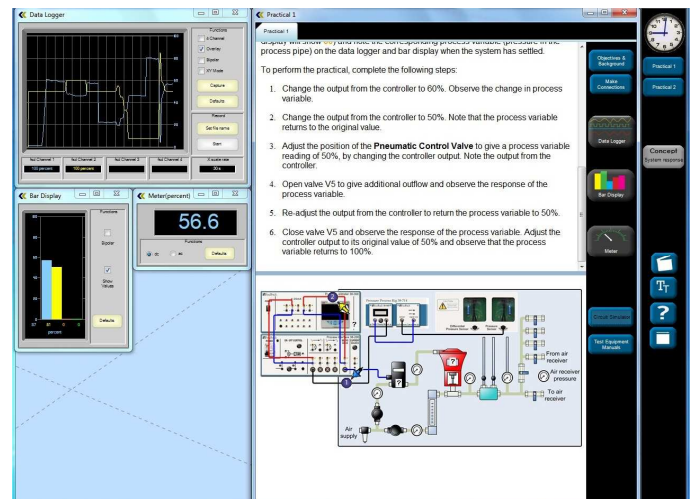
- Differential Pressure Transmitter**
 The Differential Pressure Transmitter (DPT). Calibrating the DPT.
 The Square Root Extractor.
 A Flow Control Demonstration.
- Manual Control**
 Operation of Pneumatic Control Valve.
 System Response without Air Receiver.
 System Response with Air Receiver.
- Proportional Control: Pressure**
 Proportional Control of Pressure.
 Proportional Control and Offset.
 Proportional Band.
- Proportional Control: Flow**
 Proportional Control of Flow.
 Proportional Control and Offset.

Proportional Band.

- PI & PID: Pressure Control**
 PI Control of Pressure.
 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 Proportional 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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