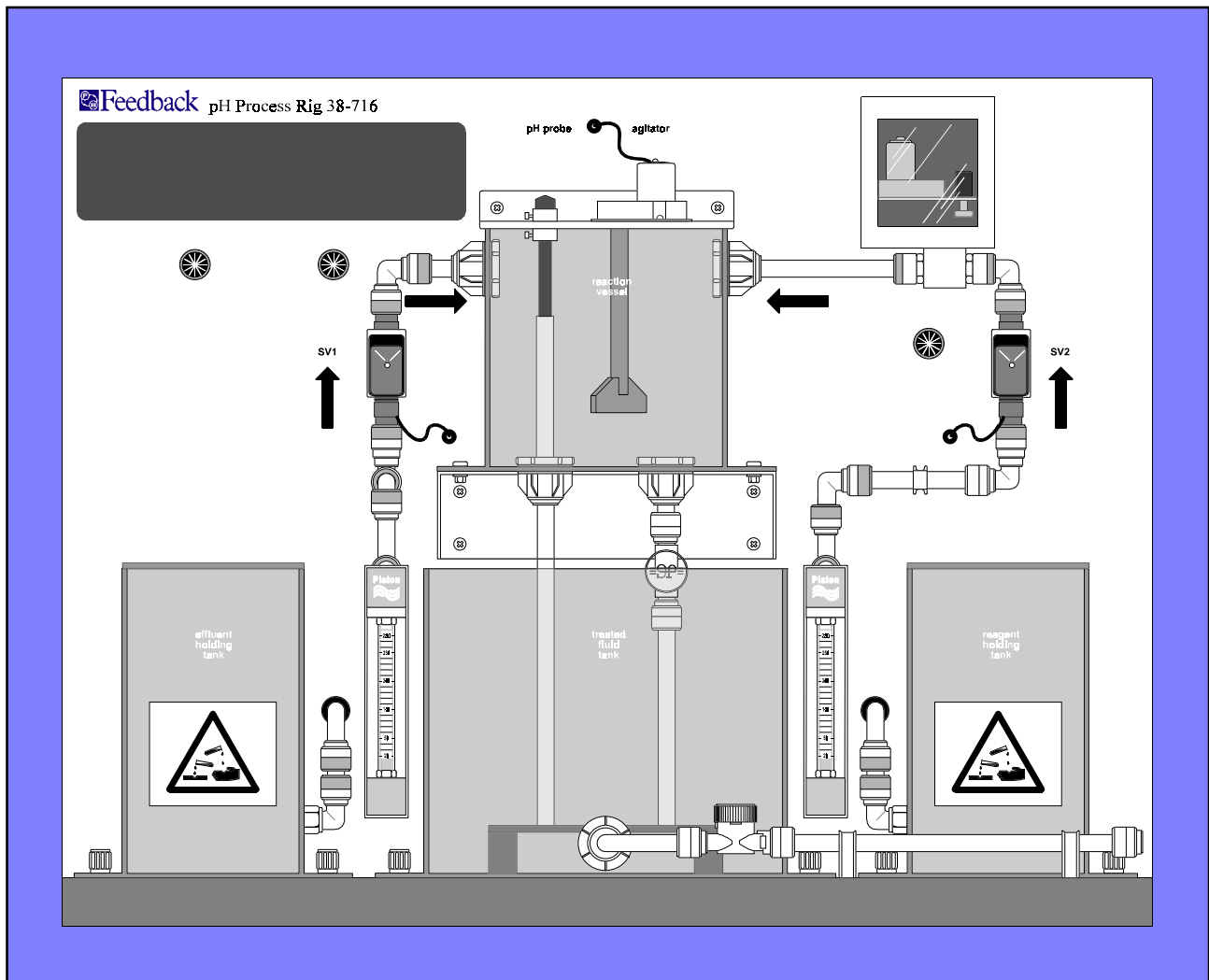


PROCON pH PROCESS CONTROL SYSTEM



One of a range of Industrial Process Control Trainers with *Discovery* software

- Removable pH probe
- 4-20mA control signals
- Rear mounted power supplies
- Four process tanks
- Motorised agitator
- Modern push fittings
- Operable at safe pH levels
- Comprehensive lab notes supplied

Description

The **PROCON** pH Process Control System is based around the pH Rig and is a self-contained educational platform for the teaching of pH level control and effluent treatment methods.

The control system includes:

- pH Process Rig**
- Process Interface**
- Process Controller**
- pH Sensor Pack**
- Digital Display Module**
- Control & Monitoring Software**

The pH Control Rig comprises two independently pumped fluid circuits mounted on a robust bench-top panel which allows the study of the principles of process control using the pH of the mixed effluent and reagent fluids as the process variable. The System is suitable for individual student work or for group demonstrations.

The rig includes:

- 2 independently pumped fluid circuits**
- Effluent and reagent holding tanks**
- Reaction vessel with agitator**
- pH probe and transmitter**
- Motorised needle/orifice control valve**
- 2 solenoid operated valves**
- 3 manual valves**
- 2 visual indication flow meters**
- Sump vessel**

Effluent and reagent are contained in separate holding tanks prior to being pumped into the reaction vessel where mixing is carried out.

The reaction vessel contains an accurate pH probe and agitator. The agitator is designed to constantly mix the contents of the reaction vessel. The pH probe is designed to monitor the pH level of the effluent/reagent mixture and is supplied with a pH transmitter which produces a standard 4-20mA control signal. This signal is passed to the Process Controller as the process variable.

A precision, motorised control valve is present in the reagent feed to allow accurate delivery control. The valve is designed to be controlled by the standard 4-20mA signals produced by the Process Controller. Total effluent and reagent fluid shut-off capability is provided by two normally-closed solenoid valves.

A treated effluent tank is provided to facilitate easy disposal of the processed fluids.

All wetted surface components have been carefully selected to be aggressive fluid resistant.

All necessary power requirements and full earth-leakage protection are supplied by the Process Interface. The Process Controller and Process Interface are identical to those used in the other PROCON Control Systems.

Assignments

Control and Monitoring software is provided with the system and the assignments that can be performed are:

- **Introduction to PROCON**
- **pH Rig Familiarisation**
- **Manual Control of pH**
 - manual operation of servo valve.
 - manual operation of solenoid valve.
 - establishing flow and position characteristics.
 - control of pH level in the reaction vessel.
 - use of the pH probe/conditioner.
- **Open-loop Response**
 - determining the open loop response of the process.
 - effect of varying effluent flow rate into the reaction tank.
- **On/off Control of pH**
 - control of pH in the reaction vessel.
 - use of pH probe and three-term controller with time
 - proportioned output to solenoid valve in the reagent line.
 - effect of changing the cycle time.
- **Proportional Control of pH**
 - effect of using motorised control valve instead of solenoid valve.
 - use of pH probe and three-term controller with 4-20mA.
 - proportioned output to motorised control valve in the reagent line.
 - effect of disturbance and of changing the set point.
 - demonstration of characteristics of a (P) Proportional only process controller to change in set point or a disturbance to the process.
 - effect of disturbance.
 - effect of changing set point.
 - effect of changing proportional band.
 - on/off control using a servo valve (PB=0%).
- **P + I Control of pH**
 - demonstration of characteristics of a (P+I) process controller to a change in set point or a disturbance.
 - effect of disturbance.
 - effect of changing set point.
 - effect of changing integral action time.
 - effect of changing proportional band.
- **P + D control**
 - demonstration of characteristics of a (P+D) process controller to a change in set point or a disturbance.
 - effect of disturbance.
 - effect of changing set point.
 - effect of changing derivative action time.
 - effect of changing proportional band.
- **PID Control**
 - demonstration of typical procedures for optimising settings of a three-term process controller to suit a particular process.
 - ultimate period method (Zeigler-Nichols).
 - reaction curve method.
 - autotune.

PROCON Tender Specification

PROCON pH Process Control System 38-005

A self-contained, benchtop mounted, pH Process Control trainer using acidic and alkaline solutions as the process fluids. The system to contain a pH Process Rig, a Process Interface, an industry standard Process Controller and a pH Sensor and Transmitter producing 4-20mA signals. The system to operate with computer aided laboratory software which provides on-screen control and instrumentation. Ten assignments are to be provided with the system.

PROCON Process Control Trainer Product Numbers

Listed below are the product numbers of the constituent parts of the pH Process Control System. It may be ordered complete, using the composite order number given. However, if you already have a compatible controller, interface or measuring equipment you may not need all the equipment in the system. In such cases you may order just the equipment that you do require. Please contact either your local agent, or Feedback, if you require further information.

Equipment in PROCON pH Process Control System 38-005 Composite	pH Process Control Rig	38-716
	Process Interface	38-200
	Process Controller	38-300
	Digital Display Module	38-490
	<i>Discovery</i> Software Pack	38-960
Optional Equipment	Programmable Logic Controller	38-350

Ordering Information

To order any of the PROCON pH Process Control System simply quote the title and number of the system, as given above.

For further information on these and other equipment in the Feedback range please contact

 **Feedback**

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