Introduction:-

- Bench mounted unit designed to demonstrate the use of ion-exchange resins for either continuous water softening or demineralisation.The equipment is designed to show industrial operations such as 'breakthrough' and regeneration cycles.
- The unit consists of two vertical transparent columns containing the cation and anion resins, mounted on a support frame together with the necessary pumps, valves and sensors.
- The arrangement of pumps and solenoid valves enables the flow configuration to be changed to demonstrate the various stages involved in the demineralisation or water-softening processes. Each stage of the process is selected by the operator using a PC and a mimic diagram for the appropriate stage displayed on the screen.
- Conductivity, temperature and pH of the influent and effluent of the columns are measured using electronic sensors for data logging.The apparatus is supplied with a typical commercial cation and anion resin, but other ion-exchange materials (not supplied) may be used so that their characteristics, exchange capacity etc. may be measured and compared.
- Union couplings at both ends of the columns enable the column to be easily removed for maintenance and set-up without the need for tools. Regenerant, test and wash solutions are stored in separate containers to avoid cross-contamination, and effluents are fed to a waste-water tank for proper disposal.

Features:

- Transparent test section for demonstration
- Control and data logging via PC
- Inline or outlet conductivity and pH sensors
- Transparent test section for demonstration
- Control and data logging via PC
- Inline or outlet conductivity and pH sensors

Scope of learning :

- Water softening using cationic resin
- Exchange capacity of a cationic softening system

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.

- Regeneration efficiency of a cationic softening system (regenerated using NaCl)
- Demineralisation using two-bed exchange (cationic resin and anionic resin used in series)
- Regeneration efficiency of a demineralisation system (regeneration cationic resin using HCl and anionic resin using NaOH)
- Exchange capacities of different resin materials (alternative materials not supplied)

Software:

- Our own customized software enables the operator to select the appropriate stage of the process and a mimic diagram with measured variables is displayed. The speed of the pump can be varied to meet the required flow rate.
- Results are saved in a log, which can be viewed and manipulated with the results viewer. Results can be printed or exported in a spreadsheet format, which can be opened in a wide range of packages for further analysis.

Technical Specifications :

- 2 x vertical columns : 16mm ID
- Solenoid valves 5 x Two-way valves (suitable for 10% HCl, 5% NaOH and 10% NaCl)
- Pumps 4 x 0-50mL (suitable for acid and alkali)
- Pump 1 x 0-75mL (suitable for acid and alkali)
- PH sensors : 2
- Conductivity/temperature sensors : 2 x 0 – 2mS/cm
- Conductivity probes : 2 x 0 – 2mS/cm
- Regenerant bottles : 2 x 1L
- Waste-water container : 25L
- Feed & wash water containers : 2 x 10L

Utility Required :

- Electrical supply: supplied with a universal mains adaptor suitable for 100-240V / 1ph / 50-60Hz
- Software requires a computer running Windows XP or above with a USB port (computer not supplied)
- Deionised water (not supplied)
- 5% sodium hydroxide (not supplied)
- 10% hydrochloric acid (not supplied)
- 10% sodium chloride (not supplied)
- Water supply: Initial fill and drain

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