

**W  
SERIES**

**ION EXCHANGE UNIT – W9-MkII**

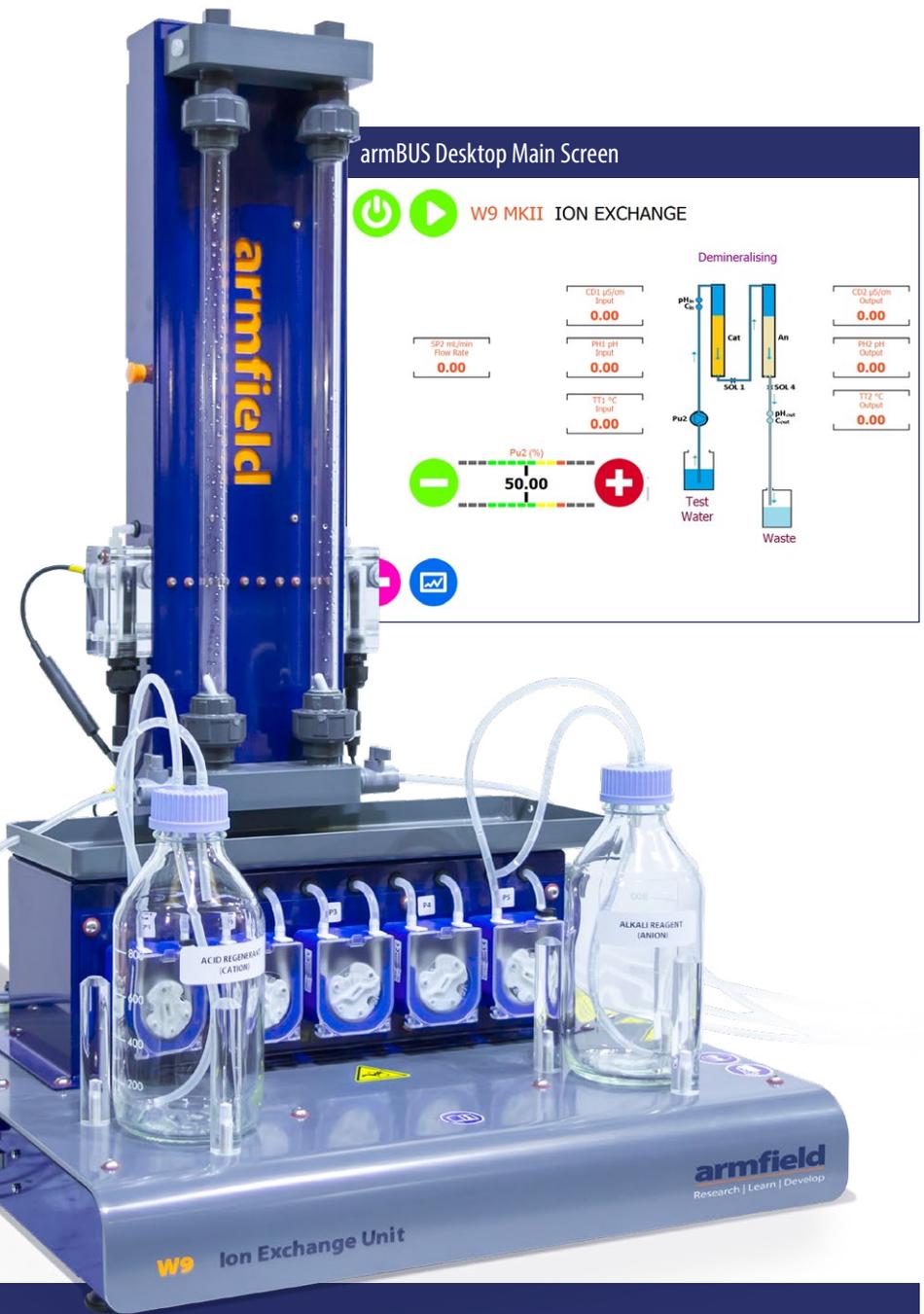
Bench mounted unit designed to demonstrate the use of ion-exchange resins for either continuous water softening or demineralisation. The equipment is designed to show industrial operations such as 'breakthrough' and regeneration cycles.

**UNIVERSAL SINGLE WIRE INTERFACE  
DATA LOGGING AND CONTROL VIA PC  
ACID PROOF BASE**

W9MKII cation and anion resin in columns



armBUS USB port and sockets



**Features / benefits**

- ▶ Transparent test section for demonstration
- ▶ Control and data logging via PC
- ▶ Inline or outlet conductivity and pH sensors
- ▶ 5 x solenoid valves for automatic selection of each part of the process
- ▶ Operational manual with teaching exercises
- ▶ Universal single-wire interface

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Issue: 2  
URL: <http://www.armfield.co.uk/w9>

Applications

ChE CE IP

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## Description

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.

## Software

The ArmBUS 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 ArmBUS 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 details

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

## Overall dimensions

<b>Length</b>	0.90m
<b>Width</b>	0.45m
<b>Height</b>	0.80m

## Packed and crated shipping specifications

<b>Volume</b>	0.32m <sup>3</sup>
<b>Gross weight</b>	35Kg

## Requirements

## Scale



- ▶ **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 by Armfield)
- ▶ 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



## Learning objectives

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

## Ordering specification

- ▶ Benchtop frame unit
- ▶ 2 x vertical transparent columns to house the resins
- ▶ 5 x peristaltic pumps for accurate process control and to prevent liquid contamination
- ▶ Two conductivity/temperature probes
- ▶ 2 x pH probes
- ▶ 5 x solenoid valves
- ▶ USB port for data logging using Armfield software
- ▶ Operational manual with teaching exercises
- ▶ Typical commercial cation and anion resins
- ▶ 2 x 1 L regenerant bottles
- ▶ 25 L waste-water container
- ▶ 2 x 10 L feed and wash water containers
- ▶ Powered by a universal power adaptor with worldwide approval

## Ordering codes

- ▶ W9-MkII

Armfield standard warranty applies with this product

## 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



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## Aftercare

Installation  
Commissioning  
Training  
Service and maintenance  
Support: [armfieldassist.com](http://armfieldassist.com)