Valves IV-908, PV-908

Instructions

1 Introduction

Valves IV-908 and PV-908 are motorised rotary 8-way valves. The valves are used in ÄKTA[™]design chromatography systems. They are powered from the ÄKTAdesign P-900 series system pump, and controlled from UNICORN[™] control system.

The valves have 8 positions and each position connects the central port with one of the peripheral ports. The valve IV-908 is used on the low pressure side (before the pump) and PV-908 on the high pressure side (after the pump).

The valve may be used to switch between sample and buffer solutions. Two valves may be used to switch between columns.

Features:

- Completely swept flow path minimises solvent or sample "memory effect".
- Flow rates up to 100 ml/min.
- All wetted parts are plastic PEEK.

Safety

WARNING! When using hazardous chemicals, all suitable protective measures, such as protective glasses, must be taken.

2 Installation

CAUTION! Before connecting Valves IV-908 or PV-908 ensure the power is switched OFF at the system pump or for the complete system.

Unpacking

Unpack the instrument and check the items against the packing list. Inspect the items for obvious damage which may have occurred during transportation.



Installing the valve

- 1 Connect the valve with two UniNet cables as a part of the *UniNet 2* chain.
- 2 Set the ID-switch at the bottom to the required valve number **0–9**. The number should correspond to that used in UNICORN. **Note:** All valves must have different numbers.



UniNet 2 chain



- 3 Mount the valve vertically, in the way it is shown in the user documentation of your ÄKTAdesign chromatography system.
- 4 Apply an identification number from the labels supplied. The number should be the same as the rotary switch at the bottom of the valve. Place the number so that it is easily readable from the front.
- 5 Connect the tubing. The valve has one main port marked *i/o* and 8 peripheral ports equally spaced marked **1–8**.



The low pressure valve *IV-908* has female 5/16"-24 UNF 2B connections.





3 Operation

The valves are controlled from UNICORN.

Storage

Overnight: The valves can be left filled with a buffer.

Overnight and Long time storage: Flush the valves with water and then fill with 20% ethanol.

4 Maintenance

CAUTION! Only spare parts approved or supplied by Amersham Pharmacia Biotech may be used for maintaining and servicing the valves.

Period	Action
Every 12 months or when required	Change channel plate and distribution plate

Cleaning-in-place

Pump a cleaning or sanitizing agent through the valve. The standard recommendation is to pump 1 M NaOH for 30 minutes and wash out with buffer.

WARNING! NaOH is injurious to health. Avoid spillage.

Changing channel plate and distribution plate

A valve kit is available, see ordering information in *Reference Information*.

- 1 Ensure that the valve is disconnected from the pump and the tubing are disconnected.
- 2 Remove the 4 screws on the front using the supplied 3 mm Allen key. Loosen each one equally in turn so the distribution plate comes off parallel to the valve body.



- 3 Slide the screws out.
- 4 Remove the distribution plate containing the 8 peripheral ports.
- 5 Remove the old channel plate and insert a new one.
- 6 Remount a new distribution plate so that the text **i/o** is horizontal and to the right of the central tubing connection. Using the Allen key, tighten the 4 screws in turn, a little at a time, until the distribution plate is fixed to the valve body.

5 Trouble shooting

If the suggested actions do not correct the fault, call Amersham Pharmacia Biotech.

Fault Action

The valve is not switching

- 1 Check the connection to the pump. The valve should be connected to the *UniNet 2* socket, not the *UniNet 1* socket.
- 2 Check the ID-switch on the valve. The ID number should correspond to the number set in UNICORN.
- 3 Check the *UniNet* cable and replace if required.

The valve is switching to wrong position

The valve parts may have been incorrectly assembled after replacement.

1 Check that the distribution plate marking i/o is horizontal.

External leakage

1 Check the tubing connections. Tighten or replace if required.

Internal leakage

Internal leakage can be detected at the small hole on the underside of the valve body.

1 Internal valve parts may be worn. Change channel plate and distribution plate according to section 4.

High back-pressure

- 1 Do cleaning-in-place according to the instructions in section 4.
- 2 Change channel plate and distribution plate according to section 4.
- Other faults Contact Amersham Pharmacia Biotech.

Reference information

Description

The valve consists of two main parts:

- Housing which encloses the motor and electronics.
- Valve body with a rotating 360° central core.



The main difference

between the IV-908 and PV-908 is the diameter of the flow channels and the maximum pressure ratings. PV-908 has 0.8 mm channels while IV-908 has 1.2 mm channels which allow higher flow rates at lower back pressure.

As the channel plate is turned by the motor, the central port on the front is connected to one of the peripheral ports 1–8, allowing a clear liquid path.



Valve switching is controlled from UNICORN by reading the actual position of the channel plate.

in the switching parts

The material used in the switching parts ensures both long mechanical and chemical lifetime.

The valve housing contains no user replaceable items.

Technical specifications

Operating data

Max Flow rate		
IV-908	100 ml/min	
PV-908	100 ml/min	
Max Pressure		
IV-908	2 MPa (20 bar, 290 psi)	
PV-908	25 MPa (250 bar, 3600 psi)	
Back pressure		
IV-908	< 3 kPa at 100 ml/min with water	
PV-908	< 40 kPa at 100 ml/min with	
	water	
Leakage		
IV-908	< 0.1 µl/min at 2 MPa	
PV-908	< 0.1 µl/min at 25 MPa	
pH stability range	1–13, 1–14 (<1 day exposure)	
Viscosity	Max. 5 cP	
Switch time	<260 ms between two	
	adjacent positions	
Operating life time	>50 000 cycles, two	
	adjacent positions	
Environment	+4 to +40 °C	
	20-95% relative humidity	
	84-106 kPa (840-1060 mbar)	
	atmospheric pressure	
Physical data		
Internal volume, in/out to port		
IV-908	26 µl	
PV-908	7 µİ	

20 µi				
7 µİ				
Flow channel diameter				
1.2 mm				
0.8 mm				
Motor controlled valve				
Switching 8-way, 8 positions controlled from UNICORN				
IP 43				

plates

Chemical resistance

PEEK (polyetheretherketone)

The wetted parts are resistant to organic solvents and salt buffers commonly used in chromatography of biomolecules, except 100% ethylacetate, 100% hexane and 100% tetrahydrofuran (THF)

Power requirement	
.	32 V DC ±10% from the system pump
Power consumption) Up to 9 W
UniNet 2 address	0-9
Inlet and outlet tubi	ng
IV-908	5/16"-24 UNF 2B for tubing with 3/16" outer diameter
PV-908	UNF 10-32 2B "Fingertights" for capillary tubing 1/16" outer diameter
Dimensions,	
HxWxD	135 x 80 x 120 mm
Weight	1.2 kg
EMC Standards	 This product meets the requirement of the EMC Directive 89/336/EEC through the harmonized standards EN 50081-1 (emission) and EN 50082-1 (immunity) Note: The declaration of conformity is valid for the instrument when it is used in laboratory locations used in the same state as it was delivered from Amersham Pharmacia Biotech except for alterations described in the user manual connected to other CE labelled Amersham Pharmacia Biotech instruments or other products as recommended.

Accessories and spare parts

ltem	Quantity per pack	Code no.
Valve IV-908 including one UniNet cable	1	18-1108-42
Valve PV-908 including one UniNet cable	1	18-1108-41
Valve kit, including channel plate and distribution plate		
IV-908 PV-908	1 1	18-1109-07 18-1109-06
Cable UniNet, 0.7 m	1	18-1109-74
Number Plates 0-9	1	18-1109-09
Mounting bracket	1	18-1109-11
Teflon tubing, i.d. 1/8", o.d. 3/16"	3 m	18-1112-47
Tubing connector for 3/16" o.d. tubing	10	18-1112-49
Ferrule for 3/16" o.d. tubing	10	18-1112-48
Stop plug, 5/16"	5	18-1112-50
Stop plug, 1/16"	5	18-1112-52
Union Luer female/1/16" male	2	18-1112-51
Union 1/16" female/M6 male	6	18-1112-57
Union M6 female/1/16" male	8	18-1112-58
PEEK tubing, i.d. 0.75 mm, o.d. 1/16"	2 m	18-1112-53
Teflon tubing, i.d. 0.75 mm, o.d. 1/16"	2 m	18-1112-54
PEEK tubing, i.d. 1.0 mm, o.d. 1/16"	2 m	18-1115-83
Fingertight connector 1/16"	10	18-1112-55

Important user information

WARNING!

The Warning sign is used to call attention to the necessity to follow an instruction in detail to avoid personal injury. Be sure not to proceed until the instructions are clearly understood and all stated conditions are met.

CAUTION!

The Caution sign is used to call attention to instructions or conditions that shall be followed to avoid damage to the product or other equipment. Be sure not to proceed until the instructions are clearly understood and all stated conditions are met.

Note

The Note sign is used to indicate information important for trouble-free or optimal use of the product.

Should you have any comments on this instruction, we will be pleased to receive them at:

Amersham Pharmacia Biotech AB SE–751 84 Uppsala Sweden

Trademarks

ÄKTA and UNICORN are trademarks of Amersham Pharmacia Biotech Limited or its subsidiaries.

Amersham is a trademark of Nycomed Amersham plc. Pharmacia and Drop Design are trademarks of Pharmacia & Upjohn Inc.

Terms and Conditions of Sale

All goods and services are sold subject to the terms and conditions of sale of the company within the Amersham Pharmacia Biotech group which supplies them. A copy of these terms and conditions of sale is available on request.

Adresses

Amersham Pharmacia Biotech UK Limited Amersham Place Little Chalfont Buckinghamshire England HP7 9NA

Amersham Pharmacia Biotech AB SE-751 84 Uppsala Sweden

Amersham Pharmacia Biotech Inc

800 Centennial Avenue PO Box 1327 Piscataway NJ 08855 USA

© Amersham Pharmacia Biotech AB 1998 – All rights reserved

