

GE Healthcare

Valves IV-908, PV-908

Instructions



Important user information

All users must read this entire manual to fully understand the safe use of Valves IV-908, PV-908.

WARNING!



The WARNING! sign highlights instructions that must be followed to avoid personal injury. It is important not to proceed until all stated conditions are met and clearly understood.

CAUTION!

The Caution! sign highlights instructions that must be followed to avoid damage to the product or other equipment. It is important not to proceed until all stated conditions are met and clearly understood.

Note

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

CE Certifying

This product meets the requirements of applicable CE-directives. A copy of the corresponding Declaration of Conformity is available on request.

The **CE** symbol and corresponding declaration of conformity, is valid for the instrument when it is:

- used as a stand-alone unit, or
- connected to other CE-marked GE Healthcare instruments, or
- connected to other products recommended or described in this manual, and
- used in the same state as it was delivered from GE Healthcare except for alterations described in this manual.

Recycling



This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

WARNING!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to make adequate measures.

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 ÄKTA design™ 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.

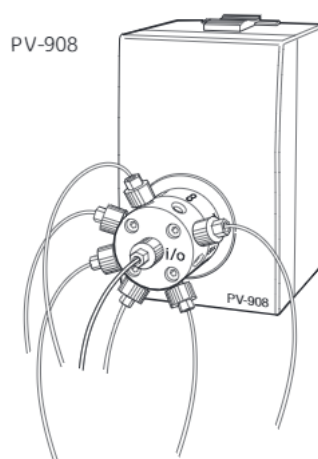
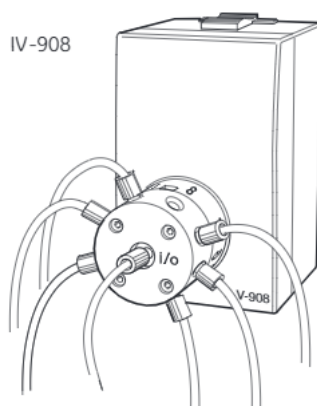
Features:

- 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, take all suitable protective measures, such as wearing protective glasses and gloves resistant to the chemicals used. Follow local regulations and instructions for safe operation and maintenance of the system.



1 Introduction

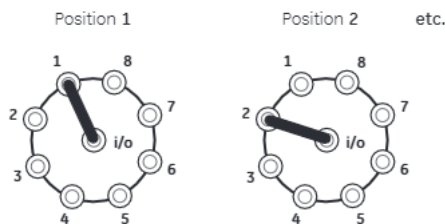
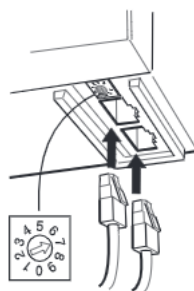
2 Installation

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

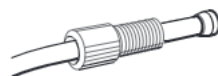
Unpacking

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

- 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.
- 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.



The high-pressure valve PV-908 has female UNF 10-32 2B connections.



2 Installation

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.

3 Operation

4 Maintenance

CAUTION! Only spare parts approved or supplied by GE Healthcare 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.

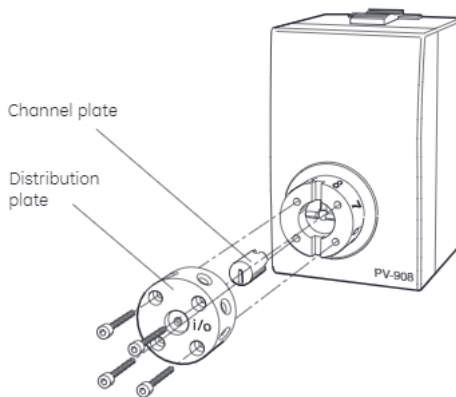


WARNING! NaOH is injurious to health. Avoid spillage.

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.



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5 Trouble shooting

If the suggested actions do not correct the fault, call GE Healthcare.

Fault	Action
The valve is not switching	<ol style="list-style-type: none"> <li data-bbox="766 491 1191 573">1 Check the connection to the pump. The valve should be connected to the <i>UniNet 2</i> socket, not the <i>UniNet 1</i> socket. <li data-bbox="766 591 1191 673">2 Check the ID-switch on the valve. The ID number should correspond to the number set in UNICORN. <li data-bbox="766 691 1191 755">3 Check the UniNet cable and replace if required.
The valve is switching to wrong position	<p data-bbox="766 828 1191 882">The valve parts may have been incorrectly assembled after replacement.</p> <ol style="list-style-type: none"> <li data-bbox="766 900 1206 964">1 Check that the distribution plate marking <i>i/o</i> is horizontal.
External leakage	<ol style="list-style-type: none"> <li data-bbox="766 1037 1206 1092">1 Check the tubing connections. Tighten or replace if required.
Internal leakage	<p data-bbox="766 1164 1191 1219">Internal leakage can be detected at the small hole on the underside of the valve body.</p> <ol style="list-style-type: none"> <li data-bbox="766 1237 1191 1328">1 Internal valve parts may be worn. Change channel plate and distribution plate according to section 4.
High back-pressure	<ol style="list-style-type: none"> <li data-bbox="766 1401 1191 1456">1 Do cleaning-in-place according to the instructions in section 4. <li data-bbox="766 1474 1206 1537">2 Change channel plate and distribution plate according to section 4.
Other faults	Contact GE Healthcare.



Recycling

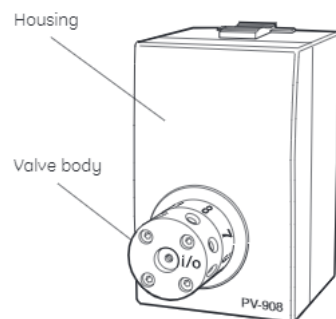
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6 Reference information

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.

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

6 Reference information

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 µl
Flow channel diameter	
IV-908	1.2 mm
PV-908	0.8 mm
Valve principle	Motor controlled valve
Functions	Switching 8-way, 8 positions controlled from UNICORN
Degree of protection	IP 43
Wetted materials	
Channel and Distribution plates	PEEK (polyetheretherketone)
Chemical resistance	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 tubing	
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,	
H x W x D	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
	<ul style="list-style-type: none">• used in laboratory locations• used in the same state as it was delivered from GE Healthcare except for alterations described in the user manual• connected to other CE labelled GE Healthcare instruments or other products as recommended.

Accessories and spare parts

Item	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	1	18-1109-07
PV-908	1	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

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