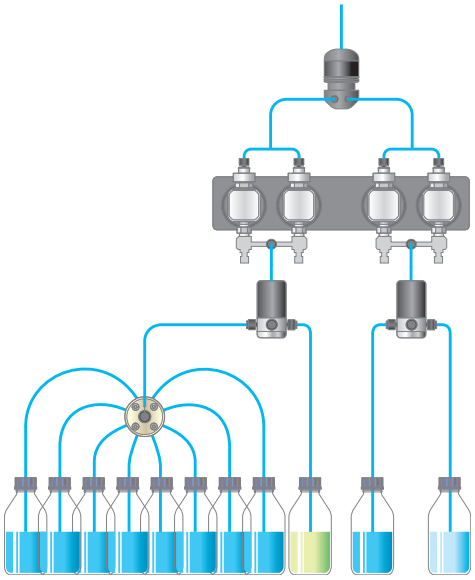
GE Healthcare

ÄKTAdesign

Buffer Selection Kit

User Manual



ÄKTA™

Important user information

All users must read this entire manual to fully understand the safe use of Buffer Selection Kit.

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 enuironment this product may cause radio interference in which case the user may be required to take adequate measures.

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1 Introduction

1.1 General

ÄKTAdesign standard system configurations can be changed to optional configurations. This flexibility in ÄKTAdesign system strategies allows the user to enhance already used purification methods and also to develop new, more complex methods.

When optional equipment is connected to a standard chromatographic system, new sets of instructions to control the optional equipment become accessible for the user.

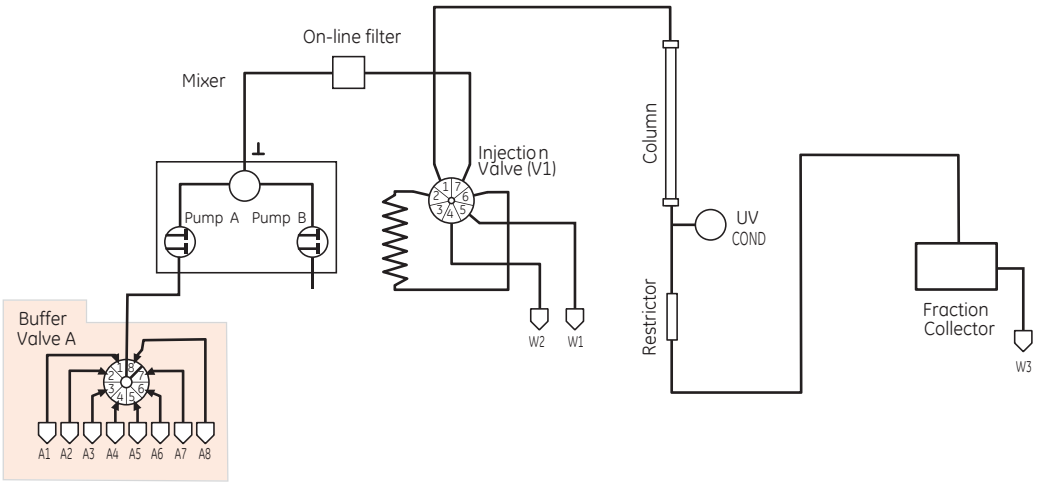
Optional configurations are selected, installed and put into operation by the user. An optional configuration consists of both hardware components and software instructions.

Optional configurations are monitored and controlled via methods run by the UNICORN™ control system in the same way as ÄKTAdesign standard system configurations.

1.2 Optional buffer selection valve

An optional buffer valve allows selecting automatically between eight additional buffers. This functionality enables the following:

- Automated buffer/reagent screening for purification optimization.
- Moving inlet tubing by hand is no longer necessary, and the risk of introducing air into the system is removed.
- A solution of nickel sulphate connected through the buffer valve enables automated charging of metal ion affinity columns.
- Buffers for cleaning can be added and stored in place for different runs.
- Large volumes and multi sample applications can be run through one or several additional buffer valves.



The optional buffer selection valve (code no. 18-1108-42) is available for:

- ÄKTAFPLC™ with UNICORN Software 3.2 or higher
- ÄKTApurifier™ with UNICORN Software 3.21 AA or higher
- ÄKTAbasic™ with UNICORN Software 3.21 AA or higher

2 Safety

IMPORTANT! ÄKTA Buffer Selection Kit intended for laboratory use only, not for clinical or *in vitro* use, or for diagnostic purposes.

- The components are designed for indoor use only.
- Do not use in a dusty atmosphere or close to spraying water.
- Operate in accordance with local safety instructions.

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

WARNING! Ensure that the entire chromatographic system has been flushed thoroughly with distilled water before removing any capillaries or components.

WARNING! Always disconnect the power supply before attempting to replace any item on the equipment during maintenance.

WARNING! If there is a risk that large volumes of spilt liquid may penetrate the casing of the equipment and come into contact with the electrical components, immediately switch off the chromatographic system and contact an authorized service technician.

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.

CAUTION! Make sure ÄKTAdesign is switched off before installing the optional components. The mains power to the system must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

3 Unpacking

Unpack the optional components and check against the supplied packing list. Inspect the items for obvious damage that may have occurred during transportation.

CAUTION! Read the following information carefully, as well as all the additional instructions supplied with the components, to ensure that the ÄKTAdesign optional equipment is installed correctly.

4 Pre-requisites

The general procedures for creating and editing methods are described in the *UNICORN User Manuals*.

Note: *The system configuration delay volume must be recalculated and reset when the standard configuration after the UV flow cell is changed.*

ÄKTAFPLC, ÄKTApurifier and ÄKTAbasic respectively must be installed and fully tested before the optional components are installed.
See the *Installation Guide* for your ÄKTAdesign chromatography system.

WARNING! Ensure that the entire system has been flushed thoroughly with distilled water before removing any capillaries or components.

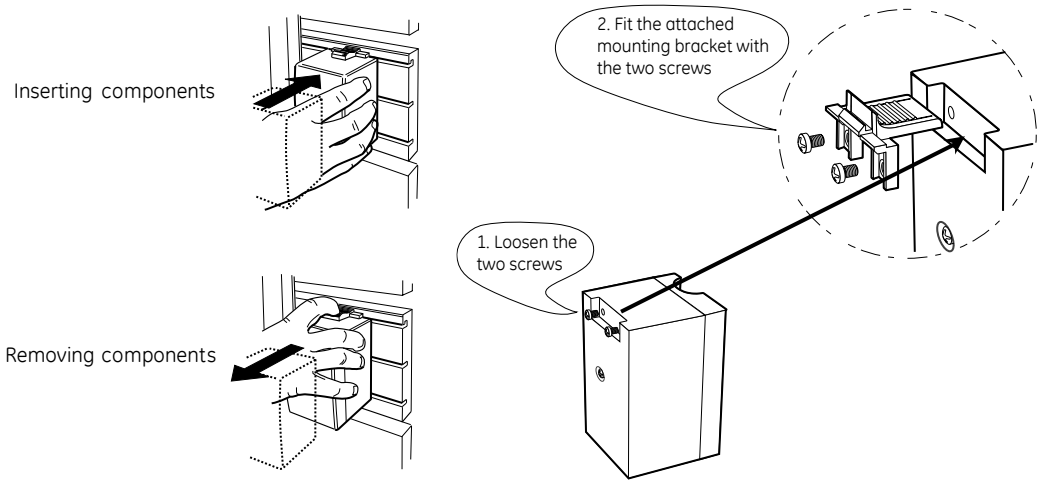
CAUTION! Make sure that the ÄKTAdesign instrument is switched off before installing the optional components. The mains power to the ÄKTAdesign instrument must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

5 Mounting of brackets

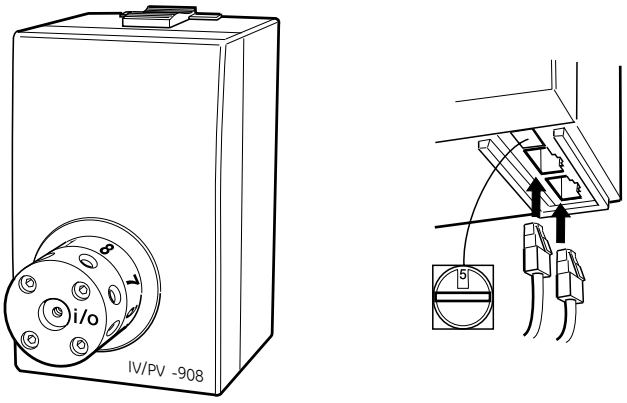
CAUTION! Make sure that the ÄKTAdesign instrument is switched off before installing the optional components. The mains power to the ÄKTAdesign instrument must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

Optional equipment can be mounted on the system. When selecting mounting location for the optional equipment it is important to choose a location which minimize the length of the capillaries used to connect the optional components to the rest of the system.

Many components that are attached to the mounting rails uses a snapin bracket. The bracket is supplied separately with the component and needs to be fitted as shown below before the component can be attached.



5.1 Valve ID



The buffer selection valve has a unique ID code which identifies it to the UNICORN control system at system start-up. This ID code should be checked before installation.

The ID code for the buffer selection valve and the corresponding instructions used in UNICORN to control it are as follows:

Valve function	ID code	Valve type	Instruction in UNICORN
Buffer selection A			
ÄKTA$_{FPLC}$	5	INV-908	BufferValveA
ÄKTApurifier	6	INV-908	BufferValveA1
ÄKTAbasic	6	INV-908	BufferValveA1

Components are connected to the UNICORN control system using either UniNet-1 or UniNet-2 cables*. Both the UniNet-1 and the UniNet-2 data communication chain in standard configuration is routed from the rear of the system pump via their respective components to the last component in the chain where it is terminated with a plug.

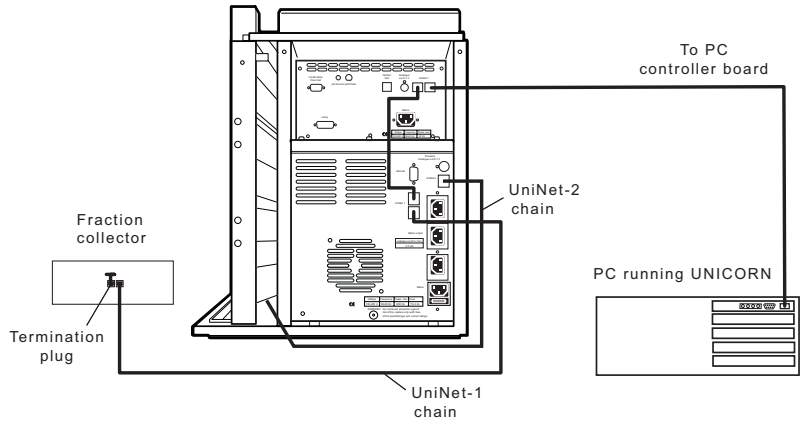
* Frac-920, Frac-950, A-900 and A-905 are connected via the UniNet-1 chain. All other optional components are connected via the UniNet-2 chain.

Note: *When Pump P-960 is used, it is always installed as the last component in the UniNet-2 chain. Since the pump has an internal termination, no termination plug is needed.*

5.2 UniNet Connection

Both the UniNet-1 and the UniNet-2 chain can be interrupted anywhere between the system pump and the termination plug to interconnect the optional components in the chain. The termination plug can be moved to the last component (furthest away from the system pump), if motivated by cable routing considerations.

WARNING! Only use mains cables delivered or approved by GE Healthcare.



Use the attached UniNet-2 cables to connect the valve to the UniNet-2 communication link. The valve can be connected anywhere between the system pump and the termination plug connected to the outlet valve.

Check that all capillary and electrical connections are carried out correctly.

WARNING! Do not block the rear panel of the system. The mains power switch must always be easy to access.

5 Mounting of brackets

6 Installation

6.1 Preparation for use

To start your ÄKTAdesign optional configuration system:

1 Switch on the ÄKTAdesign instrument with the mains switch located at the front left on the system base.

2 Check that the computer and printer are switched on.

3 Log in (see the instrument user manuals).

4 In **UNICORN Main Menu/Manager,** select **Administration:System Setup.**

5 Select **System** and then click **Edit.** Click **Component….**

6 From the **Component** list, select the optional buffer selection valve you have installed by checking the box, or by clicking **ADD.**

7 Click **OK** twice and then **Close.**

8 Mark the INV-908 valve with **A.** Check that the ID code switch is set to **6** (ÄKTAFPLC to **5**).

9 Mount the bracket and attach the valve to the system rack, see chapter 5.

10 Cut and mount the required capillaries. Use a capillary with the correct i.d. as required by your system (i.d. 1.6 mm and i.d. 2.9 mm).

7 Operation

7.1 Preparing for operation

1 The buffer selection valve is automatically recognized by UNICORN at system start-up. Check that the added valve is indicated in the Flow Scheme in UNICORN.

2 Verify that the valve is functioning properly by issuing manual commands from UNICORN as follows:

- In **System Control,** select **Manual:FlowPath.**
- Select instruction **BufferValveA.**
- Set **BufferValveA** to position **A4** (in UNICORN 5.10 to position **A14**)
- Manually run Pump A with distilled water at a flow rate of approximately 2 ml/min and check that water is drawn through port 4 in BufferValve A.

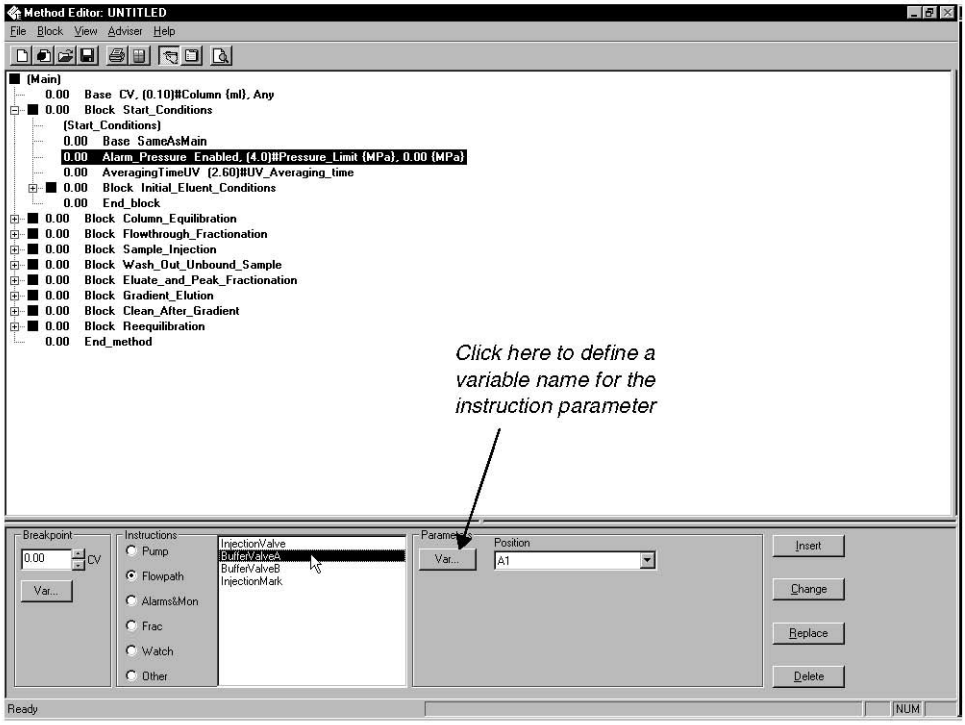
7.2 ÄKTAFPLC/ÄKTApurifier/ÄKTAbasic – UNICORN 3.2 – 3.21

7.2.1 Using the buffer selection function in a run

The buffer valve instruction is designated **BufferValveA.** In the Run Data pane, it is designated **V5_BufferA** for ÄKTAFPLC, and for ÄKTApurifier/ ÄKTAbasic it is **V6_BuffA1.** To use a valve in a method, proceed as follows:

1 In the **Main Menu,** select **File:New:Method** to create a new method. Select **System:, Technique:, Template:** and **For column:** Click **OK.**

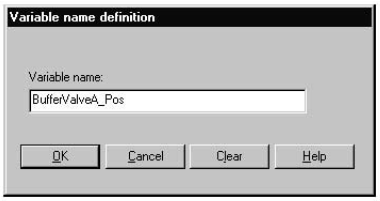
2 Select **View:Text instructions** to display the text instruction editor. Double-click on the instruction block where you want to add the general function valve instruction, e.g. **Start_Conditions_zz.** Highlight the instruction below to insert the valve instruction.



3 Click the **Flowpath** radio button.

4 From the Instructions list, select **BufferValveA.** The valve instruction parameter **Position** allows you to change all eight positions of the buffer valves individually.

5 Define a variable name for the buffer selection instruction parameters, e.g. **BufferValveA_pos.** This variable allows you to turn the position of the buffer valve to the position you want.



6 Click **OK.** The defined variable is inserted in the method.

7 Return to the **Variables** page by selecting **View:Run setup** to set the variable **BufferValveA_pos** to the desired position.

8 Save the method.

7.3 ÄKTAFPLC/ÄKTApurifier/ÄKTAbasic – UNICORN 4.0 – 4.12

7.3.1 Using the buffer selection function in a run

To use a valve in a method, select the desired valve options in the Method Wizard when creating the new method.

The buffer valve instruction is designated **BufferA.** In the Run Data pane, they are designated **V5_BufferA** for ÄKTAFPLC, and **V6_BuffA** for ÄKTApurifier and ÄKTAbasic.

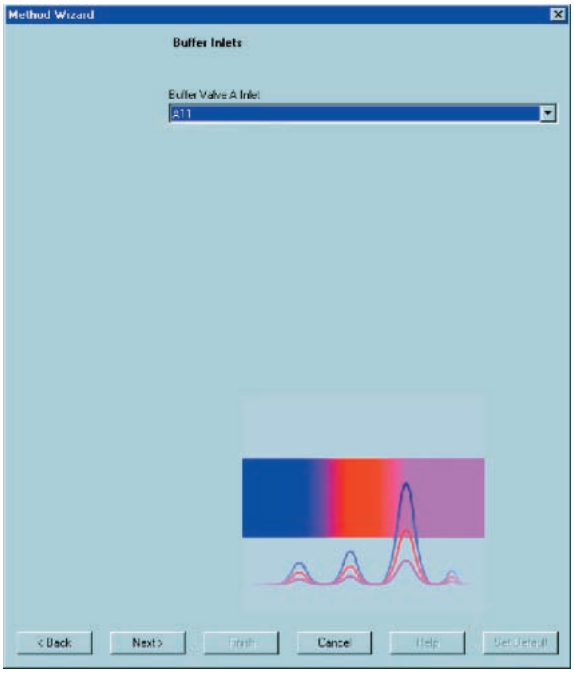
7.4 ÄKTApurifier – UNICORN 5.10 or higher

7.4.1 Using the buffer selection function in a run

To use a valve in a method, select the desired valve options in the Method Wizard when creating the new method:

1. In the **Method Editor**, select **File:Method Wizard** and start creating a new method.

2 In the **Buffer Inlets** dialog, select **A11** under **Buffer Valve Inlet**.



3 Click **Finish**.

The buffer valve instruction is designated **Buffer_A1.** In the Run Data pane, it is designated **V6_Buffer Valve A1** for ÄKTApurifier.

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