ÄKTA design

ÄKTA FPLC

Installation Guide

18-1140-46

Amersham Biosciences

Important user information

All users must read this entire manual to fully understand the safe use of ÄKTAFPLC.

WARNING!

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

Caution!

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

Note

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

CE Certification

This product meets all 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 Amersham Biosciences instruments, or
- connected to other products recommended or described in this manual, and
- used in the same state as it was delivered from Amersham Biosciences except for alterations described in this manual.

WARNING!

This is a Class A product. In a domestic environment, it may cause radio interference, in which case the user may be required to take suitable measures.

Terms and Conditions of Sale

Unless otherwise agreed in writing, all goods and services are sold subject to the terms and conditions of sale of the company within the Amersham Biosciences group which supplies them. A copy of these terms and conditions is available on request.

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

Amersham Biosciences AB
SE–751 84 Uppsala
Sweden

Trademarks

Office Addresses

Amersham Biosciences AB
SE-751 84 Uppsala
Sweden

Amersham Biosciences UK Limited
Amersham Place
Little Chalfont
Buckinghamshire
England HP7 9NA

Amersham Biosciences Corp.
800 Centennial Avenue
PO Box 1327
Piscataway NJ 08855
USA

Amersham Biosciences Europe GmbH
Munzinger Strasse 9
D-79111 Freiburg
Germany

Amersham Biosciences K.K.
Sanken Building
3-25-1 Hyakunincho, Shinjuku-ku
Tokyo 169–0073
Japan

Amersham Biosciences Limited
13/F., Tower I
Ever Gain Plaza
88 Container Port Road
Kwai Chung, New Territories
Hong Kong

www.amershambiosciences.com

Contents

1 About this installation guide 7

2 Safety 8

3 Pre-requisites 10

4 Installation overview 11

5 Installation of ÄKTAFPLC 12

6 Installation test 17

6.1 Preparation of ÄKTAFPLC 17
6.2 Running the installation test method 18
6.3 Evaluating the installation test results 22
6.4 Correcting faulty evaluation results 23

7 Test record 24

7.1 Gradient test result 24
7.2 Step response test result 24

8 Installation record 25

9 Registration form 27

9.1 Components 28

1 About this installation guide

ÄKTAFPLC™ is assembled and fully tested before shipping.

For safe transportation, however, some components have been secured and need to be released from strappings.

Extra capillaries, accessories, column holders, etc. are enclosed in separate paper boxes.

This guide describes how to install ÄKTA™FPLC. It is divided into two parts; one describing the installation and one describing how to run the installation test. After the installation procedure has been performed, your ÄKTAFPLC is ready for purification work.

For full details of specifications, methods, maintenance, etc. refer to the respective User Manuals and Instructions.

2 Safety

- The system is designed for indoor use only.
- Do not use in a dusty atmosphere or close to spraying water.

Refer to Technical Specifications in the System Manual for detailed environmental pre-requisites.

WARNING! The individual instruments must not be opened by the user. They contain high voltage circuits that can give a lethal electric shock.

WARNING! Monitor UPC-900 uses high intensity ultra-violet light. Do not disconnect the optical unit while the lamp is ON.

WARNING! ÄKTAFPLC must be connected to a grounded mains socket.

WARNING! There must always be a sample loop or Superloop™ connected to ports 2 and 6 of the injection valve. This prevents liquid spraying out of the ports when switching the valve, which is especially dangerous if hazardous chemicals are being used.

WARNING! Two people are required to lift the system.

WARNING! Only spare parts approved or supplied by Amersham Biosciences may be used for maintaining and servicing the system.

WARNING! If the system is turned around or the fraction collector removed, the external capillaries and other tubings may become entangled in nearby objects and be pulled from their connections causing leakage.

WARNING! Never place waste containers on the top of the system. If they become full and overflow, liquid may penetrate the system causing a short-circuit.

3 Pre-requisites

WARNING! ÄKTAFPLC must be connected to a grounded mains socket.

- Two people are required to lift ÄKTAFPLC onto the working bench.
- To install ÄKTAFPLC, a working area of about 200 x 80 cm is required.
- ÄKTAFPLC requires 100-120/220-240 V~, 50/60 Hz electrical supply with safety grounding.
- Cutting pliers are recommended for cutting plastic straps.
- A waste flask is needed.
- The installation test requires the following solutions:

  - 200 ml of distilled water.

  - 200 ml of 0.4% acetone in distilled water.

4 Installation overview

- Unpack ÄKTAFPLC 12
- Detach packing material and unstrap items.....13
- Unpack and install the computer.....15
- Connect mains power cabling 15
- Connect UniNet-1 data communication chain cabling 16
- Complete the first two sections of the installation record.....25
- Prepare ÄKTAFPLC for the installation test 17
- Run the installation test method 18
- Evaluate the gradient 22
- Evaluate the step response 23
- Complete the test record 24
- Complete the registration form 27
- Complete the final section of the installation record 25
- Store photocopies of all records and forms in the System Logbook.
- Store the Installation Guide in the User Manual box.

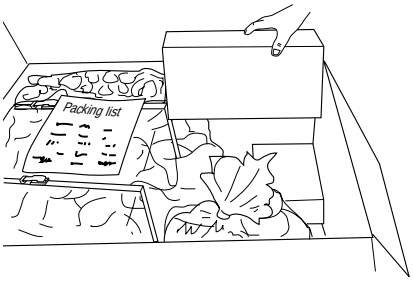
5 Installation of ÄKTAFPLC

Begin by creating a clean and dry working area of 200 x 80 cm that allows easy access. Then follow the step-by-step instructions below and fill in the Installation record as you go along, see page 25.

Note: Some items are packed in separate boxes delivered with the system.

Note: Some packing lists are included in the boxes.

1 After removing the cardboard hood and other packing material check the contents against the enclosed packing list. Also check all enclosed boxes. Store all the boxes and plastic bags in a convenient nearby place.



2 Put aside the fraction collector to unpack later.

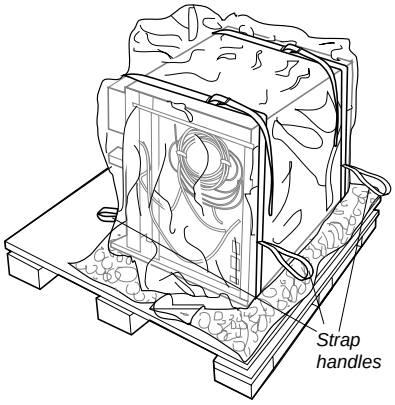
Note: The installation of the fraction collector is described in detail in the ÄKTAFPLC Optional Configuration User Manual supplied. Refer to the section that describes your fraction collector.

WARNING! Two people are required to lift the system.

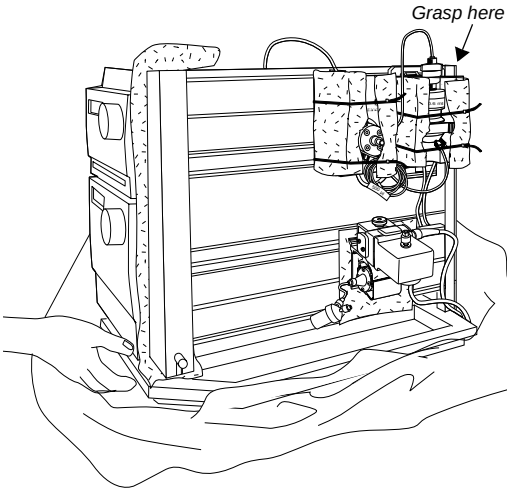
3 Lift ÄKTAFPLC onto the work area using the four red strap handles.

4 Release the two red straps with the strap handles and remove.

5 Open the plastic cover from the top and fold down to uncover the system. Take care not to damage any capillaries or components while doing this.



6 Remove the plastic cover from the system by gently tilting the system backwards and grasping it below the system rack. Pull out the plastic cover as far as possible. Then gently tilt the system forwards grasping it at the top rear and pull away the plastic cover completely.

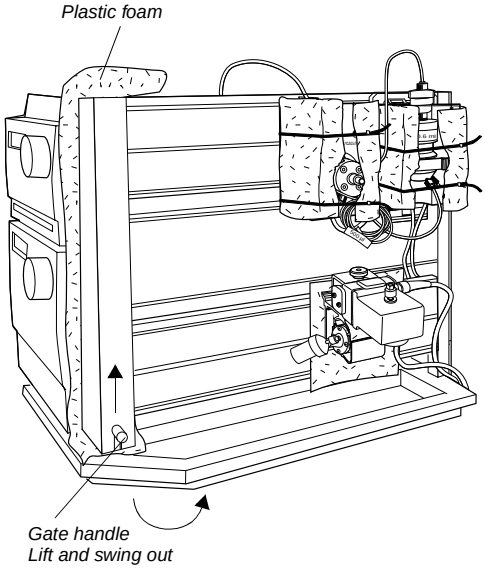


7 Save all the original packing material. If the equipment has to be re-packed, for transportation or otherwise, it is important that the system can be safely packed using the original packing material.

8 Open the system rack by lifting the gate handle and swinging out.

9 Remove the plastic foam packing.

10 Close the system rack.

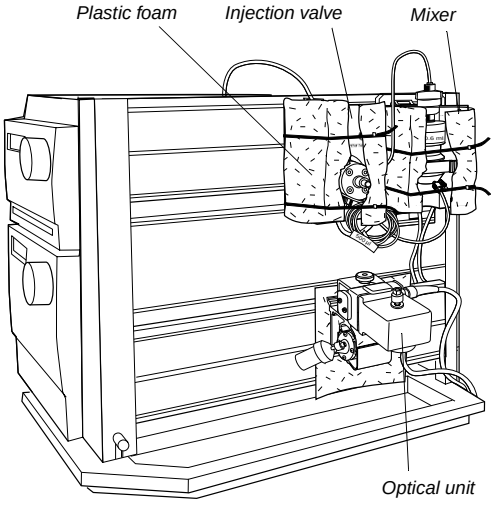


11 Turn the system so that the component side is facing you.

12 Lift the optical unit gently to remove the plastic foam packing.

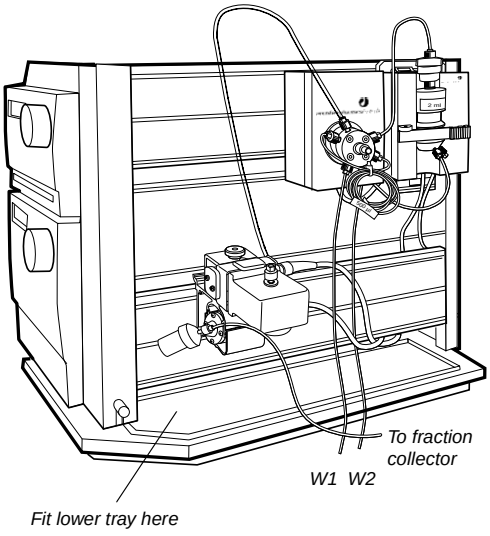
13 Cut and remove the plastic straps holding the mixer and the injection valve.

14 Lift off the mixer and the injection valve, one at a time, to remove the plastic foam packing behind them, and then refit.



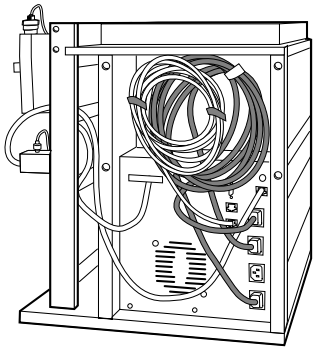
15 Position the mixer, injection valve and optical unit as illustrated, by pushing them sideways in their mounting rails.

16 Remove all red tape holding capillaries. Place the waste capillaries marked W1 and W2 in a waste bottle and place the bottle in a convenient location. Not on top of the system!



17 Take out the inlet tubings with filters from the plastic bag on top of the system.

18 Take the lower tray stored on top of the system. Open the system rack using the gate handle and fit the lower tray in its recess.



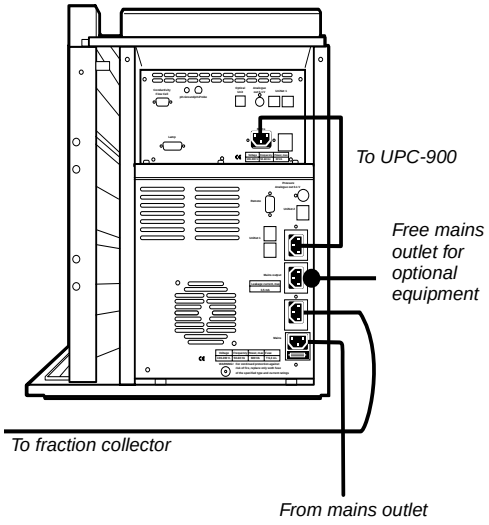
19 Remove all red tape holding the cables.

- Black cables are mains cables.

- Grey cables are UniNet-1 communication cables.

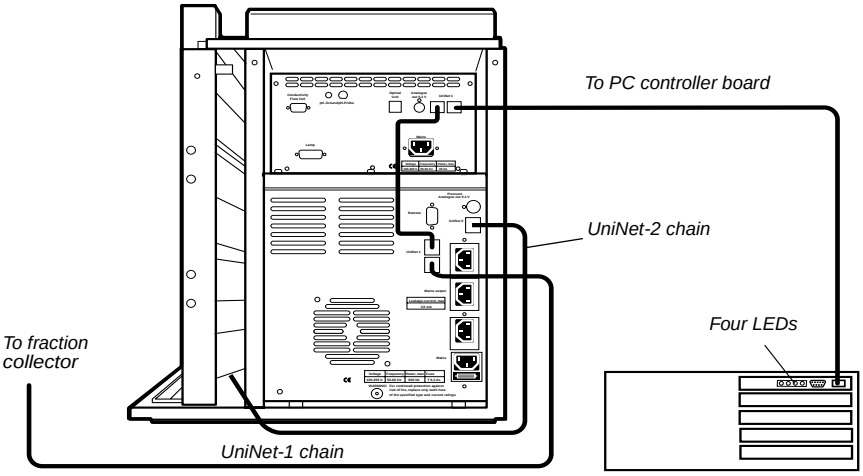
20 Connect the mains cable from the system mains outlet to the fraction collector mains inlet.

21 Unpack and install the computer and printer according to the manufacturer's instructions. Place them to the left of the system. Do not switch them on!



CAUTION! The mains power to ÄKTAFPLC must be switched OFF before the UniNet-1 cabling is installed.

22 Connect the shorter UniNet-1 cable to the fraction collector.



CAUTION! The UniNet-1 connection to the computer MUST be made to the board with four LEDs.

23 Connect the longer UniNet-1 cable to the controller board installed in the computer.

WARNING! ÄKTAFPLC must be connected to a grounded mains socket.

24 Connect the system mains cable from the mains inlet to a properly grounded mains socket.

25 All other cables are connected at delivery.

26 Check all cable connections.

27 Turn ÄKTAFPLC so that the front is facing forward.

28 Complete the first two sections of the Installation record on page 25.

29 The installation phase of ÄKTAFPLC is now completed.

6 Installation test

The installation test checks the function of the liquid delivery and the UV monitoring system of ÄKTAFPLC. The installation test can also be used at any time to check the condition of the system, e.g., after a prolonged stop.

Correct gradient formation is tested by producing a linear gradient and a series of concentration steps of acetone.

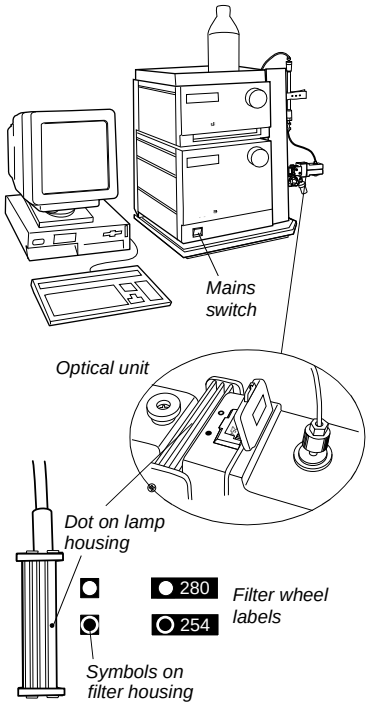
Correct UV monitoring is tested by monitoring the acetone concentration at 254 nm.

6.1 Preparation of ÄKTAFPLC

1 Switch on the ÄKTAFPLC chromatography system with the mains switch located to the left on the ÄKTAFPLC system pump P-920.

2 Switch on the computer and the printer.

3 Check on the optical unit that the UV wavelength is set to 254 nm. If not, set the wavelength by selecting lamp position (indicated by a dot on the lamp housing) in combination with the appropriate filter, i.e., the dot on the lamp housing should be adjacent to the symbol on the filter housing corresponding to the symbol on the filter wheel for the 254 nm filter. A click will indicate that the filter is in position.



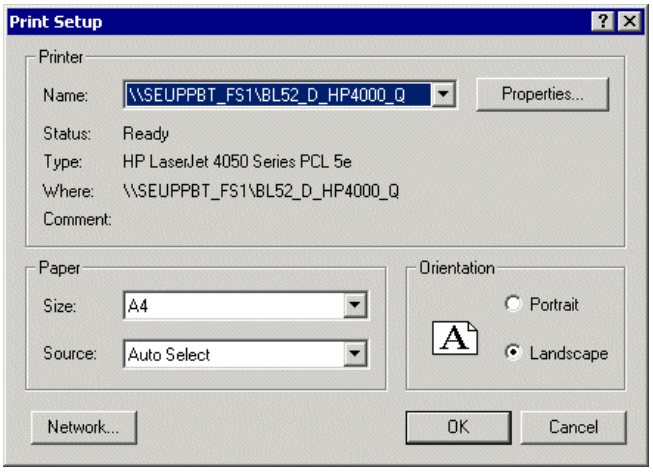
4 Check that the inlet filters are submerged in the corresponding buffers A and B.

Method Guide	
Buffer A:	Distilled water (200 ml)
Buffer B:	0.4% acetone in distilled water (200 ml)
Flow rate:	5 ml/min.
Test run time:	Approximately 25 minutes

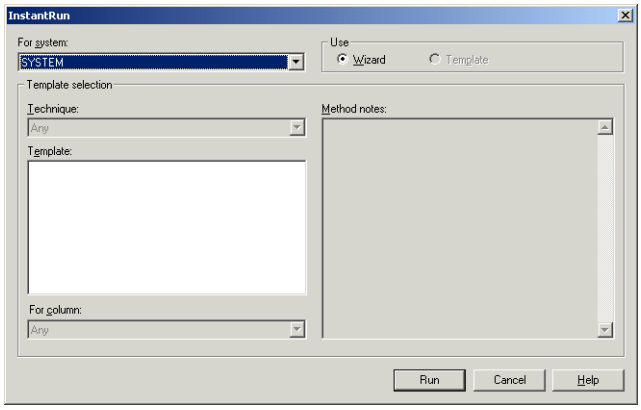
6.2 Running the installation test method

1 Start UNICORN™ as described in the *Making your first runs* booklet.

2 In UNICORN, select **File:Printer Setup...**. Select the appropriate printer from the list and select **Landscape**. Then click **OK** to acknowledge the printer chosen.

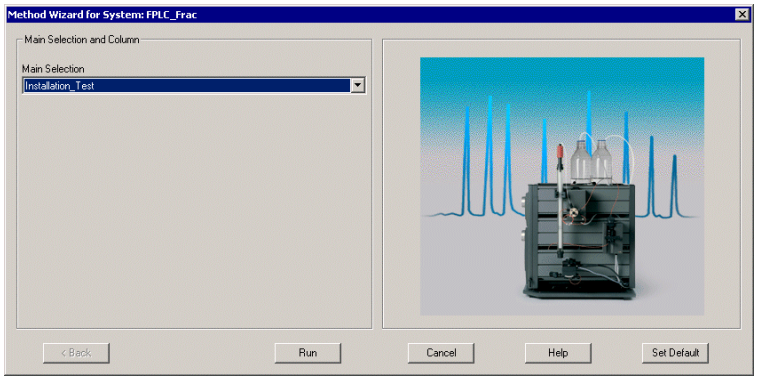


3 Click the **Instant Run** button  . The **Instant Run** window opens.

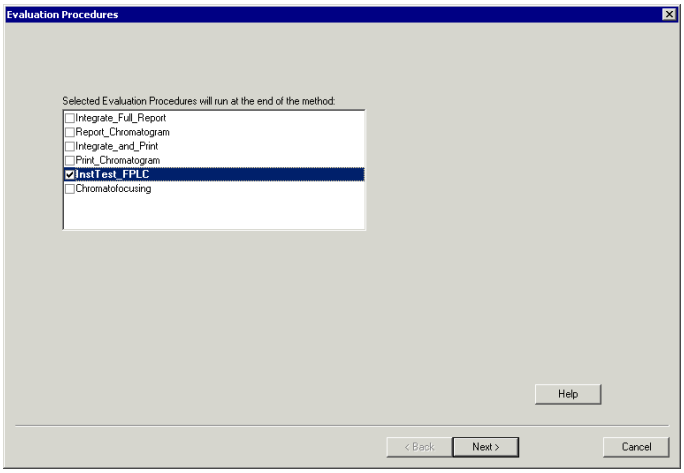


Select the appropriate system and click **Run**.

4 Select **Installation_Test** in the Method Wizard. Click **Run**.



5 In the **Evaluation Procedures** window, select the procedure for your system, for example, **InstTest_FPLC**.



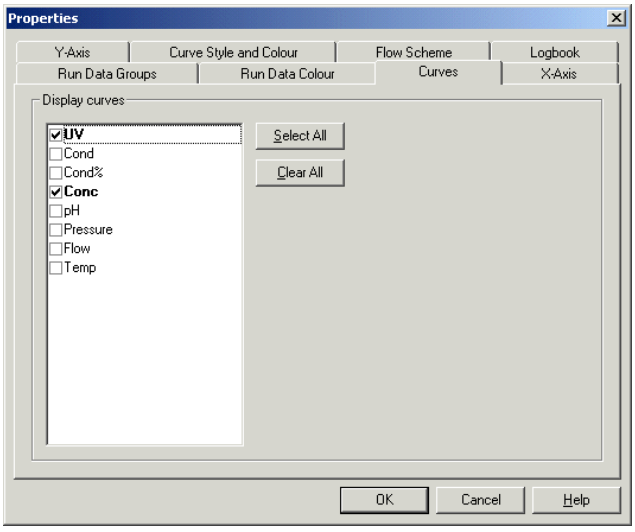
6 Click **Next** in the **Method Information** window.

7 Click **START** in the **Result Name** window to start the installation test.

The progress of the test is monitored in the **System Control** module. The installation test run time is approximately 30 min.

8 To customize the **Curves** pane, right-click in the pane and select **Properties**.

9 Click the **Curves** tab.

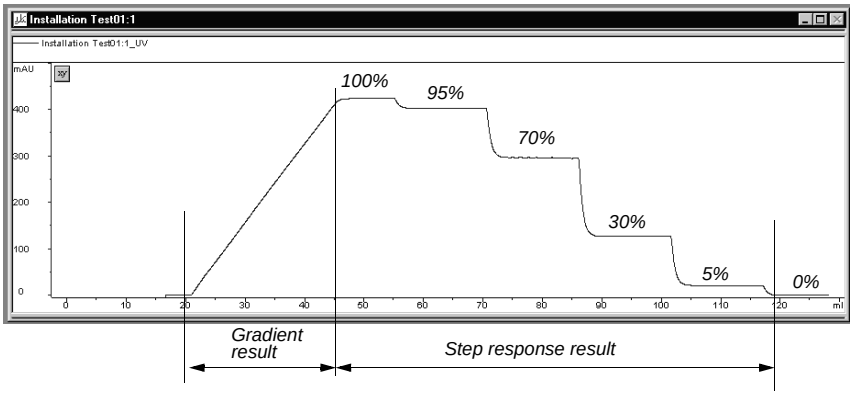


10 Select the following curves to be displayed:

- **UV**
- **Conc**

Clear all other highlighted curves. Click **OK**.

11 When the test run is finished, the printer automatically prints the chromatogram and the test result.



6.3 Evaluating the installation test results

6.3.1 Automatic evaluation

The system automatically prints the test result when the test is finished. The print-out consists of a chromatogram and an evaluation of the test result.

- If the gradient test result is OK, the print-out says "Gradient linearity accepted".
- If the step response test result is OK, the print-out says "Step response accepted".

If any of the evaluated values fall outside the specified range, go to step *6.4 Correcting faulty evaluation results.*

6.3.2 Manual evaluation

If your chromatography system deviate from the standard configuration, e.g. if optional components have been installed, the automatic evaluation will not give a reliable result. If so, perform a manual evaluation as described below.

1 Select the **UNICORN Main menu** module.

2 Click on  in the **Results** window and then double-click on the **Wizard Generated001** icon to open the result file.

3 Click **Print** to obtain a printed report of the result.

Evaluating the gradient

Place a ruler along the gradient part of curve **Wizard Generated001:1_UV@01,SMTH** in the printed report.

The curve should be linear between 10% B and 90% B and void of discontinuities.

Evaluating the step response
Calculate the relative adsorption plateau heights for curve **Wizard Generated001:1_UV@01,SMTH** as follows:

1 Subtract the base line value (0% B) from each of the values in column 2 in the Step response table of the Test record (see page 24) and enter the results in column 3.

2 Divide each value in column 3 by the baseline corrected value corresponding to 100% B, multiply by 100 and enter the results in column 4.

The values of column 4 should all fall within the intervals given in column 5.

6.4 Correcting faulty evaluation results

Should any of the evaluated values fall outside the specified range, proceed as follows:

- If the system differs from the standard configuration, evaluate the result manually.

  If the faulty evaluation result remains, continue below.

6.4.1 Faulty gradient

- The gradient is linear but the interval is too small – Mixer chamber too large, or faulty mixer.

- Disturbances – may arise from air in the pump, pump valves or bad sealings in the pump. Refer to the *Pump P-920 User Manual*.

6.4.2 Faulty step response

- If all values are faulty – air in pump or faulty pump.

- 5% and 95% faulty – bad sealing in pumps (5% faulty = pump module B, 95% faulty = pump module A).

7 Test record

Date: .....

ÄKTAFPLC serial no.: .....

7.1 Gradient test result

Gradient linear from .....%B to .....%B. (10 - 90%)

7.2 Step response test result

Step response table:

1 Programmed Conc.%B	*2 Value read*	*3 Baseline corrected value*	*4 Normalised value*	*5 Allowed interval*
100				
95				94 - 96
70				69 - 71
30				29 - 31
5				4 - 6
0				

8 Installation record

Check	*Sign*	*Remarks*
1 Unpacking • Contents according to packing lists. • All packing material removed. • No visible damage.		
2 Installation • Injection valve waste tubings (port 4 and 5, marked W1 and W2) to waste reservoir. • Fraction collector unpacked and installed. • Outlet tubing from flow restrictor connected to fraction collector. • Outlet waste tubing extended to waste reservoir. • Computer and printer installed. • UniNet-1 cabling installed. • Mains power cabling installed.		
3 Installation test • Solutions prepared. • ÄKTAFPLC prepared. • Installation Test method run. • Installation Test results evaluated. • Test Record completed. • Registration Form completed. • Test Record and copy of Registration form stored in System Logbook. • Registration form posted to Service Administration. • Installation Guide stored in User Manual box for future use.		

9 Registration form

IMPORTANT!
WARRANTY REGISTRATION INFORMATION

Please ensure that this form is completed and returned to Service Administration to register the users' equipment under warranty.

Name: .....

Institute/company: .....

Address: .....

Department/location: .....

Post Code: .....

Phone Number: ..... Fax Number: .....

End Users:..... E-mail: .....

Date of Installation: ..... Quote No: .....

Customer Order No: ..... Invoice No: .....

Support Agreement purchased with the instrument: Y / N

If YES give details: .....

Installer (name): .....

Signature of Installer:.....

Installation Accepted:.....Date:.....

Note: Fill in serial numbers over-leaf.

9.1 Components

ÄKTAFPLC system serial numbers: .....

QTY	*Part Number*	*Description*	*Serial Number*
		System rack III	
		Mixer M-925	
		Monitor UPC-900	
		Pump P-920	
		Fraction collector	
		INV-907	
		Computer	
		Computer display	

Amersham
Biosciences

TC information, Uppsala. Printed in Sweden by TK i Uppsala AB