

Mixer M-925

Instructions

1 Introduction

Mixer M-925 is a dynamic, single chamber mixer with interchangeable mixer volumes. The mixer is used in stand-alone applications with ÄKTA™ design Pump P-900 series, and in ÄKTA design chromatography systems.

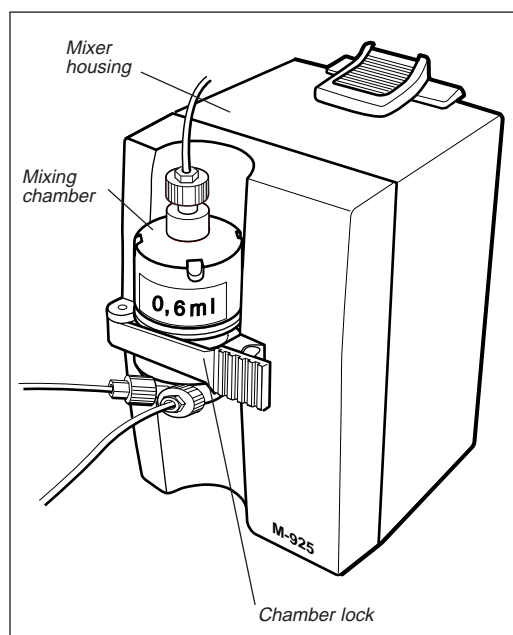
Features:

- 2-step mixing for optimum results.
- Flow rates up to 100 ml/min.
- Interchangeable mixing chambers with volumes of 0.6, 2, 5 or 12 ml.

Safety

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

WARNING! Mixer M-925 with 12 ml mixer chamber must not be used at pressures above 10 MPa (100 bar, 1450 psi). Mixer M-925 with 0.6, 2, or 5 ml mixer chamber must not be used at pressures above 25 MPa (250 bar, 3625 psi). The mixer will leak at higher pressures.



Installing the mixer

CAUTION! Do not install the mixer closer than 0.5 m from any computer display. The rotating stirrer may disturb the display screen.

The mixer and the mixer chamber(s) are delivered in separate packages, and must be assembled before use.

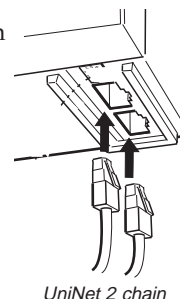
2 Installation

CAUTION! Before connecting the Mixer M-925 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 mixer with two UniNet cables as a part of the *UniNet 2* chain.

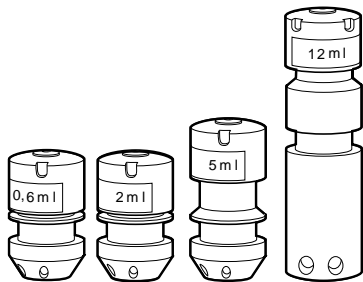


- 2 Mount the mixer in an an ÄKTAdesign chromatography system, or together with an ÄKTAdesign P-900 series system pump in stand-alone applications. See the ÄKTAdesign user documentation for further information.
- 3 Fit a mixer chamber to the mixer housing as described below.

Fitting mixing chamber

WARNING! When using hazardous chemicals, ensure that the mixer chamber has been flushed through with distilled water before removing an used chamber.

A mixer chamber must be fitted to the mixer housing prior to use.



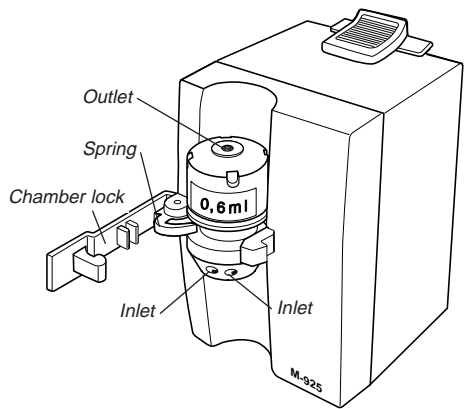
Mixer chambers of 0.6, 2, 5 and 12 ml are available.

Recommended flow rates for each mixing chamber are specified in the table below.

When using eluents that are more difficult to mix such as Isopropanol and water, a large mixer volume can be used to get optimum mixing.

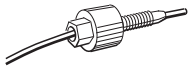
Mixing chamber volume and max. pressure	Recommended flow rates Two pump gradients	Switch valve gradients
0.6 ml/25 MPa	0.001-10.0 ml/min	0.1-5 ml/min
2 ml/25 MPa	0.5-100 ml/min	1-10 ml/min
5 ml/25 MPa	5-100 ml/min	5-30 ml/min
12 ml/10 MPa	–	15-100 ml/min

For BufferPrep select flow rates as for switch valve gradients.



To fit a mixer chamber:

- 1 Open the plastic lock covering the mixer chamber compartment. A spring is securing the mixer chamber in position when the lock is opened.
- 2 Insert a mixer chamber, and close the lock.
- 3 Fit the inlet and outlet tubing.



3 Operation

On/off

The mixer is controlled from a system pump in the ÄKTAdesign P-900 series and is, by default, operating whenever the pump is running. See the User Manual for the pump.

The mixer can be run without liquid, but it should be avoided due to mechanical wear.

Storage

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

Overnight and Long time storage: Flush the mixer 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 Mixer M-925.

<i>Period</i>	<i>Action</i>
Every 6 months	General inspection
Every 2nd year	Replace the mixer chamber

Cleaning-in-place

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

WARNING! NaOH is injurious to health. Avoid spillage.

General inspection

- 1 Check that the mixer chamber is clean and without damage. Check the tubing connectors. Replace if required.

Replacing mixer chamber

WARNING! When using hazardous chemicals, ensure that the mixer chamber has been flushed through with distilled water before removing the chamber.

- 1 Make sure the pump is stopped.
- 2 Place the buffer bottles lower than the mixer to prevent draining, and then remove the inlet and outlet tubing.
- 3 Open the plastic lock holding the mixer chamber. A spring is securing the mixer chamber in position when the lock is opened.
- 4 Pull out the mixer chamber gently.
- 5 Insert the new mixer chamber, and close the lock.
- 6 Replace the inlet and outlet tubing.

5 Trouble shooting

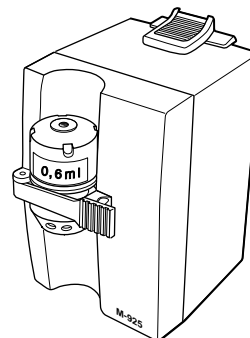
If the suggested actions do not correct the fault, call Amersham Pharmacia Biotech.

Fault	Action
Leakage	1 Check the tubing and connectors. If leakage is located to the mixer chamber, replace the complete chamber.
Waves on the gradient	1 Check that the pump is operating and is programmed correctly. 2 Clean the mixing chamber to make sure it is free of dirt or particles. 3 Change to a larger mixing chamber volume if necessary. 4 Run the mixer test from UNICORN™ to determine the working status of the mixer. If the test failed, contact Amersham Pharmacia Biotech.
Unlinear gradients or slow response to %B changes	1 Check that the tubing has been washed properly and that the pump is operating. 2 Change to a smaller mixer volume.
Not running	1 Check cables. 2 Check Setup menu on the pump.
Other faults	Contact Amersham Pharmacia Biotech.

Reference information

Description

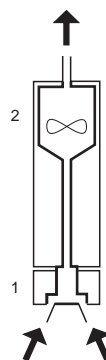
A mixer motor inside the housing spins a magnet at 600 rpm, that causes the stirrer in the mixing chamber to rotate.



The eluents are mixed in two steps:

- 1 Premixing in a static mixer with a small volume (22 µl).
- 2 Dynamic mixing chamber with rotating stirrer.

The mixer housing and the mixer chamber contains no user replaceable items.



Technical specifications

Operating data

<i>Max Flow rate</i>	0.001 – 100 ml/min
<i>Max Pressure</i>	
<i>12 ml chamber</i>	10 MPa at 0.1 – 100 ml/min (100 bar, 1450 psi)
<i>0.6, 2 and 5 ml chambers</i>	25 MPa at 0.001 – 100 ml/min (250 bar, 3625 psi)
<i>pH range</i>	1–13, 1–14 (<1 day exposure)
<i>Viscosity</i>	Max. 5 cP
<i>Environment</i>	+4 to +40 °C 20-95% relative humidity 84-106 kPa (840-1060 mbar) atmospheric pressure

Physical data

<i>Internal volume</i>	4 interchangeable mixing chambers: 0.6, 2, 5 and 12 ml
<i>Mixing principle</i>	1 static chamber and 1 dynamic chamber
<i>Degree of protection</i>	IP 43
<i>Wetted materials</i>	
<i>Stirrer</i>	PTFE (polytetrafluoroethylene)
<i>Mixing chambers</i>	PEEK
<i>Chemical resistance</i>	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)
<i>pH stability range</i>	1–13, 1–14 (<1 day exposure)
<i>Power requirement</i>	12–40 V DC from the pump
<i>Power consumption</i>	1 W
<i>Inlet and outlet tubing</i>	UNF 10-32 2B "Fingertights" with capillary tubing 1/16" outer diameter
<i>Dimensions, H x W x D</i>	152 x 77 x 111 mm
<i>Weight</i>	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 labeled Amersham Pharmacia Biotech instruments or other products as recommended.

Accessories and spare parts

<i>Item</i>	<i>Quantity per pack</i>	<i>Code no.</i>
Mixer M-925		
including one UniNet cable	1	18-1118-89
UniNet cable, 0.7 m	1	18-1109-74
Mixing chamber (must be ordered separately)		
0.6 ml	1	18-1118-90
2 ml	1	18-1118-91
5 ml	1	18-1118-92
12 ml	1	18-1118-93
Stop plug, 1/16"	5	18-1112-52

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

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