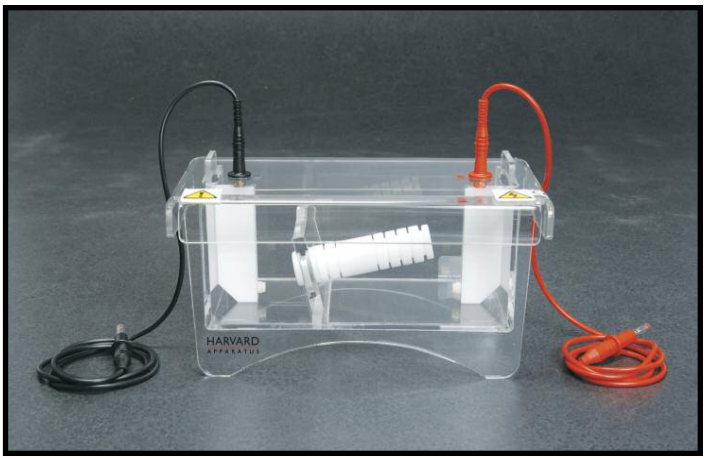
ElectroPrep™ System

User's Manual



HARVARD
APPARATUS

WEEE/RoHS Compliance Statement

EU Directives WEEE and RoHS

To Our Valued Customers:

We are committed to being a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation. The European Union (EU) has enacted two Directives, the first on product recycling (Waste Electrical and Electronic Equipment, WEEE) and the second limiting the use of certain substances (Restriction on the use of Hazardous Substances, RoHS). Over time, these Directives will be implemented in the national laws of each EU Member State.

Once the final national regulations have been put into place, recycling will be offered for our products which are within the scope of the WEEE Directive. Products falling under the scope of the WEEE Directive available for sale after August 13, 2005 will be identified with a "wheelie bin" symbol.

Two Categories of products covered by the WEEE Directive are currently exempt from the RoHS Directive – Category 8, medical devices (with the exception of implanted or infected products) and Category 9, monitoring and control instruments. Most of our products fall into either Category 8 or 9 and are currently exempt from the RoHS Directive. We will continue to monitor the application of the RoHS Directive to its products and will comply with any changes as they apply.

- **Do Not Dispose Product with Municipal Waste**
- **Special Collection/Disposal Required**

Table of Contents

WARRANTY

THE ELECTROPREP UNIT IS DESIGNED TO GIVE LONG SERVICE AND REPRODUCIBLE RESULTS IN YOUR LABORATORY. A FEW MOMENTS SPENT READING THESE INSTRUCTIONS WILL ENSURE THAT YOUR EXPECTATIONS ARE REFLECTED IN THE SUCCESSFUL USE OF THE APPARATUS.

FIRST CHECK THAT THE APPARATUS HAS BEEN RECEIVED COMPLETE AND UNDAMAGED FOLLOWING SHIPMENT. ANY FAULTS OR LOSSES MUST BE NOTIFIED TO HARVARD BIOSCIENCE IMMEDIATELY.

Harvard Apparatus warranties this instrument for a period of twenty-four (24) months from the date of purchase. At its option, Harvard Apparatus will repair or replace the unit if it is found to be defective as to workmanship or material.

This warranty extends to the equipment provided it has been used under normal laboratory conditions and in accordance with the operating limitations and maintenance procedures outlined in this instruction manual and when not having been subject to accident, alteration, misuse or abuse.

No liability is accepted for loss or damage arising from the incorrect use of this unit. Harvard Biosciences liability is limited to the repair or replacement of the unit or refund of the purchase price, at Harvard Bioscience's option. Harvard Bioscience is not liable for any consequential damages.

If a defect arises within the two-year warranty period, promptly contact ***Harvard Apparatus, Inc. 84 October Hill Road, Building 7, Massachusetts 01746*** using our toll free number 1-800-272-2775. Goods will not be accepted for return unless a RMA (return materials authorization) number has been issued by our customer service department. The customer is responsible for shipping charges. Please allow a reasonable period of time for completion of repairs, replacement and return. If the unit is replaced, the replacement unit is covered only for the remainder of the original warranty period dating from the purchase of the original device.
This warranty gives you specific rights, and you may also have other rights which vary from state to state.

REFER TO THE PACKING LIST AND CHECK THAT ALL COMPONENTS AND ACCESSORIES ARE PRESENT.

****PLEASE RETAIN ALL PACKAGING MATERIALS UNTIL THE WARRANTY PERIOD HAS EXPIRED.****

Harvard Apparatus products are for research use only and not for clinical use on human or veterinary patients

CAUTION

FOR RESEARCH USE ONLY NOT FOR CLINICAL USE ON HUMAN OR VETERINARY PATIENTS

General Safety Summary

WARNING

THESE UNITS ARE CAPABLE OF DELIVERING POTENTIALLY LETHAL VOLTAGE WHEN CONNECTED TO A POWER SUPPLY AND ARE TO BE OPERATED ONLY BY QUALIFIED TECHNICALLY TRAINED PERSONNEL.

PLEASE READ THE ENTIRE OPERATOR'S MANUAL THOROUGHLY BEFORE OPERATING THIS UNIT.

THESE UNITS COMPLY WITH THE STATUTORY CE SAFETY DIRECTIVES:

73/23/EEC: LOW VOLTAGE DIRECTIVE: IEC 1010-1:1990 plus AMENDMENT 1:1992

EN 61010-1:1993/BS EN 61010-1:1993

Please read the following safety precautions to ensure proper use of your ElectroPrep System. To avoid potential hazards and product damage, use this product only as instructed in this manual.

To Prevent Hazard or Injury:

Make Proper Connections
Make sure all connections are made properly and securely.

Observe all Terminal Ratings
Review the operating manual to learn the ratings on all connections.

Do Not Operate with Suspected Failures
If damage is suspected on or to the product do not operate the product. Contact qualified service personnel to perform inspection.

Place Product in Proper Environment
Review the operating manual for guidelines for proper operating environments.

Observe all Warning Labels on Product
Read all labels on product to ensure proper usage.

General Safety Summary

Safety Precautions

- **READ** the instructions before using the apparatus.
- Always isolate electrophoresis units from their power supply before removing the safety cover. Isolate the power supply from the mains **FIRST** then disconnect the leads.
- **DO NOT** exceed the maximum operating voltage or current.
- **DO NOT** operate the electrophoresis units in metal trays.
- Following the replacement of a platinum electrode have the unit inspected and approved by your safety officer prior to use.
- **DO NOT** fill the unit with running buffer above the maximum fill lines.
- **DO NOT** move the unit when it is running.
- **CAUTION:** During electrophoresis very low quantities of various gases are produced at the electrodes. The type of gas produced depends on the composition of the buffer employed. To disperse these gases make sure that the apparatus is run in a well ventilated area.

Specifications:

Construction:

- Rugged acrylic construction.
- All acrylic joints chemically bonded.
- Doubly insulated cables, rated safe up to 1,000 volts.
- Gold plated electrical connectors, corrosion-free and rated safe up to 1,000 volts.
- Recessed power connectors, integral with the safety lid.
- 0.2mm diameter platinum electrodes, 99.99% pure.
- User replaceable platinum electrodes.
- Silicone rubber dovetail seal provides leak-free sealing and are easy to clean and or replace.
- User friendly clamping system.
- Wide range of accessories.

Environmental Conditions:

- This apparatus is intended for indoor use only.
- This apparatus can be operated safely at an altitude of 2,000m.
- The normal operating temperature range is between 4˚C and 65˚C.
- Maximum relative humidity 80% for temperatures up to 31˚C decreasing linearly to 50% relative humidity at 40˚C.
- The apparatus is rated POLLUTION DEGREE 2 in accordance with IEC 664. POLLUTION DEGREE 2, states that: "Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected".

Packing List: Electroprep

No. Items	Description
1	TANK, LID AND CONNECTERS
1	SET OF POWER SUPPLY ADAPTERS
1	REPLACEMENT GASKET

Using the Electroprep Unit:

General Care and Maintenance

Tank:

- Disconnect leads from power supply before servicing unit.
- To remove the safety lid, push thumbs down on the plastic lugs and lift the lid vertically with your fingers.
- Before use clean and dry the apparatus with **DISTILLED WATER ONLY**. **IMPORTANT:** Acrylic plastic is **NOT** resistant to aromatic or halogenated hydrocarbons, ketones, esters, alcohol's (over 25%) and acids (over 25%), they will cause "crazing" especially of the UV transparent plastic and should **NOT** be used for cleaning. **DO NOT** use abrasive creams or scourers. Dry components with clean tissues prior to use.
- Before use, and then on a monthly basis, check the unit for any leaks at the bonded joints. Place the unit on a sheet of dry tissue and then fill with **DISTILLED WATER ONLY** to the maximum fill line. Any leakage will be seen on the tissue paper. If any leakage is seen **DO NOT ATTEMPT TO REPAIR OR USE THE APPARATUS**, but notify Harvard Bioscience immediately.
- The replacement platinum electrodes are partially shrouded for protection. However, when cleaning the main tank **DO NOT** use cleaning brushes in the electrode area. Usually a thorough rinse with distilled water is all that is required.
- Ensure that the connectors are clean and dry before usage or storage.

Teflon Chambers:

- Clean by rinsing with DI water prior to each use.
- Take care to not damage the threads
- For cases where contamination is severe, low concentration detergents may be used, followed by rinsing thoroughly with DI water.

Membranes:

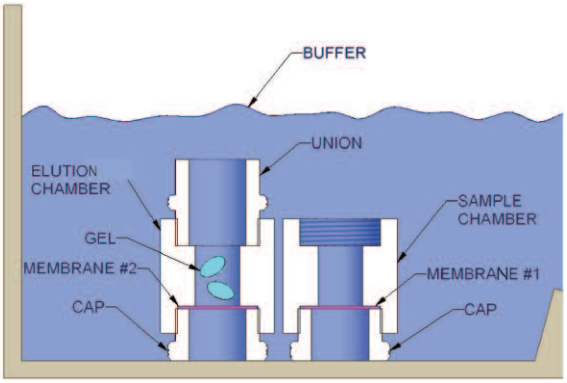
- Prior to use – rinse with DI water and treat with your buffer solution
- Membranes should be discarded after use – do not reuse.

(A) Electro-Elution from Gel Pieces:

1. Choose a elution and sample chambers *(FastDialyzer)*, union and membranes.

Note: Various systems may be created with link chambers or unions added to FastDialyzer chambers. See illustrations on following pages.

2. Remove all caps from the chambers.
3. Place Membrane #1 (lower molecular weight cutoff than your biomolecule) on the membrane platform of the sample chamber and assemble a cap (hand tighten).
4. Place Membrane #2 (lower MWCO than your molecule, may be equal to Membrane #1) into the elution chamber and assemble cap. Assemble union onto other end.
5. Fill the ElectroPrep tank with your electro-elution buffer. Place the chambers into the tank. Chambers and caps must be completely immersed in buffer so that no air bubbles are present.
6. Add your gel slices to the elution chamber.

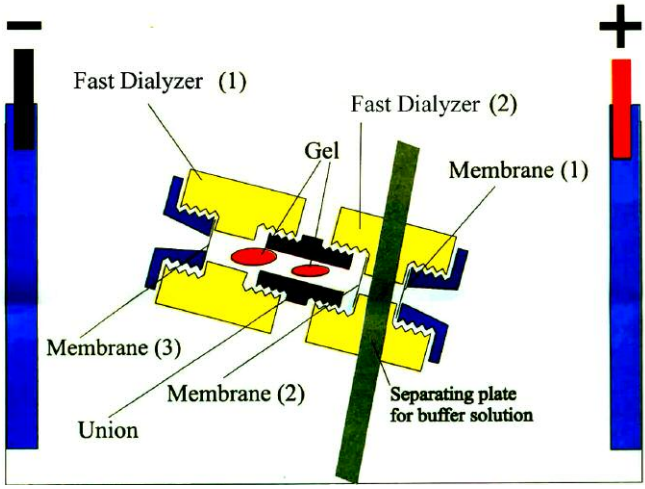


7. Place Membrane #3 (MWCO larger than your molecule) over the sample collection chamber and assemble the sample chamber to the union (hand tighten).

Keeping all parts submersed in buffer prevents the introduction of air bubbles.

8. Gently push the assemblage of chambers through the septum to secure the system in place.
   Close the lid and use the current and voltage as required for the electrophoresis (15mA recommended). Elution time can be calculated by measuring the time required for the molecule to migrate 1 cm during gel electrophoresis

(A) Final Assembly:



- Union and Fast Dialyzer (1) are the elution chamber
- Fast Dialyzer (2) is the sample collection chamber
- Membrane (1) & (3) have MWCO smaller than molecule
- Membranes (2) have MWCO larger than molecule

Applications:

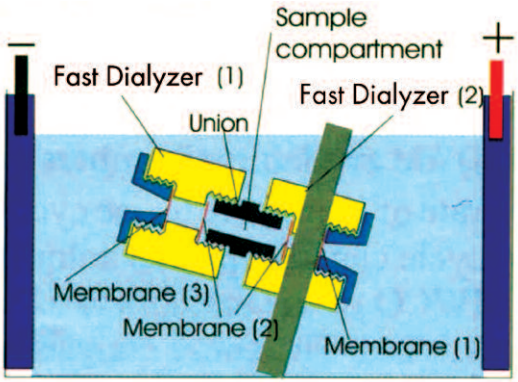
- Elution of DNA, proteins, or other biomolecules from a gel piece

(B) Selective Electro-Filtration/Concentration/Separation Based on Different Charges on Biomolecules

- Select the proper size dialyzer chambers and union to use as much of the available chamber volume as possible [minimizes air gaps]
- Membranes are assembled by placing onto platform of FastDialyzer and hand-tightening mating piece (cap, link, or union)
- Union acts as the sample compartment
- Membrane (1) & (3) have MWCO smaller than molecule
- Membranes (2) have MWCO larger than molecule

Applications:

- Separation and purification of biomolecules with unknown isoelectric potential

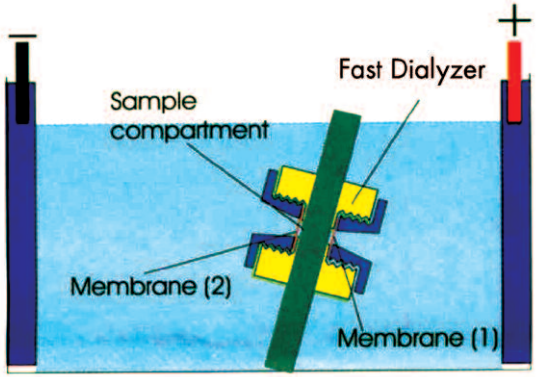


(C) Electrodialysis Through Simultaneous Exchange of Buffers

- Select the proper size dialyzer chamber to use as much of the available chamber volume as possible [minimize air gaps]
- Membranes are assembled by placing onto platform of FastDialyzer and hand-tightening mating piece (cap or link)
- Membranes (1) & (2) have a MWCO smaller than the biomolecule

Applications:

- 100% Primer removal after PCR in 5-10 minutes
- De-salting of neutral materials that do not move in an electric fields

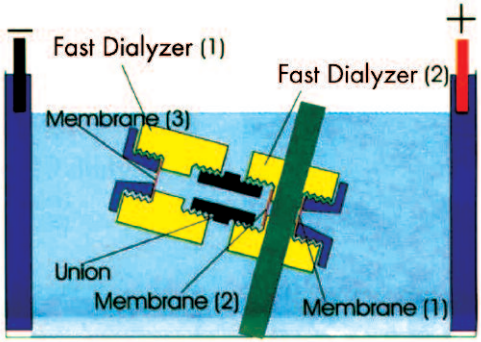


(D) Rapid and Selective Electro-Filtration/Concentration

- Select the proper size dialyzer chambers and union to use as much of the available chamber volume as possible [minimize air gaps]
- Membranes are assembled by placing onto platform of Fast Dialyzer and hand-tightening mating piece (cap, link, or union)
- Sample compartment is comprised of the Union and Fast Dialyzer (1)
- Membranes (1) & (3) have a MWCO smaller than the biomolecule
- Membrane (2) should have a MWCO larger than your biomolecule
- Sample is collected in Teflon Chamber (2)

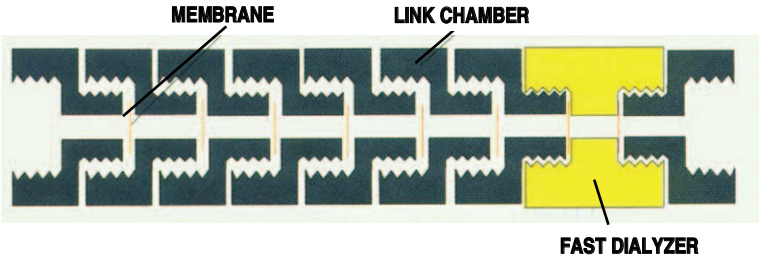
Applications:

- Concentration of small samples for selective filtration



(E) Multi-Chamber Systems

- Connection of numerous link chambers with membranes of different MWCO can be used for highly selective electro-filtration and separation
- Link Chambers can also be used to increase the chamber volume of any Fast Dialyzer.

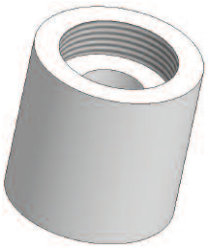


Ordering Information:

ElectroPrepä Tank: 74-1101 (includes tank, lid, test leads, and gasket)
Power Supply: 68-0609 (200Vdc, 100mA)

FAST DIALYZER:

Chamber Volume	Pkg of 1	Pkg of 5
50ul	74-0408	74-0400
100ul	74-0409	74-0401
200ul	74-0410	74-0402
500ul	74-0411	74-0403
1000ul	74-0412	74-0404
1500ul	74-0413	74-0405

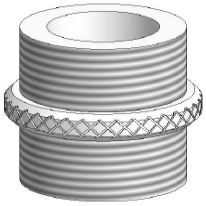


LINK CHAMBERS:

Chamber Volume	Pkg of 1	Pkg of 5
25ul	74-1619	74-1620
50ul	74-1611	74-1615
100ul	74-1612	74-1616
250ul	74-1613	74-1617
500ul	74-1614	74-1618

UNIONS:

Joins Fast Dialyzers:	Pkg of 1	Chamber Volume
Any two chambers w/ volume range of 50ul-200ul	74-0100	350ul
Any two chambers w/ volume range of 250ul-1500ul	74-1105	2500ul
Any chamber w/ volume of 50ul-200ul to any 250ul-1500ul chamber	74-0102	1500ul



Ordering Information:

A large variety of membranes are available for use with our different dialysis products. The following tables are designed to assist you in choosing the appropriate membranes for your needs. Specialty membranes are also available. Contact Harvard Apparatus for any custom membranes.

Cellulose Acetate

These membranes are low protein binding and have a sharp MWCO range. The membranes are pre-cut, and supplied in 0.05% sodium azide solution. They are ready to use after rinsing with deionized water and buffer. Glycerol, sulfur, and heavy metals are not present in these membranes. The cellulose acetate membranes are intended only for aqueous solutions, and the presence of an organic solvent is not recommended.

Regenerated Cellulose

These membranes are more stable in organic solvents, but the MWCO range is not as sharply defined as that of cellulose acetate membranes. The membranes are pre-cut, and supplied in a 0.05% sodium azide solution. They are ready to use after rinsing with deionized water and buffer. Glycerol, sulfur, or heavy metals are not present in these membranes.

Polycarbonate

These membranes are more stable in organic solvents. They are available in four highly controlled pore sizes for a well defined MWCO range.

Membranes for DIALYZER pack of 25

	CHAMBER VOLUME 50 µl to 200 µl		CHAMBER VOLUME 250 µl to 1500 µl	
MWCO (Daltons)	CELLULOSE ACETATE	REGENERATED CELLULOSE	CELLULOSE ACETATE	REGENERATED CELLULOSE
100	7424-CA100	-	7425-CA100	-
500	7424-CA500	-	7425-CA500	-
1K	7424-CA1K	7427-RC1K	7425-CA1K	7428-RC1K
2K	7424-CA2K	7427-RC2K	7425-CA2K	7428-RC2K
5K	7424-CA5K	7427-RC5K	7425-CA5K	7428-RC5K
10K	7424-CA10K	7427-RC10K	7425-CA10K	7428-RC10K
25K	7424-CA25K	7427-RC25K	7425-CA25K	7428-RC25K
50K	7424-CA50K	7427-RC50K	7425-CA50K	7428-RC50K
100K	7424-CA100K	-	7425-CA100K	-
300K	7424-CA300K	-	7425-CA300K	-
PORE SIZE	POLYCARBONATE			
0.01 µl	7431-PC01		7432-PC01	
0.05 µl	7431-PC05		7432-PC05	
0.10 µl	7431-PC10		7432-PC10	
0.60 µl	7431-PC60		7432-PC60	

Notes: