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Buffer Recirculation Pump

Instruction Manual

For Technical Service
Call Your Local Bio-Rad Office or
in the U.S. Call **1-800-4BIORAD**
(1-800-424-6723)

BIO-RAD

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Warranty

Model _____

Serial Number _____

Date of Delivery _____

Warranty Period _____

Unless otherwise specified, instruments sold by Bio-Rad Laboratories are under warranty for 1 year against defects in materials and workmanship.

If any defects should occur during this warranty period, Bio-Rad will replace the defective parts without charge. However, the following defects are specifically excluded:

1. Defects caused by improper operation, accident, or misuse.
2. Repair or modification done by anyone other than Bio-Rad Laboratories or their authorized agent.
3. Damage caused by disaster.
4. Damage due to use of improper solvent or sample.
5. Damage due to spills.
6. Use with tubings or fittings not specified by Bio-Rad Laboratories for use with this pump.

This warranty does not apply to tubing, fittings, fuses, and power cords other than those supplied with the instrument.

For inquiry or request for repair service, contact Bio-Rad Laboratories after confirming the model and serial number of your instrument.

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Section 1
Introduction

Temperature control is a key factor in achieving high resolution and reproducibility in electrophoretic separations. Temperature regulation is closely linked to the buffer flow rate in the electrophoresis chamber. The Buffer Recirculation Pump is a uni-directional oscillating pump that provides a controllable and reproducible buffer flow rate, resulting in more reproducible electrophoretic separations.

1.1 Safety

This instrument is intended for laboratory use only.

This product conforms to the “Class A” standards for electromagnetic emissions intended for laboratory equipment applications. It is possible that emissions from this product may interfere with some sensitive appliances when placed nearby or in the same circuit as those appliances. The user should be aware of this potential and take appropriate measures to avoid interference.

Section 2
Unpacking and Setting Up

2.1 Unpacking Instructions

Carefully remove the unit from the shipping box, lifting from the bottom of the instrument. Remove the plastic bag and inspect the instrument for any external damage. Included with the Buffer Recirculation Pump is a power cord and spare fuses. The Buffer Recirculation Pump is shipped with 3/8" Tygon® tubing in place. On either end is a 3/8" to 3/16" reducer that will accommodate 1/8" Tygon or silicone tubing.

If any part is missing or damaged, contact Bio-Rad Laboratories immediately.

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2.2 General Specifications

Number of Channels:	1
Flow Rate Range:	0–1.5 liters/min *
Maximum Counterpressure:	~ 10 psi
Motor:	Self-priming oscillating pump
Power Requirements:	120 VAC, 60 Hz 220 VAC, 50 Hz
Maximum Ambient Limit:	40° C
Fuses Required:	100 / 120V use .25 A type T 220 / 240V use .125 A type T
Dimensions:	19 cm x 12.7 cm x 18 cm (W x D x H)
Weight:	2.9 kg

* For 3/8" tubing and water. Flow rate will vary depending upon tubing diameter, buffer viscosity, and line voltage.

2.3 Voltage Conversion

Warning: The Buffer Recirculation Pump is shipped in its 120 V or 220 V version. To operate at other voltages, refer to the procedure below. Failure to follow this procedure may result in damage to the unit and invalidation of the warranty.

Power is supplied to the Buffer Recirculation Pump via a power entry module consisting of:

1. On/off switch: A two-position rocker switch. 'I' is On, 'O' is off.
2. Power cord receptacle: Grounded three-pin receptacle for the power cord.
3. Fuse holder/line voltage selector: Four-position 100 V/120 V/220 V/240 V line voltage selector and fuse holder.

See Figure 2.1

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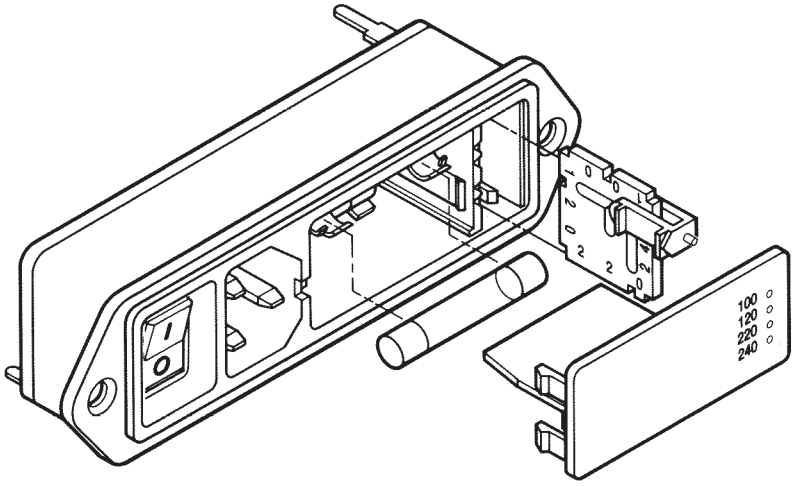


Fig. 2.1. Power entry module assembly.

Prior to connecting the power cord to the power entry module and wall outlet, verify that the voltage indicated on the power entry module matches your line voltage. If it does not, use the following procedure to make the conversion.

1. Using a screwdriver or similar tool, pry open the fuse holder cover.
2. If necessary, replace the fuses with ones having the correct current rating. For 100 V and 120 V operation, ensure that two 0.25 A fuses are inserted in the upper and lower fuse holders (Figure 2.1). For 220 V and 240 V operation, insert two 0.125 A fuses into the fuse holders.
3. Pull voltage selector card located at the end opposite the power switch straight out of the housing. Do not damage the plastic indicator pin or the metal contacts on the selector card.
4. The indicator pin can be moved across the slot located on the voltage selection card. To set the required operating voltage of the pump, orient the selector card so that the desired voltage is readable at the bottom. Orient the indicator pin to point upwards when desired voltage is readable at the bottom (Figure 2.2). The indicator pin must slide into the notch located on the outside edge of the voltage selection card.
5. Insert voltage selector card into the housing, with the edge specifying desired voltage first and the printed side facing the on/off switch.
6. Replace cover, and verify that the indicator pin shows the desired voltage.

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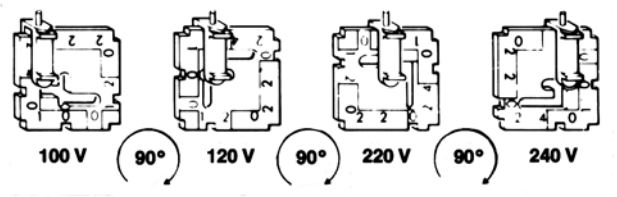


Figure 2.2. Voltage selection card orientation.

Section 3
Operation

To operate the Buffer Recirculation Pump, plug the pump into an appropriate grounded power source. Turn the pump on using the switch located in the power entry module on the back side. The pump is shipped with 3/8" Tygon tubing affixed to the pump, along with 3/8"-3/16" reducers on the tubing ends. Attach 1/8" to 3/16" tubing to the reducing fittings, and plumb the system to be circulated. Turn pump on and check for leaks. To increase the flow rate, rotate the dial on the pump face clockwise. The setting of '100' on the dial represents 100% of the pump's maximum flow rate. Table 3.1 lists approximate flow rates for various dial settings. The solvent used is water, with 1/8" Tygon tubing affixed to the reducing fittings.

Table 3.1

Pump Dial Setting	Flow Rate (ml/min)
30	20
40	25
50	30
60	50
70	95
80	250
90	375

For more precise flow rate calibration with different buffers and tubing diameters, calibrate the pump using a graduated cylinder and moving second hand of a watch. Plot dial position vs. flow rate in ml/min, and extrapolate flow rate for any given dial setting.

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Section 4
Maintenance

The simple design of the Buffer Recirculation Pump, along with the durability of the electro-mechanical components, eliminates the need for regular maintenance. The Tygon tubing should be checked for cracks or wear before each use. For fuse replacement, see Section 2.3.

Section 5
Ordering Information

Catalog Number	Product Description
170-2929	**Buffer Recirculation Pump,** 100/120 V
170-2930	**Buffer Recirculation Pump,** 220/240 V
731-8212	**Silicone Tubing,** 3.2 mm (1/8") ID, 0.8 mm wall, 10 m
731-8220	**Econo Column® Fittings Kit,** includes over 250 male and female luer connectors, 2- and 3-way stopcocks, and tubing connectors

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