

**MODEL 500/200 POWER SUPPLY
INSTRUCTION MANUAL**

SECTION 1: INTRODUCTION

The Model 500/200 Power Supply will provide either constant voltage or constant current to two sets of output jacks. The voltage reading is the same across both sets of jacks. The current reading is the sum of the loads connected to the two sets of jacks. If the loads have different resistances, each load may be connected singly for a moment to check the current each pulls. If the resistances are the same and the loads are equal, the current reading may be divided equally between the pair. When the polarity reversing switches are in the normal position, the red output jacks are positive and the black jacks are negative.

The flexible controls offered by the Model 500/200 Power Supply are essential for best results in a variety of applications. Constant current operation, which allows voltage to increase as system resistance increases, is recommended for faster protein migration rates and sharper bands in discontinuous buffer systems, such as the Laemmli and Ornstein-Davis systems.

Crossover, which automatically switches the unit to constant voltage at a preset voltage limit, provides positive protection against gel overheating, and prevents temperatures that would denature proteins. Crossover can also be used to limit current.

In continuous systems where resistance does not change, either constant voltage or constant current may be used. However, constant voltage is recommended in immunoelectrophoresis systems where power is defined in V/cm. Constant voltage is also recommended in the 1st dimension of O'Farrell 2-D electrophoresis (electrofocusing), with a manual voltage increase during the run.

The Model 500/200 Power Supply has the high current needed to run four 100 x 100 mm rocket or two-dimensional immunoelectrophoresis plates at 20V/cm for a 2 hour run. It can also be used to separate DNA fragments in thick agarose gels, or to electrophoretically transfer proteins from polyacrylamide gels to nitrocellulose membranes for post-electrophoresis analysis. The Model 500/200 will power two tube or slab cells, with up to 24 tubes or 4 slabs in typical SDS-PAGE applications.

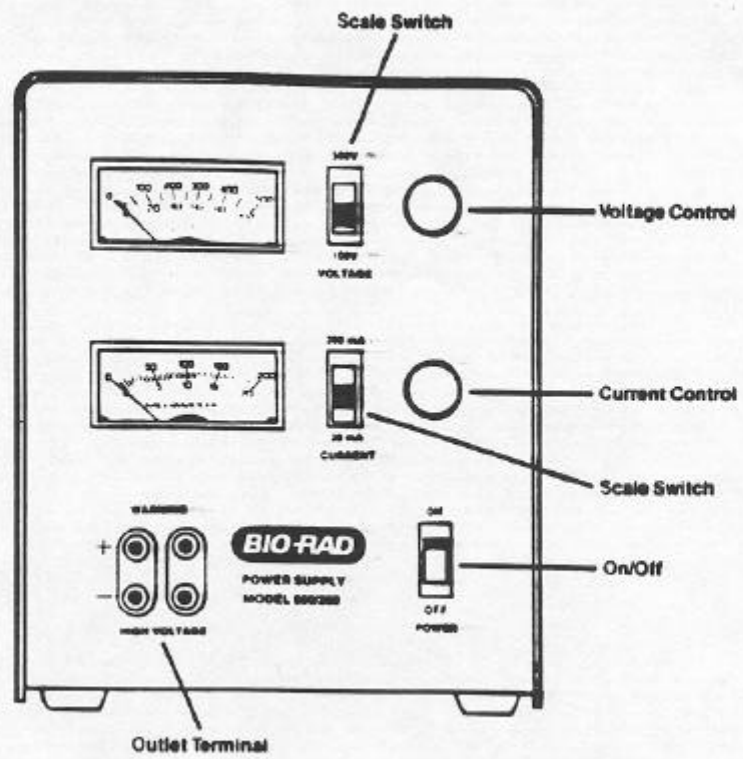


Fig. 1.

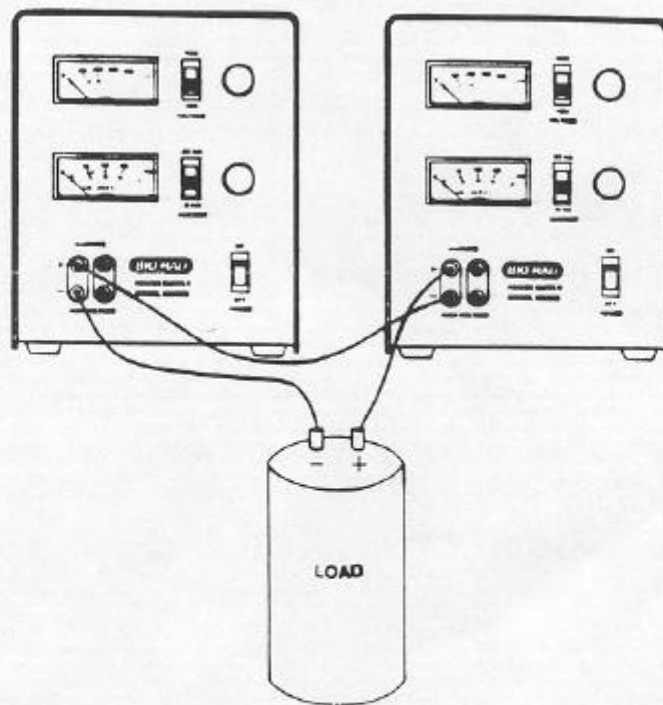


Fig. 2.

Table 1. Current and Voltage Requirements for Typical Applications

Buffer System	Gel Dimension	Volts	**mA	Control
SDS-PAGE	4 PROTEAN II cell Slabs: 14 x 16 cm, 1.5 mm	75-300	80-160	Constant current for discontinuous systems, constant current or voltage for continuous, crossover optional
	24 Gels, 5½ mm x.12 cm	50-250	72-150	
PAGE (Ornstein-Davis)	4 PROTEAN II cell Slabs	100-400	40-120	
Electrofocusing for 1st Dimension of 2-D	18 Tube Gels 2.5 mm x 14 cm	250-500	0-40	
Immuno-electro- phoresis	4 Slabs,	80-300	10-200	Constant voltage

*Voltage increases or decreases proportionately with gel length.

**Current increases or decreases proportionately with gel cross-sectional surface area and number of gels.

SECTION 2: REQUIREMENTS AND SPECIFICATIONS

Power requirements	110 VAC, 60 Hz, 160 W 220 VAC, 50 Hz, 180 W
Power output (floating)	0-500 VDC, fully adjustable, 0.1% ± 1.0 mV 0-200 mA, fully adjustable, 0.1% ± 1.0 mA
Number of outputs Constant Capability	Two, in parallel Voltage (± 0.1%) Current (± 0.1%)
Ganging Dimensions	Series to 1,000V (W x H x D) 23 x 20 x 37 cm
Weight	3 kg
Overload protection	Yes
Ambient operating range	-10° to 40°C
Brown-out paper configuration	A 98 VAC input yields a 450V, 200 mA maximum output, and a 90 VAC input yields a 411V, 200 mA maximum output both fully regulatory.

SECTION 3: CONSTANT VOLTAGE MODE OF OPERATION

WARNING

Always make certain the power is off when connecting or disconnecting loads, as the output of the supply is potentially lethal.

1. Turn power switch off. Connect the unit to 110V (220V) AC.
2. Connect load(s) and set the desired polarity.
3. Place the scale switches in "10X" position.*
4. Turn the voltage control fully counterclockwise.
5. Turn the current control fully clockwise.
6. Turn the power switch on.
7. Turn the voltage control to the desired voltage limit on the voltmeter. The voltage will now remain constant across the load and the current will change as the load resistance changes.

CAUTION*

Use the "1X" range of the voltage scale only for constant voltage operations of less than 50 volts.

SECTION 4: CONSTANT CURRENT MODE OF OPERATION

1. Turn the power switch off. Connect the unit to 110V (220V) AC.
2. Set the scale switches to the "10X" position.*
3. Turn the current control fully counterclockwise.
4. Turn the voltage control fully clockwise.
5. Set the desired polarity and connect the load.
6. Turn the power switch on and adjust the current to the desired output. Allow 5 to 10 minutes for the unit to warm up before making final current adjustments.
7. Turn the current control to the desired current level, as shown on the ammeter. The current will now remain constant and the voltage will change as the load resistance changes.

CAUTION*

Use the "IX" range of the current scale only for constant current operations of less than 20 milliamperes, otherwise meter damage may result.

WARNING

After turning the unit off, wait until both meters register zero to remove the load.

SECTION 5: COMBINATION VOLTAGE-CURRENT MODE OF OPERATION

Occasionally it may be desirable to have constant voltage operation until a specified current limit is reached and then have the unit hold a constant current. Set the voltage control to the desired voltage. Turn the unit off and set a short circuit across the output. Turn the unit on and set the current adjustment for the desired maximum current. With power off, remove short circuit. Apply power and operate in normal manner.

SECTION 6: SERIES OPERATION OF UNITS

Should it become necessary to double the voltage of the output, simply connect two Model 500/200 Power Supplies in series, as depicted in Figure 2, turning one of the unit's voltage and current controls fully clockwise. The other unit is used to control the desired voltage and current levels. The total voltage output will be the sum of the two readings on the voltage meters, the current through one unit is equal to the current through the other unit. This configuration is termed a master-slave configuration, since the unit with controls fully clockwise has no controlling effect (slave unit), while the other unit (master unit) is used to set the functional limits.

For example, if you should desire an output of 800 volts at 150 mA, the procedure would be to set the slave unit controls to 500V fully clockwise and maximum current, and turn the voltage on the master unit to 300V, yielding a total of 800V. Turn the master unit's current control to 150 mA.

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