

OPERATING INSTRUCTIONS

MODEL 810

HIGH VOLTAGE POWER SUPPLY

Introduction

The Model 810 High Voltage Power Supply is a self-contained unit that produces a variable high voltage output at low current levels. It can operate from line voltages of 100, 110, 220 or 240 Volts by an operated line voltage selector switch. Its maximum output is 10,000 Volts D.C. and either polarity may be selected. OUTPUT current is limited to 100 microamperes by an internal 100 Megohm limiting resistor.

A calibrated 3 digit LED numeric readout plus coarse and fine controls enable the user to precisely and accurately set the high voltage output to the desired level. Illuminated status indicators display the mode and polarity selected and indicate the presence or absence of high voltage at the output terminal.

Equipment Description

Controls

All controls for operating the power supply are located on the front panel of the unit.

Main AC Power ON/OFF

This self-latching (push-on-push-off) switch controls the AC power input to the unit. When depressed, the AC power will be ON and the front panel indicator lamps will be illuminated.

High Voltages Controls

This group of controls is used to select the output voltage range (HI or LO), the output polarity, High Voltage ON/OFF and to set the output voltage level.

1.2.1.2.1 Range Select (HI/LO)

This single button is used to select the range of the high voltage output. When the button is out, the unit is in the LO RANGE mode which limits the maximum output to $\pm 2KV$. When the button is pushed in, HI RANGE, the maximum output is $\pm 10KV$.

1.2.1.2.2 High Voltage Polarity and ON/OFF Select Controls

This group of three (3) interlocked, self-latching buttons provides for turning the High Voltage Power Supply ON or OFF and determining the polarity of its output. The polarity buttons are dual function since they select the polarity of the Voltage and they turn the High Voltage Supply on. The High Voltage Supply is turned off by depressing the center OFF button. Since these three (3) buttons are interlocked, depressing any one (1) button will release the one (1) that was previously depressed. Further, only one (1) button should be depressed at a time.

High Voltage COARSE and FINE Adjust

These two controls adjust the level of the voltage output. This voltage will be zero (0) with both controls fully counterclockwise and increases as each control is rotated clockwise. As its name indicates, the COARSE adjust control is used to set the high voltage level close to the desired level. The FINE adjust control range is approximately 600 Volts; thus, if this control is set to its mid

position (12 o'clock) before the COARSE control is set, it will allow the output level to be adjusted by approximately ± 300 Volts about the voltage set by the COARSE control.

Indicators

The power supply contains five (5) point source indicators which indicate the Mode, Polarity and High Voltage ON/OFF status. It also contains a 3 digit numeric indicator which displays the precise level of the output voltage.

Point Source Indicators

Voltage Range

Two (2) indicators are provided to indicate which of the two (2) voltage modes the unit has been set for. The GREEN indicator will be on when the unit is in the LO Voltage (0 to 2KV) mode while the AMBER indicator will be on when the HI Voltage mode has been selected.

1.2.2.1.2 High Voltage ON

This single RED indicator will be illuminated when the high voltage power has been turned on and the high voltage level controls have been turned from zero (0) setting. It is a signal to the operator that high voltage may be present depending on the setting of the high voltage COARSE and FINE adjust controls.

1.2.2.1.3 Polarity Mode

Two (2) indicators are provided to show which polarity has been selected. An illuminated GREEN light indicates that the output will be Positive relative to system ground while AMBER indicates that the output will be Negative.

Numeric High Voltage OUTPUT Level Indicator

This readout is a 3-digit display which provides the operator with a direct indication of the high voltage output level. In the LO Voltage mode (GREEN "LO(V)" indicator on), the readout indicates the voltage directly in VOLTS the HI Voltage mode (AMBER "HI(KV)" indicator on), a decimal point will appear on the display and the voltage will be displayed in KILOVOLTS. Thus, in the HI Voltage mode, a display of 9.83 indicates a voltage of 9.83 kilovolts. The display also indicates the polarity of the charging voltage by the insertion of a + or – to the left of the most significant digit.

In the LO (0 to 2KV) voltage mode, the readout is capable of displaying a maximum level of 1,999 Volts. If the operator sets the voltage to a level above this maximum, the readout will blank out, indicating an overscale condition. This is normal and the readout will not be damaged by settings above the $\pm 1,999$ Volts. If it is desired to test above $\pm 1,999$ Volts, the HIGH voltage mode should be used and the proper readout will be obtained.

2.0 OPERATION

Before turning on the AC power, depress the HV OFF button and rotate the High Voltage ADJUST controls so that they are both fully counterclockwise.

2.1 AC Power ON

Turn on the AC power by pushing the AC POWER ON button in. When in the ON position, the point source and numeric indicators will illuminate.

2.2 HI/LO Voltage Select

Select the desired operating voltage range by placing the high voltage HI/LO switch in the LO position (button out) for outputs up to $\pm 2\text{KV}$ or in the HI position (button in) for outputs from zero to 10KV.

The range indicators above the range select button will display the range selected.

2.3 Polarity Selection

Select the desired polarity by pushing the proper polarity button. The polarity status lights will indicate the polarity selected. If the polarity is changed when the high voltage output is active, the unit will automatically switch from one polarity to the new one chosen. The H.V. ON indicator will go out for about two (2) seconds while the transition is being made.

When a polarity is chosen, the H.V. OFF button will release automatically. This indicates that the H.V. output has been enabled and that a high voltage output will be produced when the H.V. adjust controls are rotated clockwise from their fully counterclockwise position.

2.4 High Voltage OFF

To disable the High Voltage output, depress the H.V. OFF button. This action turns off the high voltage portion of the supply and reduces the H.V. output to zero (0). The High Voltage ON indicator will go off when the H.V. OFF button is depressed.

2.5 High Voltage Level Adjustment

Rotate the FINE adjust control clockwise until the pointer is in the twelve o'clock (12:00) position. Rotate the COARSE adjust control clockwise until the approximate desired voltage level is indicated on the VOLTAGE readout. Now re-adjust the FINE control to trim the voltage reading to the final level.

NOTE: A high voltage output and indication will be produced by rotating the Level Adjust controls only if a polarity has first been selected. No output will be indicated or produced in the H.V. OFF button is depressed.

2.6 High Voltage Output Jack and Ground Terminal

The high voltage output of the supply is provided via a high voltage OUTPUT jack located in the upper right hand corner of the front panel. The BLACK terminal post directly below the high voltage OUTPUT jack is the ground reference for the high voltage output.

2.6.1 Current Output Capability

The current output of the supply is limited to 100 microamperes by an internally located plug-in 100-megohm resistor. This resistor is connected in series with the output and is located between the

internal High Voltage source and the H.V. OUTPUT connector. Refer to section 3.0 for alteration of the value of this limiting resistor.

2.6 2 OUTPUT Electrode and EXTENSION CABLE

The power supply is furnished with a five (5) foot High Voltage cable that plugs into the high voltage OUTPUT jack.

CAUTION: Although the output current of the supply itself is limited, potentially dangerous conditions can occur if capacitive loads are charged using the supply's output. External high voltage capacitors can store large amounts of energy. This energy can be released at high current levels that can be extremely dangerous. Care should be exercised when the supply is used as a high voltage source to charge such external capacitive loads.

3.0 MAINTENANCE AND MISCELLANEOUS INFORMATION

3.1 OUTPUT CURRENT Limiting Resistor

The power supply is shipped with an internally located 100 Megohm series resistor that limits the short circuit current to 100 microamperes. This resistor is located in the upper right hand corner of the unit, as shown in Figure 3-1. To gain access to this resistor, the top cover of the unit must be removed. To do this, first unplug the AC line cord, then remove the eight (8) screws that secure the front and rear bezels to the case (there are four (4) screws securing each bezel to the case). Slide the bezels away, then pull the top cover gently upward and away from the case (Figure 3.1).

Unplug the 100 Megohm resistor and replace it with the new value. A LIMITING Resistor value of less than 100 Megohm is not recommended since it may overload the supply when the output is shorted. After replacing the 100 Megohm resistor with the new value, replace the cover and front and rear bezels.

3.2 Line Voltage Section

The Model 810 has a line voltage selector located on the rear panel. Rotate the switch using a coin or flat blade screwdriver either 100, 110, 220 or 240 Volt operation. Use a $\frac{3}{4}$ Amp, 3 AG Slo-Blo fuse for 100 or 110 Volts and $\frac{3}{8}$ Amp, 3 AG Slo-Blo fuse for 220 or 240 Volts.

3.3 AC Line Fuse Replacement

Should the AC Fuse fail, replace it with a $\frac{3}{4}$ AMP Slo-Blo type fuse (type 3 AG or EQUIVALENT). The cause for the fuse failure should be determined before the fuse is replaced. For 230 Volt operation use a $\frac{3}{8}$ AMP Slo-Blo fuse.

3.4 Meter Calibration

Each unit is tested and calibrated at the factory to insure the accuracy of the Voltage readout. The Meter CAL adjustment is provided for this purpose. Under normal circumstances, this adjustment should not be altered by the User.

3.5 Cautionary Note

When servicing this equipment, always start by disconnecting its power cord from the AC line. Further, if the unit is operated with the cover removed (i.e., during servicing), extreme care should be exercised due to the high voltages which may be present.

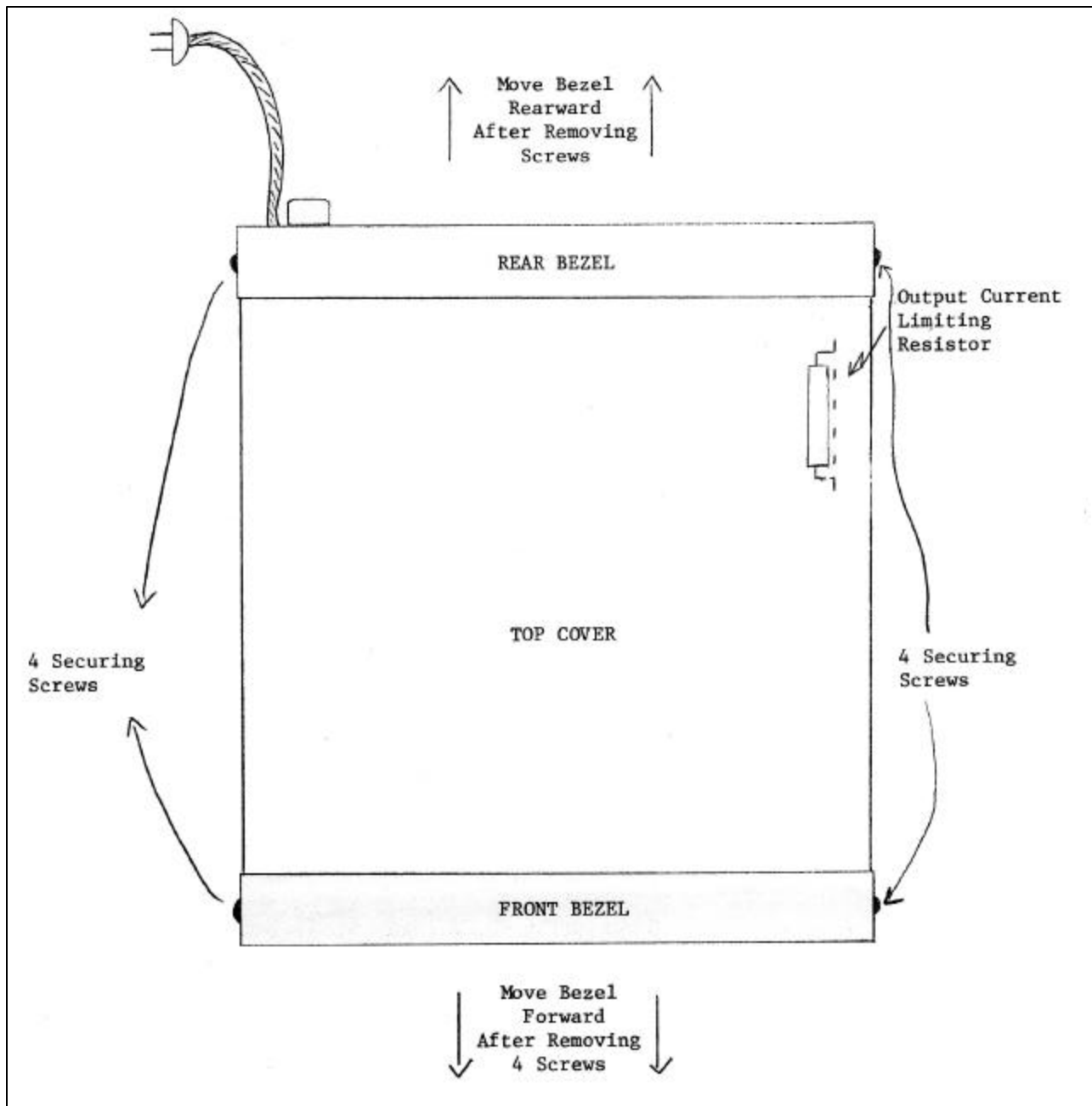


Figure 3-1

WARRANTY

Electro-Tech Systems, Inc. warrants its equipment, accessories and parts of its manufacture to be and remain free from defects in material and workmanship for a period of one (1) year from date of invoice and will, at the discretion of Seller, either replace or repair without charge, F.O.B. Glenside, similar equipment or a similar part to replace any equipment or a part of its manufacture which, within the above stated time, is proved to have been defective at the time it was sold. All equipment claimed defective must be returned properly identified to the Seller (or presented to one of its agents for inspection). This warranty only applies to equipment operated in accordance with Seller's operating instructions.

Seller's warranty with respect to those parts of the equipment which are purchased from other manufacturers shall be subject only to that manufacturer's warranty.

The Seller's liability hereunder is expressly limited to repairing or replacing any parts of the equipment manufactured by the manufacturer and found to have been defective. The Seller shall not be liable for damage resulting or claimed to result from any cause whatsoever.

This warranty becomes null and void should the equipment, or any part thereof, be abused or modified by the customer or if used in any application other than that for which it was intended. This warranty to replace or repair is the only warranty, either expressed or implied or provided by law, and is in lieu of all other warranties and the Seller denies any other promise, guarantee, or warranty with respect to the equipment or accessories and, in particular, as to its or their suitability for the purposes of the buyer or its or their performance, either quantitatively or qualitatively or as to the products which it may produce and the buyer is expected to expressly waive rights to any warranty other than that stated herein.

ETS must be notified before any equipment is returned for repair. ETS will issue an RMA (Return Material Authorization) number for return of equipment.

Equipment should be shipped prepaid and insured in the original packaging. If the original packaging is not available, the equipment must be packed in a sufficiently large box (or boxes if applicable) of double wall construction with substantial packing around all sides. The RMA number, description of the problem along with the contact name and telephone number must be included in formal paperwork and enclosed with the instrument. Round trip freight and related charges are the owner's responsibility.

WARNING

WOODEN CRATES MUST NOT BE USED. PACKAGING OF DELICATE INSTRUMENTS IN WOODEN CRATES SUBSTANTIALLY INCREASES THE CONTENT'S SUSCEPTIBILITY TO SHOCK DAMAGE. DO NOT PLACE INSTRUMENTS OR ACCESSORIES INSIDE OTHER INSTRUMENTS OR CHAMBERS. ELECTRO-TECH SYSTEMS, INC. WILL NOT ASSUME RESPONSIBILITY FOR ADDITIONAL COST OR REPAIR DUE TO DAMAGE INCURRED DURING SHIPMENT AS A RESULT OF POOR PACKAGING.