



Figure 1-1. Typical High Voltage DC Power Supply

## SECTION I GENERAL INFORMATION

### 1-1 DESCRIPTION

1-2 Hewlett-Packard's High Voltage DC Power Supplies (Figure 1-1) are all semiconductor, compact, well-regulated, constant voltage/constant current models suitable for either bench or rack operation. A three-wire five-foot input power cord is provided. The output is continuously variable between zero and the maximum rating of the supply. The continuously variable current control may be used to set the maximum output current (overload or short-circuit current) when the supply is used as a constant voltage source or the voltage control may be used to set the maximum output voltage (voltage ceiling) when the power supply is used as a constant current source. Detailed specifications are given in Table 1-1.

### 1-3 OVERLOAD PROTECTION

1-4 A crossover feature protects both power supply and load in constant voltage operation. Automatic crossover circuitry switches the power supply from constant voltage to constant current operation if the output current exceeds a preset limit. This crossover circuitry also protects the load from overvoltage during constant current operation by automatically switching the power supply into constant voltage operation if the output voltage exceeds the preset limit. The user can adjust the crossover point via the front panel controls (Paragraph 3-1).

1-5 The power supply is protected from reverse voltage (positive voltage applied to negative terminal) by an internal protection diode and the diode bridge network that shunts current across the output terminals when this condition exists, clamping the reverse voltage. Protection from reverse current (current forced into the power supply in the direction opposite to the output current) must be provided by preloading the power supply (Paragraph 3-29). The power supply cannot accept reverse current without damage.

### 1-6 COOLING

1-7 Convection cooling is used. No fan is required. The power supply has no moving parts (except for meter movement).

### 1-8 OUTPUT TERMINALS

1-9 Output power is available via two UG-931/U connectors at the rear of the power supply. Mating connectors (UG-932/U) are supplied with the unit. The output terminals are isolated from the chassis and either the positive or the negative terminal may be connected to the chassis by shorting the center pin and case of the applicable UG-931/U connector, or by grounding a wire from the connector to the chassis. The power supply is insulated to permit operation up to 2,000 vdc off ground, i.e. the maximum potential between either output terminal and ground shall not exceed 2KV above the maximum rated output.

### 1-10 INSTRUMENT IDENTIFICATION

1-11 Hewlett-Packard power supplies are identified by a two part serial number. The first part is the serial number prefix, a number-letter combination that denotes the date of a significant design change and the country of manufacture. The first two digits indicate the year (10=1970, 11=1971, etc.), the second two digits indicate the week, and the letter "A" designates the U.S.A. as the country of manufacture. The second part is the power supply serial number; a different sequential number is assigned to each power supply, starting with 00101.

1-12 If the serial number on your instrument does not agree with those on the title page of the manual, Change Sheets supplied with the manual or Manual Backdating Changes define the difference between your instrument and the instrument described by this manual.

### 1-13 ORDERING ADDITIONAL MANUALS

1-14 One manual is shipped with each power supply. Additional manuals may be purchased from your local Hewlett-Packard field office (see list at rear of this manual for addresses). Specify the model number, serial number prefix, and HP Part Number provided on the title page.

1-15 OPTIONS

1-16 Options are factory modifications of a standard instrument that are requested by the customer.

OPTION NO

J13

910

DESCRIPTION

Permits operation on 230Vac, 48-63Hz through use of an external accessory 230V to 115V step-down transformer.

Extra Manual

Table 1-1. Specifications

<p><b>INPUT:</b> 115 Vac <math>\pm 10\%</math>, 48-440 Hz, 4A, 270W.</p> <p><b>OUTPUT:</b> 0-4000 Vdc, 0-50 mA.</p> <p><b>LOAD REGULATION:</b> <u>Constant Voltage:</u> Less than 0.005% or 20mV whichever is greater for a full load to no load change in output current. <u>Constant Current:</u> Less than 2% or 1 mA whichever is greater, for a full load to no load change in output voltage.</p> <p><b>LINE REGULATION:</b> For a change in line voltage of 115Vac <math>\pm 10\%</math> at any output voltage and current within rating. <u>Constant Voltage:</u> Less than 0.005% or 20 mV, whichever is greater. <u>Constant Current:</u> Less than 1 mA.</p> <p><b>PARD (RIPPLE AND NOISE):</b> At any line voltage and under any load condition within rating <u>Constant Voltage:</u> Less than 1 mV rms/150mV p-p. <u>Constant Current:</u> Less than 500 <math>\mu</math>A rms.</p> <p><b>TRANSIENT RECOVERY TIME:</b> Less than 50 <math>\mu</math>sec is required for output voltage recovery to within 0.005% or 20mV, whichever is greater, following a full load to no load or no load to full load change in output current.</p> <p><b>TEMPERATURE RATINGS:</b> Operating: 0 to 55°C Storage: -40 to 75°C.</p> <p><b>TEMPERATURE COEFFICIENT:</b> Output change per degree centigrade change in ambient following 30 minutes warm-up <u>Constant Voltage:</u> 0.012% plus 1 mV. <u>Constant Current:</u> 0.2% plus 0.05 mA.</p>	<p><b>STABILITY:</b> Under constant ambient conditions, total drift for 8 hours following 60 minutes warm-up <u>Constant Voltage:</u> 0.036% plus 3 mV. <u>Constant Current:</u> 0.25% plus 0.12 mA.</p> <p><b>CONTROLS:</b> Voltage controls consist of a three decade thumbwheel switch plus a thumbwheel vernier with 0.002% resolution. A single turn potentiometer controls output current.</p> <p><b>METERS:</b> Zero to 4kV and 0-50 mA front panel meters are included. They provide accuracy of 2% full scale.</p> <p><b>CALIBRATION ACCURACY:</b> One percent of the voltage control setting, <math>\pm 1V</math>.</p> <p><b>OUTPUT IMPEDANCE:</b> DC to 100 Hz (cps.) -- less than 0.01<math>\Omega</math>. 100 Hz to 1 k Hz -- less than 0.02<math>\Omega</math>. 1 k Hz to 100 k Hz -- less than 0.5<math>\Omega</math>. 100 k Hz to 1 MHz -- less than 3<math>\Omega</math>.</p> <p><b>SIZE:</b> 5<math>\frac{1}{4}</math>" H x 18" D x 19" W (standard rack width).</p> <p><b>WEIGHT:</b> 42 lbs. net, 63 lbs. shipping.</p> <p><b>FINISH:</b> Light gray front panel with dark gray case.</p>
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