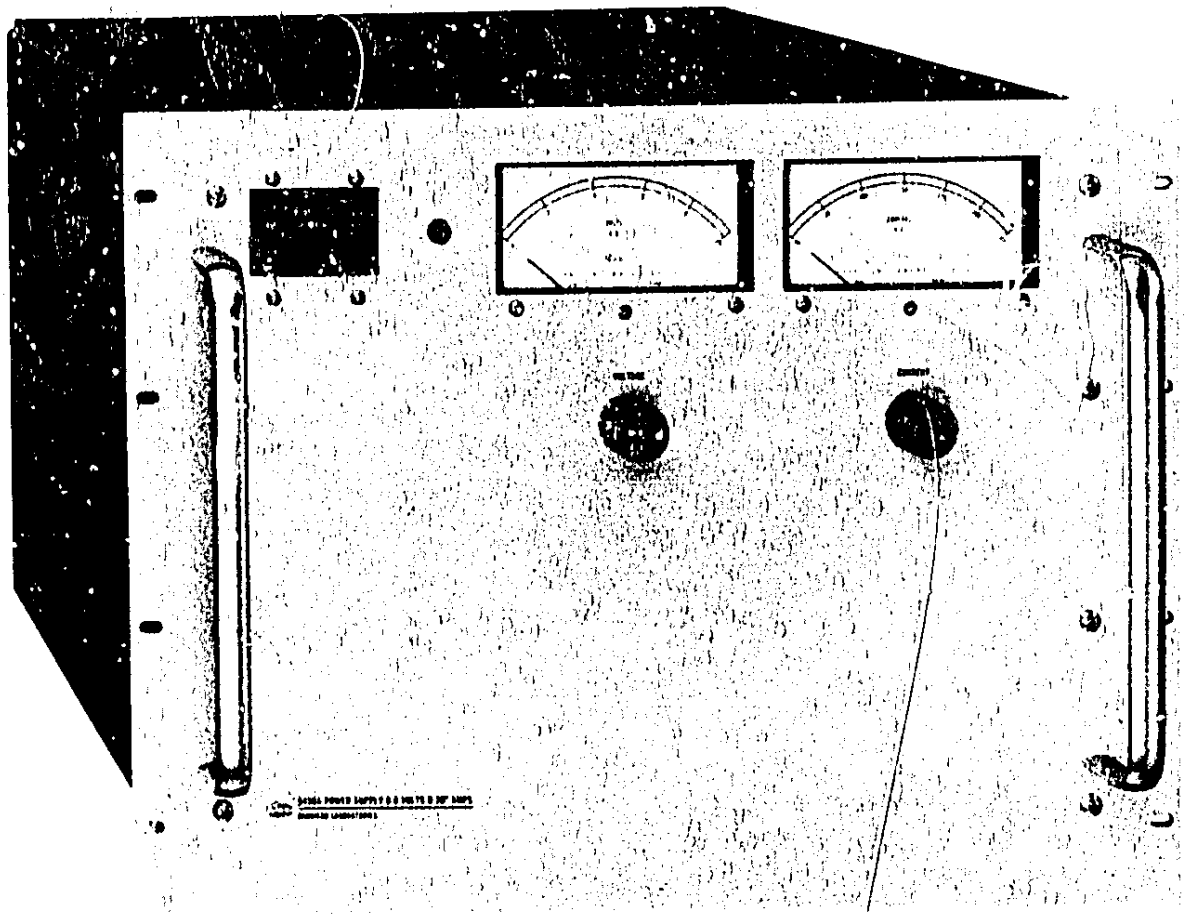

Figure 1-1. DC Power Supply, SCR-3 Series

SECTION I
GENERAL INFORMATION

1-1 DESCRIPTION

1-2 This power supply, Figure 1-1, is a completely transistorized, well-regulated, Constant Voltage/Constant Current supply that will furnish full rated output voltage at the maximum rated output current or can be continuously adjusted throughout the output range. The front panel CURRENT controls can be used to establish the output current limit (overload or short circuit) when the supply is used as a constant voltage source and the VOLTAGE controls can be used to establish the voltage limit (ceiling) when the supply is used as a constant current source.

1-3 Two meters measure load current and load voltage at the output terminals of the supply. Protection circuits incorporated in this supply are designed to protect the unit against overload conditions generated by the load device and failures in the input power line, while protection against failures in the internal main power mesh is accomplished by means of the three phase circuit breaker on the front panel. The breaker also serves as the on-off switch for the supply.

1-4 Input power is connected by means of a four-prong lock type connector at the rear of the unit. Output power connections and programming connections for the various modes of operation are also made at rear of the unit. The output terminals consist of heavy bus bar connected directly to the output capacitors for improved high frequency performance.

1-5 The programming terminals located at the rear of the unit allow ease in adapting to the many operational capabilities of the power supply. A brief description of these capabilities is given below:

a. **Remote Programming.** The power supply may be programmed from a remote location by means of an external voltage source or resistance.

b. **Remote Sensing.** The degradation in regulation which would occur at the load because of the voltage drop in the load leads can be reduced by using the power supply in the remote sensing mode of operation.

c. **Series and Auto-Series Operation.** Power supplies may be used in series when a higher output voltage is required in the voltage mode of operation or when greater voltage compliance is required in the constant current mode of operation. Auto-Series operation permits one knob control of the total output voltage from a "master" supply.

d. **Parallel and Auto-Parallel Operation.** The power supply may be operated in parallel with a similar unit when greater output current capability is required. Auto-Parallel operation permits one knob control of the total output current from a "master" supply.

e. **Auto-Tracking.** The power supply may be used as a "master" supply, having control over one (or more) "slave" supplies that furnish various voltages for a system.

1-6 COOLING EQUIPMENT

1-7 The operation of this unit under high load conditions requires that air be circulated through a compartment containing the heat-producing elements in the circuit. This circulation is by means of fans located in the compartment with air flowing from one side of the unit to the other. Maintenance procedures concerning this cooling system will be found in the maintenance section.

1-8 Detailed Specifications for the power supply are given in Table 1-1.

1-9 INSTRUMENT IDENTIFICATION

1-10 Hewlett-Packard power supplies are identified by a three-part serial number tag. The first part is the power supply model number. The second part is the serial number prefix, which consists of a number-letter combination that denotes the date of a significant design change. The number designates the year, and the letter A through L designates the month, January through December respectively. The third part is the power supply serial number.

1-11 If the serial number prefix on your power supply does not agree with the prefix on the title page of this manual, change sheets are included to update the manual. Where applicable, backdating information is given in an appendix at the rear of the manual.

1-12 ORDERING ADDITIONAL MANUALS

1-13 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 ℔ stock number provided on the title page.

Table 1-1. Specifications

INPUT:
208/230/460Vac ±10%, 60Hz, three phase. (Instructions are included for wiring for 230 or 208Vac, or unit may be ordered in original purchase contract to be wired for 460Vac.)

OUTPUT: 0-64Vdc, 0-50Adc.

COMBINED LINE AND LOAD REGULATION:
Constant Voltage - Less than 0.2% plus 10mV for a full load to no load change in output current combined with a ±10% change in line voltage.
Constant Current - Less than 1% of ½ amp whichever is greater for a full change in output voltage combined with a ±10% change in line voltage.

RIPPLE AND NOISE:
Less than ½% rms of maximum output voltage for any combination of line voltage, output voltage, and load current.

TRANSIENT RECOVERY TIME:
Less than 50 milliseconds is required for output voltage recovery to within 600 millivolts of the nominal output voltage following a load change from full load to half load or half load to full load.

OPERATING TEMPERATURE RANGE: 0 to 50°C.

TEMPERATURE COEFFICIENT:
Output voltage change per degree Centigrade is less than 0.05% plus 2 millivolts.

STABILITY:
As a constant voltage source the total drift for 8 hours (after 30 minutes warm-up) at a constant ambient is less than 0.25% plus 10 millivolts.

OVERLOAD PROTECTION:
The supply is protected for all overload conditions including a short circuit at the output terminals. This protection is inherent in the constant voltage/constant current automatic crossover operation. The current control acts as a continuously acting limit in constant voltage operation and the voltage control acts as a voltage limit in constant current operation.

AC LINE DROPOUT PROTECTION:
Protection is provided against an input ac line phase dropout. The supply senses the reduction of input voltage, turns off the rectifiers, and opens a power relay which isolates the output power bus. When the input returns to normal, output power is automatically reapplied to the load.

CONTROLS:
A single control makes possible continuous adjustment of the output voltage over the entire range from 0 to 64 volts. The current control knob permits adjustment for maximum output current to the optimum value for protection of the load device. In addition, this latter control serves as the output control for constant current operation. The three phase circuit breaker serves as the ON-OFF control and as secondary protection to the instrument.

METERS:
A 0-80V voltmeter and 0-50A ammeter are provided on the front panel. Internal meter calibration potentiometers are provided.

TERMINALS:
Output power connections are made on two tapped rectangular bus bars located at the rear of the supply. Both power supply output terminals are isolated from the chassis and either the positive or negative terminal may be connected to chassis ground. The upper bus bar is positive.

ERROR SENSING:
Remote error sensing can be accomplished from the rear programming strip.

REMOTE PROGRAMMING:
Remote programming terminals make possible external control of the output voltage or current by resistance programming or voltage programming. Resistance programming in constant voltage is approximately 300 ohms per volt. Resistance programming in constant current is approximately four ohms per ampere.

COOLING:
Internal fans provide forced air cooling of heat producing components.

SIZE:
14" H x 18¼" D x 19" W (standard relay rack mounting).

WEIGHT: 238 lbs. net; 275 lbs. shipping.

FINISH: Light gray front panel with dark gray case.