

Section 1

Introduction & Specifications

1-1. INTRODUCTION

1-2. General Description

1-3. The Model 415B High Voltage Power Supply is a stable well regulated source of dc voltage. The Model 415B is capable of providing 0 to 3100 volts dc and 0 to 30 milliamperes current. The output voltage is adjustable in steps of 500, 100, 10 and 1 volt by front panel step switch controls. A vernier control provides a means of fine adjustment within the one volt steps. Output power is available from both a front and rear panel high voltage connector, type UG931/U. Output voltage polarity may be switched by a front panel control to provide either a positive or negative output with respect to chassis ground of the instrument.

1-4. The power supply is provided with an overcurrent protection circuit to prevent damage to the instrument in the event of overload or accidental short circuit at the output. Normal operation is quickly restored by a manual reset control following removal of the overload.

1-5. The Model 415B combines the best features of electron tubes and solid state components in a hybrid circuit. The improved reliability and temperature stability characteristics of silicon transistor amplifiers and rectifier diodes together with the high voltage handling characteristics of vacuum tubes provide a dependable, low noise level, highly regulated output. Applications of the Model 415B include calibration of voltmeters and powering of photomultiplier tubes, high voltage klystrons or other devices with current requirements up to 30 milliamperes.

1-6. ELECTRICAL SPECIFICATIONS

OUTPUT VOLTAGE

Adjustable from 0 to ± 3100 volts dc.

OUTPUT CURRENT

0 to 30 milliamperes.

OUTPUT POLARITY

Positive or negative with respect to ground (the polarity is controlled by a front panel switch).

LOAD REGULATION

0.0005% or 5 millivolts (whichever is greater) from a no load to a full load change in output current.

LINE REGULATION

0.0005% or 2 millivolts (whichever is greater) for a 10% line change from nominal.

STABILITY

$\pm 0.0020\%$ per hour; $\pm 0.01\%$ per day after warmup period and constant line voltage, constant load and constant temperature.

RIPPLE

Less than 100 microvolts RMS; less than 1 millivolt peak-to-peak.

RESOLUTION

5 millivolts.

CALIBRATION ACCURACY

$\pm 0.25\%$ or 100 millivolts (whichever is greater) with vernier at zero.

RESETABILITY

$\pm 0.05\%$ or 50 millivolts.

RECOVERY TIME

Within 50 microseconds.

OVERCURRENT PROTECTION

Adjusted to disconnect output at nominally 30 milliamperes $\pm 10\%$ load current. Manual reset.

WARMUP TIME

60 minutes to meet specifications.

INPUT POWER

100/115/230 volts ac $\pm 10\%$, 50 to 60 Hz, approximately 300 volt-amperes at full load output.

1-7. MECHANICAL SPECIFICATIONS

OUTPUT CONNECTORS

One UG931/U front and rear (one mating connector supplied).

METER

3100-0-3100 vdc ($\pm 3\%$).

WEIGHT

Approximately 30 pounds.

1-8. ENVIRONMENTAL SPECIFICATIONS

OPERATING TEMPERATURE

0°C to 50°C.

STORAGE TEMPERATURE

-20°C to 70°C.

HUMIDITY

0 to 80%.

ALTITUDE OF OPERATION

Sea level to 10,000 feet.

STORAGE OR SHIPPING ALTITUDE

Sea level to 50,000 feet.

VIBRATION

Meets MIL-T-945A.

SHOCK

Meets MIL-E-4970A (20 g's, 11 milliseconds in three principal axes).

TEMPERATURE COEFFICIENT OF OUTPUT

Less than 20 ppm per °C from +10°C to -40°C.

1-9. OUTLINE DRAWING

1-10. Figure 1-1 is an outline drawing showing all dimensions necessary for mounting and installation.

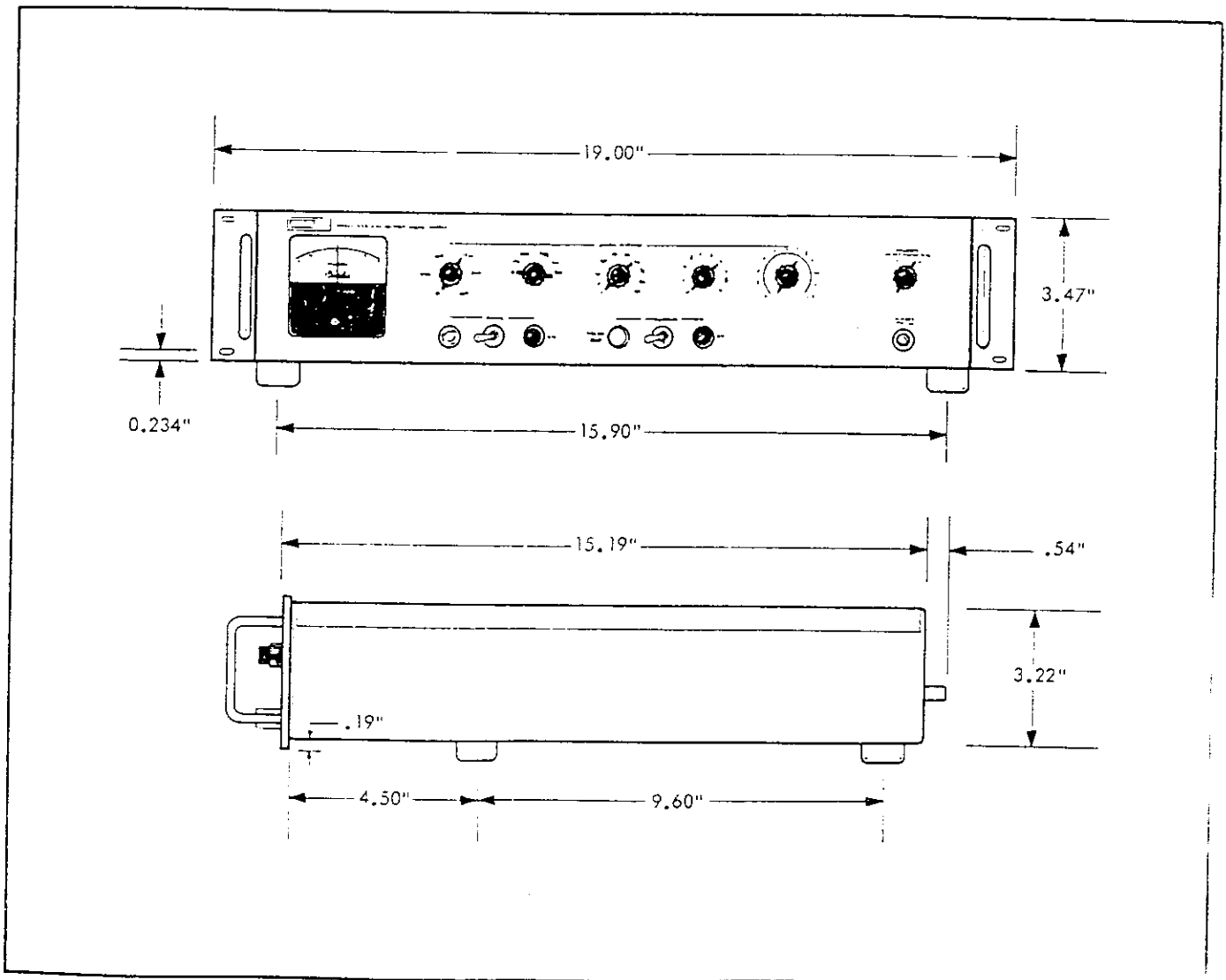


Figure 1-1. MODEL 415B OUTLINE DRAWING

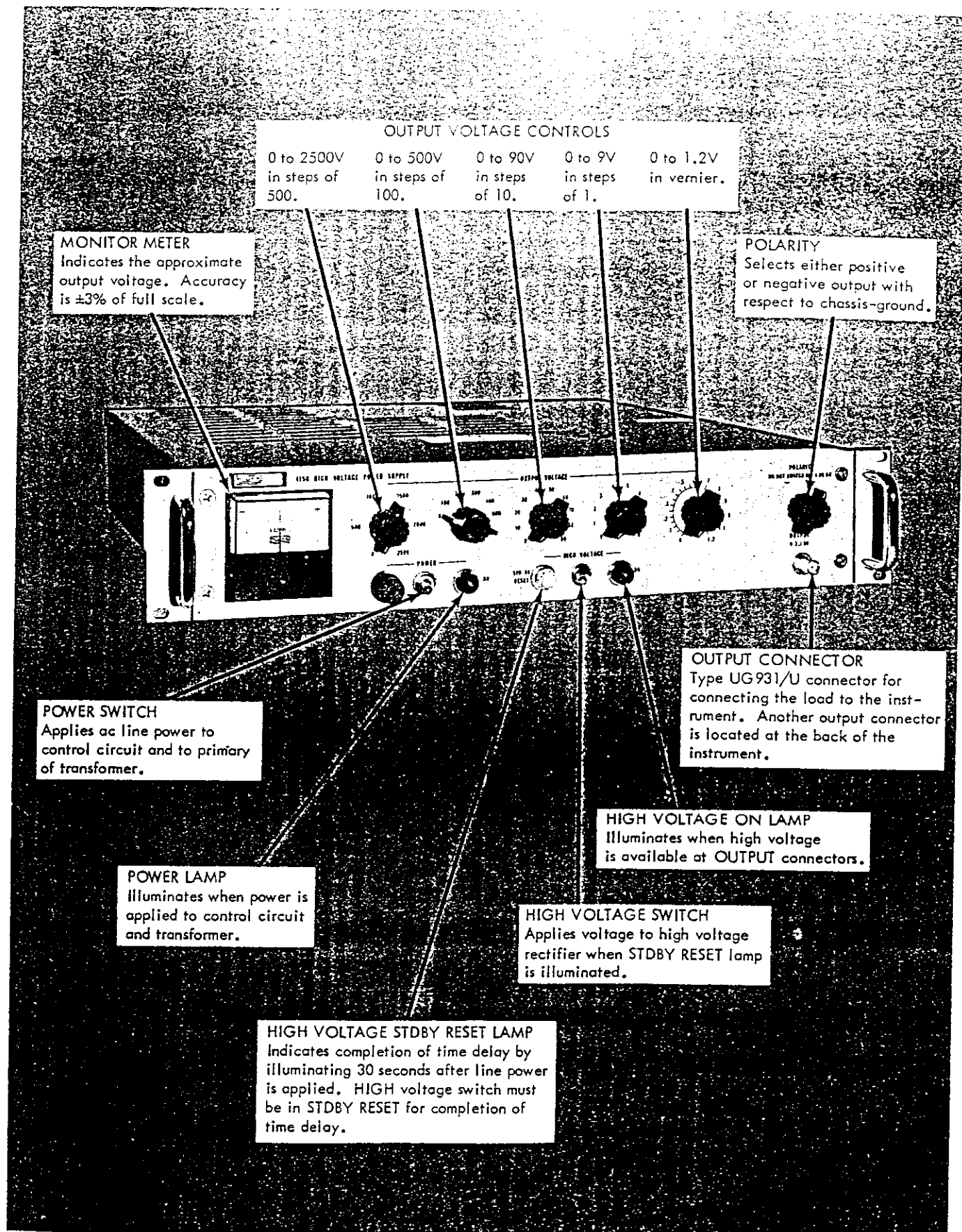


Figure 2-1. CONTROLS, TERMINALS, AND INDICATORS