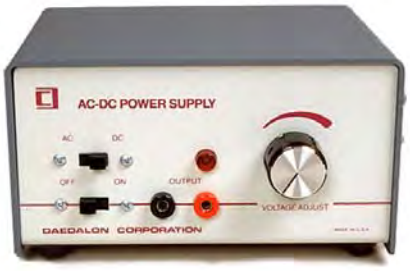
EV-04 12 Vac/dc Power Supply



Introduction

This low voltage power supply produces variable output of filtered dc or non-sinusoidal ac power. The supply is regulated for changes in line voltage and has a very stable output into a constant load. The output ripple depends upon the load impedance but is less than 5% for load resistances greater than 5 ohms. The supply will deliver 1-20 Vdc at low currents and 12 Vdc at 5 A. It internally limits the output current to 5 A. When an overload is encountered, the output falls to a low value and remains there until the power switch is turned off, then back on again. The supply is protected overall by a line fuse mounted on the rear panel. The case is grounded but the terminals are isolated for safe and flexible interconnection.

An active phase shift network controlling a Triac supplying the input voltage to a step-down transformer adjusts the output voltage. This circuit provides simple voltage control with little generated heat. The compact metal case contains the printed circuit card carrying the Triac control circuit, a full wave rectifier and an output filter capacitor to smooth the dc voltage, and the current-limiting components. A potentiometer mounted on the front panel controls the power supply. One panel slide switch selects ac or dc output, while a second switch turns the supply on or off. The output appears on color-coded banana jacks for ease in connection.

The current overload protection reliably shuts down the power supply when the current exceeds the maximum output so that there is little chance of damage from an accidental short circuit. The power supply should not be used with loads that repeatedly actuate the overload protection. The line fuse guards against component failure in the circuit, not against excessive load on the output. If the line fuse blows, there is some internal trouble and the fuse may blow again as soon as it is replaced. If this unlikely event occurs, do not replace the fuse with a larger value fuse. The power supply should be returned for repair.

Direct Current Operation

1. Connect the power supply to the correct line voltage. The supply is fitted with a three-wire grounding cord and plug for 120 Vac 60 Hz operation. The third wire ground connects to the case of the unit.

2. With the supply turned off, connect the load to the red and black banana jacks. The red jack is positive. The output is not connected to ground, so it will be unaffected by the ground connection of the load.

3. Connect a voltmeter across the terminals to monitor the output. This will prevent setting the voltage higher than desired for the load. The supply will deliver considerably more than 12Vdc if the current is low.

4. Slide the panel switch to the *"ON"* position. The pilot light will come on.

5. Rotate the knob clockwise to increase the voltage. There is a dead spot at the beginning of the rotation before the voltage rises. This dead spot varies depending upon the connected load. With no load connected, the voltage will increase to maximum quite quickly after passing the dead spot.

CAUTION

The variation of output voltage with load current, at the same knob setting, is usually no particular trouble, but under some circumstances can be damaging. This is particularly true if part of the load is drawing a substantial current, e.g. 4 A, while the supply is also powering an electronic circuit drawing a small current. Disconnecting the low resistance load suddenly, the supply voltage will rise considerably, perhaps damaging the still attached electronic circuit.

If you are in doubt about the voltage sensitivity of an electronic circuit, connecting the circuit to a regulated power supply, such as a Daedalon EV-12, is always safer than to connect it to an adjustable supply such as the EV-04.

6. When finished, return the slide switch to the "OFF' position. The control pot can be left at its setting so that the unit will supply the same voltage the next time it is turned on.

7. A safer practice is to return the control to its counter-clockwise limit; i.e. 0 V output, before turning the supply off. Using the unit the next time, the voltage is reset from zero. This practice is safer when the load is voltage-sensitive.

Alternating Current Operation

The alternating current output of the supply is available when the selector switch is moved to the ac position. The ac output is not sinusoidal, but has the waveform of the Triac output. This approximates a sine wave when fully on, but has a very distorted waveform at low voltage settings. If the load is sensitive to waveform, or if the waveform is to be viewed on an oscilloscope, this distortion must be taken into account. Most ac experiments using motors and transformers will perform normally with the ac output.