

# INSTRUCTION MANUAL FOR VOLTAGE REGULATOR USING IC 317

Voltage Regulation Circuits using IC 317 has been designed to study the working principle of a voltage regulator.

The instrument comprises of the following built in parts.

1. Step down transformer having 9V-0-9V AC tapes.
2. Rectifier section having two diodes (IN 4007) to convert the AC voltage to DC voltage.
3. Filter section having 2 electrolytic capacitor of  $1000\mu\text{f}/35\text{V}$  & 1 Inductance.
4. Regulator section consists of IC 317 and combination of resistance & capacitor.
5. Load section having different values of load resistance selectable using Band switch provided on the front panel.
6. Voltmeter and current meter are mounted on front panel to measure DC output voltage, Output current & one AC meter to measure Ripple directly.

## THEORY

A voltage regulator maintains the output voltage constant irrespective of a.c. mains fluctuations or load variation. The heart of a voltage regulator is a Zener Diode or Regulator (IC 317). Since Zener Diode or Regulator maintains constant voltage irrespective of their current after breakdown, regulation of voltage can be made available.

In an ordinary power supply, the voltage regulation is poor i.e DC output voltage changes appreciably with load current. Moreover, output voltage also changes due to variations in the input a.c. voltage. A regulated power supply consists of an ordinary power supply and voltage regulating device as shown in circuit diagram. The output of ordinary power supply is fed to the voltage regulator which produces the final output the output voltage (VDC) remains constant whether the load current changes or there are fluctuations in the input A.

## PROCEDURE

1. Connect the circuit as shown in Fig 1. Also connects DC voltmeter and current meter in the space provided (shown by dotted line at the front panel).
2. Connect electronic AC voltmeter (1V/ 10Volts) at output to measure the ripple directly.
3. Connect load ( $R_L$ ) in circuit for measuring DC output current.
4. Switch ON the instrument using ON/ OFF toggle switch provided on the front panel.
5. Note down the observations i.e. DC output voltage, DC current and AC ripples on the meters.
6. Switch ON the toggle switch S1 to connect the capacitor C1 in the circuit again check the DC output voltage, DC current and AC ripples.
7. Switch ON toggle switch S2 so that capacitor C2 also appears in the circuit. Now the filter circuit is in  $\pi$  type configuration, set the output DC voltage by using potentiometer VR1. Again note down output voltage output current and A.C. ripple.
8. Repeat the experiment for different values of load resistances.

## STANDERED ACCESSORIES

1. Fourteen single point & one interconnectable patchcords.
2. Instruction Manual.

### VOLTAGE REGULATION USING IC 317

