

## DC REGULATED 5V, 12V POWER SUPPLY

Regulated power supplies are commonly used in engineering projects which generally find its use in Embedded or Micro controller projects. The circuit description can be detailed below.

### +5V SUPPLY UNIT

The circuit diagram of +5V is shown in the figure 1. +5V supply is obtained from the +5V supply unit for microcontroller and digital ICs. Initially 230 V AC supply is reduced to (0-9V) with the help of a step down transformer having a capacity of 500mA. Since the input voltage to the regulator IC should be more than its output voltage, transformer secondary voltage is 9V. This low voltage is rectified with the help of bridge rectifier. The ripples are minimized with the help of capacitor filter to get a smooth DC supply. The rating of the chosen capacitor filter is 1000 $\mu$ F. The regulated DC voltage is obtained by using a regulator IC 7805. In the case of IC 7805, the unregulated DC voltage is applied to Pin 1, and the output is taken at Pin 3 and Pin 2 is grounded. Another capacitor filter of rating 10 $\mu$ F is connected at the output of regulator IC to eliminate the voltage oscillations at the output due to the large voltage oscillations at the input of the regulator.

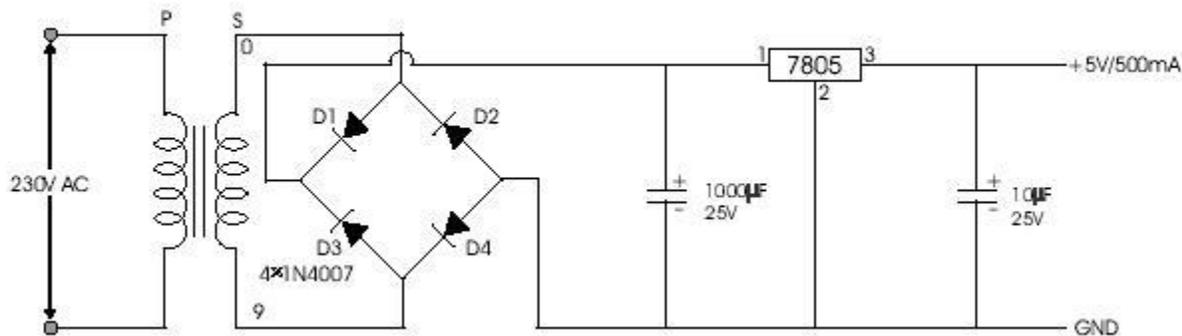


Figure 1: +5V Supply Unit

### +12V SUPPLY UNIT

The  $\pm 12$  V supply required by the OP amps is provided by the 12V supply circuit arrangement. The circuit diagram of  $\pm 12$ V power supply unit is shown in figure 2. Initially 230 V AC supply is reduced to (15V-0-15V) with the help of a step down transformer having a capacity of 1A and the center tap of the transformer is grounded. This low voltage is rectified with the help of bridge rectifier. Since the input voltage to the regulator IC should be more than its output voltage, transformer secondary voltage is 15V-0-15V. The ripples are minimized with the help of capacitor filter to get a smooth DC supply. The rating of the chosen capacitor filter is 1000 $\mu$ F. The regulated DC output voltage is obtained by using regulator ICs. For regulated +12V DC supply, IC 7812 is used and for regulated -12V DC supply, IC 7912 is used. In the case of IC 7812 the unregulated DC voltage is applied to Pin 1, and the output is taken at Pin 3 and Pin 2 is grounded. In the case of 7912, the unregulated DC voltage is applied to Pin 2, the output is taken at Pin 3 and Pin 1 is grounded. The pair of capacitors of 10 $\mu$ F is connected at the output as shown in figure to eliminate the voltage oscillations at the output due to the large voltage oscillations at the input of the regulator.

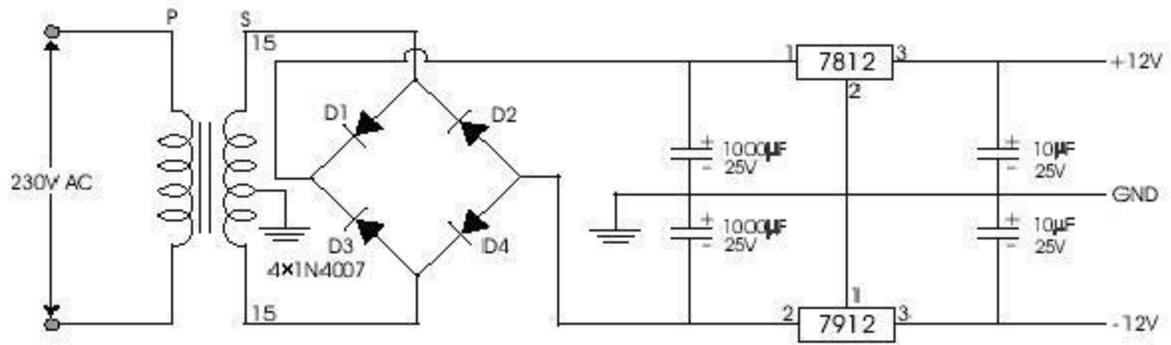


Figure 2:  $\pm 12V$  Supply Unit