TRANSFORMER SELECTION GUIDE

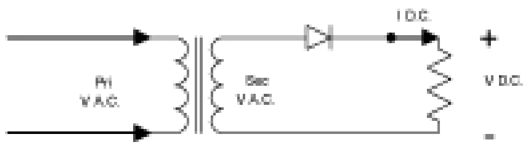
Transformer Voltage: A transformer's secondary A.C. voltage required varies greatly with the type of rectifier chosen and filter arrangement. Use the formulas below as a guide based on the D.C. voltage you require and the rectifier/filter chosen. All A.C. voltage references are R.M.S. Don't forget to take into account losses (not included in this guide), especially diode voltage drop. Leave an adequate safety margin for D.C. regulator voltage requirements and minimum operating line voltage.

Transformer Current Ratings: A transformer's A.C. current rating needs to be recalculated from the D.C. load current. The required current varies with type of rectifier chosen and filter type. Use the formulas below as a guide, shown for common D.C. supplies. Included in the formulas is higher peak to peak capacitor charging current in the filter.

Rectifier Selection Notes: When selecting rectifiers remember, average current in a full wave circuit is .5 x I D.C. per diode. In a half wave circuit, average current is equal to I D.C. per diode. A rating at least twice the output current is recommended to cover turn on surge. In full wave circuits, the reverse voltage rating should be in excess of 1.4 x V A.C. In half wave circuits, the reverse voltage rating should be in excess of 2.8 x V A.C.

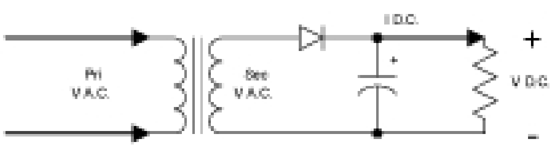
Capacitor Selection Notes: When choosing capacitor voltage, allowances should be made for D.C. voltage rise due to transformer regulation. Remember, RMS ripple current in a filter capacitor can be 2 to 3 times D.C. load current. Capacitor life is greatly increased by reducing it's temperature via less RMS current or reduced ambient temperature.

HALF WAVE Resistive Load



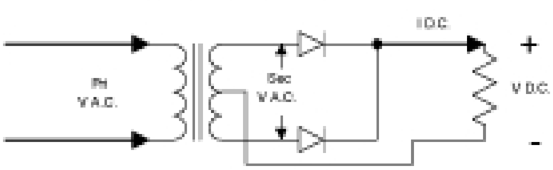
V D.C. = 0.45 X Sec. V A.C.
I D.C. = 0.64 X Sec. I A.C.

HALF WAVE Capacitor Input Load



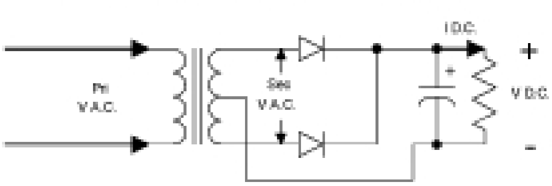
V (Peak) D.C. = 1.41 X Sec. V A.C.
V (Avg) D.C. = 0.90 X Sec. V A.C.
I D.C. = 0.28 X Sec. I A.C.

FULL WAVE Resistive Load



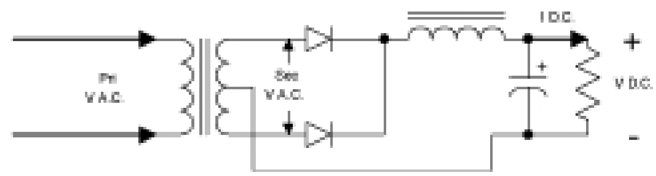
V D.C. = 0.45 X Sec. V A.C.
I D.C. = 1.27 X Sec. I A.C.

FULL WAVE Capacitor Input Load



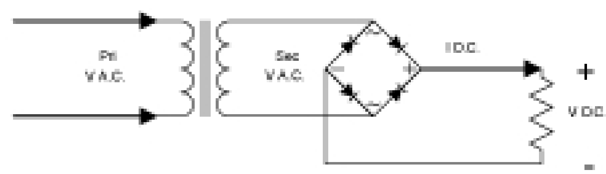
V (Peak) D.C. = 0.71 X Sec. V A.C.
V (Avg) D.C. = 0.45 X Sec. V A.C.
I D.C. = 1.00 X Sec. I A.C.

FULL WAVE Choke Input Load



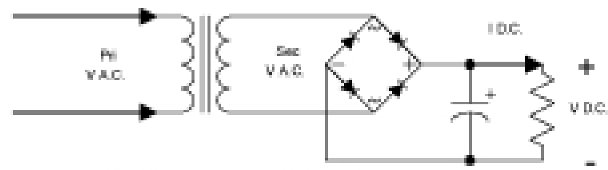
V (Peak) D.C. = 0.45 X Sec. V A.C.
V (Avg) D.C. = 0.45 X Sec. V A.C.
I D.C. = 1.54 X Sec. I A.C.

FULL WAVE BRIDGE Resistive Load



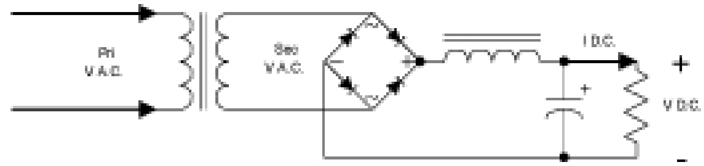
V D.C. = 0.90 X Sec. V A.C.
I D.C. = 0.90 X Sec. I A.C.

FULL WAVE BRIDGE Capacitor Input Load



V (Peak) D.C. = 1.41 X Sec. V A.C.
V (Avg) D.C. = 0.90 X Sec. V A.C.
I D.C. = 0.62 X Sec. I A.C.

FULL WAVE BRIDGE Choke Input Load



V (Peak) D.C. = 0.90 X Sec. V A.C.
V (Avg) D.C. = 0.90 X Sec. V A.C.
I D.C. = 0.94 X Sec. I A.C.