

Single phase full bridge converter

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Single Phase Full Wave Controlled Rectifier is similar to Single Phase diode bridge rectifier but the only difference is that diodes are replaced by thyristors.

The controlled bridge type converters are classified into two classes:

Fig. 1 (a) shows the typical circuit diagram of single-phase fully controlled bridge converter. It consists of four SCRs T1 to T4 and they are connected in bridge type configuration driving the resistive load.

The operation of single-phase fully controlled converter consists of three modes:

At $\omega t = 0$ instant, the supply voltage goes through zero, after $\omega t = 0$, the supply goes towards positive, i.e. during positive half cycle of AC input voltage, thyristors T1 and T2 are fired at $\omega t = \alpha$, thus the average output voltage is equal to the supply voltage (i.e. $V_0 = V_S$). The current flows from point L through thyristor T1 through load resistance through T2 to point N. The load current is positive and has the same shape as that of AC mains input voltage. The load voltage and load current are in phase. At $\omega t = \pi$ instant, the supply voltage goes through zero, the conducting SCRs T1 and T2 are turned off due to natural commutation. At this instant, both load voltage and load currents are zero.

At $\omega t = \pi$, the supply becomes zero, after $\omega t = \pi$ the supply voltage reverses polarities. Therefore, in this mode of operation, no SCR conducts. Both load voltage and load currents are zero.

At instant $\omega t = \pi + \alpha$ i.e. during negative half cycle of AC input voltage, the SCRs T2 and T4 are fired at $\omega t = \pi + \alpha$. Therefore, the load is directly connected to supply voltage and average output voltage is equal to the instantaneous supply voltage (i.e. $V_0 = V_S$). The load voltage is positive and load current is continuous positive. The SCRs T2 and T4 continue to conduct upto 2π . At $\omega t = 2\pi$, the supply goes through zero, so conducting thyristors T2 and T4 will turn-off at $\omega t = 2\pi$, due to line natural commutation.

In this topic, you study Single Phase Transformer. The transformers are designed to operate either…

Single Phase Full Wave Controlled Rectifier with RL load consists of four thyristors T1 to…

Single phase half wave controlled rectifier consists of single thyristor feeding DC power to the…

In this topic, you study Full Wave Bridge Rectifier - Circuit Diagram, Working & Waveforms.…

In this topic, you study Single Phase Rectifier - Circuit Diagram, Working, Types & Waveforms.…



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