1 phase full bridge inverter

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Definition: A full bridge single phase inverter is a switching device that generates a square wave AC output voltage on the application of DC input by adjusting the switch turning ON and OFF based on the appropriate switching sequence, where the output voltage generated is of the form +Vdc, -Vdc, Or 0.

The construction of full-bridge inverter is, it consists of 4 choppers where each chopper consists of a pair of a transistor or a thyristor and a diode, pair connected together that is

From graph at 0 to T/2 if we apply DC excitation to RLC load. The output load current obtained is in the sinusoidal waveform. Since the RLC load is being used the reactance of the RLC load is represented in 2 conditions as XL and XC

Case1: From f to p, V0 > 0 and I0 > 0 then switches S1, S2 conductsCase2: From 0 to f, V0 > 0 and I0 < 0 then diodes D1, D2 conductsCase3: From p + f to 2 p, V0 < 0 and I0 < 0 then switches S3, S4 conductsCase4: Form p to p + f, V0 < 0 and I0 > 0 then diodes D3, D4 conducts.

From the graph, we can observe that “f to p - f”, S1and S2 is conducting and after “p - f”, D1, D2 are conducting, at this point, the forward voltage drop across D1 and D2 is 1 Volt. Where S1 and S2 are facing negative voltage after “p - f” and so S1 and S2 turn off. Hence self commutation is possible in this case.

From the graph, we can observe that “o to f”, D1 and D2 are conducting, and from p to f, S1, and S2 are conducting and are short-circuited. After “f” D3 and D4 conduct only if S1 and S2 are turned off, but this condition can be satisfied only by forcing S1 and S2 to turn off. Hence, we use the concept of forced commutation.

3). Self-commutation is possible only in leading power factor load or underdamped system at of circuit turn off time tc = f / w0. Where w0 is the fundamental frequency.

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