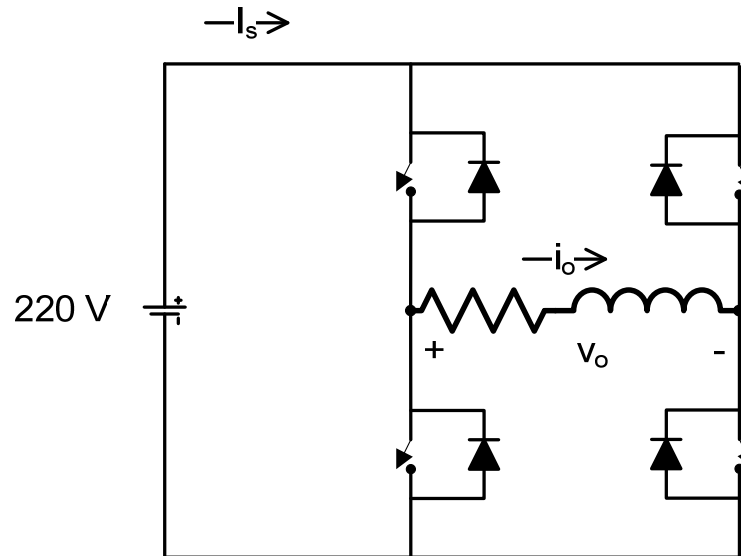


Consider the full-bridge inverter below. The ac load inductance is 15 mH and the resistance is 10 Ω .



The switching scheme of the inverter is a single-pulse-width modulation. The rms and frequency of the output voltage is 120 V and 60 Hz respectively.

- Calculate the output voltage pulse width.
- Calculate the rms of up to the 13th harmonic order and the THD of the output voltage v_o and current i_o .
- What is the power consumed by the load, the displacement factor and power factor.
- Simulate the above inverter in SIMULINK along with a suitable grid control to generate the desired voltage. Show plots of the output for 1 steady state period. Then use the FFT routine in the powergui to compare the voltage and current harmonics with the theoretical calculations above.