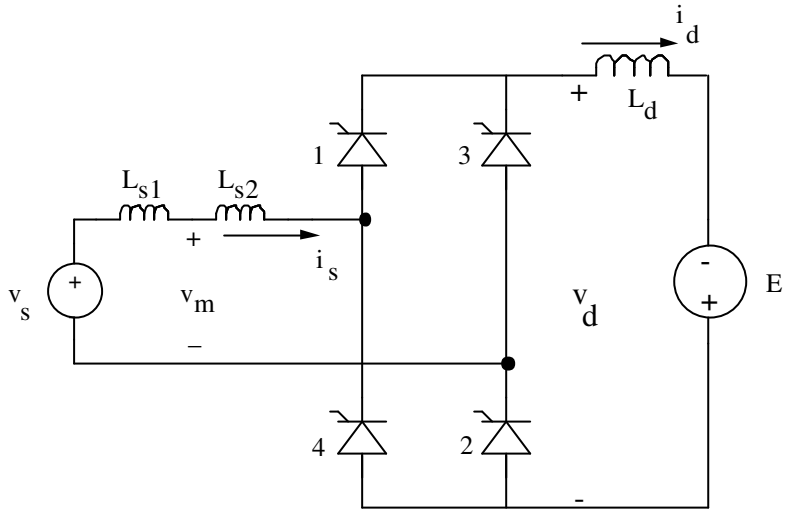
EXAMPLE 4

1-Phase Thyristor Inverter



Nominal Values: V_S(rms) = 120 V at 60 Hz
L_{S1} = 0.2 mH
L_{S2} = 1.0 mH
L_d = 20 mH
E = 88 V (dc)
delay angle α = 135°

Problems

1. (a) Obtain v_S, v_d and i_d waveforms using Thyinv1.
   (b) Obtain v_S and i_S waveforms.

2. Calculate I_S, %THD in the input current, the input displacement power factor and the input power factor.

3. Study the startup of inverter operation. Increase the delay angle to a value close to 180° (for example, 150°) and look at the v_S, v_d and i_d waveforms. Repeat the above procedure by reducing α slowly to its nominal value of 135°. Plot the average dc current I_d versus α.

Reference: Section 6-3-4, pages 135 - 138.

PSpice Schematic: Thyinv1