Problem 8-1

$V_d = 295 - 325V$, $m_a \leq 1.0$

(a) From Eq. 8-19, voltage rating of the inverter $V_{01,max}^{(rms)} = \frac{V_{d,min}}{\sqrt{2}} = 208.6$ V

(b) $$I_{o,max} = \frac{2000}{208.6} = 9.6A$$

$$\hat{I}_{o,max} = \sqrt{2} \times I_{o,max} \simeq 13.6A$$

switch voltage rating $V_T = V_{d,max} = 325V$

switch current rating $I_T = \hat{I}_{o,max} = 13.6A$

number of switches $q = 4$

$\therefore$ Combined Switch Utilization Ratio $= \frac{\text{Rated volt-ampere}}{qV_TI_T}$

$$= \frac{2000}{4x325x13.6} = 0.113$$

[In practice, it will be substantially lower as discussed in the book]

Problem 8-2