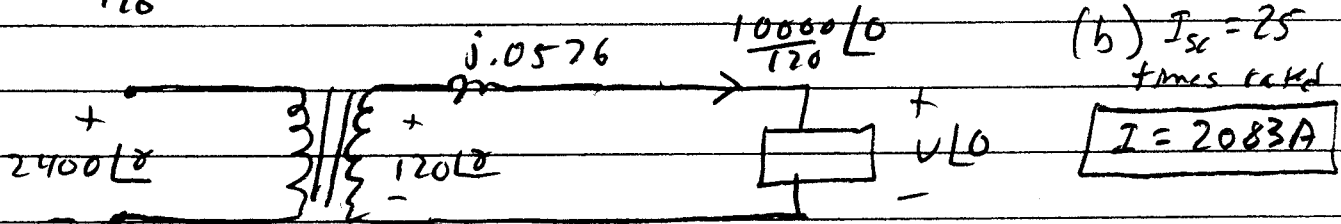


#1 $P_{3\phi} = |\bar{S}| = \sqrt{3} \times 230 \times 8 = 3,187$ $Q_{3\phi} = 2400 \text{ VARs}$
with C

$|\bar{S}_{3\phi}| = \sqrt{3,187^2 + 2400^2} = 3,990 \text{ VA} = \sqrt{3} \times 230 \times I_L$
without C without C

$I_L = 10 \text{ Amps}$
without C

#2 $Z_{\text{rated}} = \frac{120}{10,000/120} = 1.44 \Omega$ $X_{120} = .04 \times 1.44 = .0576 \Omega$



(a) $120 \angle 0 = j.0576 \times \frac{10000}{120} \angle 0 + V \angle 0 = V + j4.8$
 $120^2 = V^2 + 4.8^2$ $V = 119.9 \text{ V}$

#3 $15 \text{ Nm} = \frac{3 \left(\frac{230}{\sqrt{3}} \right)^2}{\frac{1}{3} \times 377}$
 $S = .071$
 $.071 = \frac{1200 - \text{RPM}}{1200}$ $\text{RPM} = 1115$
 $\bar{I}_1 = \frac{230/\sqrt{3}}{j40} + \frac{230/\sqrt{3}}{2/.071}$

$|\bar{I}_1| = 5.8 \text{ A}$

#4 $Q_{sc} = 180 = 2400^2 / R_c$ $R_c = 31,135 \Omega$
 $Q = \sqrt{(2400 \times 2083)^2 - 185^2} = 464 = \frac{2400^2}{X_m}$ $X_m = 12,400 \Omega$

$S_{sc} = 615 = 20.83^2 / (r_1 + r_2')$ $r_1 + r_2' = 1.417$ split equal
 $|\bar{I}| = \frac{5^2}{20.83} = 2.5 = \sqrt{1.417^2 + (x_1 + x_2')^2}$ $x_1 + x_2' = 2.05$ split equal