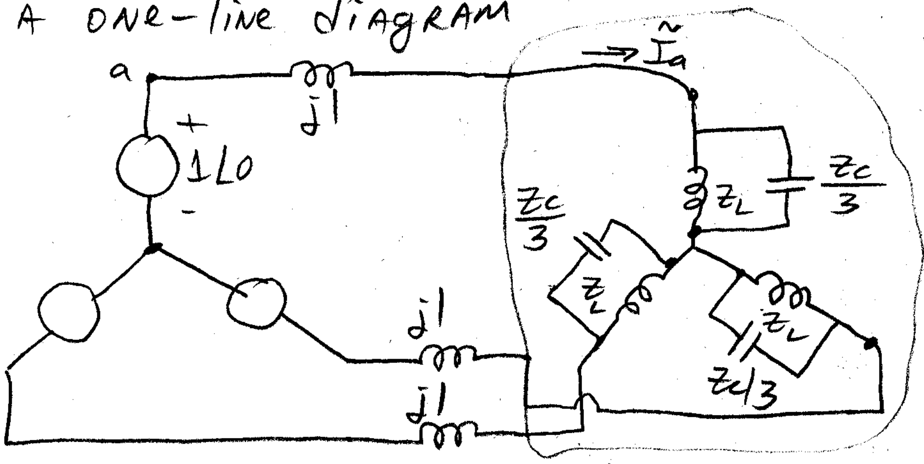
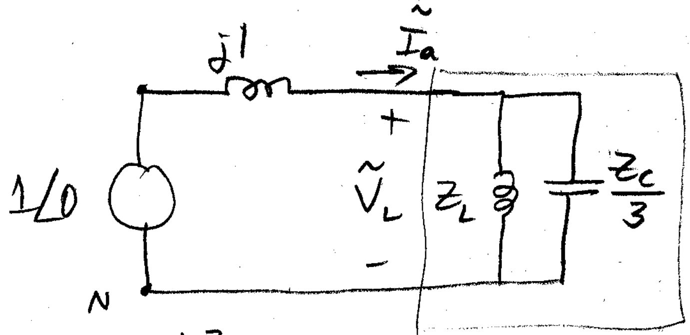
Balanced! So, convert deltas to wyes, and draw a one-line diagram



$Z_L = j10$
$Z_C = -j10$

"The load" (3φ)

One-line



"The load" (one-line)

$$\tilde{V}_L = 1\angle 0 \left[\frac{Z_L \| \frac{Z_C}{3}}{j1 + Z_L \| \frac{Z_C}{3}}\right].$$

$$Z_L \| \frac{Z_C}{3} = (j10) \| \left(\frac{-j10}{3}\right) = \frac{(j10)(-j10/3)}{j10 - j10/3} = \frac{100/3}{j\,20/3} = -j5\,\Omega$$

$$\tilde{V}_L = 1\angle 0 \left[\frac{-j5}{j1 - j5}\right] = 1\angle 0\left[\frac{-j5}{-j4}\right] = 1.25\angle 0$$

(yes, the voltage can rise when caps are in the circuit!)

Now, $\tilde{I}_a = \frac{1\angle 0}{j1 - j5} = \frac{1\angle 0}{-j4} = j0.25\,A$

So $S_{1\phi\,\text{source}} = V_{aN} I_a^* = (1\angle 0)(-j0.25) = -j0.25\,VA$

$S_{3\phi\,\text{source}} = 3S_{1\phi\,\text{source}} = -j0.75\,VA = -0.75\,VAr$ ← supplied by the source

$$\tilde{I}_{CAP\,1\phi} = \frac{\tilde{V}_L}{Z_C/3} = \frac{1.25\angle 0}{-j10/3} = j\,\frac{3(1.25)}{10} = j0.375A$$

Now, the $\tilde{I}_{cap}$ in the picture is $\tilde{I}_{ab}$ in a delta, We solved for $\tilde{I}_{aN}$ in a wye. From the three-phase phasor diagram, we know that

$$\tilde{I}_{ab} = \frac{\tilde{I}_{aN}}{\sqrt{3}} \cdot 1\angle 30 = \frac{j0.375}{\sqrt{3}} \cdot 1\angle 30 = 0.217\angle 120° \text{ A}$$

For the load S,

$$S_{LOAD\,1\phi} = V_{LOAD} I_a^* = (1.25)(-j0.25) = -j0.313\text{VA} = -0.313\text{VAr}$$

$$S_{3\phi} = 3S_{1\phi} = -0.939 \text{ VAr}$$

Now, lets check for conservation of P, Q in 1ϕ

Supplied by source

$P = 0$

$Q = -0.25$

Consumed by the load

$P = 0$

$Q = -0.313\text{VAr}$

Consumed by line j1

$Q = I^2X = (0.25)^2(1) = 0.0625$

$-0.25 \overset{?}{=} -0.313 + 0.0625$ OK ✓