

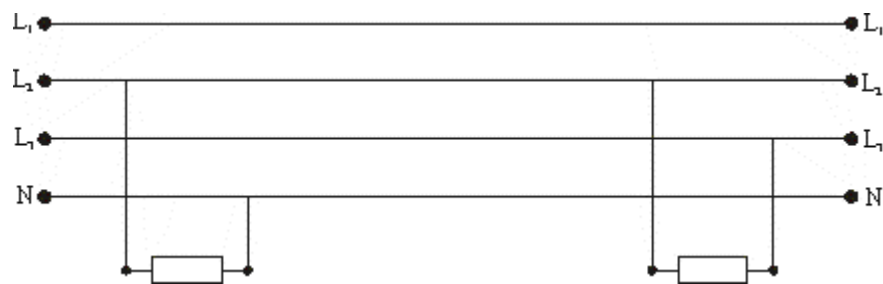
7.21 Til en 4-leder 400/230 V gruppeledning er sluttet to belastninger:
Mellem fase L2 og N er forbundet en induktiv belastning på 990 W
ved $\cos\phi = 0,75$. Mellem faserne L2 og L3 er tilsluttet en ohmsk
belastning på 3040 W.

- Find strømmene i netlederne.
Sikringen i gruppeledningens fase L2 brænder over
- Find strømmene i fase L3 og i nullederen
- Find den samlede effekt P i watt.

$$U_N := 400 \cdot V$$

$$U_f := \frac{U_N}{\sqrt{3}}$$

$$U_f = 230.94 \text{ V}$$



$$P_{Z1} := 990 \cdot W$$

$$\cos\phi_{Z1} := 0.75$$

$$\angle\phi_{Z1} := \arccos(\cos\phi_{Z1})$$

$$\angle\phi_{Z1} = 41.41 \cdot \text{deg}$$

$$S_{Z1} := \frac{P_{Z1}}{\cos(\angle\phi_{Z1})}$$

$$S_{Z1} = 1320 \cdot V \cdot A$$

$$Z_1 := \frac{U_f^2}{S_{Z1}}$$

$$Z := 40 \cdot \Omega$$

$$P_{R2} := 3040 \cdot W$$

$$R_2 := \frac{U_N^2}{P_{R2}}$$

$$R_2 = 52.632 \Omega$$

$$R_1 := Z_1 \cdot \cos(\angle\phi_{Z1})$$

$$R_1 = 30.303 \Omega$$

$$X_{L1} := Z_1 \cdot \sin(\angle\phi_{Z1})$$

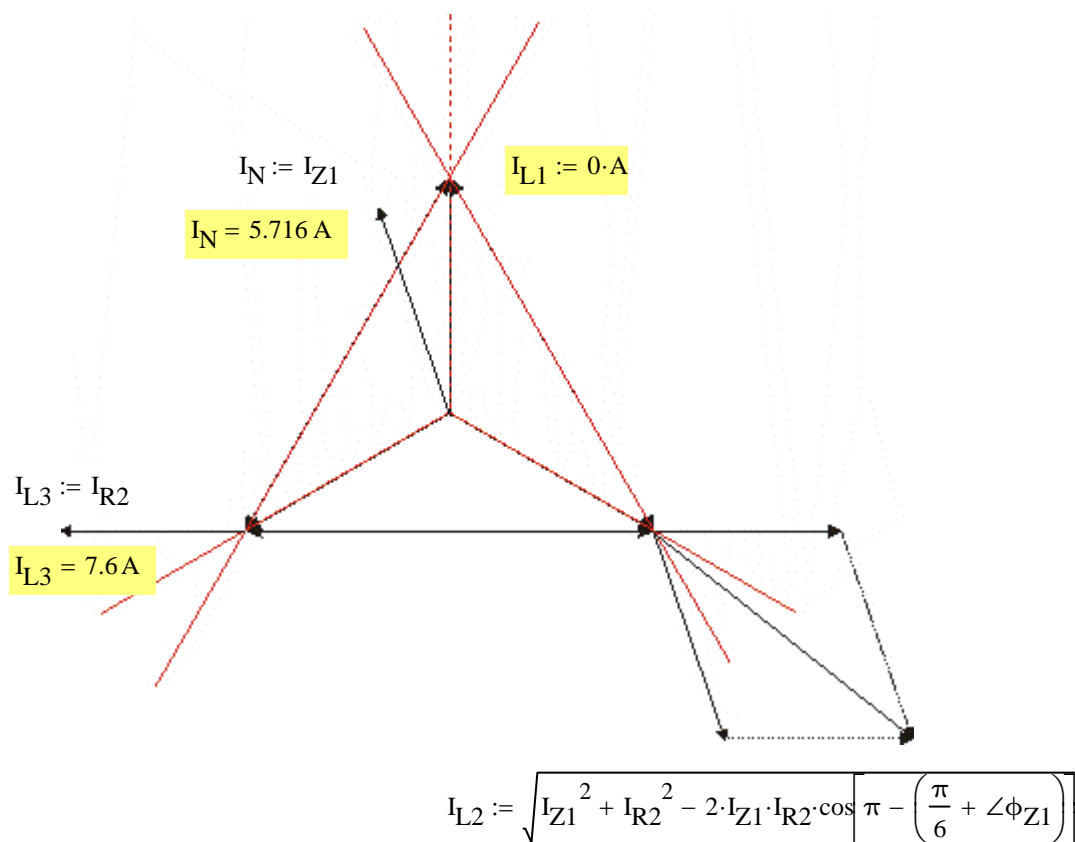
$$X_{L1} = 26.725 \Omega$$

$$I_{Z1} := \frac{P_{Z1}}{U_f \cdot \cos\phi_{Z1}}$$

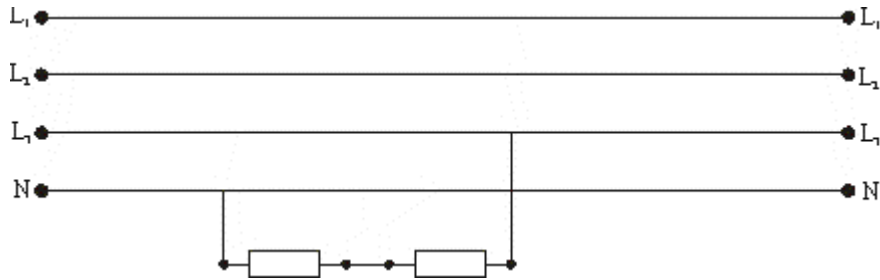
$$I_{R2} := \frac{P_{R2}}{U_N}$$

$$I_{Z1} = 5.716 \text{ A}$$

$$I_{R2} = 7.6 \text{ A}$$



$$I_{L2} = 10.869 \text{ A}$$



$$Z := \sqrt{(R_1 + R_2)^2 + (X_{L1})^2}$$

$$Z = 87.134 \Omega$$

$$\cos\phi_Z := \frac{R_1 + R_2}{Z}$$

$$\cos\phi_Z = 0.952$$

$$P := \frac{U_f^2}{Z} \cdot \cos\phi_Z$$

$$P = 582.583 \text{ W}$$