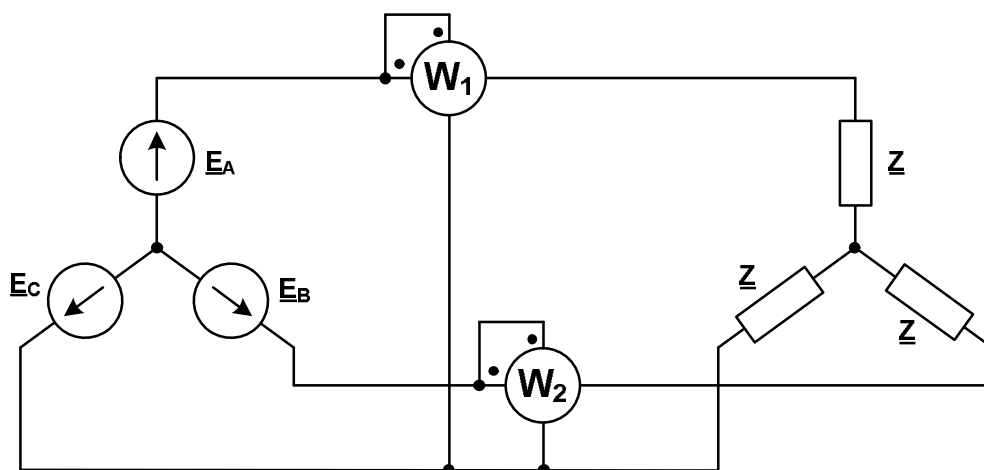


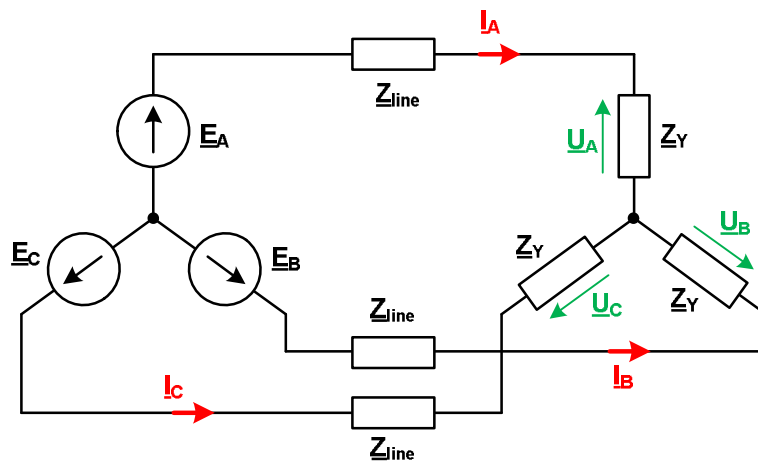
Module name: **Electrical Circuits 2**
Module ID: **IS-FEE-10085S**
Module type: **Class**
Semester: **summer 2024/2025**
Instructor: **Jarosław Forenc**, j.forenc@pb.edu.pl

Class 6 (08.04.2025)

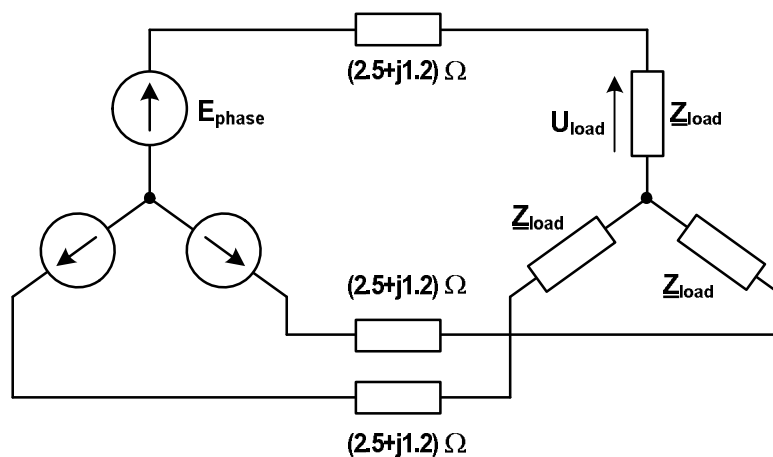
1. In a 3-phase balanced Y-Y system, the source voltage is $E_{\text{phase}} = 230 \text{ V rms}$. The impedance per phase is $\underline{Z} = (8+j6) \Omega$. Check whether an overcurrent circuit breaker with a rated current of 10 A is sufficient to protect this circuit. Also, find the active power of the load and the readings of the wattmeters.



2. In a 3-phase balanced Y-Y system, the source voltage is $E_{\text{phase}} = 230 \text{ V rms}$. The impedance per phase is $\underline{Z}_Y = (9+j9) \Omega$ and the line impedance per phase is $(0.5+j0.4) \Omega$. What should be the rated current of the overcurrent circuit breakers protecting this circuit? Standard rated currents are: 6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A, 80 A, 125 A. Calculate the active power losses in the power line. Also, calculate the percentage voltage drop across the load compared to the rated voltage.



3. In the 3-phase balanced Y-Y system, the load voltage is $U_{\text{load}} = 400 \angle -20^\circ \text{ V rms}$, the line impedance is $(2.5 + j1.2) \Omega$, and the source voltage is $E_{\text{phase}} = 440 \text{ V rms}$. Find the load impedance, its power, and the value of supplying current.



4. The line-to-line voltage of a balanced 3-phase distribution line is $U_{LL} = 380 \text{ V rms}$. The load impedance per phase is $Z_L = (30 + j20) \Omega$. Calculate the line currents and the active power of the load for the following configurations of load impedance:
- a) a wye-connected system, b) a delta-connected system.

