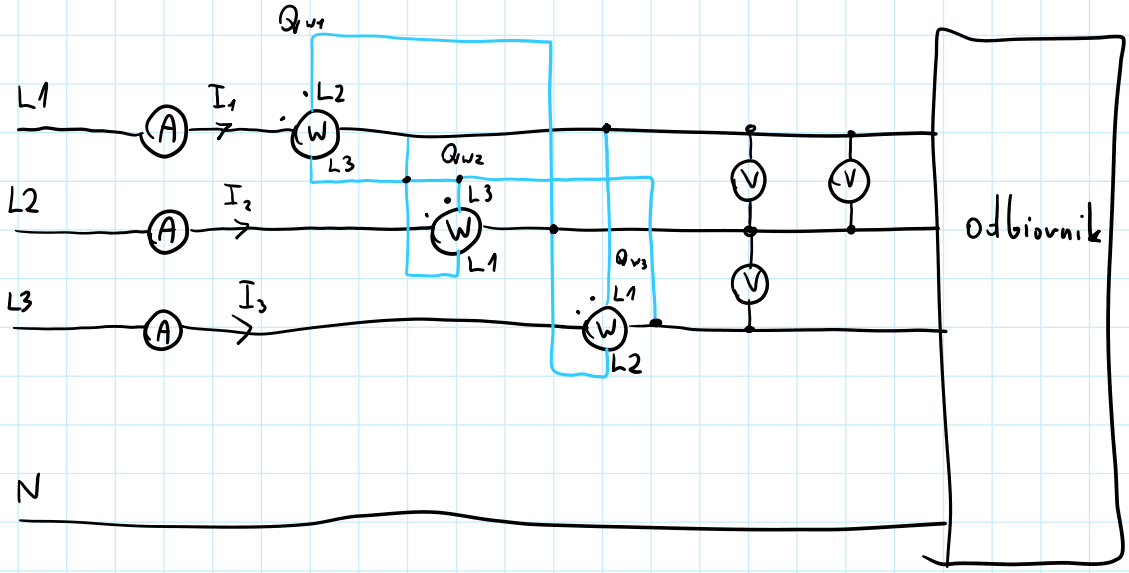
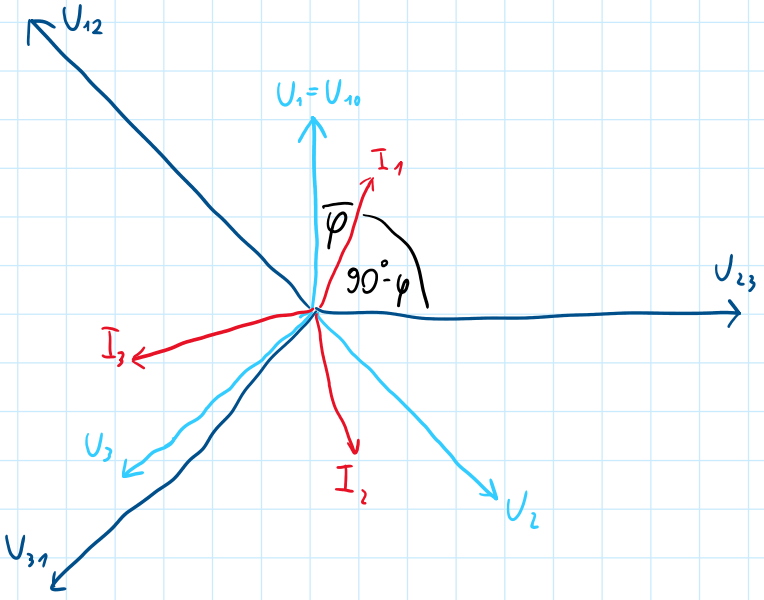
Wykład 12 - Pomiar mocy w 3-fazowym, 4-przewodowym, niesymetryczny odbiornik

sobota, 12 maja 2018 08:25

Pomiar mocy w obwodzie 3-fazowym, 4-przewodowym o niesymetrycznym odbiorniku jest realizowany w układzie:



WYKRES WSKAZOWY:

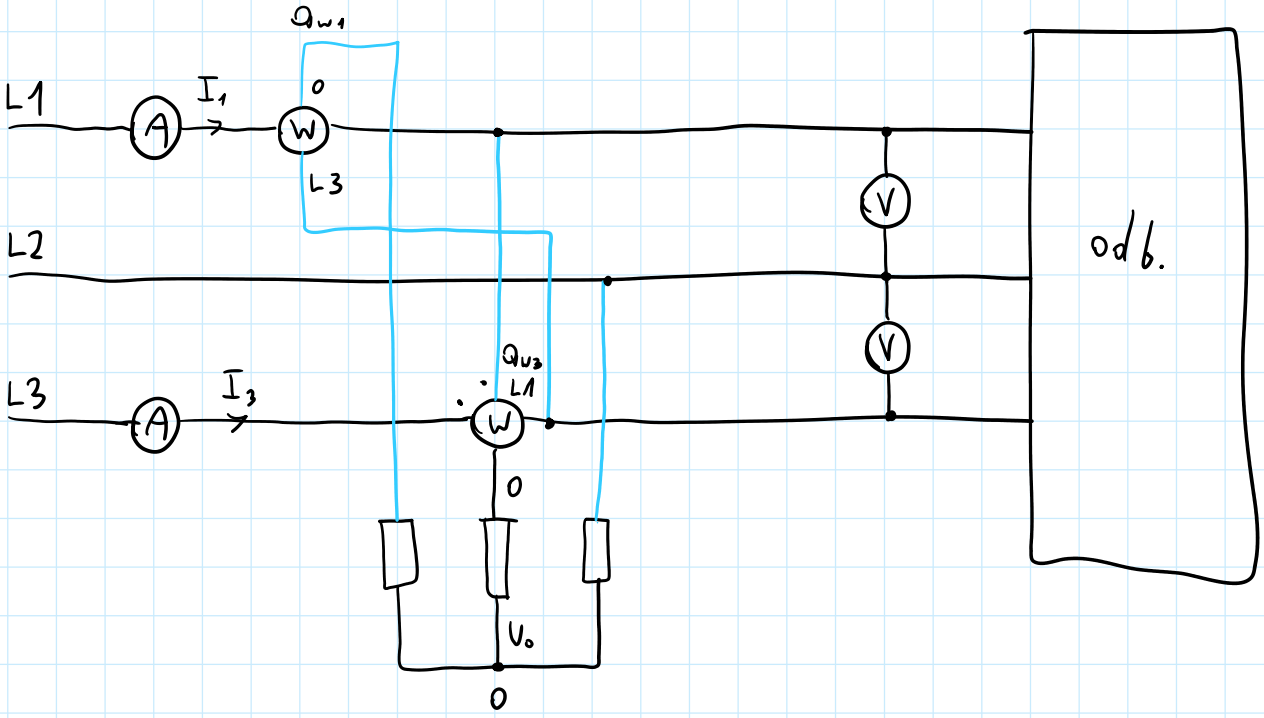


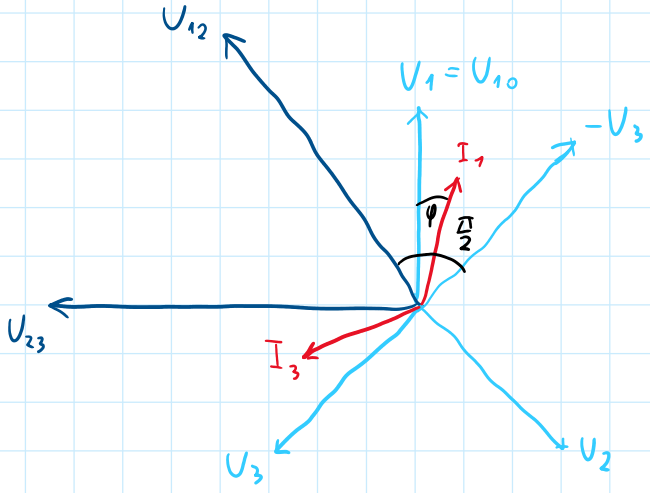
$$Q = Q_1 + Q_2 + Q_3 = \frac{U_{23} I_1 \sin\varphi_1}{\sqrt{3}} + \frac{U_{31} I_2 \sin\varphi_2}{\sqrt{3}} + \frac{U_{12} I_3 \sin\varphi_3}{\sqrt{3}}$$

$$Q = \frac{Q_{w1} + Q_{w2} + Q_{w3}}{\sqrt{3}}$$

POMIAR MOCY W OBW. 3-Fazowym 3-przew. niesymetrycznym odbiornik

UKŁAD ARONA:





$$Q_{w1} = U_3 I_1 \cos(90° - (30° + \varphi)) = U_3 I_1 \sin(30° + \varphi)$$

$$Q_{w3} = U_1 I_3 \cos(90° + 30° - \varphi) = U_1 I_3 \sin(30° - \varphi)$$

$Q_{w3} = U_1 I_3 \cos(90° + 30° - \varphi) = U_1 I_3 \sin(30° - \varphi)$

$Q_w = Q_{w1} + Q_{w3} = U_f I \left[\sin(30° + \varphi) - \sin(30° - \varphi) \right] = U_f I \cdot 2 \cos 30° \sin\varphi$

$U_1 = U_3 = U_f$
$I_1 = I_3 = I_f$

$= \sqrt{3} I 2 \cdot \frac{\sqrt{3}}{2} \cdot \sin\varphi = \sqrt{3} U_f I \sin\varphi = UI \sin\varphi$

$Q = \sqrt{3}(Q_{w1} + Q_{w3})$