

Calculation of the electrical data of capacitors

Example with AC capacitor in delta configuration: 3 x 82.9 μ F / 400 V, 50 Hz

$$Q_c = 3 \times U^2 \times \omega \times C$$

$$Q_c = 3 \times 400 \text{ V} \times 400 \text{ V} \times 314 \text{ Hz} \times 0.0000829 \text{ F}$$

$$Q_c = 12.495 \text{ kVAr}$$

$$I = \frac{Q_c}{U \times \sqrt{3}}$$

$$I = \frac{12495 \text{ VAr}}{400 \text{ V} \times 1.73}$$

$$I = 18.1 \text{ A}$$

Example with single-phase capacitor 74 μ F / 400 V, 50 Hz

$$Q_c = U^2 \times \omega \times C$$

$$Q_c = 400 \text{ V} \times 400 \text{ V} \times 314 \text{ Hz} \times 0.000074 \text{ F}$$

$$Q_c = 3.718 \text{ kVAr}$$

$$I = \frac{Q_c}{U}$$

$$I = \frac{3718 \text{ VAr}}{400 \text{ V}}$$

$$I = 9.3 \text{ A}$$

Legend:

- C = capacitance in farads
- Q_c = capacitive reactive power in kVAr
- ω = radial frequency at 50Hz: $2 \times 3.14 \times 50 \text{ Hz} = 314 \text{ Hz}$